CITY OF SANTA CLARITA
PLANNING COMMISSION MEETING

Tuesday, April 7, 2015
6:00 p.m.
City Council Chambers
23920 Valencia Boulevard
Santa Clarita, CA 91355

AGENDA

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the Planning Division at (661) 255-4330. Notification 48 hours prior to the meeting will enable the City to make reasonable arrangements to ensure accessibility to this meeting. (28CFR 35.102-35.104 ADA Title II)

CALL TO ORDER

FLAG SALUTE

ROLL CALL

APPROVAL OF AGENDA

APPROVAL OF MINUTES OF THE FEBRUARY 17, 2015, REGULAR MEETING

COMMISSION SECRETARY ANNOUNCEMENT

A. PUBLIC HEARINGS

ITEM 1 MASTER CASE NO. 15-007, UNIFIED DEVELOPMENT CODE AMENDMENT 15-001 (LOW IMPACT DEVELOPMENT (LID) ORDINANCE)

Case Planner: Oliver Cramer, Project Development Coordinator

Applicant: City of Santa Clarita, Environmental Services Division

Location: Citywide

Request: This is a request to update the City of Santa Clarita's Unified Development Code to be consistent with the Municipal Storm Water National Pollutant Discharge Elimination System Permit development standards including Low Impact Development requirements, as required by State Law.

Recommendation: Staff recommends the Planning Commission adopt Resolution P15-02, which recommends that the City Council approve Master Case No. 15-007, consisting of Unified Development Code Amendment 15-001.

ITEM 2 MASTER CASE NO. 14-198, CONDITIONAL USE PERMIT NO. 14-017, DEVELOPMENT REVIEW NO. 14-017

Case Planner: Mike Ascione, Assistant Planner II

Applicant: AT&T Mobility

Location: 25201 Via Princessa (APN 2841-061-903)

Request: The applicant, AT&T Mobility, is requesting a Conditional Use Permit (CUP) and Development Review (DR), to allow for the installation and operation of a wireless telecommunications facility to be located at Golden Oak Elementary School, 25201 Via Princessa, within the Public Institution (PI) zone.

Recommendation: Staff recommends the Planning Commission adopt Resolution P15-04, adopting the Negative Declaration and approving Master Case No. 14-198, Conditional Use Permit 14-017, Development Review 14-017 to allow for the installation and operation of a wireless telecommunications facility to be located at 25201 Via Princessa, at Golden Oak Elementary School, subject to the attached Conditions of Approval (Exhibit A).

B. PLANNING MANAGER'S REPORT

C. PLANNING COMMISSIONERS' REPORTS

D. PUBLIC BUSINESS FROM THE FLOOR

E. ADJOURNMENT

Complete packets are available for public inspection at the City Clerk's front counter and the Permit Center front counter. Any writings or documents distributed to a majority of the members of the Planning Commission regarding any open session item on this agenda will be made available for public inspection in the Permit Center located at 23920 Valencia Boulevard, Suite 140, during normal business hours. These writings or documents will also be available for review at the meeting. Thank you for attending your City Planning Commission meeting. If you have any questions or wish to know more about the City or the Community Development Department, please call (661) 255-4330 Monday through Thursday, 7:30 a.m. to 5:30 p.m. and Fridays 8:00 a.m. to 5:00 p.m.

CERTIFICATION

I, Jeff W. Hogan, do hereby certify that I am the duly appointed and qualified Planning Manager for the City of Santa Clarita, and that on April 3, 2015, between the hours of 9:00 a.m. and 5:00 p.m., the foregoing agenda was posted at City Hall, Valencia Library, and the Santa Clarita Sheriff's Station.

Jeff W. Hogan, AICP
Planning Manager
Santa Clarita, California

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MINUTES OF THE
REGULAR MEETING OF THE PLANNING COMMISSION
OF THE CITY OF SANTA CLARITA

Tuesday
February 17, 2015
6:00 p.m.

CALL TO ORDER

The meeting of the Planning Commission of the City of Santa Clarita was called to order by Chair Trautman at 6:00 p.m. in the City Council Chambers, 23920 Valencia Boulevard, Santa Clarita, California.

FLAG SALUTE

Commissioner Heffernan led the flag salute.

ROLL CALL

Chair Trautman, Vice Chair Ostrom, and Commissioners Eichman, Burkhart, and Heffernan were present.

APPROVAL OF AGENDA

A motion was made by Commissioner Burkhart and seconded by Commissioner Heffernan to approve the agenda. Said motion was approved by a vote of 5-0.

APPROVAL OF THE MINUTES OF THE JANUARY 20, 2015, STUDY SESSION

A motion was made by Vice Chair Ostrom and seconded by Commissioner Burkhart to approve the minutes of the January 20, 2015, study session. Said motion was approved by a vote of 5-0.

APPROVAL OF THE MINUTES OF THE JANUARY 20, 2015, REGULAR MEETING

A motion was made by Commissioner Heffernan and seconded by Vice Chair Ostrom to approve the minutes of the January 20, 2015, regular meeting. Said motion was approved by a vote of 5-0.

PUBLIC HEARING

ITEM 1 MASTER CASE NO. 14-143, TENTATIVE TRACT MAP 73066, DEVELOPMENT REVIEW 14-012, OAK TREE PERMIT 14-014

Jason Smisko, Senior Planner, gave the staff report and computer slide presentation.

The public hearing was opened at 6:15 p.m.

Ed Poulin, the applicant, spoke in support of the project. Kevin Haub, the project architect was available for the Commission's architectural questions.

Susan Grogan, Dave Grogan, Max Morgan, Pamela Morgan, and Vytas Keblys submitted written comments in support of the project.

Commissioner Heffernan commended the applicant on the architecture of the project and for removing one unit from the original submission to protect the oak trees. He also had a question about oak tree maintenance and the applicant informed him that there will be an HOA and landscape contractor maintaining the trees upon project completion. Chair Trautman requested that the oak tree recommendations be highlighted in the conditions of approval.

At the request of the Commission the following conditions were added or modified in italics:

EN5. Prior to Tract Map approval, the applicant shall obtain approval from the City Engineer and the City Attorney for Covenants, Conditions, and Restrictions (CC&Rs) for this development. The applicant shall reimburse the City for the City Attorney's review and approval fee. The CC&Rs shall include a disclosure to comply with the Geologist's recommendations in the Geology Report *and shall include language to ensure post construction monitoring on all impacted oak trees for a period of three (3) years.*

OT6. The applicant shall be required to perform post construction monitoring on all impacted oak trees for a period of three (3) years. Oak Tree Monitoring Reports shall be submitted every six months by a qualified Oak Tree Consultant. All reports shall be submitted to the City Oak Tree Specialist by e-mail. *This condition shall be noted in the development's CC&Rs.*

OT13. *The applicant shall follow the recommendations in the oak tree report dated January 7, 2015.*

The public hearing was closed at 6:29 p.m.

A motion was made by Commissioner Burkhart and seconded by Commissioner Heffernan to adopt Resolution P15-03, approving Master Case No. 14-143 with the attached Conditions of Approval (Exhibit A). A roll call vote was taken. Said motion was carried by a vote of 5-0.

PLANNING MANAGER'S REPORT

Jeff Hogan, Planning Manager, informed the Commissioners that their next meeting will be on March 17, 2015.

PLANNING COMMISSIONERS' REPORTS

There were no reports.

PUBLIC BUSINESS FROM THE FLOOR

Sandy Logan came to follow up on the information she presented to the Commission at the last meeting about alcohol retailer training. She informed the Commission about a new program she is implementing to gather data.

Dennis Conn spoke to the Commission about the riverbed cleanup.

ADJOURNMENT

A motion was made by Vice Chair Ostrom and seconded by Commissioner Heffernan to adjourn the meeting. Said motion was approved by a vote of 5-0, and the meeting was adjourned at 6:36 p.m.

Diane Trautman

Diane Trautman, Chair
Planning Commission

Jeff W. Hogan AICP, Planning Manager
Community Development

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CITY OF SANTA CLARITA
STAFF REPORT
MASTER CASE NO. 15-007
UNIFIED DEVELOPMENT CODE AMENDMENT (UDCA) 15-001
(LOW IMPACT DEVELOPMENT (LID) ORDINANCE)

DATE:	April 7, 2015
TO:	Chairperson Trautman and Members of the Planning Commission
FROM:	Jeff Hogan, AICP, Planning Manager
CASE PLANNER:	Oliver Cramer, Project Development Coordinator
APPLICANT:	City of Santa Clarita, Environmental Services Division
LOCATION:	Citywide
REQUEST:	This is a request to update the City of Santa Clarita's Unified Development Code to be consistent with the Municipal Storm Water National Pollutant Discharge Elimination System Permit development standards including Low Impact Development requirements, as required by State Law.

BACKGROUND

In late 2012, the Municipal Stormwater National Pollutant Discharge Elimination System Permit (Permit) became effective. This is the fourth iteration of the Permit issued by the State of California to municipalities since 1990 as part of the Federal Water Pollution Control Act (Clean Water Act). The current version of the Permit contains many new requirements related to the management of surface water quality that affects the City of Santa Clarita and 84 other cities throughout Los Angeles County. One of the new requirements is to develop a new plan called an Enhanced Watershed Management Plan to narrow down the requirements and direct resources to focus on pollutants specific to those found in the Santa Clara River. The City is working collaboratively with Los Angeles County to develop a plan for the Santa Clarita Valley.

The Permit contains provisions requiring specific development projects to implement Low Impact Development (LID) practices to infiltrate and/or retain and re-use run-off water from precipitation on-site. The term "Low Impact Development" consists of building in landscape features or storage vessels designed to retain stormwater runoff water and filter pollutants and therefore preventing polluted runoff from entering the storm drain system and affecting local waterways.

Agenda Item: 1

Low impact development guidelines were included in the City's adopted General Plan's Conservation and Open Space Element by way of stated objectives and policies to limit disruption of natural hydrology, reducing impervious cover, increasing on-site infiltration, and managing stormwater runoff at the source. Recent City capital improvement projects have incorporated low impact development strategies into their design including the McBean Transfer Station, Old Town Newhall Library, and the Valencia Library parking lot expansion.

The County adopted a similar ordinance in November 2013 to reflect the new stormwater runoff water quality and hydromodification requirements for new development and redevelopment projects. The County ordinance affects development projects in the unincorporated areas of the Santa Clarita valley. Local developers have been aware of this design concept for several years.

This item was originally agendized for the March 17, 2015, Planning Commission meeting. However, due to a lack of quorum, the item has been re-advertised and is being held at tonight's meeting.

PROJECT DESCRIPTION

The LID ordinance is a requirement of the Stormwater Permit. This ordinance is intended to enhance the City's current Standard Urban Stormwater Mitigation Plan ordinance by using smart growth practices for certain new development and redevelopment projects with the idea of reducing pollution with other benefits, such as enhancing local aquifers and lessening impervious surfaces.

The LID measures that will be imposed under the proposed ordinance will require that the new development and redevelopment projects sites are to be designed to control pollutants, pollutant loads, and runoff volume to the 85th percentile of a 24 hour storm by minimizing impervious surface areas and controlling runoff through:

1. Infiltration (entry of water into the surface of the soil)
2. Bioretention (reducing stormwater runoff by intercepting rainfall with vegetation, evapotranspiration, and infiltration)
3. Rainfall harvest and use (capturing runoff to provide temporary storage until the harvested water can be used for irrigation)

The "85th percentile, 24-hour event" is an engineering term that represents the precipitation quantity in a 24-hour period not exceeded in 85 percent of all events and is represented in isohetyl maps for the region. For Santa Clarita, the 85th percentile is approximately 1.00 inch. In simple terms, for a parking lot on a one-acre parcel, which is mostly impervious surface, with heavy stormwater runoff, the developer would need to infiltrate 22,809 gallons of water, which is essentially the size of a large swimming pool. Conversely, for a one acre grassy park with little impervious surface area and little runoff, the developer would need to infiltrate 3,258 gallons of water, which is the size of a typical spa.

Los Angeles County has developed a LID Standards Manual and made it available on-line. The manual explains how a site designer/engineer could use a wide array of techniques that focus on site-level hydrologic control to meet Low Impact Development regulations. The LID manual describes those techniques, provides examples and descriptions of how they work, and contains best management practice (BMP) fact sheets.

As part of the City's development review process, discretionary projects are reviewed and conditioned. Written conditions for development will be provided to the owner, developer, engineer, etc. and, if the project falls under the list applicable developments, a Standard Urban Stormwater Mitigation Plan (SUSMP) incorporating LID standards will be a condition of development. The applicant will be required to prepare and submit a SUSMP for review and approval by the City's Development Services Division to ensure LID requirements are implemented and comply with the requirements prescribed in the Stormwater Permit.

Development projects that will be required to form a SUSMP and incorporate LID are similar to the projects listed in the previous Permit with two new categories added to the list. The development projects that will be required to implement LID are as follows:

1. All projects that add more than 10,000 square feet of impervious surface area.
2. Industrial parks with 10,000 square feet or more of surface area.
3. Commercial malls with 10,000 square feet or more of surface area.
4. Retail gasoline outlets with 5,000 square feet or more of surface area.
5. Restaurants with 5,000 square feet or more of surface area.
6. Parking lots with 5,000 square feet or more of impervious surface area, or with 25 or more parking spaces.
7. Streets and roads construction of 10,000 square feet or more of impervious surface area.
8. Automotive service facilities with 5,000 square feet or more of surface area.
9. Projects located in, or directly adjacent to, or discharging directly to a Significant Ecological Area (SEA), where the development will:
    a. Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and
    b. Create 2,500 square feet or more of impervious surface area
10. Single-family homes on a graded hillside.
11. Redevelopment of the projects listed above that disturb land and results in the creation or addition or replacement of 5,000 square feet or more of impervious surface area on an already developed site:
    a. Where Redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to post-construction stormwater quality control requirements, the entire project must be mitigated.
    b. Where Redevelopment results in an alteration of less than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to post-construction stormwater quality control requirements, only the alteration must be mitigated, and not the entire development.

c. Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of facility or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways which does not disturb additional area and maintains the original grade and alignment, is considered a routine maintenance activity. Redevelopment does not include the repaving of existing roads to maintain original line and grade.
d. Existing single-family dwelling and accessory structures are exempt from the Redevelopment requirements unless such projects create, add, or replace 10,000 square feet of impervious surface area.

If approved by City Council, this ordinance shall be in effect on January 1, 2016, and apply only to the specified new development or redevelopment projects listed above.

ENVIRONMENTAL

The proposed project is exempt from the California Environmental Quality Act (CEQA) under Article 19, Categorical Exemptions, Section 15308, Class 8. A Class 8 exemption consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment.

PUBLIC NOTICE

All notices required by law were completed which consisted of a one-eighth page legal advertisement in The Signal newspaper on February 24, 2015. As of the writing of this staff report, staff has received no correspondence from the community.

RECOMMENDATION

Staff recommends the Planning Commission adopt Resolution P15-02, which recommends that the City Council approve Master Case No. 15-007, consisting of Unified Development Code Amendment 15-001.

ATTACHMENTS

Resolution P15-02
Exhibit A - Redline version of current Chapter 17.95 of the Unified Development Code
Draft Notice of Exemption

RESOLUTION NO. P15-02

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF SANTA CLARITA RECOMMENDING THE CITY COUNCIL APPROVE MASTER CASE NO. 15-007 (UNIFIED DEVELOPMENT CODE AMENDMENT 15-001), AMENDING THE SANTA CLARITA UNIFIED DEVELOPMENT CODE (LOW IMPACT DEVELOPMENT ORDINANCE)

THE PLANNING COMMISSION OF THE CITY OF SANTA CLARITA DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. FINDINGS OF FACT. The Planning Commission does hereby make the following findings of fact:

A. The City of Santa Clarita is a permittee under the "Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, except those discharges originating from the City of Long Beach MS4," issued by the California Regional Water Quality Control Board--Los Angeles Region, (Order No. R4-2012-0175) which also serves as an NPDES Permit under the Federal Clean Water Act (NPDES No. CAS004001), as well as Waste Discharge Requirements under California law (the "Municipal NPDES permit");

B. The Municipal MS4 permit (NPDES No. CAS004001) requires permittees to develop and implement a Low Impact Development (LID) Ordinance;

C. Urbanization has led to increased impervious surface areas resulting in increased water runoff causing the transport of pollutants to downstream receiving waters;

D. LID is widely recognized as a viable approach to managing the quantity and quality of stormwater and non-stormwater runoff by setting standards and practices to maintain or restore the natural hydrologic character of a developed site, reduce runoff from the site, improve water quality, and provide groundwater recharge;

E. It is the intent of the City of Santa Clarita to amend the current Standard Urban Stormwater Mitigation Plan (SUSMP) requirements by providing stormwater and rainwater LID strategies for specific development and redevelopment projects as defined under "Applicability." Where there are conflicts between this LID Ordinance and previously adopted SUSMP Manuals, the standards in this LID Ordinance shall prevail;

F. The City of Santa Clarita's proposed project consists of Unified Development Code Amendment (UDCA) 15-001 to update the zoning code to implement LID requirements while ensuring consistency with the General Plan;

G. The project was advertised in The Signal newspaper on February 24, 2015 for a public hearing to be held on March 17, 2015, in accordance with the City's noticing requirements. The hearing was to be held at City Hall, 23920 Valencia Boulevard, Santa Clarita, at 6:00 p.m. Prior to that meeting, it was determined that there would be a lack of quorum of the Planning Commission for that meeting and the item could not be heard at that time.

H. The Planning Commission held a duly-noticed public hearing on April 7, 2015, in accordance with the City's noticing requirements. The project was re-advertised in The Signal newspaper on March 17, 2015, for a public hearing to be held on April 7, 2015. The hearing was held at City Hall, 23920 Valencia Boulevard, Santa Clarita, at 6:00 p.m.;

I. At this public hearing the Planning Commission received staff's presentation summarizing the proposed project, opened the public hearing, received public testimony regarding the project, provided comments to staff, and closed the public hearing. Staff presented the necessary approval documents (resolution and associated attachments), and the Planning Commission took action on the resolution of recommendation to the City Council;

J. Based upon staff presentations and reports, and public comments and testimony, the Planning Commission finds that Master Case 15-007 will not adversely affect the health, peace, comfort, or welfare of persons residing in the area; nor will the project jeopardize, endanger or otherwise constitute a menace to the public health, safety, or general welfare; and

K. The location of the documents and other materials that constitute the record of proceedings upon which the decision of the Planning Commission is based for the Master Case No. 15-007 project file is with the Community Development Department; the record specifically is in the custody of the Director of Community Development.

SECTION 2. CALIFORNIA ENVIRONMENTAL QUALITY ACT FINDINGS. Based upon the Notice of Exemption prepared for the project, the Planning Commission recommends the City Council hereby find as follows:

A. A Notice of Exemption for this project was prepared in compliance with the California Environmental Quality Act (CEQA);

B. This project is exempt from the provisions of CEQA per Article 19: Categorical Exemptions, Section 15308: Actions by Regulatory Agencies for Protection of the

Environment, Class 8. A Class 8 consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment;

C. The documents and other materials that constitute the record of proceedings upon which the decision of the Planning Commission is based is the Master Case 15-007 project file and that this project file is located within the Community Development Department and is in the custody of the Director of Community Development; and

D. The Planning Commission, based upon the findings set forth above, hereby finds the Notice of Exemption for this project has been prepared in compliance with CEQA.

SECTION 3. GENERAL FINDINGS FOR MASTER CASE NO. 15-007. Based on the foregoing facts and findings for Master Case No. 15-007, the Planning Commission recommends the City Council hereby find as follows:

A. The proposal is consistent with the General Plan;

The project is consistent with the General Plan because the proposed LID Ordinance codifies a number of General Plan policies and objectives. Specifically, the Conservation and Open Space Element of the General Plan dictates that the City limit disruption of natural hydrology by reducing impervious cover, increasing on-site infiltration, and managing stormwater runoff at the source (Objective CO 4.3). The proposed ordinance is also consistent with Conservation and Open Space Policy CO 3.6.2, by reducing impervious surfaces and providing more natural vegetation to enhance microclimates and provide habitat. This is achieved by increasing vegetated areas to allow surface water infiltration and drainage in lieu of curbed landscapes.

B. The proposal is allowed within the applicable underlying zone and complies with all other applicable provisions of the Unified Development Code (UDC);

The proposed LID Ordinance would not change the character or nature of development throughout the city but would allow the established land use patterns to continue, therefore supporting the provisions of the UDC.

C. The proposal will not endanger, jeopardize, or otherwise constitute a hazard to the public convenience, health, interest, safety, general welfare, or be materially detrimental or injurious to the improvements, persons, property, or uses in the vicinity and zone in which the property is located; and

Nothing contained in the proposed LID Ordinance would endanger, jeopardize, or otherwise constitute a hazard to the public because the proposed ordinance does not

result in the disturbance of land or the physical development of any property and would be consistent with the provisions of the UDC and General Plan.

D. The proposal is physically suitable for the site.

The proposed LID Ordinance is a document that does not supersede, but rather enacts the provisions of the General Plan. The proposed LID Ordinance does not propose to change zoning or land use. A similar LID Ordinance is currently in place for the unincorporated Los Angeles County areas served by the County of Los Angeles.

SECTION 4. ADDITIONAL FINDINGS FOR UNIFIED DEVELOPMENT CODE AMENDMENT 15-001. Based upon the foregoing facts and findings for Unified Development Code Amendment 15-001, the Planning Commission recommends the City Council hereby find as follows:

A. The amendment is consistent with the adjacent area, if applicable;

B. The amendment is consistent with the principles of the General Plan;

C. Approval of the amendment will be in the interest of public health, convenience, safety, and general welfare and in conformity with good zoning practice;

D. The amendment is consistent with other applicable provisions of this code; and

E. The amendment is necessary to implement the General Plan and/or that the public convenience, the general welfare or good zoning practice justifies such action.

The proposed LID Ordinance codifies and implements all provisions of the General Plan and would therefore be consistent with the areas adjacent to the plan area. The project is consistent with the General Plan because it would carry out a number of General Plan policies and objectives. The proposed LID Ordinance creates development standards that would enact the provisions of the General Plan, and affect the aesthetic quality of the planning area upon the approval of development projects that are consistent with the development standards detailed within the code. The standards do not address California Building Code requirements or subdivision requirements and would be consistent with all other provisions of the UDC. The Conservation and Open Space Element of the General Plan dictates the City promote on-site stormwater infiltration through design techniques such as pervious paving, draining runoff into bioswales or properly designed landscape areas, preservation of natural soils and vegetation, and limiting impervious surfaces. Further, the Conservation and Open Space Element sets policies to integrate detention and retention basins into the landscape design of development projects as well as reduce the amount of pollutants entering the Santa Clara River and its tributaries by capturing and treating stormwater runoff at the source. The approval

of the LID Ordinance would result in a document that would require future development and redevelopment to implement low impact development design consistent with the intent of the General Plan and would be justified by serving the general welfare of the public.

SECTION 5. NOW, THEREFORE, BE IT RESOLVED, by the Planning Commission of the City of Santa Clarita, California, as follows:

Adopt Resolution P15-02, recommending the City Council approve Master Case No. 15-007, which includes Unified Development Code Amendment 15-001, consisting of the Revisions to Chapter 17.95 of the Unified Development Code (Exhibit A)

SECTION 6. The Planning Commission Secretary shall certify to the adoption of this Resolution and certify this record to be a full, complete, and correct copy of the action taken.

PASSED, APPROVED, AND ADOPTED this 7th day of April, 2015.

DIANE TRAUTMAN, CHAIRPERSON
PLANNING COMMISSION

ATTEST:

JEFF W. HOGAN, SECRETARY
PLANNING COMMISSION

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss
CITY OF SANTA CLARITA)

I, Jeff W. Hogan, Planning Commission Secretary of the City of Santa Clarita, do hereby certify that the foregoing Resolution was duly adopted by the Planning Commission of the City of Santa Clarita at a regular meeting thereof, held on the 17th of March, 2015, by the following vote of the Planning Commission:

AYES: COMMISSIONERS:

NOES: COMMISSIONERS:

ABSENT: COMMISSIONERS:

PLANNING COMMISSION SECRETARY

Exhibit A

Chapter 17.95 of the Santa Clarita Municipal Code is proposed to be amended as follows:

Sections:

17.95.010 ~~Limits~~ Purpose of Chapter.

17.95.020 Scope ~~of Chapter~~and Applicability.

17.95.030 Definitions.

17.95.040 Rate of Discharge.

17.95.050 Subdivision Design.

17.95.060 Best Management Practices (BMPs).

17.95.070 Control of Erosion of Slopes and Channels.

17.95.080 Signage of Storm Drains.

17.95.090 Outdoor Storage of Materials.

17.95.100 Outdoor Trash Storage Areas.

17.95.110 Maintenance of Best Management Practices.

17.95.120 Design Standards for Best Management Practices.

~~17.95.130 Loading Docks.~~

~~17.95.140 Repair and Maintenance Bays.~~

~~17.95.150 Wash Areas.~~

~~17.95.160 Restaurants.~~

~~17.95.170 Retail Gasoline Outlets.~~

~~17.95.180 Parking Lots.~~

17.95.190 Violations.

17.95.200 Inspections.

17.95.210 Fees.

17.95.220 ~~Waiver.~~Alternative Compliance

17.95.010 ~~Limits~~ Purpose of Chapter.

The provisions of this ~~section~~ chapter contain requirements for post-construction stormwater activities and facility operations of development and redevelopment projects to comply with the current "Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4)" issued by the California Regional Water Quality Control Board--Los Angeles Region, (Order No. R4-2012-0175) which also serves as a National Pollutant Discharge Elimination System

(NPDES) Permit under the Federal Clean Water Act (NPDES No. CAS004001), as well as Waste Discharge Requirements under California law (the "Municipal NPDES permit"), lessen the water quality impacts of development by using smart growth practices, and integrate low-impact development (LID) design principles to mimic predevelopment hydrology through infiltration, evapotranspiration and rainfall harvest and use. LID shall be inclusive of previously adopted Standard Urban Stormwater Mitigation Plan (SUSMP) requirements.

Nothing in this chapter shall be interpreted to:

A. ~~A.~~ Infringe any right or power guaranteed by the California Constitution, including any vested property right; or

B. ~~B.~~ Require any action inconsistent with any applicable and lawfully adopted general plan, specific plan, plan amendment, or building code that conforms to the laws of California and the requirements of this chapter; or

C. ~~C.~~ Restrict otherwise lawful land- use except as authorized by the laws of California, subject to the limitations of this chapter. (Ord. 13-8 § 4 (Exh. A), 6/11/13)

17.95.020 Scope ~~of Chapter~~and Applicability.

Scope: This Section contains requirements for stormwater pollution control measures in development and redevelopment Planning Priority Projects and authorizes the City of Santa Clarita (City) to further define and adopt stormwater pollution control measures, to develop LID principles and requirements, including but not limited to the objectives and specifications for integration of LID strategies, and to grant alternate compliance as allowed by the Municipal NPDES permit and collect fees from projects granted exceptions. Except as otherwise provided herein, the City ~~of Santa Clarita~~ shall administer, implement and enforce the provisions of this Section. Guidance documents supporting implementation of requirements in this Ordinance are hereby incorporated by reference, including SUSMP and the Los Angeles County Low Impact Development Standards Manual, and all future amendments. ~~This chapter shall take effect on February 15, 2001, and shall apply only to approval of discretionary (within the meaning of the California Environmental Quality Act, Public Resources Code Section 21000 et seq.) new development or redevelopment (as those terms are defined this chapter):~~

Applicability:

A. All development projects equal to (one) 1 acre or greater of disturbed area that adds more than 10,000 square feet of impervious surface area.

~~A.~~B. Single-family ~~residences on graded sites~~ hillside homes.

~~B.~~C. Industrial ~~/commercial facilities that disturb one (1) acre or more of surface area~~ parks with 10,000 square feet or more of surface area.

~~C.~~D. Commercial malls with 10,000 square feet or more of surface area.

E. Automotive ~~repair shops~~ service facilities (Standard Industrial Classification (SIC) of 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) with 5,000 square feet or more of surface area.

F. Retail gasoline outlets with 5,000 square feet or more of surface area.

G. Restaurants (Standard Industrial Classification (SIC) of 5812) with 5,000 square feet or more of surface area.

H. Parking lots with 5,000 square feet or more of impervious surface area, or with 25 or more parking spaces

~~D. Retail gasoline outlets.~~

~~E. Restaurants (Standard Industrial Classification (SIC) of 5812) .~~

~~F. Parking lots with 5,000 square feet or more of impervious surface area, or with 25 or more parking spacesand potentially exposed to stormwater runoff, as defined in this chapter.~~

I. Streets and roads construction of 10,000 square feet or more of impervious surface area.

~~G.~~J. Projects located in or directly adjacent to, or discharging directly to a~~n Environmentally Sensitive Area~~Significant Ecological Area (~~ESA~~SEA), where the development will:

a. Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and

~~a.~~b. Create 2,500 square feet or more of impervious surface area.

K. Redevelopment Projects

a. Land disturbing activity that results in the creation, addition, or replacement of 5,000 square feet or more of impervious surface area on an already developed site on Planning Priority Project categories.

b. Where Redevelopment results in an alteration to more than fifty (50) percent of impervious surfaces of a previously existing development, and the existing development was not subject to post-construction stormwater quality control requirements, the entire project must be mitigated.

c. Where Redevelopment results in an alteration of less than fifty (50) percent of impervious surfaces of a previously existing development, and the existing development was not subject to post-construction stormwater quality control requirements, only the alteration must be mitigated, and not the entire development.

d. Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of facility or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways which does not disturb additional area and maintains the original grade and alignment, is considered a routine maintenance activity. Redevelopment does not include the repaving of existing roads to maintain original line and grade.

e. Existing single-family dwelling and accessory structures are exempt from the Redevelopment requirements unless such projects create, add, or replace 10,000 square feet of impervious surface area.

Effective date: This chapter shall take effect on January 1, 2016, and shall apply only to approval of discretionary (within the meaning of the California Environmental Quality Act, Public Resources Code Section 21000 et seq.) new development or redevelopment Planning Priority Projects (as those terms are defined this chapter).

17.95.030 Definitions.

For the purposes of this chapter, the following words and phrases shall have the meanings respectively ascribed to them by this chapter, unless clearly inapplicable. Words and phrases not ascribed a meaning by this chapter shall have the meanings ascribed by the ~~"Standard Urban Stormwater Mitigation Plan for Los Angeles County and Cities in Los Angeles County" approved by the Executive Officer of the California Regional Water Quality Control Board for the Los Angeles Region, on March 8, 2000~~"Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except those Discharges Originating from the City of Long Beach MS4," issued by the California Regional Water Quality Control Board--Los Angeles Region," (Order No. R4-2012-0175),or as modified by the State Water Resources Control Board ~~in Order WQ 2000-11~~, if defined therein, and if not, by the regulations implementing ~~the National Pollutant Discharge Elimination System,~~ Clean Water Act Section 402, and Division 7 of the California Water Code, as they may be amended from time to time, if defined therein, and if not, to the definitions in an

applicable permit issued by the California Regional Water Quality Control Board—Los Angeles (Regional Board), as such permits may be amended from time to time.

Automotive ~~Repair Shop~~ Service Facility ~~-~~means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) and North American Industry Classification System (NAICS) codes. For inspection purposes, permittees need not inspect facilities with SIC codes 5013, 5014, 5541, 5511, provided that these facilities have no outside activities or materials that may be exposed to stormwater (Source: Order No. R4-2012-0175).

Basin Plan means the Water Quality Control Plan, Los Angeles Region, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, adopted by the Regional Water Board on June 13, 1994, and subsequent amendments (Source: Order No. R4-2012-0175).

~~"Best management practice" or "BMP" means any schedule of activities, prohibition of practices, maintenance procedure, program, technology, process, siting criteria, operational methods of measures, or other management practices or engineered systems, which when implemented prevent, control, remove, or reduce pollution.~~
Best Management Practice (BMP) means any practices or physical devices or systems designed to prevent or reduce pollutant loading from stormwater or non-stormwater discharges to receiving waters, or designed to reduce the volume of stormwater or non-stormwater discharged to the receiving water (Source: Order No. R4-2012-0175).

Biofiltration means a LID BMP that reduces stormwater pollutant discharges by intercepting rainfall on vegetative canopy, and through incidental infiltration and/or evapotranspiration, and filtration. Incidental infiltration is an important factor in achieving the required pollutant load reduction. Therefore, the term "biofiltration" as used in this Ordinance is defined to include only systems designed to facilitate incidental infiltration or achieve the equivalent pollutant reduction as biofiltration BMPs with an underdrain (subject to approval by the Regional Board's Executive Officer). Biofiltration BMPs include bioretention systems with an underdrain and bioswales. (Modified from: Order No. R4-2012-0175)

Bioretention means a LID BMP that reduces stormwater runoff by intercepting rainfall on vegetative canopy, and through evapotranspiration and infiltration. The bioretention system typically includes a minimum 2-foot top layer of a specified soil and compost mixture underlain by a gravel-filled temporary storage pit dug into the in-situ soil. As defined in the Municipal NPDES permit, a bioretention BMP may be designed with an overflow drain, but may not include an underdrain. When a bioretention BMP is designed or constructed with an underdrain it is regulated by the Municipal NPDES permit as biofiltration.
(Modified from: Order No. R4-2012-0175)

Bioswale means a LID BMP consisting of a shallow channel lined with grass or other dense, low-growing vegetation. Bioswales are designed to collect stormwater runoff and to achieve a uniform sheet flow through the dense vegetation for a period of several minutes.
(Source: Order No. R4-2012-0175)

~~**City** means the City of Santa Clarita.~~

Clean Water Act (CWA) means the Federal Water Pollution Control Act enacted in 1972, by Public Law 92-500, and amended by the Water Quality Act of 1987. The Clean Water Act prohibits the discharge of pollutants to Waters of the United States unless the discharge is in accordance with an NPDES permit.

Commercial ~~development~~ Malls means any development ~~on private land that is not residential or a site of an industrial activity, as defined in 40 C.F.R. Section 122.26(b)(14). "Commercial development" includes, but is not limited to, hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, multi-apartment buildings, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses and other light industrial complexes not within the scope of 40 C.F.R. Section 122.26(b)(14).~~ comprised of one or more buildings forming a complex of stores which sells various merchandise, with interconnecting walkways enabling visitors to easily walk from store to store, along with parking area(s). A commercial mall includes, but is not limited to: mini-malls, strip malls, other retail complexes, and enclosed shopping malls or shopping centers (Source: Order No. R4-2012-0175).

Construction Activity means any construction or demolition activity, clearing, grading, grubbing, or excavation or any other activity that result in land disturbance. Construction does not include emergency construction activities required to immediately protect public health and safety or routine maintenance activities required to maintain the integrity of structures by performing minor repair and restoration work, maintain the original line and grade, hydraulic capacity, or original purposes of the facility. See "Routine Maintenance" definition for further explanation. Where clearing, grading or excavating of underlying soil takes place during a repaving operation, State General Construction Permit coverage by the State of California General Permit for Storm Water Discharges Associated with Industrial Activities or for Stormwater Discharges Associated with Construction Activities is required if more than one acre is disturbed or the activities are part of a larger plan (Source: Order No. R4-2012-0175).

Control means to minimize, reduce or eliminate by technological, legal, contractual, or other means, the discharge of pollutants from an activity or activities
(Source: Order No. R4-2012-0175).

Development means construction, rehabilitation, redevelopment or reconstruction of any public or private residential project (whether single-family, multi-unit or planned unit development); industrial, commercial, retail, and other non-residential projects, including public agency projects; or mass grading for future construction. It does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility, nor does it include emergency construction activities required to immediately protect public health and safety (Source: Order No. R4-2012-0175).

Directly Adjacent means situated within 200 feet of the contiguous zone required for the continued maintenance, function, and structural stability of the environmentally sensitive area (Source: Order No. R4-2012-0175).

~~"Directly connected impervious area" ("DCIA") means a land area made impermeable to water from which runoff may enter a storm drainage system without first flowing across a permeable land area.~~

Discharge means any release, spill, leak, pump, flow, escape, dumping, or disposal of any liquid, semi-solid, or solid substance.

Disturbed Area means an area that is altered as a result of clearing, grading, and/or excavation (Source: Order No. R4-2012-0175).

Evapotranspiration means the combined effect of evaporation from surface water and loss of water as vapor through plants and released into the atmosphere.

Flow-through BMPs means modular, vault type "high flow biotreatment" devices contained within an impervious vault with an underdrain or designed with an impervious liner and an underdrain (Modified from: Order No. R4-2012-0175).

General Construction Activities Storm Water Permit (GCASP) means the general NPDES permit adopted by the State Board which authorizes the discharge of stormwater from construction activities under certain conditions.

General Industrial Activities Storm Water Permit (GIASP) means the general NPDES permit adopted by the State Board which authorizes the discharge of stormwater from certain industrial activities under certain conditions.

~~"Greater than nine (9) unit home subdivision" means any subdivision where at least ten (10) single-family or multifamily dwelling units are to be developed.~~

Green Roof means a LID BMP using planter boxes and vegetation to intercept rainfall on the roof surface. Rainfall is intercepted by vegetation leaves and through evapotranspiration. Green roofs may be designed as either a bioretention BMP or as a biofiltration BMP. To receive credit as a bioretention BMP, the green roof system planting medium shall be of sufficient depth to provide capacity within the pore space volume to contain the design storm depth and may not be designed or constructed with an underdrain (Source: Order No. R4-2012-0175).

Hazardous Material(s) means any material(s) defined as hazardous by Division 20, Chapter 6.95 of the California Health and Safety Code.~~Hazardous Materials~~

~~"Hillside" means a parcel in an area with known erosive soil conditions, where the development will require grading on any natural slope which is twenty-five percent (25%) or greater~~

Hillside means a property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is 25% or greater and where grading contemplates cut or fill slopes (Source: Order No. R4-2012-0175).

Hydromodification means the alteration of the hydrologic characteristics of coastal and non-coastal waters, which in turn could cause degradation of water resources. Hydromodification can cause excessive erosion and/or sedimentation rates, causing excessive turbidity, channel aggradation and/or degradation. (Source: General Construction Activities Stormwater Permit).0~~)~~

Impervious Surface means any man-made or modified surface that prevents or significantly reduces the entry of water into the underlying soil, resulting in runoff from the surface in greater quantities and/or at an increased rate, when compared to natural conditions prior to development. Examples of places that commonly exhibit impervious surfaces include parking lots, driveways, roadways, storage areas, and rooftops. The imperviousness of these areas commonly results from paving, compacted gravel, compacted earth, and oiled earth.

~~"Industrial/commercial developments that disturb one (1) acre or more of surface area" means any development on private land that is not residential that disturbs one (1) acre or more of surface area, including, but not limited to, parking areas (see "commercial development").~~
Industrial Park means land development that is set aside for industrial development. Industrial parks are usually located close to transport facilities, especially where more than one transport modalities coincide: highways, railroads, airports, and navigable rivers. It includes office parks, which have offices and light industry (Source: Order No. R4-2012-0175).

Infiltration BMP means a LID BMP that reduces stormwater runoff by capturing and infiltrating the runoff into in-situ soils or amended onsite soils. Examples of infiltration BMPs include infiltration basins, dry wells, and pervious pavement (Source: Order No. R4-2012-0175).

~~**LID** means Low Impact Development. LID consists of building and landscape features designed to retain or filter stormwater runoff (Source: Order No. R4-2012-0175).~~

~~**Low Impact Development** means LID. Please refer to LID.~~

Low Impact Development (LID) -means any building and landscape features designed to retain or filter stormwater runoff (Source: Order No. R4-2012-0175).

MS4 means Municipal Separate Storm Sewer System (MS4). The MS4 is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

1. Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
2. Designed or used for collecting or conveying stormwater;
3. Which is not a combined sewer; and
4. Which is not part of a Publicly Owned Treatment Works (POTW) as defined in
    a. Title 40 of the Code of Federal Regulations (CFR) §122.2.26(b)(8)

(Source: Order No. R4-2012-0175)

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under CWA §307, 402, 318, and 405. The term includes an "approved program" (Source: Order No. R4-2012-0175).

Natural Drainage System means a drainage system that has not been improved (e.g., channelized or armored). The clearing or dredging of a natural drainage system does not cause the system to be classified as an improved drainage system (Source: Order No. R4-2012-0175).

New Development means ~~the subdivision of land, or the construction of structures or other impervious surfaces, or both~~ land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision (Source: Order No. R4-2012-0175).

Non-Stormwater Discharge means any discharge to a municipal storm drain system that is not composed entirely of stormwater (Source: Order No. R4-2012-0175).

Parking Lot means an ~~land~~ area or facility for the temporary parking or storage of motor vehicles used ~~personally or~~ for businesses or commerce, industry, or personal use, with a lot size of 5,000 square feet or more of surface area, or with 25 or more parking spaces~~, and which is exposed to stormwater~~ (Source: Order No. R4-2012-0175).

Planning Priority Projects means development projects subject to Permittee conditioning and approval for the design and implementation of post-construction controls to mitigate stormwater pollution, prior to completion of the project(s) (Modified from: Order No. R4-2012-0175).

Pollutant means any "pollutant" defined in Section 502(6) of the Federal Clean Water Act or incorporated into the California Water Code Sec. 13373. Pollutants may include, but are not limited to the following:

1. Commercial and industrial wastes (such as fuels, solvents, detergents, plastic pellets, hazardous substances, fertilizers, pesticides, slag, ash, and sludge).

2. Metals (such as cadmium, lead, zinc, copper, silver, nickel, chromium, and non-metals such as phosphorus and arsenic).

3. Petroleum hydrocarbons (such as fuels, lubricants, surfactants, waste oils, solvents, coolants, and grease).

4. Excessive eroded soil, sediment, and particulate materials in amounts that may adversely affect the beneficial use of the receiving waters, flora, or fauna of the State.

5. Animal wastes (such as discharge from confinement facilities, kennels, pens, recreational facilities, stables, and show facilities).

6. Substances having characteristics such as pH less than 6 or greater than 9, or unusual coloration or turbidity, or excessive levels of fecal coliform, or fecal streptococcus, or enterococcus.

Project means all development, redevelopment, and land disturbing activities. The term is not limited to "Project" as defined under CEQA (Pub. Resources Code §21065) (Source: Order No. R4-2012-0175).

Rainfall Harvest and Use means a LID BMP system designed to capture runoff, typically from a roof but can also include runoff capture from elsewhere within the site, and to provide for temporary storage until the harvested water can be used for irrigation or non-potable uses. The harvested water may also be used for potable water uses if the system includes disinfection treatment and is approved for such use by the local building department (Source: Order No. R4-2012-0175).

Receiving Water means "water of the United States" into which waste and/or pollutants are or may be discharged (Source: Order No. R4-2012-0175).

~~"Redevelopment" means, on an already developed site, the creation or addition of at least five thousand (5,000) square feet of impervious surfaces. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; and land-disturbing activities related with structural or impervious surfaces. Where redevelopment results in an increase of less than fifty percent (50%) of the impervious surfaces of a previously existing development, and the existing development was not subject to these SUSMPs, the design standards apply only to the addition, and not to the entire development.~~
Redevelopment means land-disturbing activity that results in the creation, addition, or replacement of 5,000 square feet or more of impervious surface area on an already developed site. Redevelopment includes, but is not limited to: the expansion of a building footprint; addition or replacement of a structure; replacement of impervious surface area that is not part of routine maintenance activity; and land disturbing activity related to structural or impervious surfaces. It does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility, nor does it include emergency construction activities required to immediately protect public health and safety (Source: Order No. R4-2012-0175).

Restaurant means ~~a stand-alone~~ facility ~~where~~ that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC Code 5812) ~~"Restaurant" does not include co-located stalls or food counters in general purpose establishments such as markets and grocery stores~~ (Source: Order No. R4-2012-0175).

Retail Gasoline Outlet means any facility engaged in selling gasoline and lubricating oils (Source: Order No. R4-2012-0175).

Routine Maintenance means, but is not limited to, projects conducted to:

1. Maintain the original line and grade, hydraulic capacity, or original purpose of the facility.
2. Perform as-needed restoration work to preserve the original design grade, integrity and hydraulic capacity of flood control facilities.
3. Includes road shoulder work, regrading dirt or gravel roadways and shoulders, and performing ditch cleanouts.
4. Replacing existing lines with new materials or pipes and updating facilities to comply with applicable codes, standards, and regulations regardless if such projects result in increased capacity.
5. Repair leaks.

Routine maintenance does not include construction of new lines (i.e. that are not associated with existing facilities and are not part of a project to update or replace existing lines) or facilities resulting from compliance with applicable codes, standards and regulations (Source: Order No. R4-2012-0175).

Significant Ecological Areas (SEAs) means an area that is determined to possess an example of biotic resources that cumulatively represent biological diversity, for the purposes of protecting biotic diversity, as part of the City of Santa Clarita General Plan. Areas are designated as SEAs, if they possess one or more of the following criteria:

1. The habitat of rare, endangered, and threatened plant and animal species.
2. Biotic communities, vegetative associations, and habitat of plant and animal species that are either one of a kind, or are restricted in distribution on a regional basis.
3. Biotic communities, vegetative associations, and habitat of plant and animal species that are either one of a kind or are restricted in distribution in Los Angeles County.
4. Habitat that at some point in the life cycle of a species or group of species, serves as a concentrated breeding, feeding, resting, migrating grounds and is limited in availability either regionally or within Los Angeles County.
5. Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent an unusual variation in a population or community.
6. Areas important as game species habitat or as fisheries.
7. Areas that would provide for the preservation of relatively undisturbed examples of natural biotic communities in Los Angeles County.
8. Special areas (Source: Order No. R4-2012-0175).

Site means land or water area where any "facility or activity" is physically located or conducted, including adjacent land used in connection with the facility or activity (Source: Order No. R4-2012-0175).

~~"Source control BMP" means any schedules of activities, prohibitions of practices, maintenance procedures, managerial practices or operational practices that aim to prevent stormwater pollution by reducing the potential for contamination at the source of pollution.~~

Storm Drain System means any facilities or any part of those facilities, including streets, gutters, conduits, natural or artificial drains, channels, and watercourses that are used for the purpose of collecting, storing, transporting or disposing of stormwater.

~~"Storm event" means a rainfall event that produces more than one-tenth (0.1) inch of precipitation separated from the previous storm event by at least seventy-two (72) hours of dry weather.~~

Storm Water or Stormwater means water that originates from atmospheric moisture (rain or snow) and that falls onto land, water, or other surfaces. Without any change in its meaning, this term may be spelled or written as one word or two separate words.

Stormwater Runoff means that part of precipitation (rainfall or snowmelt) which travels across a surface to the storm drain system or receiving waters.

~~"Structural control BMP" means any structural facility designed and constructed to mitigate the adverse impacts of urban runoff pollution (e.g., a canopy, structural enclosure). This category may include both treatment control BMPs and source control BMPs.~~

SUSMP means the Los Angeles Countywide Standard Urban Stormwater Mitigation Plan. The SUSMP was required as part of the previous Municipal NPDES Permit (Order No. 01-182, NPDES No. CAS004001) and required plans that designate best management practices (BMPs) that must be used in specified categories of development projects.

~~"Treatment" means the use of physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media absorption, biodegradation, biological uptake, chemical oxidation and UV radiation.~~

~~"Treatment control BMP" means any engineered system designed to remove pollutants by simple gravity setting of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process. (Ord. 13-8 § 4 (Exh. A), 6/11/13)~~

Urban Runoff means surface water flow produced by storm and non-storm events that is shed from both pervious and non-pervious surfaces. Non-storm events that produce urban runoff include flow from residential, commercial, or industrial activities involving the use of potable and non-potable water.

17.95.040 Rate of Discharge.

No new development shall increase the peak rate of discharge of stormwater from the developed site if this increase would make downstream erosion more probable. (Ord. 13-8 § 4 (Exh. A), 6/11/13)

17.95.050 Subdivision Design.

Unless inconsistent with vested rights, the site design for all subdivisions subject to this chapter, to the maximum extent practicable, shall:

A. Concentrate or cluster new development on portions of the site while leaving the remaining land in a natural undisturbed condition;

B. Limit clearing and grading of native vegetation to the minimum extent practicable, consistent with the construction of lots, and to allow access and provide fire protection;

C. Preserve riparian areas and wetlands. (Ord. 13-8 § 4 (Exh. A), 6/11/13)

17.95.060 Best Management Practices (BMPs).

A. On the date the ordinance codified in this chapter takes effect, those best management practices which are listed in ~~Tables 1 and 2 of the "Standard Urban Stormwater Mitigation Plan for Los Angeles County and Cities in Los Angeles County" approved by the Executive Officer of the California Regional Water Quality Control Board for the Los Angeles Region, on March 8, 2000, as modified by the State Water Resources Control Board in Order WQ 2000-11,~~ the Los Angeles County Low Impact Development (LID) Standards Manual shall be deemed to be incorporated by reference and adopted by this City and shall remain in effect until the Council shall adopt by resolution a guidebook prepared or recommended by the City Engineer, categorizing development and best management practices for each category.

B. The City Engineer may from time to time revise the guidebook, and the Council may adopt these revisions by resolution.

C. No best management practice other than a structural or treatment control best management practice shall be used in any development regulated under this chapter, unless the guidebook recommends that practice.

D. No structural or treatment control best management practice may be used in any development regulated under this chapter unless the guidebook recommends that practice. (Ord. 13-8 § 4 (Exh. A), 6/11/13)

17.95.070 Control of Erosion of Slopes and Channels.

Best management practices used on slopes or channels in new development or redevelopment subject to this chapter shall:

A. Convey runoff from tops of slopes;

B. Eliminate or reduce flow to natural drainage systems, and for flows which cannot be eliminated, utilize natural drainage systems, rather than artificial drainage systems, to the maximum extent practicable;

C. Stabilize soil at permanent channel crossings;

D. Vegetate slopes with native or drought-tolerant species known to control erosion; and

E. Dissipate concentrated flows before they enter unlined channels. (Ord. 13-8 § 4 (Exh. A), 6/11/13)

17.95.080 Signage of Storm Drains.

In the project area of new development or redevelopment subject to this chapter, a notice that dumping in storm drains and catch basins is illegal shall be:

A. Stenciled in paint or other permanent means at all storm drain inlets and catch basins within the project area;

B. Posted at all known public accesses to natural or artificial drainage channels within the project area; and

C. Maintained to preserve the sign. (Ord. 13-8 § 4 (Exh. A), 6/11/13)

17.95.090 Outdoor Storage of Materials.

A. All materials stored outdoors in new development or redevelopment subject to this chapter which, if exposed to stormwater, may reasonably be expected to add pollutants to it, shall be thoroughly isolated from contact:

1. With stormwater, by enclosure in a structure; or

2. With stormwater, by a surrounding curb or other containment structure.

B. The storage area must be completely covered:

1. By impermeable paving; and

2. Any structure by an overhead covering that adequately diverts precipitation away from the ground between the material and the surrounding containment structure. (Ord. 13-8 § 4 (Exh. A), 6/11/13)

17.95.100 Outdoor Trash Storage Areas.

Except where they serve only single-family residences, solid waste containers in new development or redevelopment subject to this chapter shall be stored in areas that:

A. Are isolated from contact with stormwater originating outside the storage area; and

B. Are surrounded with a barrier sufficient to prevent all trash and debris from being transported out of the storage area, except during collection. (Ord. 13-8 § 4 (Exh. A), 6/11/13)

17.95.110 Maintenance of Best Management Practices.

A. Every person applying to the City for discretionary approval of any new development or redevelopment subject to this chapter, as part of that application, in a signed writing, shall agree to maintain any structural or treatment control best management practice to be implemented in that development through means such as a covenant running with the land (such as covenants, conditions and restriction, commonly known as CC&Rs), CEQA mitigation measures, conditional use permit or other legal agreement (collectively "agreement").

B. The agreement described in subsection (A) of this section shall remain in force until ownership of the developed property has been entirely transferred, and upon transfer, shall be binding on the new owner(s). (Ord. 13-8 § 4 (Exh. A), 6/11/13)

17.95.120 Design Standards for ~~Best Management Practices~~ Stormwater Pollution Control Requirements.

The site for every Planning Priority Project shall be designed to control pollutants, pollutant loads, and runoff volume to the maximum extent feasible by minimizing impervious surface area and controlling runoff from impervious surfaces through infiltration, evapotranspiration, bioretention and/or rainfall harvest and use.

1. A new single-family hillside home development shall include mitigation measures to:

    a. Conserve natural areas;

    b. Protect slopes and channels;

    c. Provide storm drain system stenciling and signage;

    d. Divert roof runoff to vegetated areas before discharge unless the diversion would result in slope instability or damage building foundations; and

    e. Direct surface flow to vegetated areas before discharge, unless the diversion would result in slope instability or damage building foundations.

2. Street and road construction of 10,000 square feet or more of impervious surface shall follow USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets (December 2008 EPA-833-F-08-009) to the maximum extent practicable.

3. All other Planning Priority Projects shall prepare a LID Plan to comply with the following:

a. Retain stormwater runoff onsite for the Stormwater Quality Design Volume (SWQDv) defined as the runoff from:

i. The 85th percentile 24-hour runoff event as determined from the Los Angeles County 85th percentile precipitation isohyetal map; or

ii. The volume of runoff produced from a 0.75 inch, 24-hour rain event, whichever is greater.

~~a.~~b. Minimize hydromodification impacts to natural drainage systems as defined in the Municipal NPDES Permit as described below:

i. Projects disturbing an area greater than 1 acre but less than 50 acres must demonstrate the project is designed to retain onsite, through infiltration, evapotranspiration, and/or harvest and use, the stormwater volume from the runoff of the 95th percentile, 24-hour storm event, or the runoff flow rate, volume, velocity, and duration for the post-development condition for the 2-year, 24-hour rainfall event, or

ii. Projects disturbing 50 acres or more must demonstrate the project infiltrates onsite at least the runoff from a 2-year, 24-hour storm event, or the runoff flow rate, volume, velocity, and duration for the post-development condition for the 2-year, 24-hour rainfall event.

~~Except as this chapter may specifically exempt, every structural or treatment control best management practice implemented pursuant to this chapter in new development or redevelopment subject to this chapter, for the area contributing to that practice:~~

~~A. Shall be adequate to protect from flooding those parts of the contributing area adjacent to drainage channels, according to design criteria the City Engineer may establish.~~

~~B. Shall be adequate:~~

~~1. For the volume of stormwater that, as determined by the formula recommended in "ASCE Manual of Practice No. 87 (1998)," may be collected from the contributing area during a twenty-four (24) hour period in which the total stormwater runoff exceeds eighty-five percent (85%) of all runoff volumes that have been measured for twenty-four (24) hour periods for that same area; or~~

~~2. To treat, by the method recommended in "California Stormwater Best Management Practices Handbook—Industrial/Commercial (1993)," and as determined there, eighty~~

~~percent (80%) or more volume treatment of the annual volume of stormwater runoff from the contributing area; or~~

~~3. For the volume of stormwater runoff from the contributing area produced by a storm event of seventy-five hundredths (0.75) inches.~~

~~C. Subsection (B) of this section shall not apply to any land area of less than five thousand (5,000) square feet being developed or redeveloped for use by any restaurant, or any retail gasoline outlet.~~

~~D. Where redevelopment results in an increase of less than fifty percent (50%) of the impervious surfaces of a previously existing development, and the existing development was not subject to these SUSMPs, the design standards apply only to the addition, and not to the entire development. (Ord. 13-8 § 4 (Exh. A), 6/11/13)~~

~~17.95.130 Loading Docks.~~

~~In any industrial/commercial development that disturbs one (1) acre or more of surface area or in any automotive repair shop, the design of any outdoor loading dock area in new development or redevelopment subject to this chapter shall:~~

~~A. Use an overhead covering that prevents the entry of stormwater; or~~

~~B. Prevent the entry of stormwater by diverting it away; and~~

~~C. Not conduct stormwater from any truck well directly into a storm drain system. (Ord. 13-8 § 4 (Exh. A), 6/11/13)~~

~~17.95.140 Repair and Maintenance Bays.~~

~~In any industrial/commercial development that disturbs one (1) acre or more of surface area or in any automotive repair shop, in new development or redevelopment subject to this chapter the design of any repair or maintenance bay shall:~~

~~A. Prevent the entry of stormwater by diverting it away or by locating such bays indoors; and~~

~~B. Use a drainage system that collects all water from washing and from leaks or spills and stores it in a sump for disposal; and~~

~~C. Does not conduct stormwater from the bay directly to a storm drain system. (Ord. 13-8 § 4 (Exh. A), 6/11/13)~~

~~17.95.150 Wash Areas.~~

~~The design of any wash area for motor vehicles or equipment in new development or redevelopment subject to this chapter shall use:~~

~~A. An adequate overhead covering; and~~

~~B. A device that clarifies or otherwise pretreats all wash water; and~~

~~C. A drain conducting all treated wash water to a sanitary sewer. (Ord. 13-8 § 4 (Exh. A), 6/11/13)~~

~~17.95.160 Restaurants.~~

~~The design of any restaurant subject to this chapter shall include an area for the washing or cleaning of equipment, which:~~

~~A. If indoors, shall:~~

~~1. Be self-contained;~~

~~2. Use a grease trap; and~~

~~3. Use a drain conducting all wastewater to a sanitary sewer; and~~

~~B. If outdoors, shall:~~

~~1. Use an overhead covering adequate to prevent contact with stormwater;~~

~~2. Be covered with impermeable paving;~~

~~3. Be surrounded by a curb or other containment; and~~

~~4. Use a drain conducting all wastewater to a sanitary sewer. (Ord. 13-8 § 4 (Exh. A), 6/11/13)~~

~~17.95.170 Retail Gasoline Outlets.~~

~~All fuel dispensing areas in any retail gasoline outlet subject to this chapter shall:~~

~~A. Be covered by a structure that:~~

~~1. Extends outward at least as far as the grade break at all points, and~~

~~2. Diverts all stormwater away from the fueling area;~~

~~B. Be paved with a material, other than asphaltic concrete, that is impermeable to water and has a smooth surface with a slope of not less than two percent (2%) but not more than four percent (4%);~~

~~C. Be separated from the rest of the site by a grade break that, to the maximum extent practical, prevents stormwater from entering the fueling area;~~

~~D. Extend outward at least six and one-half (6 1/2) feet from the outermost corner of any fuel dispenser, or a distance one (1) foot greater than the combined length of the dispensing hose and nozzle, whichever distance is less. (Ord. 13-8 § 4 (Exh. A), 6/11/13)~~

~~17.95.180 Parking Lots.~~

~~To the maximum extent practical, all parking lots subject to this chapter shall minimize off-site transport of pollutants by using the following design criteria and BMPs:~~

~~A. Minimizing impervious land coverage;~~

~~B. Providing for effective treatment or infiltration of stormwater before it is discharged into storm drains; and~~

~~C. Use of operational and maintenance measures to remove heavy metals, oil and grease and polycyclic aromatic hydrocarbons. (Ord. 13-8 § 4 (Exh. A), 6/11/13)~~

17.95.190 Violations.

A. Violation of any provision of this chapter shall be both a misdemeanor and a public nuisance.

B. The remedies specified in this chapter shall not exclude any other legal remedy that may be available to the City. (Ord. 13-8 § 4 (Exh. A), 6/11/13)

17.95.200 Inspections.

A. The City Engineer and such officers as the City Engineer may designate shall enforce the provisions of this chapter.

B. As necessary, these officers may, at a reasonable time and in a manner authorized by the laws of California, enter and make inspections on any property regulated under this chapter. (Ord. 13-8 § 4 (Exh. A), 6/11/13)

17.95.210 Fees.

The Council may establish and fix the amount of fees for services provided under this chapter, as authorized under Sections 66016 and 66018 of the California Government Code and this code. (Ord. 13-8 § 4 (Exh. A), 6/11/13)

17.95.220 ~~Waiver~~ Alternative Compliance.

Technical Infeasibility - When, as determined by the City Engineer or his/her appointee, 100 percent onsite retention of the SWQDv is technically infeasible, partially or fully, the infeasibility shall be demonstrated in the submitted LID Plan. The technical infeasibility may result from conditions that may include, but are not limited to:

1. The infiltration rate of saturated in-situ soils is less than 0.3 inch per hour and it is not technically feasible to amend the in-situ soils to attain an infiltration rate necessary to achieve reliable performance of infiltration or bioretention BMPs in retaining the SWQDv onsite.

2. Locations where seasonal high groundwater is within five to ten feet of surface grade;

3. Locations within 100 feet of a groundwater well used for drinking water;

4. Brownfield development sites or other locations where pollutant mobilization is a documented concern;

5. Locations with potential geotechnical hazard;

6. Smart growth and infill or redevelopment locations where the density and/ or nature of the project would create significant difficulty for compliance with the onsite volume retention requirement.

If partial or complete onsite retention is technically infeasible, the project site may biofiltrate 1.5 times the portion of the remaining SWQDv that is not reliably retained onsite. Biofiltration BMPs must adhere to the design specifications provided in the Municipal NPDES Permit.

a. Additional alternative compliance options such as offsite infiltration may be available to the project Site. The project Site should contact the City Engineer or his/her appointee to determine eligibility. Alternative compliance options are further specified in the Los Angeles County 2014 Low Impact Development Standards Manual (2014 LID Standards Manual).

A. The remaining SWQDv that cannot be retained or biofiltered onsite must be treated to reduce pollutant loading. BMPs must be selected and designed to meet pollutant-specific benchmarks as required per the Municipal NPDES Permit. Flow-through BMPs may be used to treat the remaining SWQDv and must be sized based on a rainfall intensity of:

i. 0.2 inches per hour, or

ii. The 1-year, 1-hour rainfall intensity as determined from the most recent Los Angeles County isohyetal map, whichever is greater.

B. A Multi-Phased Project may comply with the standards and requirements of this section for all of its phases by: (a) designing a system acceptable to the City Engineer to satisfy these standards and requirements for the entire Site during the first phase, and (b) implementing these standards and requirements for each phase of Development or Redevelopment of the Site during the first phase or prior to commencement of construction of a later phase, to the extent necessary to treat the stormwater from such later phase. For purposes of this section, "Multi-Phased Project" shall mean any Planning Priority Project implemented over more than one phase and the Site of a Multi-Phased Project shall include any land and water area designed and used to store, treat or manage stormwater runoff in connection with the Development or Redevelopment, including any tracts, lots, or parcels of real property, whether Developed or not, associated with, functionally connected to, or under common ownership or control with such Development or Redevelopment (Source: Order No. R4-2012-0175).

~~A. Any person required under this chapter to implement a structural or treatment control best management practice may petition to the Council to waive that requirement as impractical, provided the petitioner has in good faith considered and rejected as not feasible all such practices available.~~

~~B. The Council may waive a structural or treatment control best management practice as impractical if:~~

~~1. Inadequate space for treatment exists on a redevelopment project; or~~

~~2. Soil conditions strongly disfavor the use of infiltration; or~~

~~3. The natural land surface where the BMP would be located lies:~~

~~a. Above a known unconfined aquifer, or~~

~~b. Less than ten (10) feet above an existing or potential source of drinking water.~~

~~C. Any petition for waiver not falling within the foregoing categories shall be forwarded to the Regional Board for consideration. (Ord. 13-8 § 4 (Exh. A), 6/11/13)~~

NOTICE OF EXEMPTION

TO:

[X] County Clerk, County of Los Angeles
12400 Imperial Highway, Room 2001
Norwalk, CA 90650

[ ] Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

FROM:

City of Santa Clarita
23920 Valencia Boulevard, Suite 302
Santa Clarita, CA 91355

APPLICATION:	Master Case 15-007; Unified Development Code Amendment 15-001
PROJECT LOCATION:	Throughout the City of Santa Clarita
PROJECT APPLICANT:	City of Santa Clarita, Environmental Services Division
PROJECT DESCRIPTION:	The applicant is requesting approval of a Low Impact Development (LID) Ordinance to impose on certain, specified development and redevelopment sites with the goal of preventing pollutants from entering the storm drain and local waterways within and around the City of Santa Clarita.

This is to advise that the City of Santa Clarita [ ] Director of Community Development [ ] Planning Commission [X] City Council has approved the above described project on May 26, 2015 and has found the project is EXEMPT from the provisions of the California Environmental Quality Act (CEQA).

The EXEMPT STATUS of the project is listed under Article 19 CATEGORICAL EXEMPTION, Section 15308: Actions by Regulatory Agencies for Protection of the Environment, Class 8. A Class 8 exemption consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment.

Person or agency carrying out the project: City of Santa Clarita, Environmental Services Division

This is to certify that the Notice of Exemption and record of project approval is available for public review at:

City of Santa Clarita
Community Development Department
23920 Valencia Boulevard, Suite 140
Santa Clarita, California 91355
(661) 255-4330

_____ _____

Oliver Cramer, Project Development Coordinator
City of Santa Clarita Public Works Department
23920 Valencia Boulevard, Suite 140
Santa Clarita, CA 91355
(661) 286-4098

Date

CITY OF SANTA CLARITA
STAFF REPORT
MASTER CASE NO. 14-198
CONDITIONAL USE PERMIT NO. 14-017
DEVELOPMENT REVIEW NO. 14-017

DATE: April 7, 2015

TO: Chairperson and Members of the Planning Commission

FROM: Jeff W. Hogan, AICP, Planning Manager

CASE PLANNER: Mike Ascione, Assistant Planner II

APPLICANT: AT&T Mobility

LOCATION: 25201 Via Princessa (APN 2841-061-903)

REQUEST: The applicant, AT&T Mobility, is requesting a Conditional Use Permit (CUP) and Development Review (DR), to allow for the installation and operation of a wireless telecommunications facility to be located at Golden Oak Elementary School, 25201 Via Princessa, within the Public Institution (PI) zone.

BACKGROUND

On November 26, 2014, AT&T, the applicant, submitted an application for a Conditional Use Permit and Development Review to install a wireless telecommunications facility at 25201 Via Princessa (APN 2841-061-903), in the community of Canyon Country in order to provide improved coverage in this area of the valley. The application was deemed incomplete on December 17, 2014. On March 2, 2015, the application was deemed complete.

PROJECT DESCRIPTION AND SETTING

The applicant is requesting a Conditional Use Permit and Development Review to allow for the installation of an unmanned wireless telecommunications facility, within a new clock tower at Golden Oak Elementary School, in the community of Canyon Country, within the City of Santa Clarita.

The City of Santa Clarita's Unified Development Code requires the approval of a Conditional Use

Agenda Item: 2

Permit for a wireless telecommunications facility, above 35 feet in height, and located in the Public/Institutional zone.

The new wireless telecommunications facility is proposed to contain the following:

1) A 52' high, 15' by 15' clock tower, concealing twelve 8-foot long antennas. The antennas will be located inside of the clock tower in a three-sided triangular formation. The tower will contain working clock faces on all four sides that are each 7'-7" tall. The tower will also contain a school identification sign that is 4' tall that reads "Golden Oak Community School." The base of the tower will comprise of natural river stone with the tower itself containing the same stucco colors used for the existing school on-site. The clock tower could be modified in the future to allow for another carrier to collocate.

2) A 8' high, 8' by 15' CMU block wall will house the associated equipment and will be attached to the base of the clock tower. Equipment will also be placed under the clock tower itself that will be concealed by the walls of the clock tower. The equipment enclosure will contain a river stone veneer to match the clock tower and materials used on the existing school on site.

GENERAL PLAN DESIGNATION AND ZONING

The General Plan and zoning designation for the subject property is Public Institutional (PI). The PI zone, as provided in Section 17.37.020 of the UDC, is intended for "various types of pubic and/or community services facilities owned and operated by public agencies, special districts, nonprofit organizations and other entities." Wireless telecommunications facilities are anticipated within the PI zone as they are compatible with the existing and anticipated future public uses, provide service to residents, and serve as resources to emergency officials.

The Unified Development Code (UDC) requires approval of a Conditional Use Permit (CUP) and Development Review (DR) for wireless communications facilities proposed in a PI zone to be erected or installed above 35 feet in height. The City's Wireless Communications Ordinance requires "stealth facilities, flush-mounted and concealed antennas should be utilized whenever possible." The proposed project utilizes a clock tower to achieve a stealth antenna installation. With approval of the CUP and the associated conditions of approval, the wireless telecommunication facility will comply with the UDC, General Plan, and the City's Wireless Communications Ordinance.

The following is a table breaking down the zoning and surrounding land uses:

	General Plan	Zoning	Land Use
Project	**PI**	**PI**	**School**
North	UR2	UR2	Single Family/Vacant
South	UR2	UR2	Vacant
East	UR2	UR2	Vacant
West	UR2	UR2	Vacant

ANALYSIS

Aesthetics
The project consists of the installation of an unmanned wireless telecommunications facility concealed within a 52' high, clock tower. Ground mounted equipment will be screened through a combination of existing vegetation and a CMU block wall located at the base of the clock tower. The colors and materials used for the proposed clock tower and equipment enclosure will match the colors and materials used at the existing school on site. The proposed project complies with the standards set forth within the City's Unified Development Code related to wireless facilities.

Sulphur Springs Union School District
The applicant initially meet with school district representatives in May of 2013 to determine if there was an interest in and support for the construction of cellular facilities at their school sites. Through meetings with site administrators, staff and parent committees, and a presentation to the District's Board of Trustees, it was determined that there was support for the District board to support the construction of wireless facilities on school property. The Board of Trustees took action to approve the agreement for the construction of the cellular tower at two publically noticed meetings.

AT&T Public Outreach Meeting
The applicant held a community workshop to share plans for the proposed wireless facility with the community on January 20, 2015 at Golden Oak Elementary School. The applicant sent a notice to all property owners within 1,000 feet of the project site. The workshop was held between 6:30 p.m. and 8:30 p.m. During the two hour community workshop, one neighboring citizen came to learn about the current project. This citizen shared no concerns with the proposal.

Federal Communications Commission Regulations
The Telecommunications Act of 1996 requires the Federal Communications Commission (FCC) to prescribe and make effective regulations governing the environmental effects of radio frequency (RF) emissions for telecommunication facilities. Local jurisdictions are preempted by the FCC under the act from making decisions based on environmental and health effects related to radio frequency emissions from wireless telecommunications facilities. The proposal would operate in compliance with these regulations, therefore, no potential hazard to the public's health or safety would result from the proposed wireless telecommunication facility.

Noise
The City's adopted Noise Ordinance stipulates that noise levels shall not exceed 65 dBA during daytime hours or 55dBA during nighttime hours in residentially zoned areas. The closest residential lot is over 300 feet west. Site noise measurements were taken. A noise assessment modeled post construction operational noise levels and concluded that the operation of the wireless facility, would result in no-net increase in ambient noise levels at the project boundaries. No backup generators are proposed under this submittal. This is in conformance with the City's adopted Noise Ordinance as well as the noise standards contained in the City's Wireless Ordinance.

ENVIRONMENTAL STATUS

An Initial Study was prepared in accordance with the California Environmental Quality Act (CEQA). The Initial Study determined that there are no significant environmental impacts related to the proposed wireless facility. Therefore, a Negative Declaration was prepared in accordance with Section 15070 of CEQA.

PUBLIC COMMENT

The Sulphur Springs Union School District has issued a letter of support for the project (attached). As required by the Unified Development Code, 51 property owners within a 1,000-foot radius of the subject property were notified of the public hearing by mail. A public notice was placed in The Signal on March 17, 2015, and a sign was posted at the site on March 24, 2015, for this public hearing. To date, the Community Development Department has received no other correspondence in response to the public notice.

RECOMMENDATION

Staff recommends that the Planning Commission:

Adopt Resolution P15-04, adopting the Negative Declaration and approving Master Case No. 14-198, Conditional Use Permit 14-017, Development Review 14-017 to allow for the installation and operation of a wireless telecommunications facility to be located at 25201 Via Princessa, at Golden Oak Elementary School, subject to the attached Conditions of Approval (Exhibit A).

ATTACHMENTS

Resolution P15-04
Conditions of Approval (Exhibit A)
Aerial/Zoning Map
Site Plan and Elevations
Visual Simulations
Initial Study/Negative Declaration
Sulphur Springs Union School District Support Letter
Public Notice
Noise Study
Coverage Map

RESOLUTION NO. P15-04

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF SANTA CLARITA ADOPTING A NEGATIVE DECLARATION AND APPROVING MASTER CASE NO. 14-198, CONDITIONAL USE PERMIT NO. 14-017, AND DEVELOPMENT REVIEW NO. 14-017, TO ALLOW FOR THE CONSTRUCTION AND OPERATION OF A WIRELESS TELECOMMUNICATIONS FACILITY LOCATED AT 25201 VIA PRINCESSA (APN: 2841-061-903), IN THE CITY OF SANTA CLARITA

THE PLANNING COMMISSION OF THE CITY OF SANTA CLARITA DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. FINDINGS OF FACT. The Planning Commission does hereby make the following findings of fact:

A. An application for Master Case No. 14-198 (Conditional Use Permit 14-017 and Development Review 14-017) was filed by AT&T (hereinafter "Applicant") with the City of Santa Clarita on November 26, 2014. The property for which this application was filed is located at 25201 Via Princessa (APN: 2841-061-903) (hereinafter "Subject Site");

B. The application was deemed complete on March 2, 2015;

C. The applicant proposes to allow for the installation and operation of an unmanned wireless telecommunications facility, within a new 52-foot tall working clock tower, concealing 12 antennas. The tower will also contain a school identification sign reading "Golden Oak Community School." The associated equipment will be concealed within the base of the tower and within a 15' by 8' enclosure attached to the clock tower;

D. The zoning and General Plan designation for the subject site is PI (Public/Institutional);

E. The surrounding land uses include single-family residential surrounding the subject site;

F. On April 7, 2015, a duly noticed public hearing was held before the City of Santa Clarita Planning Commission at 6:00 p.m. at City Hall, Council Chambers, 23920 Valencia Boulevard, Santa Clarita; and

G. At this public hearing, the Planning Commission considered the staff report, staff presentation, applicant's presentation, and public testimony.

SECTION 2. CALIFORNIA ENVIRONMENTAL QUALITY ACT FINDINGS. Based upon the foregoing facts and findings, the Planning Commission hereby find as follows:

A. An Initial Study and a Negative Declaration for this project have been prepared in compliance with the California Environmental Quality Act (CEQA);

B. The Initial Study has been circulated for review and comment by affected governmental

agencies and the public, and all comments received, if any, have been considered. The Negative Declaration was posted and advertised on March 17, 2015, in accordance with CEQA. The public review period was open from March 17, 2015 through April 7, 2015;

C. There is no substantial evidence that the project will have a significant effect on the environment. The Negative Declaration reflects the independent judgment of the City of Santa Clarita;

D. The location of the documents and other material which constitutes the record of proceedings upon which the decision of the Planning Commission is the Master Case No. 14-198 project file, within the Community Development Department and is in the custody of the Director of Community Development; and

E. The Planning Commission, based upon the findings set forth above, hereby finds that the Negative Declaration for this project has been prepared in compliance with CEQA.

SECTION 3. GENERAL FINDINGS FOR MASTER CASE NO. 14-198. Based on the foregoing facts and findings for Master Case No. 14-198, the Planning Commission hereby determines as follows:

A. That the proposal is consistent with the General Plan;

The proposed unmanned wireless telecommunications facility as proposed is consistent with the goals, policies and objectives of the General Plan. Specifically, the Land Use Element of General Plan policy LU 4.4.4 dictates that the City work to protect and enhance public utility facilities as necessary to maintain the safety, reliability, integrity, and security of essential public service systems for all Valley residents. As proposed, the project would improve the City's cellular coverage and service. The proposed project is also consistent with Policy N 1.1.4 of the Noise Element of the General Plan by controlling noise sources adjacent to residential development by creating no new net increases in noise as determined by noise analysis.

B. The proposal is allowed within the applicable underlying zone and complies with all other applicable provisions of the UDC;

With the approval of a CUP, the proposed project complies with the Unified Development Code, including the development standards outlined in the Wireless Communications Ordinance (Section 17.69.030). The antenna arrays would not be visually obtrusive because a stealth installation within a clock tower is proposed, and the ground mounted equipment would be screened by a CMU screen wall and existing vegetation. The facility would be unmanned and would not increase pedestrian or vehicular traffic and would have no effect on circulation patterns in the area. The City's adopted noise ordinance allows for daytime and nighttime sound levels of 65 dBA and 55 dBA respectively in residential zones. The noise assessment performed for the project determined that that the operation of the facility would result in no-net increase in

ambient noise levels at the project boundary. Therefore, the project complies with the City's adopted Noise Ordinance and has no potential for noise impacts to residential uses or other sensitive receptors.

C. The proposal will not endanger, jeopardize, or otherwise constitute a hazard to the public convenience, health, interest, safety, or general welfare, or be materially detrimental or injurious to the improvements, persons, property, or uses in the vicinity and zone in which the property is located; and

The wireless facility would not create harmful effects or change the character of the surrounding neighborhood. The facility has been appropriately located to minimize its visual impact by locating the antenna arrays within a clock tower and screening the ground mounted equipment behind a CMU screen wall. The clock tower would match the same architectural style in terms of colors and materials to the existing school on site. The proposed wireless facility is required to comply with the Federal Communications Commission regulations to ensure that there is no potential hazard to the public's health or safety. Therefore, the wireless telecommunications facility would not be detrimental to the public's health, safety, or welfare, nor would it be materially injurious to properties or improvements in the vicinity.

D. The proposal is physically suitable for the site. The factors related to the proposal's physical suitability for the site shall include, but are not limited to, the following:

1) The design, location, shape, size, and operating characteristics are suitable for the proposed use;

This project is proposed for a small portion of the school site located at 25201 Via Princessa (APN: 2841-061-903). The proposed wireless facility is suitable for this location based on:

(1) Zoning, which is Public Institutional (PI);
(2) Type and intensity of development on the site, which is currently developed with a school;

Other wireless telecommunications facilities have been approved within similar stealth facilities, such as clock towers in the past. The wireless antennas would be concealed within a clock tower with a maximum height of 52 feet above ground level and be designed with the same colors and materials as the existing buildings and structures on the project site.

2) The highways or streets that provide access to the site are of sufficient width and are improved as necessary to carry the kind and quantity of traffic such proposal would generate;

The proposed wireless facility would be unmanned and thus would not generate

traffic or impact the physical character or capacity of surrounding streets. The wireless facility would not change the nature or use of the existing uses on-site, nor would it affect any of the current or future uses of the subject property.

3) Public protection services (e.g., Fire protection, Sheriff protection, etc.) are readily available; and

The project site is located in a developed portion of the City that is served by public facilities, services, and utilities. The site is unmanned; therefore, the proposed project is not anticipated to generate significant additional demand on public facilities, services, and utilities.

The Land Use Element of General Plan policy LU 4.4.4 envisions that the City work to protect and enhance public utility facilities as necessary to maintain the safety, reliability, integrity, and security of essential public service systems for all Valley residents. As proposed, the project would improve the City's cellular coverage and service.

4) The provision of utilities (e.g., potable water, schools, solid waste collection and disposal, storm drainage, wastewater collection, treatment, and disposal, etc.) is adequate to serve the site.

The project site is located in a developed portion of the City that is served by electrical utilities; therefore, the proposed project would not create a significant demand for additional utilities. The facility is unmanned; therefore no impact would occur to schools and no services for potable water or wastewater collection, treatment, or disposal is needed. The proposed facility would not alter the existing site drainage and will not produce any additional solid waste on site.

SECTION 4. WIRELESS COMMUNICATIONS FACILITIES ORDINANCE FINDINGS FOR MASTER CASE NO. 14-198. Based on the foregoing facts and findings for Master Case No. 14-198, the Planning Commission hereby determines as follows:

A. That the proposed wireless communications facility complies with aesthetic and screening standards set forth in the Wireless Communications Facilities Ordinance;

The City's Wireless Communications Facilities Ordinance recommends that new wireless communications facilities be designed to match existing structures whenever possible, the proposed wireless facility has been designed to look like a clock tower. The colors and materials used to construct the clock tower are similar to those used for the construction of the existing elementary school building on the project site. The proposal also includes ground-mounted equipment that is screened with a CMU block wall that also matches other walls on the schools grounds. Because the proposed wireless communications facility conforms to these aesthetic standards, the proposal fully complies with the Wireless Communications Facilities Ordinance's aesthetic and screening standards.

B. That the proposed wireless communications facility complies with siting standards set forth in the Wireless Communications Facilities Ordinance;

Applicants for new wireless communications facilities are encouraged by the City's Wireless Communications Facilities Ordinance to screen wireless facilities from public view. The proposal includes a working clock tower that will fully screen all antennas and wiring. This proposal also includes ground-mounted equipment that would be located within a block wall enclosure. The proposed facility would also be required to adhere to all minimum siting distances to habitable structures required for compliance with Federal Communications Commission regulations and standards governing the environmental effects of radio frequency emissions. Therefore, the proposal complies with the City's siting standards for new wireless communications facilities.

C. That the proposed wireless communications facility complies with noise standards set forth in the Wireless Communications Facilities Ordinance; and

A noise study was prepared for the proposed project with noise measurements taken during the daytime and nighttime hours at the nearest residential property to the proposed wireless communications facility. The study concludes that with the installation and operation of the proposed project, there would be no increase in ambient noise resulting from the project. The proposed project would comply with the noise standards of the Wireless Communications Facilities Ordinance.

D. That the proposed wireless communications facility complies with development guidelines set forth in the Wireless Communications Facilities Ordinance;

The proposed wireless communications facility is in conformance with the development guidelines outlined in the Wireless Communications Facilities Ordinance because it mimics a clock tower which completely screens the wireless facility from public view. The clock tower could be modified in the future to allow for co-location of a second wireless provider and is architecturally compatible with the existing buildings and structures on-site by using the same colors and materials.

SECTION 5. NOW, THEREFORE, BE IT RESOLVED, by the Planning Commission of the City of Santa Clarita, California, as follows:

Adopt Resolution P15-04, adopting the Negative Declaration and approving Master Case 14-198, CUP14-017 and DR14-017, to allow for the construction and operation of a wireless communications facility, located at 25201 Via Princessa (APN: 2841-061-903), subject to the attached conditions of approval (Exhibit A).

PASSED, APPROVED, AND ADOPTED this 7th day of April, 2015.

DIANE TRAUTMAN, CHAIRPERSON
PLANNING COMMISSION

ATTEST:

JEFF W. HOGAN, SECRETARY
PLANNING COMMISSION

STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES)
CITY OF SANTA CLARITA)

I, Jeff W. Hogan, Planning Commission Secretary of the City of Santa Clarita, do hereby certify that the foregoing Resolution was duly adopted by the Planning Commission of the City of Santa Clarita at a regular meeting thereof, held on the 7th day of April, 2015 by the following vote of the Planning Commission:

AYES: COMMISSIONERS:

NOES: COMMISSIONERS:

ABSENT: COMMISSIONERS:

PLANNING COMMISSION SECRETARY

EXHIBIT A
RESOLUTION NO. P15-04
CONDITIONS OF APPROVAL
MASTER CASE 14-198
CONDITIONAL USE PERMIT 14-017
DEVELOPMENT REVIEW 14-017

CONDITIONS OF APPROVAL

GENERAL CONDITIONS

GC1. The approval of this project shall expire if the approved use is not commenced within two (2) years from the date of this approval, unless it is extended in accordance with the terms and provisions of the City of Santa Clarita's Unified Development Code (UDC).

GC2. To the extent the use approved with this project is a different use than previously approved for the property, the prior approval shall be terminated along with any associated vested rights to such use, unless such prior approved use is still in operation, or is still within the initial pre-commencement approval period. Once commenced, any discontinuation of the use approved with this project for a continuous period of one hundred eighty (180) calendar days or more shall terminate the approval of this use along with any associated vested rights to such use. The use shall not be re-established or resumed after the one hundred eighty (180) day period. Discontinuation shall include cessation of a use regardless of intent to resume.

GC3. The applicant may file for an extension of the conditionally approved project prior to the date of expiration. If such an extension is requested, it must be filed no later than sixty (60) days prior to expiration.

GC4. The applicant shall be responsible for notifying the Director of Community Development, in writing, of any change in ownership, designation of a new engineer, or change in the status of the developer, within thirty (30) days of said change.

GC5. Unless otherwise apparent from the context, the term "applicant" shall include the applicant and any other persons, corporation, or other entity making use of this grant. The applicant shall defend, indemnify, and hold harmless the City of Santa Clarita, its agents, officers, and employees from any claim, action, or proceeding against the City or its agents, officers, or employees to attack, set aside, void, or annul the approval of this project by the City, including any related environmental approvals. In the event the City becomes aware of any such claim, action, or proceeding, the City shall promptly notify the applicant. If the City fails to cooperate fully in the defense, the applicant shall not thereafter be responsible to defend, indemnify, or hold harmless the City. Nothing contained in this condition prohibits the City from participating in the defense of any claim, action, or proceeding, if both of the following occur: 1) the City bears its own attorneys' fees and costs; and 2) the City defends the action in good faith. The applicant

shall not be required to pay or perform any settlement unless the settlement is approved by the applicant.

GC6. The property shall be developed and maintained in substantial conformance with the approvals granted by the City. Any modifications shall be subject to further review by the City.

GC7. The applicant and property owner shall comply with all inspections requirements as deemed necessary by the City of Santa Clarita.

GC8. The owner, at the time of issuance of permits or other grants of approval agrees to develop the property in accordance with City codes and other appropriate ordinances including, but not limited to, the California Building Code (Building, Mechanical, Plumbing, Electrical, Green Building, and Energy Codes), Fire Code, Unified Development Code (Grading Code and Undergrounding of Utilities Ordinance), Utilities Code (Sanitary Sewer and Industrial Waste Ordinance), and Highway Permit Ordinance.

GC9. This grant shall not be effective for any purpose until the applicant has filed with the Director of Community Development, their affidavit (Acceptance Form) stating that they are aware of, and agree to accept, all of the conditions of this grant.

GC10. Details shown on the site plan are not necessarily approved. Any details which are inconsistent with the requirements of state or local ordinances, general conditions of approval, or City policies and not modified by this permit must be specifically approved.

GC11. It is hereby declared and made a condition of this permit that if any condition hereof is violated, or if any law, statute, or ordinance is violated, the City may commence proceedings to revoke this approval.

PLANNING DIVSION

PL1. The applicant shall be permitted to install an unmanned wireless telecommunications facility on the subject property located at 25201 Via Princessa (APN 2841-061-903), including twelve antennas concealed within a 52 foot high clock tower and an 8’ by 15’ equipment shelter, consistent with the approved site plan and elevation plan on file with the Planning Division. Any change in size, location or configuration shall be subject to the review of the Director of Community Development, and may require subsequent approval of the Planning Commission.

PL2. Prior to issuance of building permits, the applicant shall comply with all applicable regulations and fees of affected agencies including the Los Angeles County Fire Department.

PL3. All requirements of the Unified Development Code (UDC) and specific zoning for the subject property shall be complied with unless set forth in this permit and shown on the approved site plan.

PL4. The wireless telecommunications facility and antennas shall be designed and constructed in accordance with the approved clock tower design, to minimize visual impacts and to be consistent with the approved site plan, visual simulations and color and materials boards on file with the City of Santa Clarita's Planning Division. Prior to building permit final, the applicant shall meet on site with Community Development Department staff and demonstrate conformance with the colors, materials and architectural design as approved by the Planning Commission.

PL5. All antennas shall meet the minimum siting distances to habitable structures required for compliance with Federal Communications Commission (FCC) regulations and standards governing the environmental effects of radio frequency emissions.

PL6. The proposed wireless communication facility shall conform to all standards and guidelines of the City's UDC, including chapter 17.69 (Wireless Communication Facilities and Satellite Dish Antennas).

PL7. All wire or cable necessary for operation of the facility including reception shall be adequately screened from public view as part of construction.

PL8. The wireless telecommunications facility shall not restrict access to any existing antenna or potential future antenna location which could be used either by the permitee or by another provider.

PL9. The applicant is required to obtain a building permit prior to the construction of the proposed facility and is required to meet all requirements set forth by the City of Santa Clarita Building and Safety Division.

PL10. Necessary equipment for the proposed project shall be located in a locked or otherwise secured area that is not accessible to unauthorized persons. All wireless telecommunication facilities shall be designed to prevent unauthorized climbing.

PL11. The operation of the facility shall not cause interference with any electrical equipment in the surrounding neighborhoods, including television, radio, telephone or computer use, nor may the antenna create harmful interference between any other telecommunication facilities, including City-owned communication facilities.

PL12. All wireless facilities shall comply with City adopted noise standards. All equipment, including accessory equipment shall comply with the City's noise standards as set forth

in the City's noise ordinance. If necessary, equipment shall be replaced or modified with noise dampening materials or techniques to come into compliance with City standards.

DEVELOPMENT SERVICES DIVISION

General Requirements

EN1. At issuance of permits or other grants of approval, the applicant agrees to develop the property in accordance with City codes and other appropriate ordinances such as the Building Code, Plumbing Code, Grading Code, Highway Permit Ordinance, Mechanical Code, Unified Development Code, Undergrounding of Utilities Ordinance, Sanitary Sewer and Industrial Waste Ordinance, Electrical Code, and Fire Code.

Street Improvement Requirements

EN2. Prior to any construction (including, but not limited to, drive approaches, sidewalks, curb and gutter, etc.), trenching or grading within public or private street right-of-way, the applicant shall submit a street improvement plan consistent with the approved site plan, oak tree report and conditions of approval and obtain encroachment permits from the Engineering Division.

EN3. Prior to building final, the applicant shall repair any broken or damaged curb, gutter and sidewalk, and refurbish the half section of pavement on streets within or abutting the project, to the satisfaction of the City Engineer.

BUILDING AND SAFETY DIVISION

BS1. Detailed construction plans for the wireless facility shall be submitted to the Building and Safety Division for plan review and building permit issuance. Supporting documentation, such as structural calculations, energy calculations and soil/geology reports shall be included in the plan submittal package for each structure.

BS2. Plans submitted for plan review shall show full compliance with the California Building Codes in effect at the time the plans and building permit application are submitted. The current California codes are: 2013 California Building, Mechanical, Plumbing, and Electrical Codes, and the 2013 California Energy Code.

BS3. Plans submitted to Building and Safety for plan review shall be 100% complete. Plans submitted shall show all work being performed for this project including architectural, structural, mechanical, electrical and plumbing. Plans shall be prepared by a licensed design professional (architect or engineer).

BS4. For the building-mounted equipment, cupolas and screen walls, the applicant shall provide a complete vertical and lateral analysis and submit structural calculations and details for attachment of all new equipment and/or structures to the roof and/or walls of buildings.

BS5. Submitted plans shall be stamped and signed by a California licensed architect or engineer qualified to design the type of work proposed.

BS6. Each separate detached structure, such as clock tower, equipment room, trash enclosures, fences, retaining walls and shade structures require separate applications and building permits. These other structures need not be on separate plans, but may be part of the same plans for the main project.

BS7. A complete soils and geology report will be required for the project. The report shall be formally submitted to Development Services Division (Engineering) for review and approval with a copy of the report submitted to Building & Safety at time of plan submittal. The recommendations of the report shall be followed and incorporated into the plans for the project.

BS8. It is encouraged all plans for commercial projects be submitted electronically using the City's ePLANS system. For more information about ePLANS, please visit our website at: www.santa-clarita.com/index.aspx?page=698.

BS9. Prior to submitting plans to Building and Safety for plan review, the applicant shall contact Deanna Hamrick or Racheal Allen, at (661) 255-4941, for project addressing or address verification.

BS10. The site plan submitted to Building and Safety shall show all lot lines, easements, restricted use areas, flood hazard areas, etc. Any structures proposed in an easement shall obtain written permission from the easement holder(s).

BS11. All buildings, walls, fences, retaining walls and other structures shall be set back from the adjacent ascending or descending slopes per section 1805.3 CBC.

BS12. Prior to issuance of building permits, clearances from other agencies may be required. Contact Building and Safety for the agency clearances required for this project.

BS13. The project is located within City's fire hazard zone. All new buildings shall comply with the California Building Code Chapter 7A: MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE. A summary of these requirements are available at the Building and Safety's public counter or on the City's

website at: www.santa-clarita.com/Index.aspx?page=552. The submitted plans to Building & Safety shall show all fire zone requirements.

BS14. These conditions are based on a review of preliminary plans submitted by the applicant for this review. Additional comments and more detailed building code requirements will be listed during the plan review process when plans are submitted to Building and Safety.

ENVIRONMENTAL SERVICES

ES1. All demolition projects regardless of valuation and new construction projects valuated greater than $500,000 must comply with the City's Construction and Demolition Materials (C&D) Recycling Ordinance.

ES2. C&D Materials Recycling Ordinance:

a. A Construction and Demolition Materials Management Plan (C&DMMP) must be prepared and approved by the Environmental Services Division prior to obtaining any grading or building permits.
b. A minimum of 50% of the entire project's inert (dirt, rock, bricks, etc.) waste and 50% of the remaining C&D waste must be recycled or reused rather than disposing in a landfill.
c. A deposit of 3% of the estimated total project cost or $25,000, whichever is less, is required. The full deposit will be returned to the applicant upon proving that 50% of the inert and remaining C&D waste was recycled or reused.

ES3. Per the California Green Building Standards Code, 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed.

ES4. All projects within the City that are not self-hauling their waste materials must use one of the City's franchised haulers for temporary and roll-off bin collection services. The applicant shall contact Environmental Services staff at 661-286-4098 for a complete list of franchised haulers in the City.



This map is a user-generated static output from City of Santa Clarita GIS Online mapping website and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. The City of Santa Clarita does not warrant the accuracy of the data and assumes no liability for any errors or omissions.

DSA NOTES:

1. ALL WORK SHALL CONFORM TO 2010 EDITION TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR)
2. CHANGES TO THE APPROVED DRAWINGS AND SPECIFICATION SHALL BE MADE ADDENDA OR CHANGE ORDERS APPROVED BY THE DIVISION OF THE STATE ARCHITECT, AS REQUIRED BY SECTION 4-338, PART 1, TITLE 24, CCR
3. A 'DSA' CERTIFIED PROJECT INSPECTOR EMPLOYED BY THE DISTRICT (OWNER) AND APPROVED BY THE DIVISION OF THE STATE ARCHITECT SHALL PROVIDE CONTINOUS INSPECTION OF THE WORK. THE DUTIES OF THE INSPECTOR ARE DEFINED IN SECTION 4-342, CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE (PART 1, TITLE 24, CCR)
4. A 'DSA CERTIFIED' INSPECTOR WITH CLASS (3) CERTIFICATION IS REQUIRED FOR THIS PROJECT.
5. A DSA ACCEPTED TESTING LABORATORY DIRECTLY EMPLOYED BY THE SCHOOL BOARD SHALL CONDUCT ALL THE REQUIRED TEST AND INSPECTIONS FOR THE PROJECT.
6. GRADING PLANS, DRAINAGE IMPROVEMENTS, ROAD AND ACCESS REQUIREMENTS AND ENVIRONMENTAL HEALTH CONSIDERATIONS SHALL COMPLY WITH ALL LOCAL ORDINANCES.
7. AN INSPECTOR WHO IS SPECIALLY QUALIFIED IN MECHANICAL AND ELECTRICAL WORK WILL BE REQUIRED FOR THIS PROJECT.
8. A STATEMENT THAT TITLE 24 PARTS 1-5 MUST BE KEPT ON SITE DURING CONSTRUCTION.

at&t Mobility

SULPHUR SPRINGS SCHOOL DISTRICT

SITE NUMBER: NL0226

SITE NAME: GOLDEN OAK COMMUNITY SCHOOL

PTN: 65045-15

DRAWING INDEX (ZONING)

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CODE COMPLIANCE

** NOTE: ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THESE CODES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

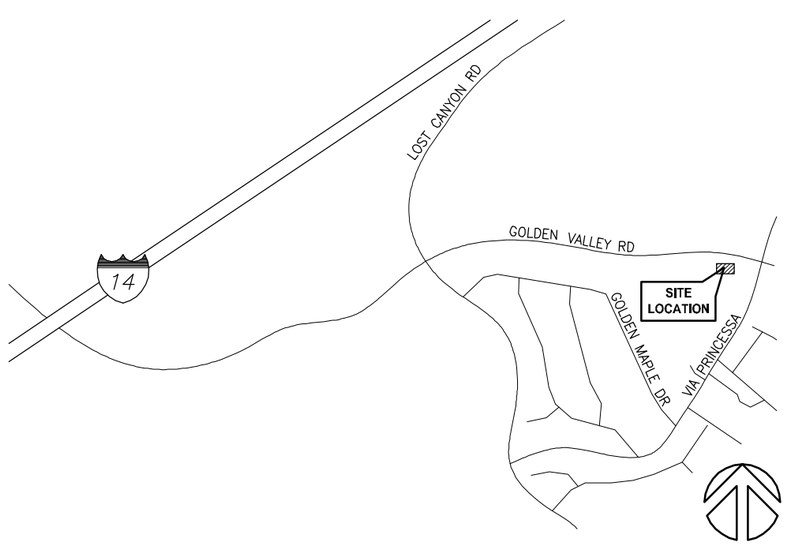
1. 2010 CALIFORNIA ADMINISTRATIVE CODE (CAC)
2. 2010 CALIFORNIA BUILDING CODE (CBC), VOLUMES 1, AND 2 (2009 EDITION INTERNATIONAL BUILDING CODE WITH 2010 CALIFORNIA AMENDMENTS)
3. 2010 CALIFORNIA ELECTRICAL CODE (2008 EDITION NATIONAL ELECTRICAL CODE WITH 2010 CALIFORNIA AMENDMENTS)
4. 2010 CALIFORNIA MECHANICAL CODE (CMC) (2009 EDITION IAPMO UNIFORM MECHANICAL CODE WITH 2010 CALIFORNIA AMENDMENTS)
5. 2010 CALIFORNIA ENERGY CODE (2008 EDITION CALIFORNIA ENERGY COMMISSION BUILDING ENERGY EFFICIENCY STANDARDS)
6. 2010 CALIFORNIA FIRE CODE (CFC) (2009 EDITION OF INTERNATIONAL FIRE CODE WITH 2010 CALIFORNIA AMENDMENTS)
7. 2010 CALIFORNIA GREEN CODE
8. 2010 CALIFORNIA REFERENCES STANDARDS CODE

DIRECTIONS

DRIVING DIRECTIONS FROM AT&T WIRELESS, CERRITOS

FROM AT&T CERRIOTS OFFICE (12900 PARK PLAZA DRIVE, CERRITOS, CA 90703):
1. START OUT GOING EAST ON PARK PLAZA DR TOWARD SHOEMAKER AVE
2. TURN LEFT ONTO SHOEMAKER AVE
3. TURN LEFT ONTO ARTESIA BLVD
4. MERGE ONTO CA-91 W
5. MERGE ONTO I-605 N TOWARD ALONDRA BLVD
6. MERGE ONTO I-5 N TOWARD LOS ANGELES
7. KEEP RIGHT TO TAKE I-5 N TOWARD SACRAMENTO / SANTA MONICA
8. KEEP RIGHT TO TAKE I-5-TRUCK N TOWARD CA-14 N
9. MERGE ONTO CA-14 N TOWARD PALMDALE / LANCASTER
10. TAKE THE GOLDEN VALLEY RD EXIT, EXIT 5
11. TURN RIGHT ONTO GOLDEN VALLEY RD
12. TURN RIGHT ONTO VIA PRINCESSA
13. 25201 VIA PRINCESSA IS ON THE RIGHT

VICINITY MAP



PROJECT INFORMATION

SCOPE OF WORK: AN UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE INSTALLATION OF:

1. 15'x15'x52'H. CLOCK TOWER
2. 15'x8'x8'H. CMU ENCLOSURE
3. (12) 8FT. AIR ANTENNAS INSIDE CLOCK TOWER
4. (24) REMOTE RADIO UNITS AT ANTENNA AREA
5. (4) DC SURGE SUPPRESSORS AT ANTENNA AREA
6. INDOOR EQUIPMENT INSIDE CLOCK TOWER AT GROUND LEVEL
7. (2) GPS ANTENNAS ON CMU ENCLOSURE
8. POWER, TELCO AND FIBER/COAX RUNS

SITE ADDRESS: 25201 VIA PRINCESSA, SANTA CLARITA, CA 91387

PROPERTY OWNER:

OWNER: SULPHUR SPRINGS SCHOOL DISTRICT
ADDRESS: 17866 SIERRA HWY, CANYON COUNTRY, CA 91351
PHONE: (661) 252-5131

BUILDING SUMMARY:

OCCUPANCY: S2
TYPE OF CONSTRUCTION: V-B (UNMANNED TELECOM)
LEASE AREA: 345 SQ. FT
ZONING: RS - RESIDENTIAL SUBURBAN
JURISDICTION: DIVISION OF STATE ARCHITECT (DSA)
LATITUDE: 34° 23' 37.15" N
LONGTITUDE: 118° 27' 26.66" W
LAT/LONG TYPE: NAD 83
APN: 2841-061-903
ACCESSIBILITY REQ'D: UNMANNED TELELCOMMUNICATIONS FACILITY AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.

APPLICANT: AT&T MOBILITY SERVICES, 12900 PARK PLACA DRIVE, CERRITOS, CA 90703
CONTACT: RENIA BOUDAGHIAN
PHONE: (562) 207-8487
SITE ACQUISITION: ERIK HARGRAVE
PHONE: (626) 695-7375
ZONING: VANCE POMEROY
PHONE: (661) 361-5619
RF ENGINEER: SANDEEP MANGAT
PHONE: (540) 815-6789
CONSTRUCTION: .

UTILITY PROVIDER:

POWER COMPANY: .
ADDRESS: .
CONTACT PERSON: .
PHONE: .
TEL COMPANY: .

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
03 115460
AC_____FLS_____SS_____
DATE_____

DCI PACIFIC
A|E|C WORKS
ARCHITECTURE | ENGINEERING | CONSULTING
32 EXECUTIVE PARK | SUITE 110 | IRVINE | CA 92614
T 949.475.1000 | 949.475.1001 F

7431 LAMPSON AVENUE
GARDEN GROVE, CA 92841

NL0226
GOLDEN OAK COMMUNITY SCHOOL
25201 VIA PRINCESSA
SANTA CLARITA, CA 91387

at&t Mobility
12900 PARK PLAZA DRIVE
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4	10/31/14	REVISED PLANNING COMMENTS	MM3	BOK	DKD
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2	05/06/14	REVISED PER PLAN CHECK#2	JGD	BOK	DKD
1	03/14/14	REVISED PER PLAN CHECK#1	JGD	BOK	DKD
0	11/19/13	REVISED PER DRM REDLINES (100% CD)	JGD	BOK	DKD

SCALE AS SHOWN | DESIGNED | DRAWN

LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE	SHEET NUMBER
TITLE SHEET	T01

ABBREVIATIONS

NOTE: NOT ALL ABBREVIATIONS ARE USED ON THESE DRAWINGS

APPROX.	APPROXIMATE
ABV.	ABOVE
AL.	ALUMINUM
ASPH.	ASPHALT
AWG	AMERICAN WIRE GAUGE
BCW	BARE COPPER WIRE
BTS	BASE TRANSMISSION STATION
CAB.	CABINET
CONC.	CONCRETE
CONT.	CONTINUOUS
DIA.	DIAMETER
DWG.	DRAWING
EGB	EQUIPMENT GROUND BAR
EA.	EACH
ELECT.	ELECTRICAL
EL	ELEVATION
EMT	ELECTRICAL METALLIC TUBING
EQ.	EQUAL
EQUIP.	EQUIPMENT
GA.	GAUGE
GALV.	GALVANIZED
GEN	GENERATOR
GRND	GROUND
IGR	INTERIOR GROUND RING (HALO)
IMC	INTERMEDIATE METALLIC CONDUIT
MAX.	MAXIMUM
MECH.	MECHANICAL
MFR.	MANUFACTURER
MGB	MASTER GROUND BAR
MIN.	MINIMUM
NTS	NOT TO SCALE
OC	ON CENTER
OPP	OPPOSITE
PCS	PERSONAL COMMUNICATION SYSTEM
PVC	POLYVINYL CONDUIT
RGS	RIGID GALVANIZED STEEL
SF.	SQUARE FOOT
SH	SHEET
SIM.	SIMILAR
SS	STAINLESS STEEL
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
VIF	VERIFY IN FIELD
WWF	WELDED WIRE FABRIC

SYMBOLS AND MATERIAL

- DETAIL REFERENCE (X / XX)
- SECTIONS AND DETAILS (X / XX)
- CONCRETE
- EARTH
- GRAVEL/STONE
- GROUND ROD WITH ACCESS
- CHEMICAL GROUND ROD
- GROUND ROD
- DISCONNECT SWITCH
- METER (M)

SITE LEGENDS

- PROPERTY LINE
- —X——X——X— FENCE LINE
- —— E —— POWER SERVICE
- —— T —— TELEPHONE SERVICE
- —— E/T —— POWER/TEL SERVICES
- —— 50 —— PROPOSED CONTOUR
- —— 50 —— EXISTING CONTOUR
- —— A —— COAX CABLE
- CIRCUIT BREAKER
- CADWELD TYPE CONNECTION
- COMPRESSION TYPE CONNECTION
- —G— GROUNDING WIRE
- X / XX — REPRESENTS DETAIL NUMBER / REF. DRAWING NUMBER

SITE DEVELOPMENT NOTES

1. THE ARCHITECT/ENGINEER AND REPRESENTATIVES OF THE LESSEE AND OWNER, MUST BE NOTIFIED AT LEAST TWO FULL DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. DO NOT EXCAVATE OR DISTURB SOILS BEYOND THE PROPERTY LINES OR LEASE LINES, UNLESS SPECIFICALLY INSTRUCTED, IN WRITING, BY THE ARCHITECT/ENGINEER AND LESSEE.
3. DO NOT SCALE BUILDING DIMENSIONS FROM DRAWINGS.
4. ANY DRAIN AND/OR FIELD TILE ENCOUNTERED DURING CONSTRUCTION SHALL BE RETURNED TO ITS ORIGINAL CONDITION PRIOR TO COMPLETION OF WORK. SIZE, LOCATION AND TYPE OF ANY UNDERGROUND UTILITIES OR IMPROVEMENTS SHALL BE ACCURATELY NOTED AND PLACED ON AS-CONSTRUCTED DRAWINGS BY GENERAL CONTRACTOR AND ISSUED TO ARCHITECT/ENGINEER AT COMPLETION OF PROJECT.
5. ALL EXISTING UTILITIES, FACILITIES, CONDITIONS, AND THEIR DIMENSIONS SHOWN ON PLANS HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THE ARCHITECT/ENGINEER, LESSEE, AND OWNER ASSUME NO RESPONSIBILITY WHATSOEVER AS TO THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN ON THE PLANS OR THE MANNER OF THEIR REMOVAL OR ADJUSTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL EXISTING UTILITIES AND FACILITIES PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL ALSO OBTAIN FROM EACH UTILITY COMPANY DETAILED INFORMATION RELATIVE TO WORKING SCHEDULES AND METHODS OF REMOVING OR ADJUSTING EXISTING UTILITIES.
6. CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES BOTH HORIZONTALLY AND VERTICALLY PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES OR DOUBTS AS TO THE INTERPRETATION OF PLANS SHOULD BE IMMEDIATELY REPORTED TO THE ARCHITECT/ENGINEER FOR RESOLUTION AND INSTRUCTION, AND NO FURTHER WORK SHALL BE PERFORMED UNTIL THE DISCREPANCY IS CHECKED AND CORRECTED BY THE ARCHITECT/ENGINEER. FAILURE TO SECURE SUCH INSTRUCTION MEANS CONTRACTOR WILL HAVE WORKED AT HIS/HER OWN RISK AND EXPENSE. CONTRACTOR SHALL CALL LOCAL DIGGER HOT LINE FOR UTILITY LOCATIONS 48 HOURS PRIOR TO START OF CONSTRUCTION.
7. ALL NEW AND EXISTING UTILITY STRUCTURES ON SITE AND IN AREAS TO BE DISTURBED BY CONSTRUCTION SHALL BE ADJUSTED TO FINISH ELEVATIONS PRIOR TO FINAL INSPECTION OF WORK.
8. THE BUILDING DEPARTMENT ISSUING THE BUILDING PERMIT SHALL BE NOTIFIED AT LEAST TWO WORKING DAYS PRIOR TO THE COMMENCEMENT OF WORK OR AS STIPULATED BY THE CODE ENFORCEMENT OFFICIAL HAVING JURISDICTION.
9. GRADING OF THE SITE WORK AREA IS TO BE SMOOTH AND CONTINUOUS IN SLOPE AND IS TO FEATHER INTO EXISTING GRADES AT THE GRADING LIMITS.
10. ALL TEMPORARY EXCAVATIONS FOR THE INSTALLATION OF FOUNDATIONS, UTILITIES, ETC., SHALL BE PROPERLY LAID BACK OR BRACED IN ACCORDANCE WITH CORRECT OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS.
11. STRUCTURAL FILLS SUPPORTING PAVEMENTS SHALL BE COMPACTED TO 90% OF MAXIMUM STANDARD PROCTOR DRY DENSITY.
12. NEW GRADES NOT IN BUILDING AND DRIVEWAY IMPROVEMENT AREA TO BE ACHIEVED BY FILLING WITH APPROVED CLEAN FILL AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY.
13. ALL FILL SHALL BE PLACED IN UNIFORM LIFTS. EACH LIFT'S THICKNESS SHOULD NOT EXCEED THAT WHICH CAN BE PROPERLY COMPACTED THROUGHOUT ITS ENTIRE DEPTH WITH THE EQUIPMENT AVAILABLE.
14. ANY FILLS PLACED ON EXISTING SLOPES THAT ARE STEEPER THAN 10 HORIZONTAL TO 1 VERTICAL SHALL BE PROPERLY BENCHED INTO THE EXISTING SLOPE AS DIRECTED BY A GEOTECHNICAL ENGINEER.
15. THE GRADES WITHIN FENCED AREAS ARE TO BE ACHIEVED BY COMPACTING CLEAN FILL TO A DENSITY OF 90% OF STANDARD PROCTOR COVERING THE AREA WITH GEO-TECH CLOTH (18" MIN. OVERLAP AT ALL SEAMS) FOR WEED SUPPRESSION, THEN ACHIEVING FINISH GRADE BY ADDING 6" OF 3/4" CRUSHED STONE, NO FINES.
16. CONTRACTOR SHALL CLEAN ENTIRE SITE AFTER CONSTRUCTION SUCH THAT NO PAPERS, TRASH, WEEDS, BRUSH OR ANY OTHER DEPOSITS WILL REMAIN. ALL MATERIALS COLLECTED DURING CLEANING OPERATIONS SHALL BE DISPOSED OF OFF-SITE BY THE GENERAL CONTRACTOR.
17. ALL TREES AND SHRUBS WHICH ARE NOT IN DIRECT CONFLICT WITH THE IMPROVEMENTS SHALL BE TRIMMED AS REQUIRED AND PROTECTED IN PLACE BY THE GENERAL CONTRACTOR.
18. DRIVEWAY CONSTRUCTION, GRADING AND DRAINAGE WORK SHALL CONFORM TO CALIFORNIA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION", LATEST EDITIONS, AND ALL APPLICABLE PROVISIONS OF LOCAL COUNTY ORDINANCES.
19. IT SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN, READ, AND FOLLOW THE GEO-TECHNICAL REPORT FOR EACH PROJECT SITE. ALL PROVISIONS WITHIN SAID REPORT SHALL BE ACCOMMODATED BY THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS. CONTINUOUS ONSITE SUPERVISION BY THE GEO-TECHNICAL/SOILS ENGINEER SHALL BE ARRANGED FOR BY THE CONTRACTOR PRIOR TO THE START OF ANY EXCAVATION AND/OR GRADING OPERATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE GEO-TECHNICAL/SOILS ENGINEER PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM THE SUPERVISING GEO-TECHNICAL ENGINEER PRIOR TO PROCEEDING WITH PLACEMENT OF ANY FORMS AND/OR MATERIALS.
20. IT SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE AND INSTALL ALL REQUIRED SIGNS FOR THIS PROJECT. THE CONTRACTOR SHALL OBTAIN WRITTEN INSTRUCTIONS FROM THE CONSTRUCTION MANAGER AS TO THE EXACT MATERIAL, SIZE, WORDING, AND LOCATION FOR ALL SIGNS.
    SIGNS THAT MAY BE REQUIRED INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
    a. 7x24 ACCESS SIGN.
    b. SITE ENTRY SIGN.
    c. ANTENNA STRUCTURE COMPLIANCE SIGN.
    d. NEPA RF EXPOSURE SIGN(S).
    e. ANY ADDITIONAL SIGNS AS REQUIRED BY CARRIER AND/OR GOVERNMENTAL AGENCIES.

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES

03 115460

AC_____FLS_____SS_____

DATE_____

DCI PACIFIC
A|E|C WORKS
ARCHITECTURE | ENGINEERING | CONSULTING
32 EXECUTIVE PARK | SUITE 110 | IRVINE | CA 92614
T 949.475.1000 | 949.475.1001 F

VeloTera SERVICES, Inc.
7431 LAMPSON AVENUE
GARDEN GROVE, CA 92841

NL0226
GOLDEN OAK COMMUNITY SCHOOL
25201 VIA PRINCESSA
SANTA CLARITA, CA 91387

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12900 PARK PLAZA DRIVE
CERRITOS, CA 90703

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LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE	SHEET NUMBER
GENERAL NOTES, LEGENDS & ABBREVIATIONS	T02

EXIDE TECHNOLOGIES

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

MANUFACTURER Exide Technologies Industrial Energy 3950 Sussex Avenue Aurora, IL 60504-7932	CHEMICAL/TRADE NAME (as used on label)	MARATHON V-0 and SPRINTER V-0 Valve Regulated Lead Acid Battery
FOR INFORMATION Primary: MACTEC Engineering and Consulting, Inc. Attention: Julann Cothran (770) 421-3485 Secondary: Environmental, Safety & Health Attention: Eric Murray (800) 532-4622 or Fred Ganster (610) 921-4052	CHEMICAL FAMILY/ CLASSIFICATION DATE ISSUED:	Electrical Storage Battery Monoblock type January 2010
FOR EMERGENCY CHEMTREC (800) 424-9300 24-hour Emergency Response Contact Ask for Environmental Coordinator	CHEMTREC INTERNATIONAL (703) 527-3887 – Collect	

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

			Approximate Air Exposure Limits ($\mu g/m^3$)		
Components	CAS Number	% by Wt.	OSHA	ACGIH	NIOSH
Inorganic components of:					
Lead	7439-92-1	71-76	50	50	50
Antimony Oxide	7440-36-0	< 0.6	500	500	500
Calcinated Clay	N/A	< 1.2	N/A	N/A	N/A
Tin	7440-31-5	0.4-0.6	2000	2000	2000
Copper	7440-50-8	< 0.1	1000	1000	1000
Electrolyte (sulfuric acid)	7664-93-9	16-18	1000	200	1000
Case Material:					
Polypropylene	9003-07-0	6-7	N/A	N/A	N/A
Plate separator material:					
Glass	N/A	2-3	N/A	N/A	N/A

NOTE: Inorganic lead and electrolyte (water and sulfuric acid solution) are the primary components of every battery manufactured by Exide Technologies or its subsidiaries. Other ingredients may be present dependent upon battery type. Polypropylene is the principal case material of automotive and commercial batteries.

III. PHYSICAL DATA

Boiling Point (Electrolyte)	203° F (at 760 mm Hg)	Specific Gravity (H_2O=1)	1.230 to 1.350
Melting Point	Not Applicable	Vapor Pressure (mm Hg at 20 °C)	10
Solubility in Water	100%		
Evaporation Rate (Butyl acetate=1)	Less Than 1	Vapor Density (AIR=1)	Greater than 1
Appearance and Odor	A clear liquid with a sharp, penetrating, pungent odor. A battery is a manufactured article; no apparent odor.	% Volatiles by Weight	Not Applicable

ANY PHOTOCOPY MUST BE OF THIS ENTIRE DOCUMENT

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable

Flammable Limits: LEL = 4.1% (Hydrogen Gas in air) ; UEL = 74.2%

Extinguishing media: CO_2; foam; dry chemical

Special Fire Fighting Procedures:
Use positive pressure, self-contained breathing apparatus. Beware of acid splatter during water application and wear acid-resistant clothing, gloves, face and eye protection. If batteries are on charge, shut off power to the charging equipment, but, note that strings of series connected batteries may still pose risk of electric shock even when charging equipment is shut down.

Unusual Fire and Explosion Hazards:
In operation or when on charge, batteries generate hydrogen and oxygen gases (hydrogen is highly flammable and oxygen supports combustion). They must always be assumed to contain these gases which, if ignited by burning cigarette, naked flame or spark, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instructions for installation and service. Keep away all sources of gas ignition, ensure that adequate ventilation is provided, and do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery.

V. REACTIVITY DATA

Stability: Stable _X_ Unstable ___

Conditions to Avoid: Prolonged overcharging and overheating current; sparks and other sources of ignition.

Incompatibility: (materials to avoid)
Electrolyte: Contact of sulfuric acid with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, most metals, carbides, chlorates, nitrates, and picrate, sulfur trioxide gas, strong oxidizers, and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas.

Lead compounds: Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen, potassium, carbides, sulfides, phosphorus, sulfur and reducing agents.

Hazardous Decomposition Products:
Electrolyte: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, hydrogen sulfide, hydrogen.

Lead compounds: Temperatures above the melting point are likely to produce toxic metal fume, vapor, or dust; contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas.

Hazardous Polymerization: May Occur ____ Will Not Occur _X_

VI. HEALTH HAZARD DATA

Routes of Entry:
Electrolyte: Harmful by all routes of entry. Under normal conditions of use, sulfuric acid vapors and mist are not generated. Sulfuric acid vapors and mist may be generated when product is overheated, oxidized, or otherwise processed or damaged.
Lead compounds: Under normal conditions lead dust, vapors, and fumes are not generated. Hazardous exposure can occur only when product is heated above the melting point, oxidized or otherwise processed or damaged to create dust, vapor, or fume.

Inhalation:
Electrolyte: Breathing of sulfuric acid vapors or mists may cause severe respiratory irritation.
Lead compounds: Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs.

Ingestion:
Electrolyte: May cause severe irritation of mouth, throat, esophagus, and stomach.
Lead compounds: Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea, and severe cramping. This may lead rapidly to systemic toxicity. Acute ingestion should be treated by physician.

Skin Contact/Skin Absorption
Electrolyte: Severe irritation, burns, and ulceration. Sulfuric acid is not readily absorbed through the skin.
Lead compounds: Not readily absorbed through the skin.

Eye Contact:
Electrolyte: Severe irritation, burns, cornea damage, blindness.
Lead compounds: May cause eye irritation.

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VI. HEALTH HAZARD DATA (CONTINUED)

Effects of Overexposure - Acute:
Electrolyte: Severe skin irritation, burns, damage to cornea may cause blindness, upper respiratory irritation.
Lead compounds: Headache, fatigue, abdominal pain, loss of appetite, nausea, vomiting, diarrhea, muscular aches and weakness, sleep disturbances, and irritability.

Effects of Overexposure - Chronic:
Electrolyte: Possible erosion of tooth enamel; inflammation of nose, throat, and bronchial tubes, and scarring of the cornea.
Lead compounds: Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in both males and females.

Carcinogenicity:
Electrolyte: The National Toxicology Program (NTP) and the International Agency for Research on Cancer (IARC) have classified "strong inorganic acid mist containing sulfuric acid" as a substance that is carcinogenic to humans. This classification does not apply to sulfuric acid solutions in static liquid state or to electrolyte in batteries. Batteries subjected to abusive charging at excessively high currents for prolonged periods of time without vent caps in place may create a surrounding atmosphere of the offensive strong inorganic acid mist containing sulfuric acid.
Lead compounds: Listed as a 2B carcinogen, likely in animals at extreme doses. Proof of carcinogenicity in humans is lacking at present.

Medical Conditions Generally Aggravated by Exposure:
Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary conditions. Contact of electrolyte (water and sulfuric acid solution) with skin may aggravate skin diseases such as eczema and contact dermatitis. Contact of electrolyte (water and sulfuric acid solution) with eyes may damage cornea and/or cause blindness. Lead and its compounds can aggravate some forms of kidney, liver, and neurologic diseases.

Emergency and First Aid Procedures:
Inhalation:
Electrolyte: Remove to fresh air immediately. If breathing is difficult, give oxygen.
Lead compounds: Remove from exposure, gargle, wash nose, eyes, and lips; consult physician.

Ingestion:
Electrolyte: Give large quantities of water; **do not** induce vomiting; consult physician.
Lead compounds: Consult physician immediately.

Skin:
Electrolyte: Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes and do not wear clothes again until cleaned. If acid is splashed on shoes, remove and discard it they contain leather.
Lead compounds: Wash immediately with soap and water. Lead compounds are not readily absorbed through the skin.

Eyes: Electrolyte and Lead compounds: Flush immediately with large amounts of water for at least 15 minutes; consult physician immediately.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Handling and Storage:
Store batteries under roof in cool, dry, well-ventilated areas that are separated from incompatible materials and from activities which may create flames, sparks, or heat. Keep away from metallic objects that could bridge the terminals on a battery and create a dangerous short-circuit. Single batteries pose no risk of electric shock but there may be increasing risk of electric shock from strings of connected batteries exceeding three 12-volt units.

Charging:
There is a possible risk of electric shock from charging equipment and from strings of series connected batteries, whether or not being charged. Shut-off power to chargers whenever not in use and before detachment of any circuit connections. Batteries being charged will generate and release flammable hydrogen gas. Charging space should be ventilated. Keep battery vent caps in position. Prohibit smoking and avoid creation of flames and sparks nearby. Wear face and eye protection when near batteries being charged.

Spill or Leak Procedures:
Remove combustible materials and all sources of ignition. Stop flow of material and contain spill by diking with soda ash, etc. Carefully neutralize spill with soda ash, etc. Make certain mixture is neutral then collect residue and place in a drum or other suitable container with a label specifying "contains hazardous waste" (or if uncertain call distributor regarding proper labeling procedures). Dispose of as hazardous waste. If battery is leaking, place battery in a heavy duty plastic bag. Wear acid resistant boots, face shield, chemical splash goggles and acid resistant gloves. DO NOT RELEASE UNNEUTRALIZED ACID.

ANY PHOTOCOPY MUST BE OF THIS ENTIRE DOCUMENT

VII. PRECAUTIONS FOR SAFE HANDLING AND USE (CONTINUED)

Waste Disposal Methods:
Sulfuric Acid: Neutralize as described above for a spill, collect residue and place in a container labeled as containing hazardous waste. Dispose of as a hazardous waste. If uncertain about labeling procedures, call your local battery distributor or listed contact. DO NOT FLUSH LEAD CONTAMINATED ACID TO SEWER.

Spent batteries: Send to secondary lead smelter for recycling following applicable federal, state, and local regulations.

Precautionary Labeling:
POISON - CAUSES SEVERE BURNS
DANGER - EXPLOSIVE GASES
CORROSIVE - CONTAINS SULFURIC ACID
KEEP AWAY FROM CHILDREN

VIII. CONTROL MEASURES

Engineering Controls and Work Practices:
Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant.
Handle batteries cautiously. Make certain vent caps are on securely. If battery case is damaged, avoid bodily contact with internal components. Wear protective clothing, eye and face protection, when charging or handling batteries. Follow all manufacturers' recommendations when stacking or palletizing. Do not allow metallic materials to simultaneously contact both the positive and negative terminals of the batteries. Use a battery carrier to lift a battery or place hands at opposite corners to avoid spilling acid through the vents. Avoid contact with internal components of the batteries.

Hygiene Practices:
Wash hands thoroughly before eating, drinking or smoking after handling batteries.

Respiratory Protection:
None required under normal conditions. If an overcharging or overheating condition exists and concentrations of sulfuric acid mist are known or suspected to exceed PEL, use NIOSH or MSHA-approved respiratory protection.

Protective Clothing:
None required under normal conditions. If battery case is damaged, use rubber or plastic acid-resistant gloves with elbow-length gauntlet, acid-resistant apron, clothing, and boots.

Eye Protection:
None required under normal conditions. If battery case is damaged, chemical goggles or face shield.

Emergency Flushing:
In areas where water and sulfuric acid solutions are handled in concentrations greater than 1%, emergency eyewash stations and showers should be provided, with unlimited water supply.

IX. OTHER REGULATORY INFORMATION

NFPA Hazard Rating for sulfuric acid:
Flammability (Red) = 0 Health (Blue) = 3 Reactivity (Yellow) = 2

TRANSPORTATION:
Not regulated pursuant to §173.159(d) of the DOT Hazardous Materials Regulations (49 CFR Parts 171-180) provided each package is marked 'NONSPILLABLE' or 'NONSPILLABLE BATTERY'. For air shipments, reference IATA Dangerous Goods Regulations Special Provision A-67. For ocean shipments, reference IMDG Special Provision #238.

Note: Exide Technologies batteries which have met the test requirements for "nonspillable batteries" in shipment must be protected against short circuit and securely packaged.

Label: NONSPILLABLE

RCRA: Spent lead-acid batteries are not regulated as hazardous waste when recycled. Spilled sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity).

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IX. OTHER REGULATORY INFORMATION (CONTINUED)

CERCLA (Superfund) and EPCRA:
(a) Reportable Quantity (RQ) for spilled 100% sulfuric acid under CERCLA (Superfund) and EPCRA (Emergency Planning and Community Right to Know Act) is **1,000 lbs.** State and local reportable quantities for spilled sulfuric acid may vary.
(b) Sulfuric acid is a listed "Extremely Hazardous Substance" under EPCRA, with a Threshold Planning Quantity (TPQ) of **1,000 lbs.**
(c) EPCRA Section 302 notification is required if **1,000 lbs** or more of sulfuric acid is present at one site. An average automotive/commercial battery contains approximately 5 lbs of sulfuric acid. Contact your Exide representative for additional information.
(d) EPCRA Section 312 Tier Two reporting is required for non-automotive batteries if sulfuric acid is present in quantities of **500 lbs** or more and/or if lead is present in quantities of 10,000 lbs or more.
(e) **Supplier Notification:**

This product contains a toxic chemical or chemicals subject to the reporting requirements of section 313 of (Title) III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Chemical	CAS	Percent by Weight
Lead (Pb)	7439-92-1	71-76
Electrolyte: Sulfuric Acid	7664-93-9	16-18

If you distribute this product to other manufacturers in SIC Codes 20 through 39, this information must be provided with the first shipment of each calendar year.
Note: The Section 313 supplier notification requirement does not apply to batteries that are "consumer products".

CAA: Exide Technologies supports preventative actions concerning ozone depletion in the atmosphere due to emissions of CFC's and other ozone depleting chemicals (ODC's), defined by the USEPA as Class I substances. Pursuant to Section 611 of the Clean Air Act Amendments (CAAA) of 1990, finalized on January 19, 1993, Exide established a policy to eliminate the use of Class I ODC's prior to the May 15, 1993 deadline.

TSCA: Each ingredient chemical listed in Section II of this MSDS is also listed on the TSCA Registry.

CANADIAN REGULATIONS: All chemical substances in this product are listed on the CEPA DSL/NDSL or are exempt from list requirements.

CALIFORNIA PROPOSITION 65:
"WARNING: This product contains lead, a chemical known to the State of California to cause cancer, or birth defects or other reproductive harm."

PREPARED BY: EXIDE TECHNOLOGIES INDUSTRIAL ENERGY

3950 SUSSEX AVENUE
AURORA, IL 60504-7932
(800) 872-0471

VENDEE AND THIRD PERSONS ASSUME THE RISK OF INJURY PROXIMATELY CAUSED BY THE MATERIAL IF REASONABLE SAFETY PROCEDURES ARE NOT FOLLOWED AS PROVIDED FOR IN THE DATA SHEET, AND VENDOR SHALL NOT BE LIABLE FOR INJURY TO VENDEE OR THIRD PERSONS PROXIMATELY CAUSED BY ABNORMAL USE OF THE MATERIAL EVEN IF REASONABLE PROCEDURES ARE FOLLOWED.

ALL PERSONS USING THIS PRODUCT, ALL PERSONS WORKING IN AN AREA WHERE THIS PRODUCT IS USED, AND ALL PERSONS HANDLING THIS PRODUCT SHOULD BE FAMILIAR WITH THE CONTENTS OF THIS DATA SHEET. THIS INFORMATION SHOULD BE EFFECTIVELY COMMUNICATED TO EMPLOYEES AND OTHERS WHO MIGHT COME IN CONTACT WITH THE PRODUCT.

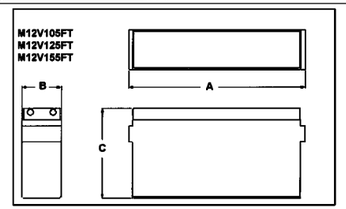
WHILE THE INFORMATION ACCUMULATED AND SET FORTH HEREIN IS BELIEVED TO BE ACCURATE AS OF THE DATE HEREOF, EXIDE TECHNOLOGIES MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE FOR THEIR PARTICULAR CIRCUMSTANCES.

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MARATHON™

MARATHON™ Front Terminal Specifications

Model Number	Voltage	Capacity (AH) 8 Hr To 1.75 VPC @ 25°C	Capacity (AH) 10 hr To 1.80 VPC @ 25°C	Nominal Dimensions Inches A	B	C	Millimeters A	B	C	Nominal Weight lbs.	Kg
M12V105FT	12	104	100	20.12	4.33	9.38	511	110	238	79	35.8
M12V125FT	12	125	121	22.00	4.90	11.15	559	124	283	105	47.6
M12V155FT	12	155	150	22.00	4.90	11.15	559	124	283	119	53.8



Float Voltage & Charging

Constant Voltage charging is recommended
Recommended float voltage: 2.27 VPC @ 25°C (77°F)
Float Voltage Range: 2.25 to 2.30 VPC @ 25°C (77°F)
Equalize voltage: 2.35 VPC for 24 Hours

MARATHON™ Front Terminal Electrical Data

Model Number	Short Circuit Current	Internal Resistance (mOhms)
M12V105FT	3129	4.0
M12V125FT	3814	3.2
M12V155FT	3883	3.0

NOTE: Design and/or specifications subject to change without notice. If questions arise, contact your local GNB sales representative for clarification.

STATIONARY STORAGE BATTERY SYSTEM ANALYSIS (INDOOR)

CODE COMPLIANCE	SPRINKLERED? =	NO	
2010 CBC	SPRINKLER DENSITY (IF APPLICABLE) =	N/A	
2010 CEC	CONSTRUCTION TYPE =	V-B	
2010 CFC	OCCUPANCY =	S-2	

LEAD AND ACID DATA		
MANUFACTURER:	EXIDE / MARATHON	
MODEL NO.:	12MV155FT	
TYPE	SEALED LEAD ACID BATTERY	
NUMBER OF STRINGS:	2	
MODULES PER STRING:	4	
TOTAL MODULES:	8	

DATA PROVIDED BY BATTERY MANUFACTURER:		
WEIGHT PER MODULE	119	LBS
WEIGHT PER SYSTEM	952	LBS
% OF ELECTROLYTE	0.18	%
ELECTROLYTE SPECIFIC GRAVITY	1.32	%
WEIGHT OF WATER (PER GALLON)	8.35	LBS
WEIGHT OF ELECTROLYTE (PER GALLON)	10.97	LBS

ELECTROLYTE CALCULATION:			REMARKS
WEIGHT OF ELECTROLYTE PER MODULE	21.42	LBS	
WEIGHT OF ELECTROLYTE PER SYSTEM	171.36	LBS	
VOLUME OF ELECTROLYTE PER MODULE	1.95	GAL	
VOLUME OF ELECTROLYTE PER SYSTEM	15.61	GAL	<50 GAL. (SEE CFC 27)
VOLUME OF SULFURIC ACID PER SYSTEM	5.62	GAL	

BATTERY NOTES:
1) PER CFC SECTION 602.1, THIS IS A STATIONARY STORAGE BATTERY, AS DEFINED.
2) PER CFC SECTION 608, STATIONARY STORAGE BATTERY HAVING AN ELECTROLYTE CAPACITY OF MORE THAN 50 GALLONS SHALL COMPLY WITH THIS SECTION AND TABLE 608.1. THIS PROJECT HAS ELECTROLYTE CAPACITY OF SUBSTANTIALLY LESS THAN THE 50 GALLON THRESHOLD (SEE TABLE).

UL ONLINE CERTIFICATIONS DIRECTORY

BAZR2.MH13517
Batteries, Standby - Component

Page Bottom

Batteries, Standby - Component

See General Information for Batteries, Standby - Component

GNB INDUSTRIAL POWER, DIV OF EXIDE TECHNOLOGIES MH13517
3950 SUSSEX AVE
AURORA, IL 60504 USA

Model	Max Discharge Rate Amps	Max Discharge Rate Hr	Min Charge Rate Amps	Min Charge Rate Hr	Operating Range °C	Battery Case Flame Rating	External Battery Supply Enclosure Investigated For
Sealed cell, lead acid batteries with pressure release vents, designated Absolyte II P.							
Sealed cell, lead acid batteries with pressure release vents, designated marathon Series.							
M6V190	--	--	--	--	--	--	--
M6V190F	--	--	--	--	--	V-0	--
M12V30							
M12V105FT	--	--	--	--	--	V-0	--
M12V125FT	--	--	--	--	--	V-0	--
M12V155FT	--	--	--	--	--	V-0	--
M12V180FT	--	--	--	--	--	V-0	--

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
03 115460
AC_____FLS_____SS_____
DATE_____

NOTE:
THE ARGUS RACK HAS A 9.0 SQ. FT. OF FLOOR AREA COVERED BY THE RACK. A 6.25 CU FT. PER MINUTE OF CONTINUOUS VENTILATION IS PROVIDED VIA AXIAL FAN. (2) ARE INSTALLED, ONE FOR INTAKE AND ANOTHER FOR EXHAUST.

DCI PACIFIC
A|E|C WORKS
ARCHITECTURE | ENGINEERING | CONSULTING
32 EXECUTIVE PARK | SUITE 110 | IRVINE | CA 92614
T 949 475.1000 | 949 475.1001 F

VeloTera SERVICES, Inc.
7431 LAMPSON AVENUE
GARDEN GROVE, CA 92841

NL0226
GOLDEN OAK COMMUNITY SCHOOL
25201 VIA PRINCESSA
SANTA CLARITA, CA 91387

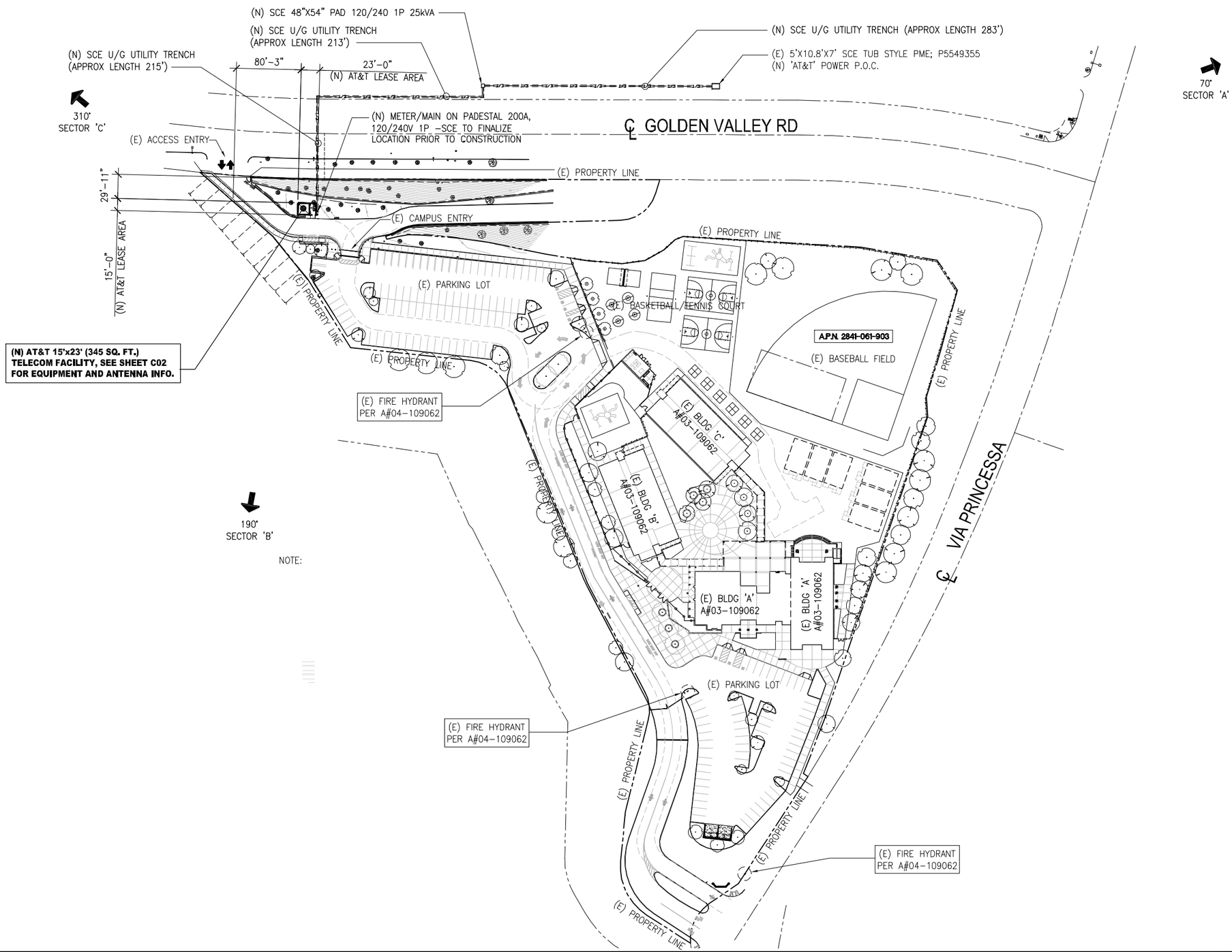
at&t Mobility
12900 PARK PLAZA DRIVE
CERRITOS, CA 90703

NO.	DATE	REVISIONS	BY	CHK	APP'D
4	10/31/14	REVISED PLANNING COMMENTS	MM3	BOK	DKD
3	06/09/14	REVISED STRUCTURAL DWGS PER DSA PLN CHK#3	JGD	BOK	DKD
2	05/06/14	REVISED PER PLAN CHECK#2	JGD	BOK	DKD
1	03/14/14	REVISED PER PLAN CHECK#1	JGD	BOK	DKD
0	11/19/13	REVISED PER DRM REDLINES (100% CD)	JGD	BOK	DKD

SCALE AS SHOWN | DESIGNED | DRAWN

LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE: MATERIAL SAFETY DATA SHEET, LEAD ACID BATTERY
SHEET NUMBER: T03



IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES

03 115460

AC_____FLS_____SS_____

DATE_____

SITE PLAN

NORTH | SCALE: 1/64"=1'-0" | 0 20' 40' 64' | 1

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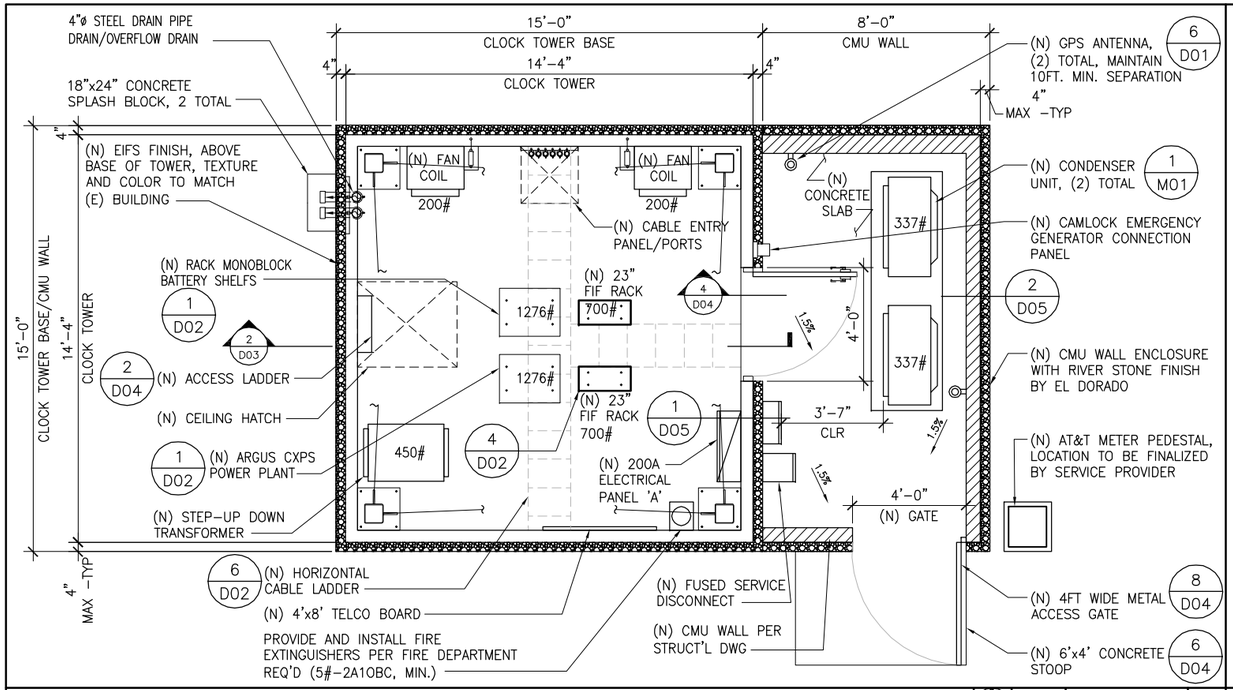
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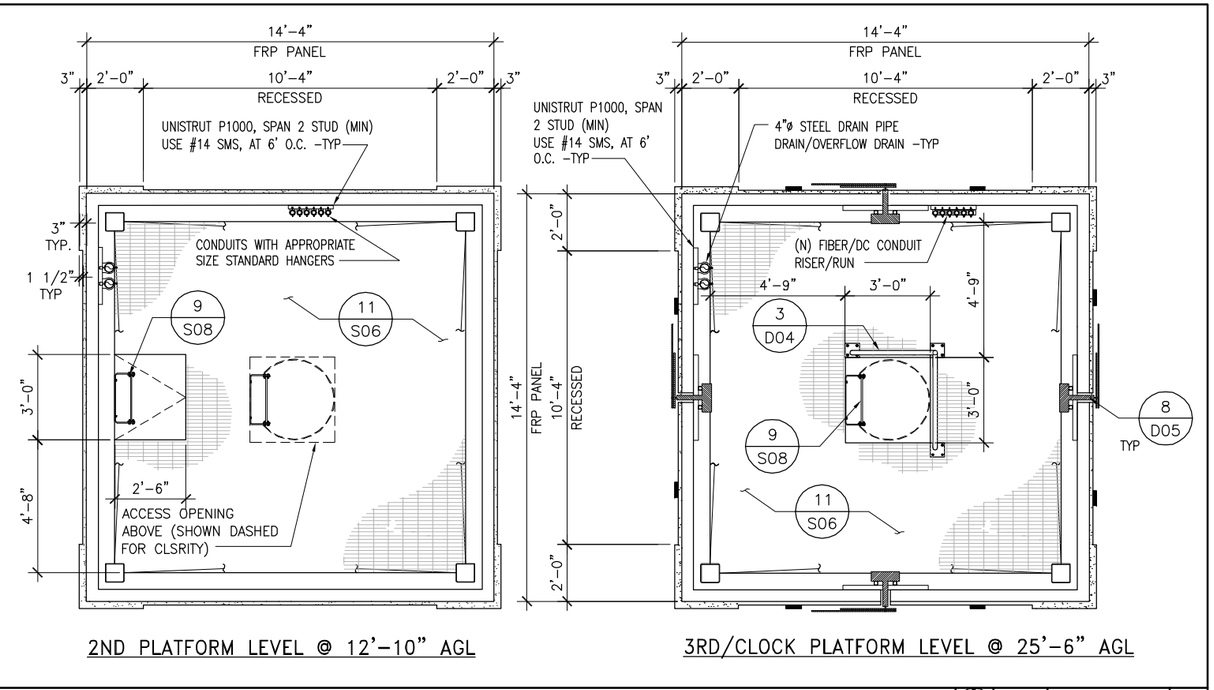
SHEET TITLE: SITE PLAN

SHEET NUMBER: C01



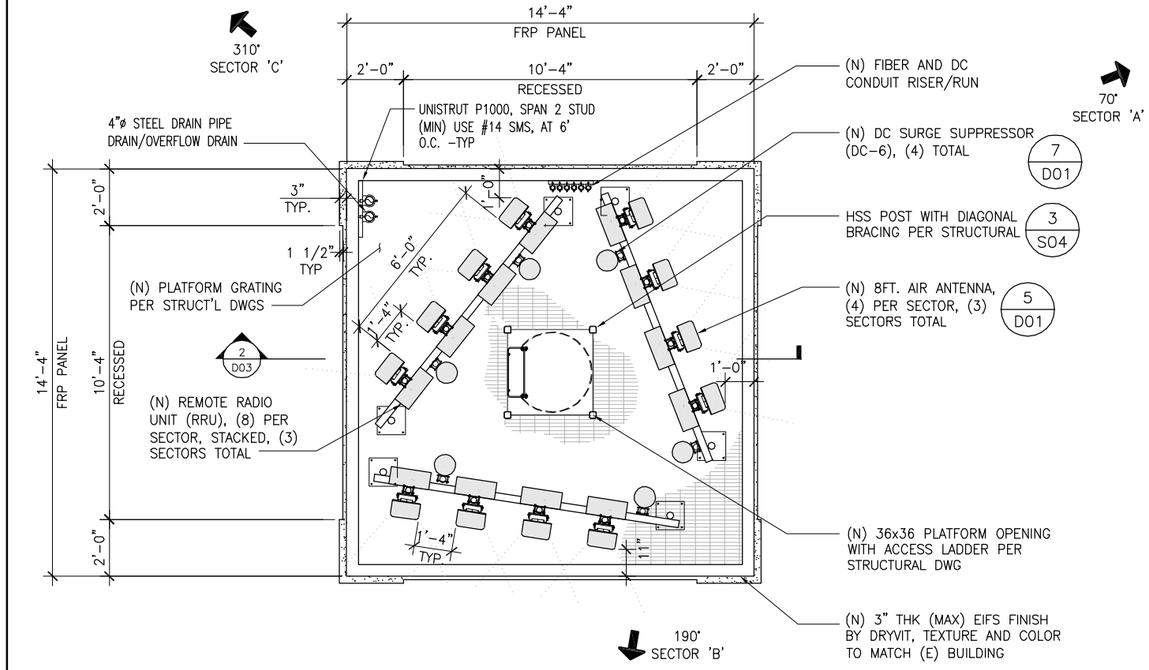
EQUIPMENT LAYOUT PLAN @ GROUND LEVEL

NORTH SCALE: 3/8"=1'-0" 0 1' 3' **2**



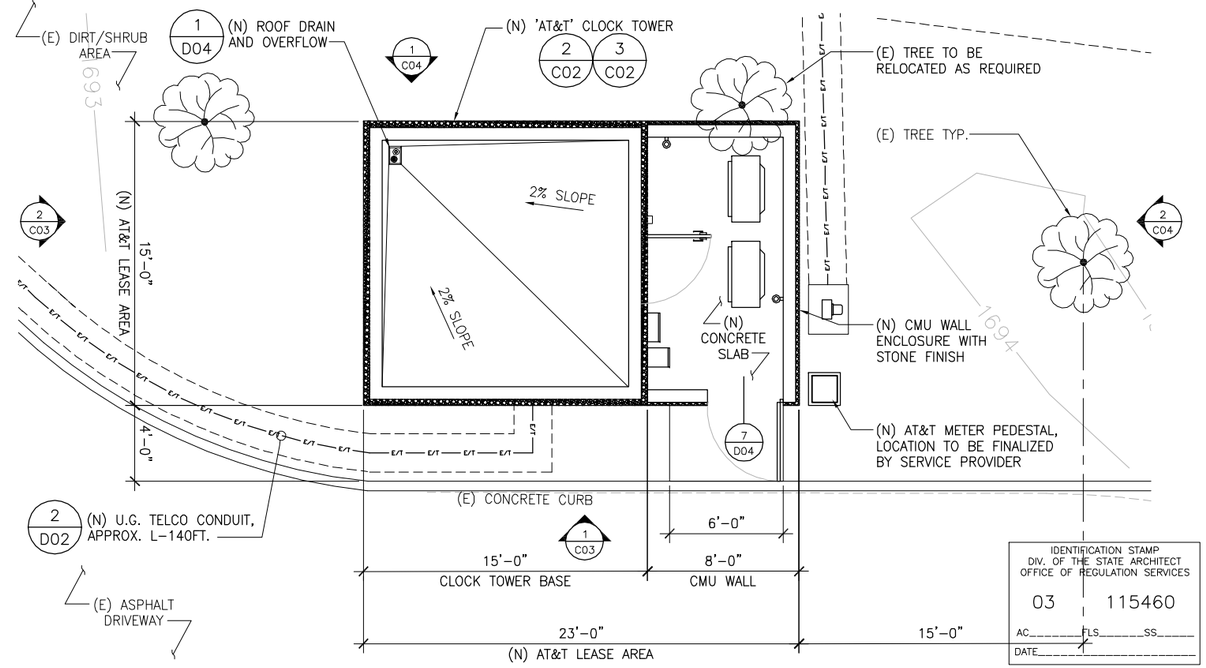
PLATFORM LEVELS

NORTH SCALE: 3/8"=1'-0" 0 1' 3' **4**



ANTENNA LAYOUT PLAN @ 38'-2" AGL

NORTH SCALE: 3/8"=1'-0" 0 1' 3' **3**



ENLARGED SITE PLAN / ROOF PLAN

NORTH SCALE: 1/4"=1'-0" 0 1' 2' 4' **1**

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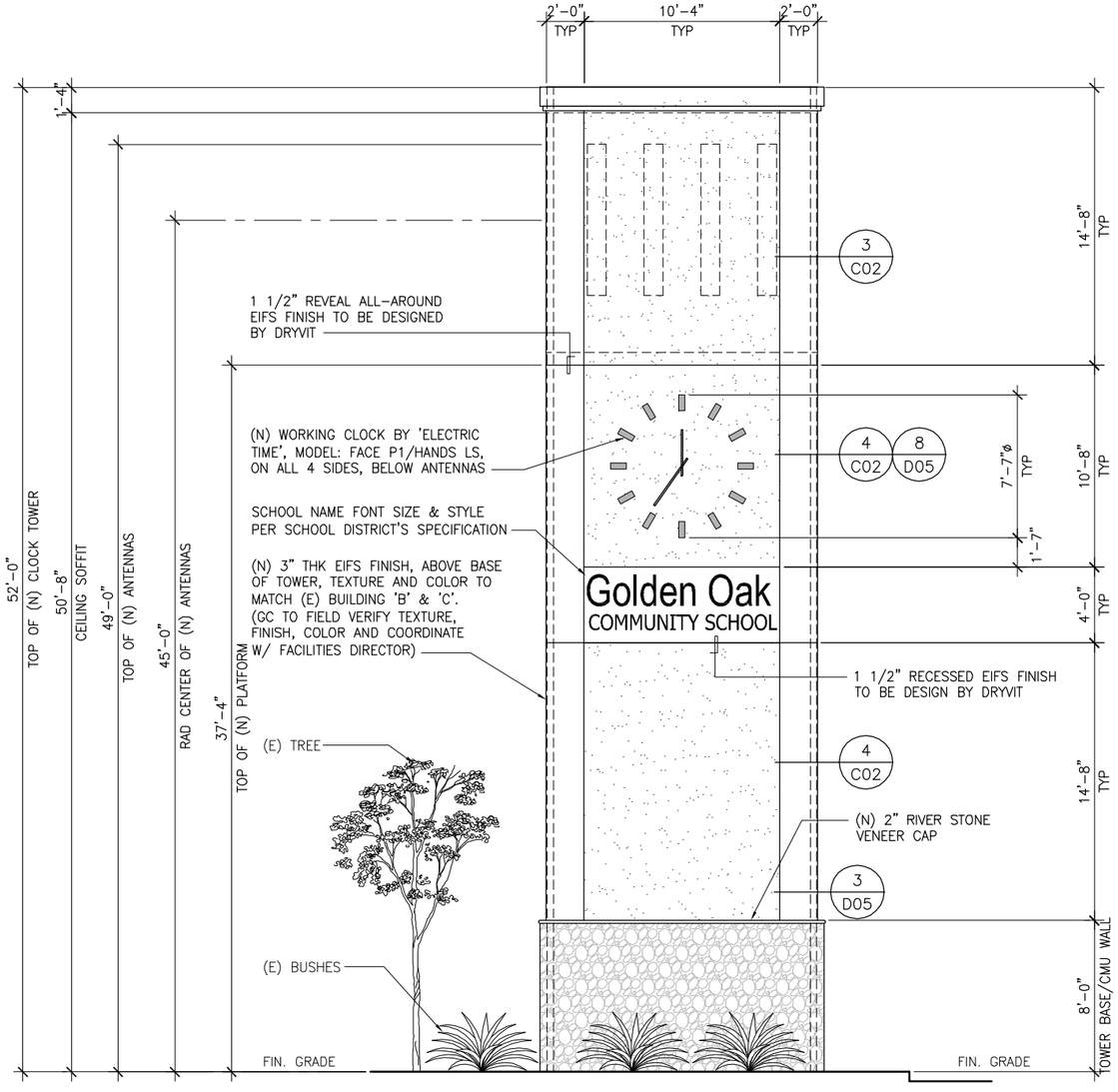
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0	11/19/13	REVISED PER DRM REDLINES (100% CD)	JGD	BOK	DKD
A	10/14/13	ISSUED FOR CD REVIEW AND COMMENT (90% CD)	JGD	BOK	DKD

SCALE AS SHOWN | DESIGNED | DRAWN

LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE: **EQUIPMENT & ANTENNA LAYOUT PLANS**

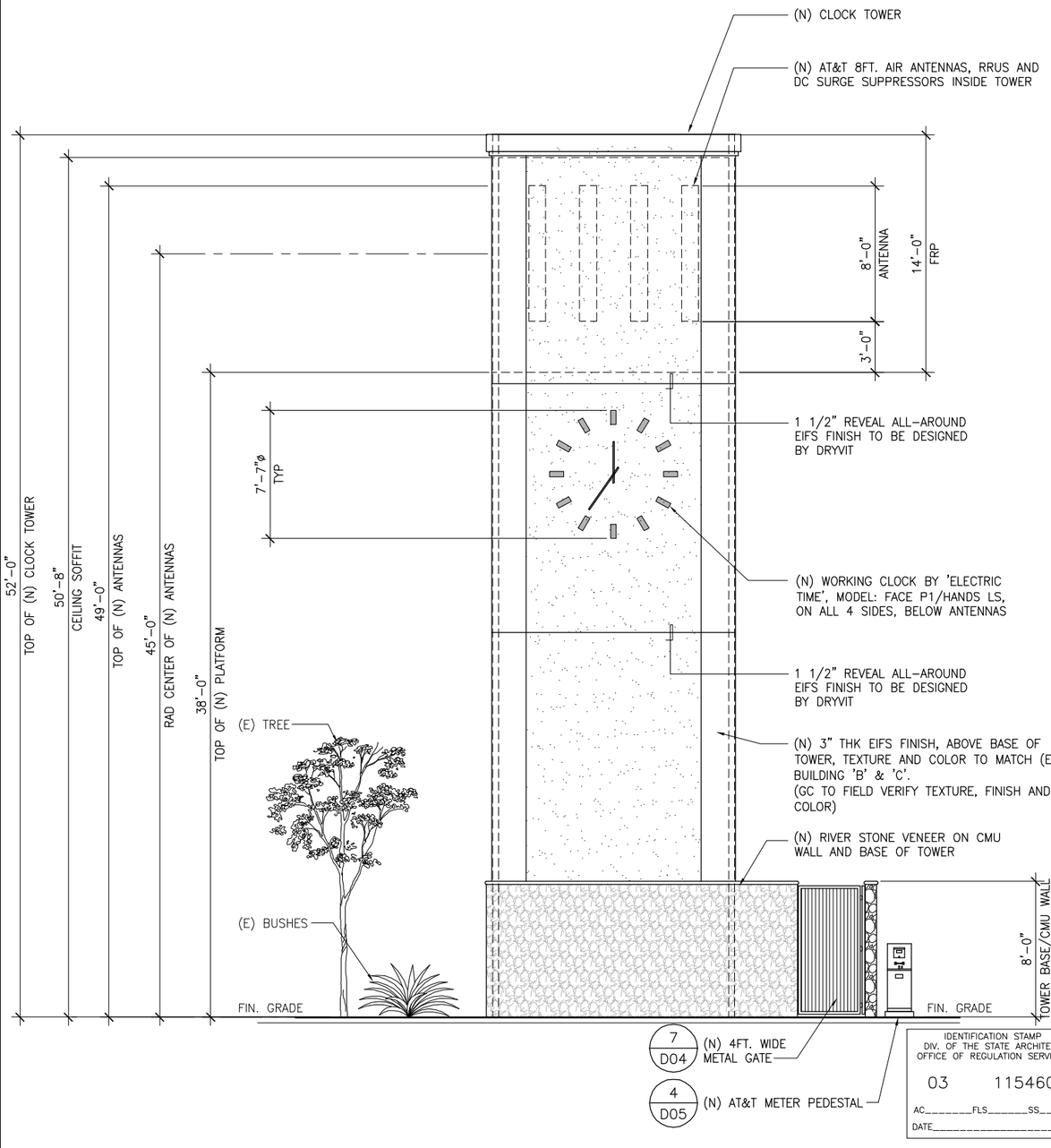
SHEET NUMBER: **C02**



WEST ELEVATION

SCALE: 1/4"=1'-0" 0 1' 2' 4"

2



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SOUTH ELEVATION

SCALE: 1/4"=1'-0" 0 1' 2' 4"

1

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32 EXECUTIVE PARK | SUITE 110 | IRVINE | CA 92614
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VeloTera SERVICES, Inc.
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GARDEN GROVE, CA 92841

NL0226
GOLDEN OAK COMMUNITY SCHOOL
25201 VIA PRINCESSA
SANTA CLARITA, CA 91387

at&t Mobility
12900 PARK PLAZA DRIVE
CERRITOS, CA 90703

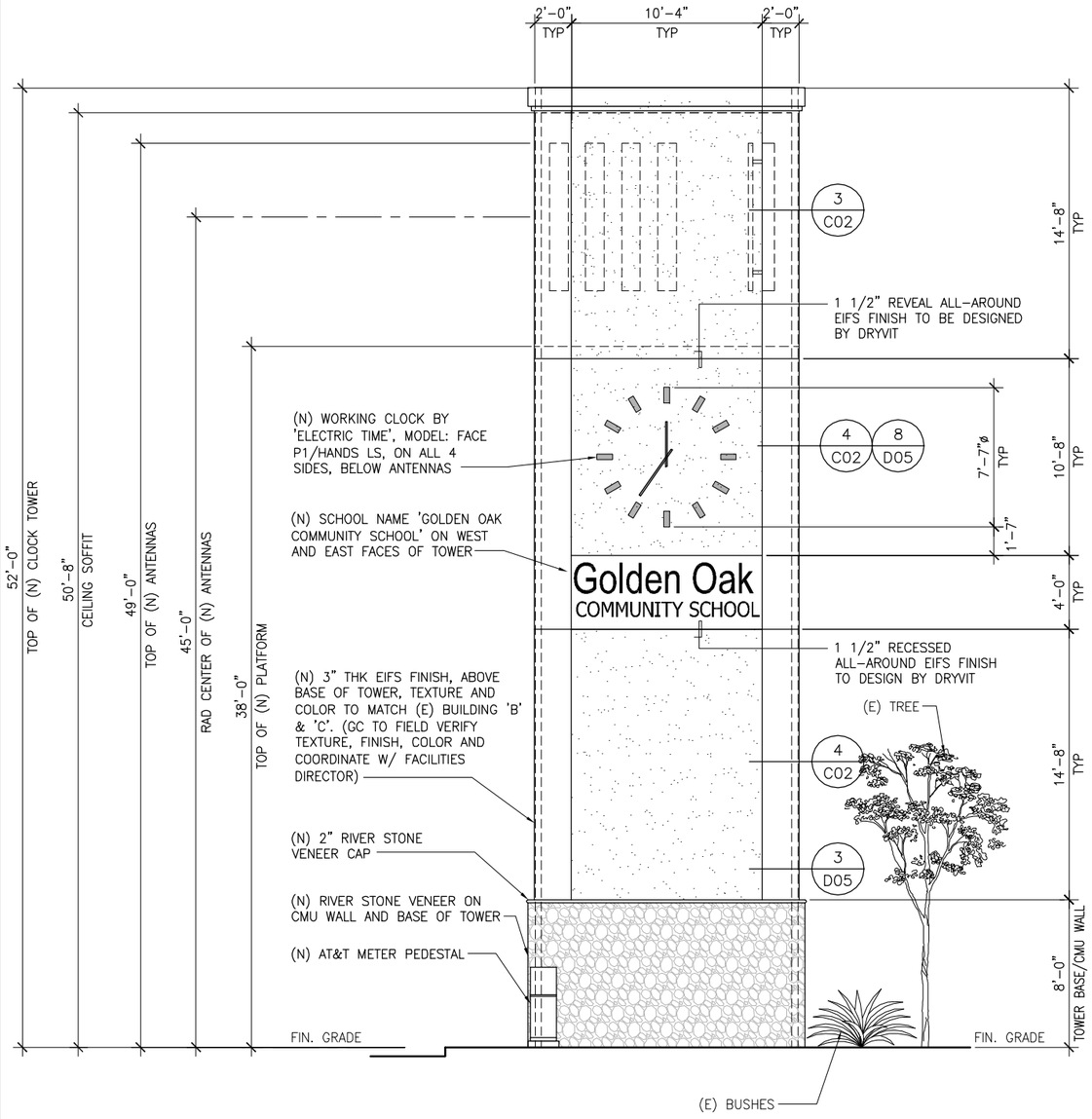
NO.	DATE	REVISIONS	BY	CHK	APP'D
4	10/31/14	REVISED PLANNING COMMENTS	MM3	BOK	DKD
3	06/09/14	REVISED STRUCTURAL DWGS PER DSA PLN CHK#3	JGD	BOK	DKD
2	05/06/14	REVISED PER PLAN CHECK#2	JGD	BOK	DKD
1	03/14/14	REVISED PER PLAN CHECK#1	JGD	BOK	DKD
0	11/19/13	REVISED PER DRM REDLINES (100% CD)	JGD	BOK	DKD

SCALE AS SHOWN | DESIGNED | DRAWN

LICENSED ARCHITECT D.K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE: ELEVATIONS

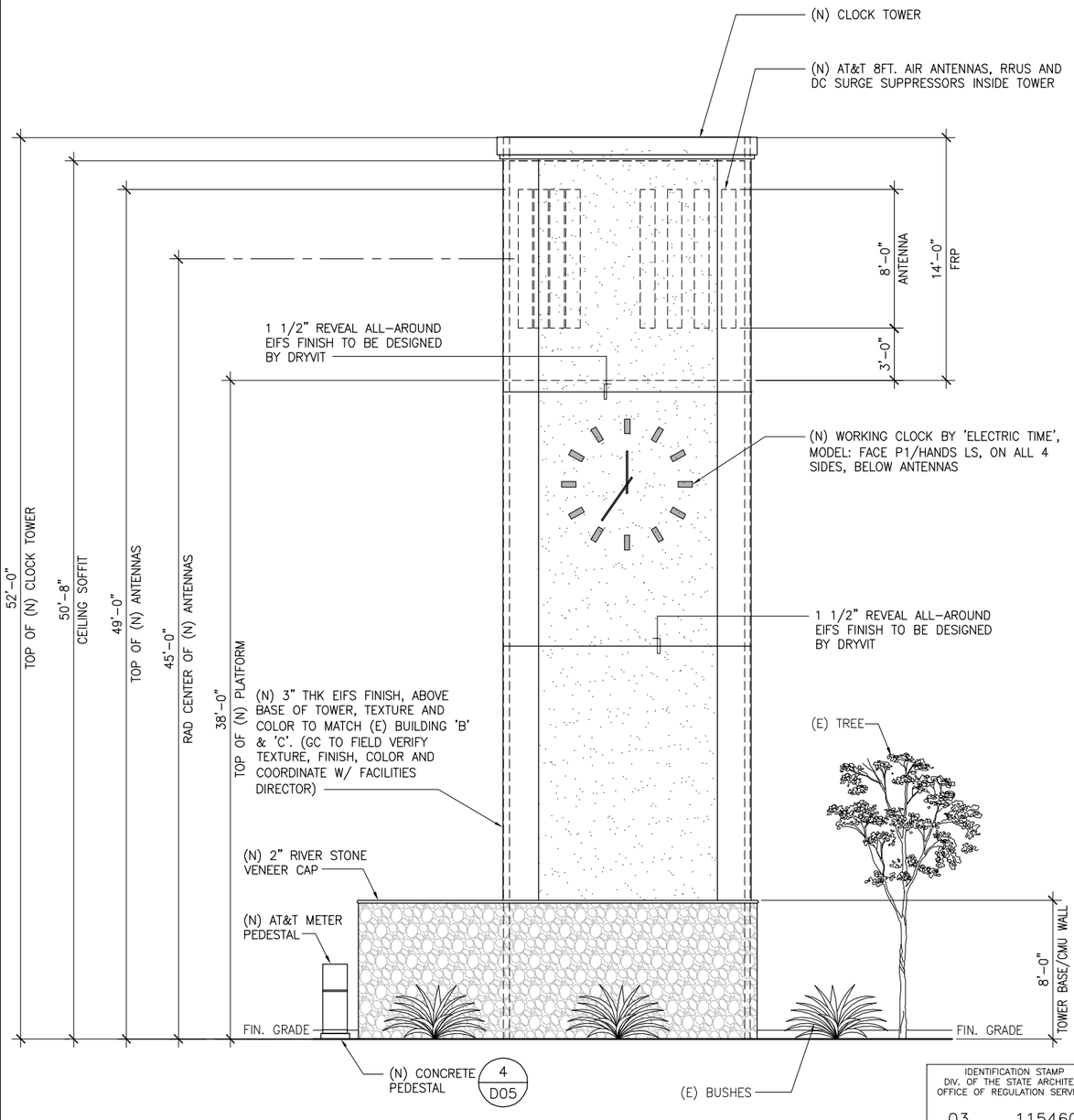
SHEET NUMBER: C03



EAST ELEVATION

SCALE: 1/4"=1'-0" 0 1' 2' 4'

2



NORTH ELEVATION

SCALE: 1/4"=1'-0" 0 1' 2' 4'

1

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GARDEN GROVE, CA 92841

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25201 VIA PRINCESSA
SANTA CLARITA, CA 91387

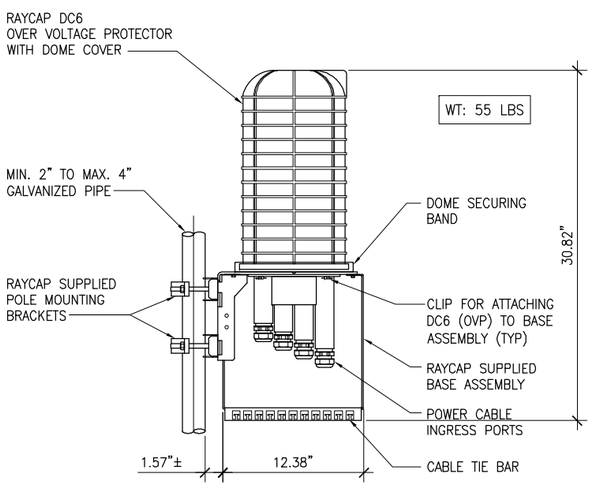
at&t Mobility
12900 PARK PLAZA DRIVE
CERRITOS, CA 90703

NO.	DATE	REVISIONS	BY	CHK	APP'D
4	10/31/14	REVISED PLANNING COMMENTS	MM3	BOK	DKD
3	06/09/14	REVISED STRUCTURAL DWGS PER DSA PLN CHK#3	JGD	BOK	DKD
2	05/06/14	REVISED PER PLAN CHECK#2	JGD	BOK	DKD
1	03/14/14	REVISED PER PLAN CHECK#1	JGD	BOK	DKD
0	11/19/13	REVISED PER DRM REDLINES (100% CD)	JGD	BOK	DKD

SCALE AS SHOWN | DESIGNED | DRAWN

LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

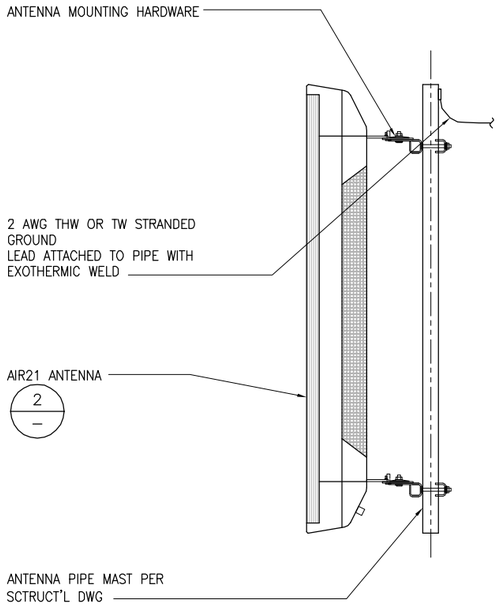
SHEET TITLE	SHEET NUMBER
ELEVATIONS	C04



NOTES:
1. RAYCAP VIA AT&T SUPPLIES THE DC6 OVER VOLTAGE PROTECTOR AND PIPE MOUNTING BRACKETS. SUBCONTRACTOR SHALL SUPPLY THE PIPE.

RAYCAP DC6-48-60-18-8F

SCALE: N.T.S | 7



ANTENNA MOUNTING DETAILS

SCALE: N.T.S | 5

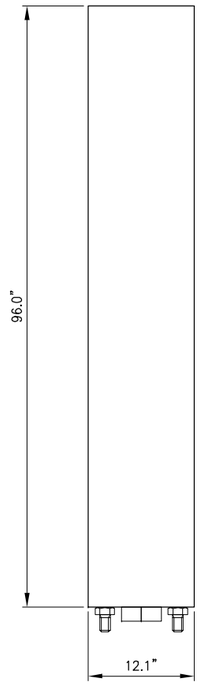
ANTENNA SECTOR		ANTENNA AZIMUTH	MODEL	RAD CENTER	DOWNTILT	SKEW	RRU AT ANTENNA LEVEL MODEL	QTY	CABLE LENGTH (SEE FIBER AND DC INFORMATION BELOW)
ALPHA	A1	70	AIR KRC118 054/1 (8')	45'-0"	-	0	RRUS-11	2	75 FT
	A2		AIR KRC118 054/1 (8')	45'-0"	-	0	RRUS-11	2	
	A3		AIR KRC118 054/1 (8')	45'-0"	-	0	RRUS-11	2	
	A4		AIR KRC118 054/1 (8')	45'-0"	-	0	RRUS-11	2	
BETA	B1	190	AIR KRC118 054/1 (8')	45'-0"	-	0	RRUS-11	2	75 FT
	B2		AIR KRC118 054/1 (8')	45'-0"	-	0	RRUS-11	2	
	B3		AIR KRC118 054/1 (8')	45'-0"	-	0	RRUS-11	2	
	B4		AIR KRC118 054/1 (8')	45'-0"	-	0	RRUS-11	2	
GAMMA	C1	310	AIR KRC118 054/1 (8')	45'-0"	-	0	RRUS-11	2	75 FT
	C2		AIR KRC118 054/1 (8')	45'-0"	-	0	RRUS-11	2	
	C3		AIR KRC118 054/1 (8')	45'-0"	-	0	RRUS-11	2	
	C4		AIR KRC118 054/1 (8')	45'-0"	-	0	RRUS-11	2	
DELTA	D1	N/A	-	-	-	-	-	0	-
	D2		-	-	-	-	-	0	
	D3		-	-	-	-	-	0	
	D4		-	-	-	-	-	0	
								24	
GPS	GPS #1	N/A	KATHREIN OG-860/1920/GPS-A	INSTALL (2) 1/2" COAX PER GPS, L=		20'			
	GPS #2	N/A	KATHREIN OG-860/1920/GPS-A	INSTALL (2) 1/2" COAX PER GPS, L=		20'			

FIBER AND DC INFORMATION:

TOTAL **FIBER INNERDUCTS** FROM LEASE AREA TO SURGE SUPPRESSOR =	**2**	2" DIAMETER INNERDUCT (STANDARD)
TOTAL **DC-6 (SQUID)** =	**4**	PCS (STANDARD)
TOTAL NUMBER OF **CONDUIT FOR DC** (ONE PER SQUID) =	**4**	2" DIAMETER INNERDUCT (STANDARD)
TOTAL REQUIRED **FIBER RIBBONS** FROM SURGE SUPPRESSOR TO RRUs =	48	RIBBONS
TOTAL **DC LINES** FROM SURGE SUPPRESSOR TO RRUs =	24	PAIRS
EACH FIBER INNERDUCT CONTAINS 24 FIBER RIBBONS, MAXIMUM RIBBONS =	48	RIBBONS AVAILABLE
	48	RIBBONS REQUIRED
	0	RIBBONS SPARE
EACH CONDUIT FOR DC CABLES CONTAINS 6 PAIRS DC LINES, MAXIMUM DC LINES =	24	PAIRS AVAILABLE
	24	PAIRS REQUIRED
	0	PAIRS SPARE

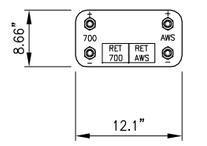
ANTENNA SPECIFICATIONS AND EQUIPMENT TABLE

SCALE: N.T.S | 2



FRONT

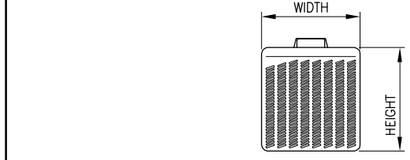
MODEL NUMBER	AIR KRC118 054/1 (8')
DESCRIPTION	4 BAND
FREQUENCY (MHz)	1710-1755 / 2110-2155 MHz
DIMENSIONS (HxWxD)	96.0" x 12.1" x 8.66"
WEIGHT (LBS.)	121
RET	-2° TO -12°



BOTTOM

NOTES TO CONTRACTOR:
1. CONTRACTOR IS TO REFER TO AT&T 'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
2. CABLE LENGTHS WERE DETERMINED BASED ON VISUAL INSPECTION DURING SITE-WALK. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK.

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SIZE AND WEIGHT TABLE

RRUS-11	WIDTH	DEPTH	HEIGHT	WEIGHT
WITH SOLAR SHIELD	17.0"	7.2"	17.8"	55 LBS.

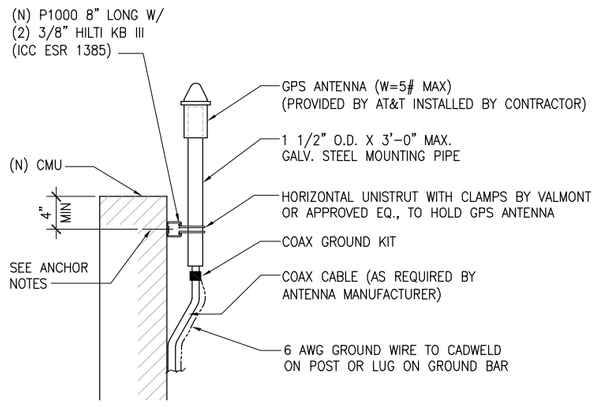
MINIMUM CLEARANCE TABLE - INSTALL PER MANUFACTURER SPECIFICATIONS

RRU CABINET	CLEARANCES (INCHES)	COMMENTS
FRONT	36"	INSTALLATION ACCESS
REAR	0"	ZERO REAR CLEARANCE IS ALLOWED USING SUPPLIED MOUNTING BRACKETS
RIGHT	0"	
LEFT	0"	
TOP	16"	AIR FLOW
BOTTOM	8"	CONDUIT ROUTING/AIR FLOW

ERICSSON
REMOTE RADIO UNIT (RRU)

LTE REMOTE RADIO UNIT (RRU)

SCALE: N.T.S | 8



ELEVATION

NOTES:
1. LOCATION OF ANTENNA MUST HAVE CLEAR VIEW OF SOUTHERN SKY AND CANNOT HAVE ANY BLOCKAGES EXCEEDING 25% OF THE SURFACE AREA OF A HEMISPHERE AROUND THE GPS ANTENNA.
2. ALL GPS ANTENNA LOCATIONS MUST BE ABLE TO RECEIVE CLEAR SIGNALS FROM A MINIMUM OF FOUR (4) SATELLITES. VERIFY WITH HANDHELD GPS BEFORE FINAL LOCATION OF GPS ANTENNA.

E911-GPS ANTENNA PIPE MOUNT

GPS ANTENNA

SCALE: N.T.S | 6

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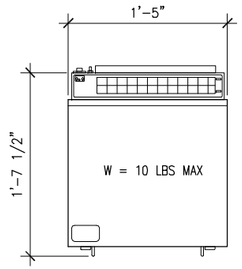
at&t Mobility
12900 PARK PLAZA DRIVE
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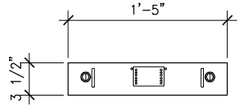
SCALE AS SHOWN | DESIGNED | DRAWN

LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

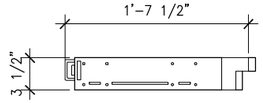
SHEET TITLE	SHEET NUMBER
DETAILS	D01



TOP VIEW



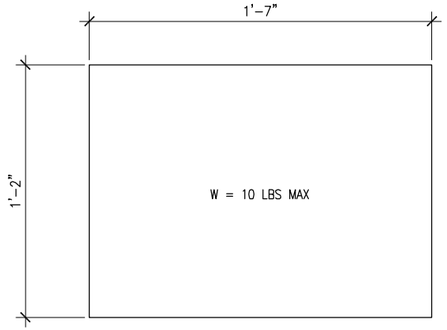
FRONT VIEW



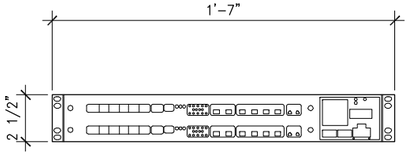
SIDE VIEW

RAYCAP DC12-48-60-RM

SCALE: N.T.S | 7



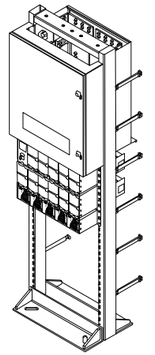
TOP VIEW



FRONT VIEW

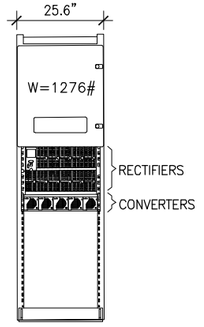
RBS 6601 (DUL)

SCALE: N.T.S | 5



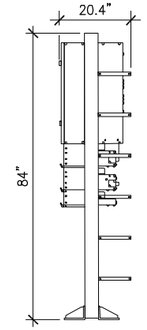
SYSTEM CONFIGURATION 0540091-001 SHOWN
(INCLUDES 7 FT SEISMIC RACK)

NEQ. 15238 P/N 0540091-001	
DESCRIPTION: 24/48V DUAL VOLTAGE DC POWER SYSTEM 1200A, 24V AND 185A, 48V W/LVBD	
WEIGHT:	575 lbs (NO RECTIFIERS) 800 lbs (W/ RECTIFIERS & CONVERTERS)
# OF RECTIFIER POSITIONS:	UP TO (11) 24V-3.1kW
# OF CONVERTER POSITIONS:	UP TO (5) 24-48V/2kW
# OF BREAKER POSITIONS:	24V DC = 48 (PLUG-IN) (2) TIERS, 24-POS.
	48V DC = 40 (PLUG-IN) (2) TIERS, 20-POS.
# OF FUSE POSITIONS:	10 (GMT TYPE) - 24V



OUTLINE ALPHA CORDEX POWER SYSTEM

NEQ. 15240 P/N 0540149-001	
DESCRIPTION: 48/24V DUAL VOLTAGE DC POWER SYSTEM 825A, 48V AND 296A 24V (3-TIER)	
WEIGHT:	575 lbs (RECTIFIERS AND CONVERTERS NOT INCLUDED) 777 lbs FULLY EQUIPPED
# OF RECTIFIER POSITIONS:	UP TO (11) 48V-3.6kW
# OF CONVERTER POSITIONS:	UP TO (4) 48-24V/2kW
# OF BREAKER POSITIONS:	24V DC = 20 (PLUG-IN) (1) TIERS, 20-POS.
	48V DC = 48 (PLUG-IN) (2) TIERS, 24 POS. EXPANDABLE TO 3 TIERS
# OF FUSE POSITIONS:	10 (GMT TYPE) - 48V DC

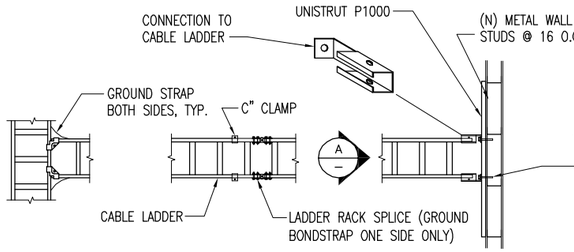


NOTE:
FOR ANCHOR AND BOLTING TEMPLATES SEE STRUCTURAL DWGS. (4 / S05)

NEQ. 15239 P/N 0540151-001	
DESCRIPTION: 48/24V DUAL VOLTAGE DC POWER SYSTEM 825A, 48V AND 296A, 24V (4-TIER) W/LVBD	
WEIGHT:	575 lbs (RECTIFIERS AND CONVERTERS NOT INCLUDED) 777 lbs FULLY EQUIPPED
# OF RECTIFIER POSITIONS:	UP TO (11) 48V-3.6kW
# OF CONVERTER POSITIONS:	UP TO (4) 48-24/2kW
# OF BREAKER POSITIONS:	24V DC = 20 (PLUG-IN) (1) TIER, 20-POS.
	48V DC = 72 (PLUG-IN) (3) TIERS, 24-POS.
# OF FUSE POSITIONS:	10 (GMT TYPE) - 48V DC

ARGUS CXPS 24-4T INSTALLATION DETAIL

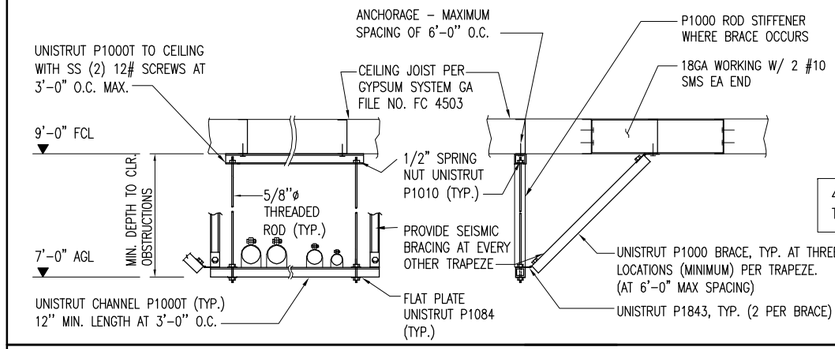
SCALE: N.T.S | 1

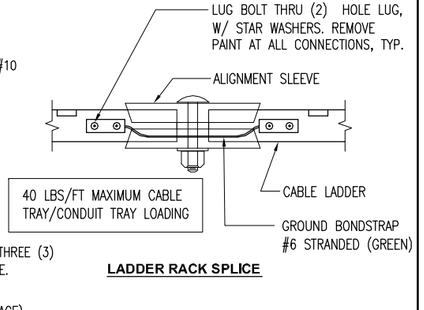


PLAN AT TYPICAL RUN **PLAN AT WALL/ CONNECTION**

CABLE LADDER NOTES:

1. ALL CUT ENDS OF CABLE LADDER TO BE FILED SMOOTH AND PAINTED WITH MATCHING COLOR.
2. BOTTOM OF CABLE LADDER TO BE 7'-6" ABOVE FINISH FLOOR UNLESS NOTED OTHERWISE.
3. CORNER BRACKETS TO BE ON THE INSIDE, UNLESS LADDER RUNGS INTERFERE, THEN CORNER BRACKETS MAY BE ON THE OUTSIDE.
4. CABLE LADDER RUNGS TO BE ON TOP OF HORIZONTAL LADDER AND AWAY FROM WALL ON VERTICAL LADDERS.
5. NUTS TO BE ON BOTTOM OF ASSEMBLY, OR TOWARDS WALL.
6. LADDER RACKS TO BE SUPPORTED USING (2) 5/8"øTHREADED RODS AT 3'-0" O.C. (MAX).
7. AFTER FINAL LEVELING OF CABLE LADDER, CUT ROD SO THAT 1/2" OF THE THREADS ARE EXPOSED BELOW THE NUT. CAP WITH SAUNDERS BROS. PN SB 300-D.
8. ANCHOR ALL ENDS OF CABLE LADDERS TO WALL OR FLOOR.

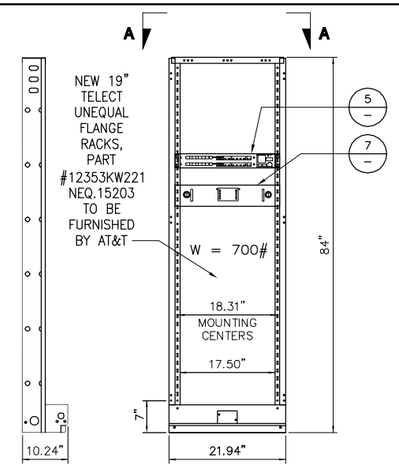


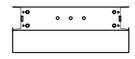


LADDER RACK SPLICE

COAX HORIZONTAL LADDER RACK SUPPORT

SCALE: N.T.S | 6





VIEW A-A
(TOP VIEW)

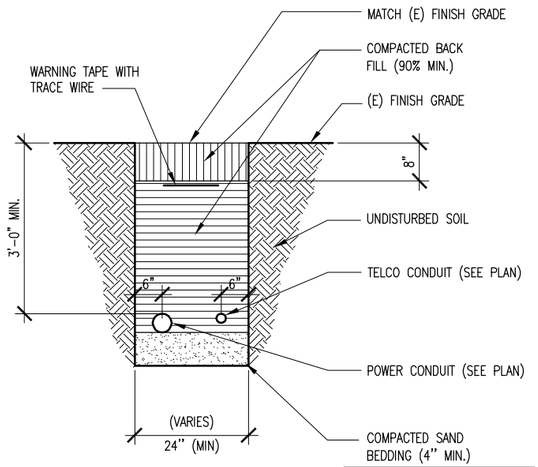
NOTE:
1. ADDITIONAL EARTHQUAKE BRACE IS NOT REQUIRED UNLESS DRAWINGS SPECIFY OTHERWISE.

INDOOR FLOOR MOUNTED EQUIPMENT RACK INSTALLATION DETAIL

NOTE:
FOR ANCHOR AND BOLTING TEMPLATES SEE STRUCTURAL DWGS. (5 / S05)

EQUIPMENT RACK

SCALE: N.T.S | 4



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COMBINED POWER AND TELCO TRENCH

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12900 PARK PLAZA DRIVE
CERRITOS, CA 90703

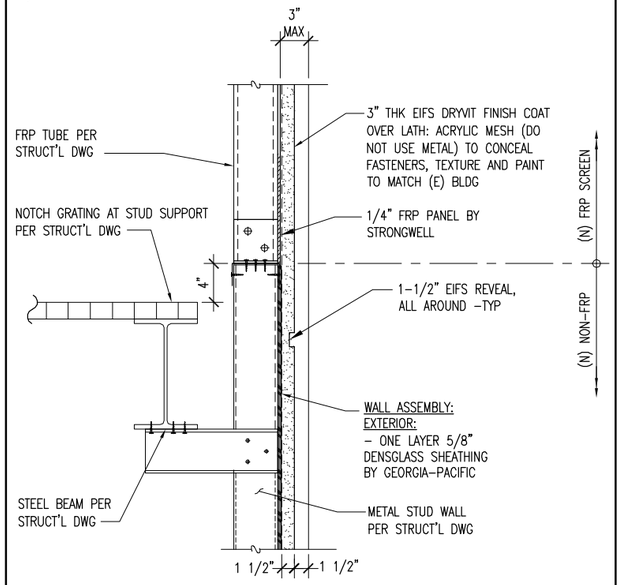
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4	10/31/14	REVISED PLANNING COMMENTS	MM3	BOK	DKD
3	06/09/14	REVISED STRUCTURAL DWGS PER DSA PLN CHK#3	JGD	BOK	DKD
2	05/06/14	REVISED PER PLAN CHECK#2	JGD	BOK	DKD
1	03/14/14	REVISED PER PLAN CHECK#1	JGD	BOK	DKD
0	11/19/13	REVISED PER DRM REDLINES (100% CD)	JGD	BOK	DKD

SCALE AS SHOWN | DESIGNED | DRAWN

LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

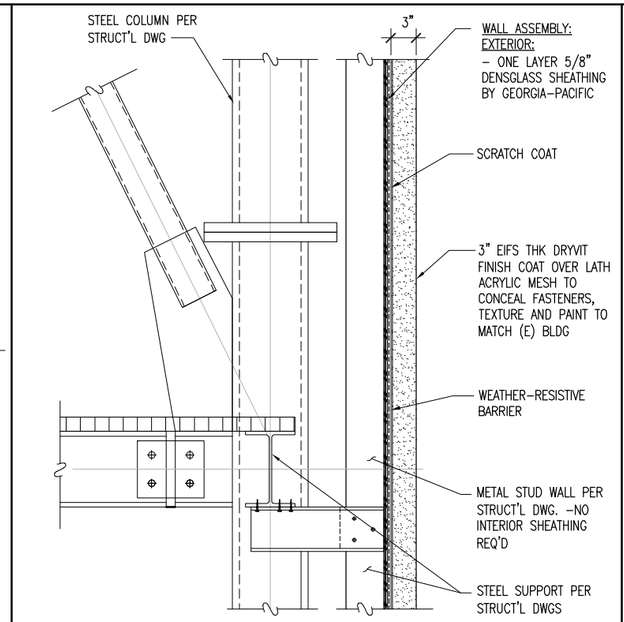
SHEET TITLE	SHEET NUMBER
DETAILS	D02

NOTE:
1) ENSURE INDUSTRY-STANDARD WATER PROOFING AND APPLY NRCA STANDARDS
2) FRP MATERIAL TO MATCH (N) STRUCTURE TEXTURE AND FINISH. SEAL ALL GAPS
3) NO METAL MATERIAL SHALL BE PERMITTED IN FRONT OF ANTENNAS



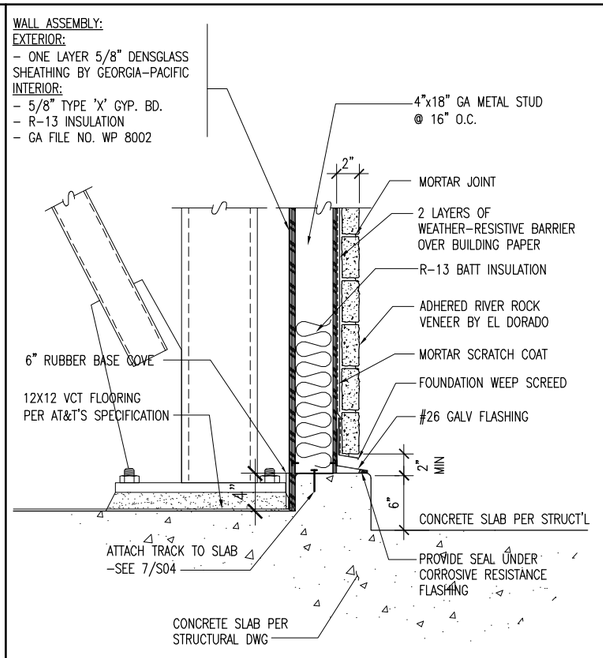
EIFS DETAIL

SCALE: N.T.S | 7



TYPICAL EIFS DETAIL

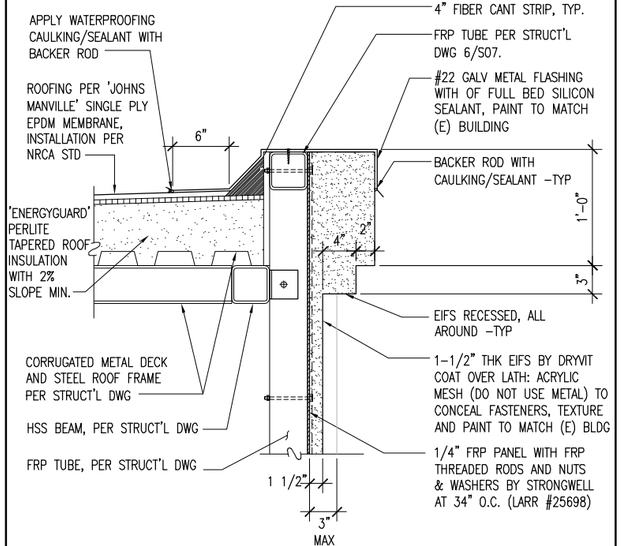
SCALE: N.T.S | 5



ADHERED RIVER STONE VENEER DETAIL

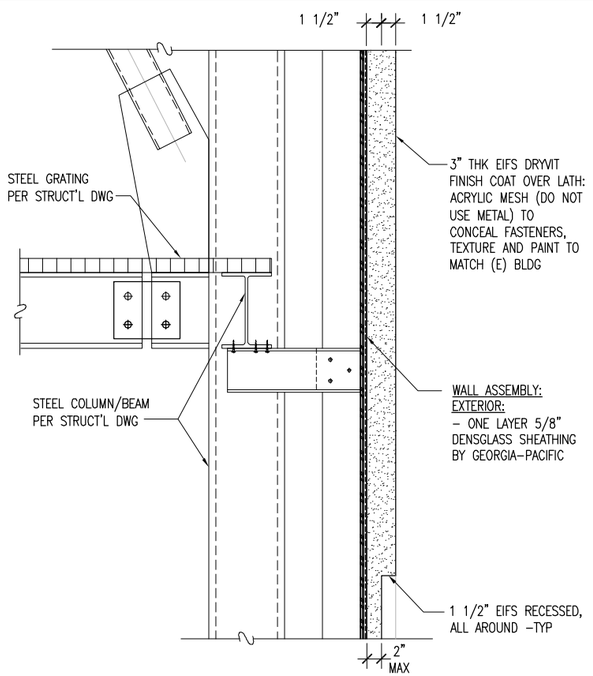
SCALE: N.T.S | 3

NOTE:
1) ENSURE INDUSTRY-STANDARD WATER PROOFING AND APPLY NRCA STANDARDS
2) FRP MATERIAL TO MATCH (N) STRUCTURE TEXTURE AND FINISH. SEAL ALL GAPS
3) NO METAL MATERIAL SHALL BE PERMITTED IN FRONT OF ANTENNAS



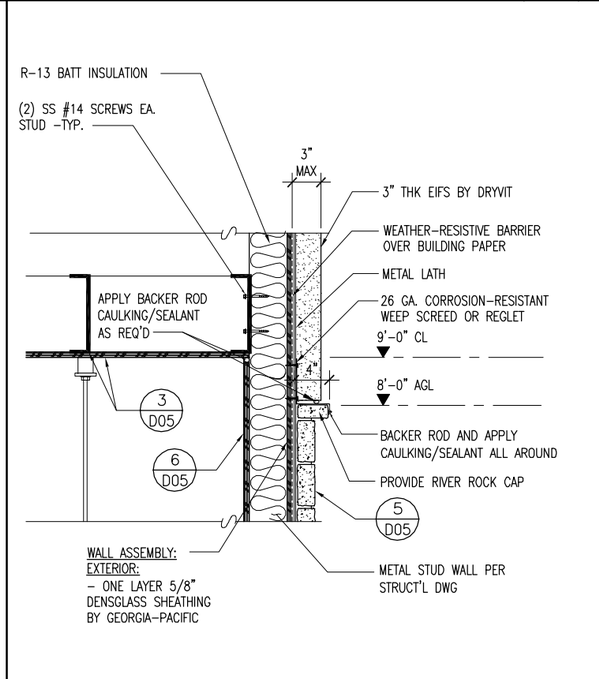
ROOF FLASHING DETAIL

SCALE: N.T.S | 8



TYPICAL EIFS RECESSED DETAIL

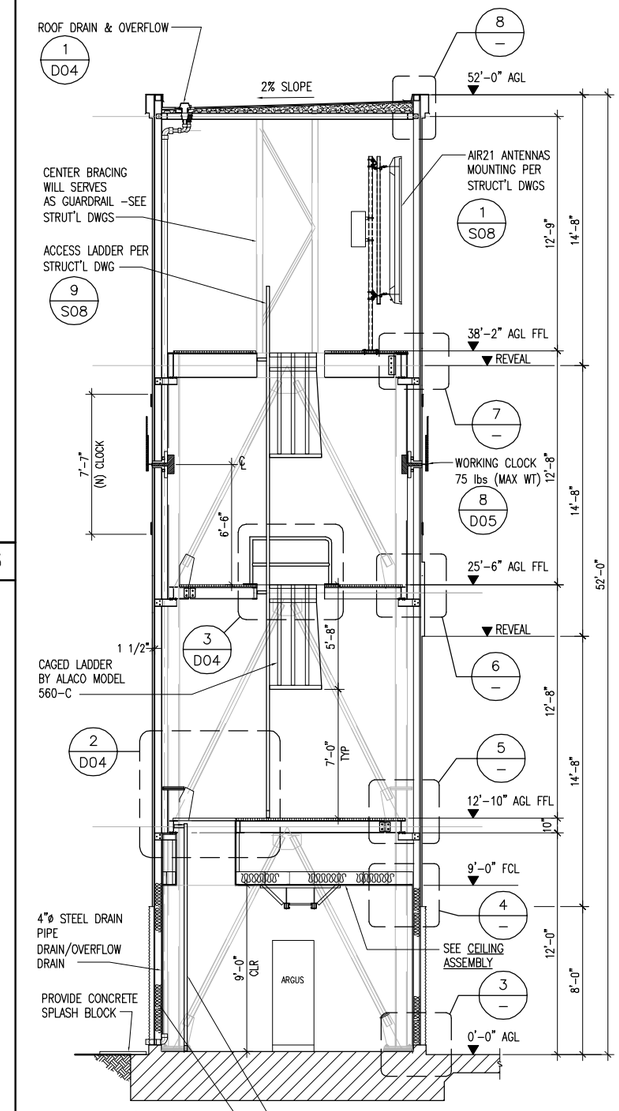
SCALE: N.T.S | 6



STONE VENEER & EIFS TRANSITION

SCALE: N.T.S | 4

NOTE:
1) ENSURE INDUSTRY-STANDARD WATER PROOFING AND APPLY NRCA STANDARDS



CEILING ASSEMBLY (INDOOR):
- ONE LAYER 5/8" TYPE 'X' GYP. BD.
- R-19 INSULATION
-GA FILE NO. FC 4503

WALL ASSEMBLY (INDOOR):
- ONE LAYER 5/8" TYPE 'X' GYP. BD. BOTH SIDES
- R-13 INSULATION
- GA FILE NO. WP 8002

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SECTION

SCALE: N.T.S | 2

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GARDEN GROVE, CA 92841

NL0226
GOLDEN OAK COMMUNITY SCHOOL
25201 VIA PRINCESSA
SANTA CLARITA, CA 91387

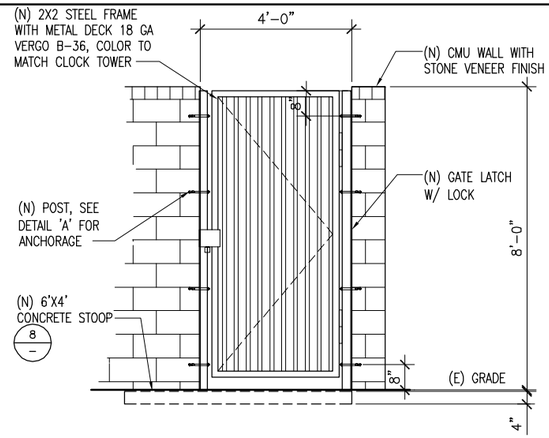
at&t Mobility
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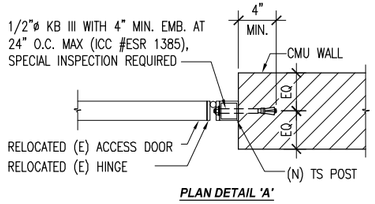
SCALE AS SHOWN | DESIGNED | DRAWN

LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE	SHEET NUMBER
DETAILS	D03



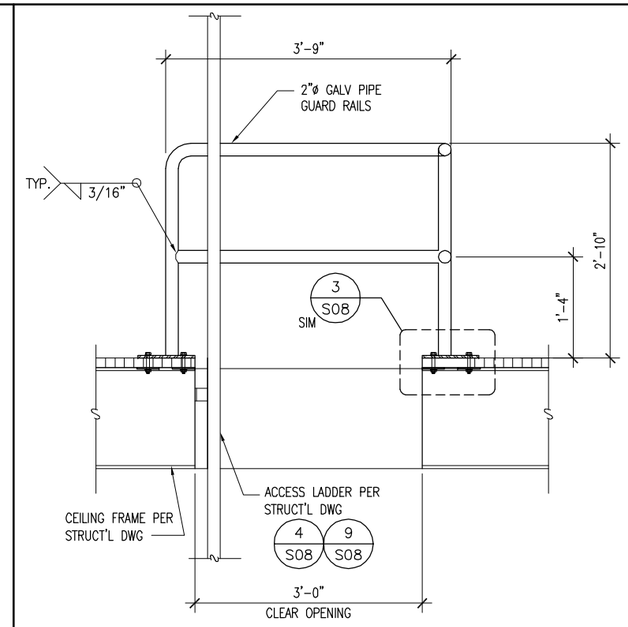
ELEVATION



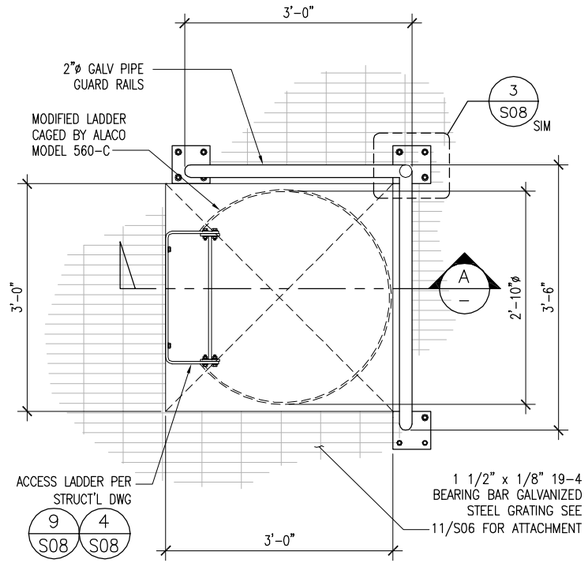
PLAN DETAIL 'A'

METAL GATE

SCALE: N.T.S | 7



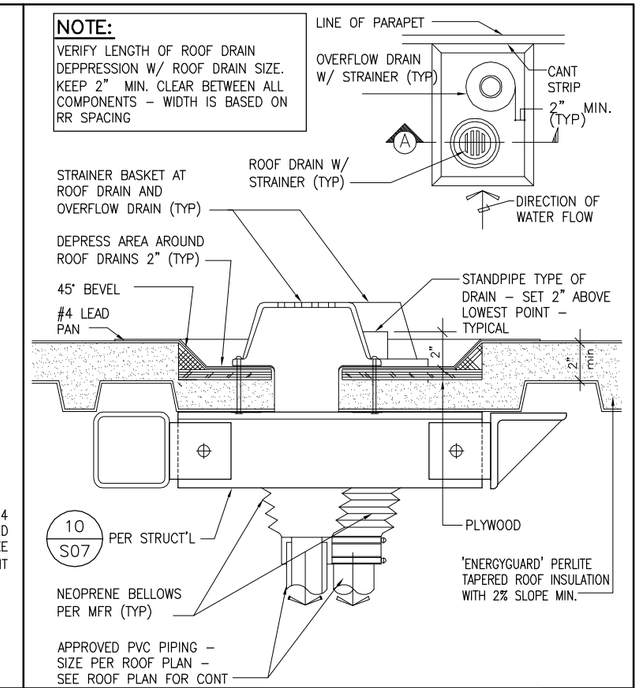
SECTION 'A'



PLAN

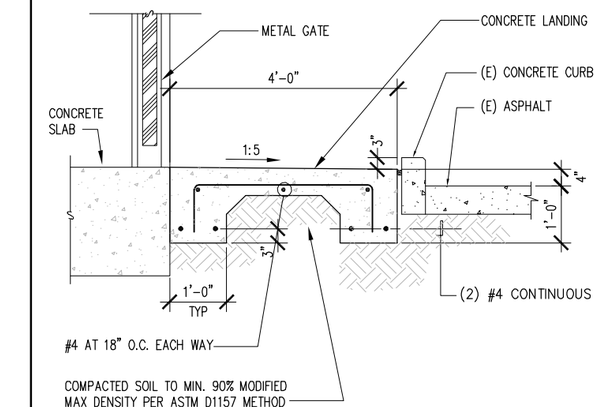
PLATFORM GUARD RAIL DETAIL

SCALE: N.T.S | 3



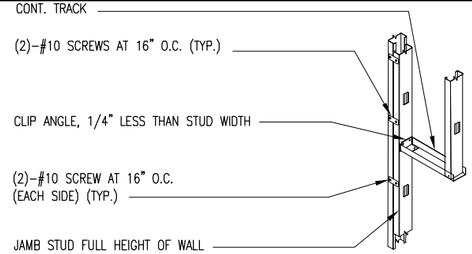
ROOF DRAIN AND OVERFLOW

SCALE: N.T.S | 1

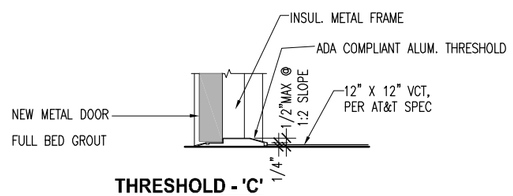


CONCRETE LANDING (STOOP)

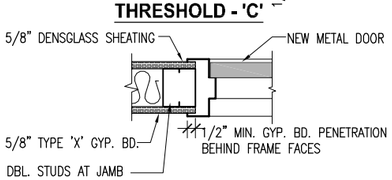
SCALE: N.T.S | 8



JAMB STUD DETAIL -'A'



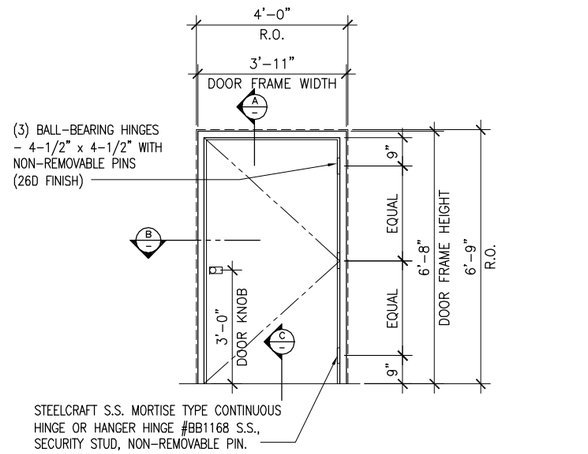
THRESHOLD - 'C'



DOOR JAMB/HEAD - 'B'

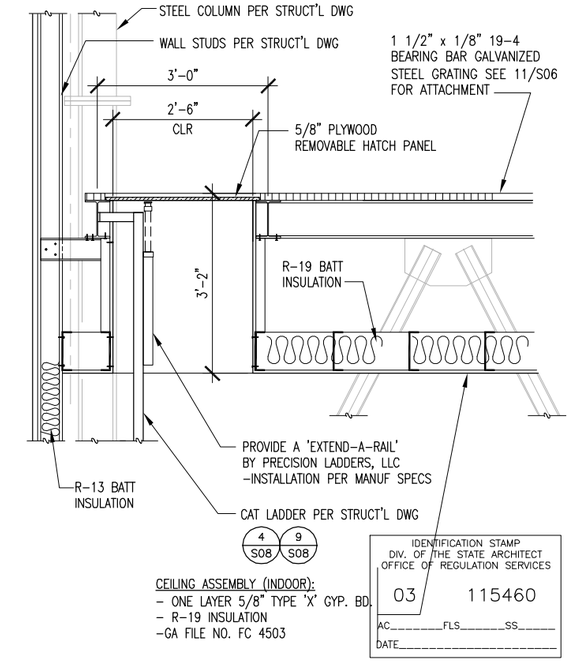
DOOR SCHEDULE

QTY.	LOCATION	HR RATING	FRAMES					DOORS			
			GAUGE	ANCHOR/ WALL TYPE	DETAILS			GAUGE	TYPE	DOOR OPENING	
					HEAD	JAMB	SILL			WIDTH	HEIGHT
1	EQUIPMENT SHELTER	N/A	16	#10/METAL STUDS	METAL	METAL	N/A	20	B	4'-0"	6'-8"



DOOR DETAIL

SCALE: N.T.S | 4



CEILING ASSEMBLY (INDOOR):
- ONE LAYER 5/8" TYPE 'X' GYP. BD.
- R-19 INSULATION
-GA FILE NO. FC 4503

CEILING ACCESS HATCH

SCALE: N.T.S | 2

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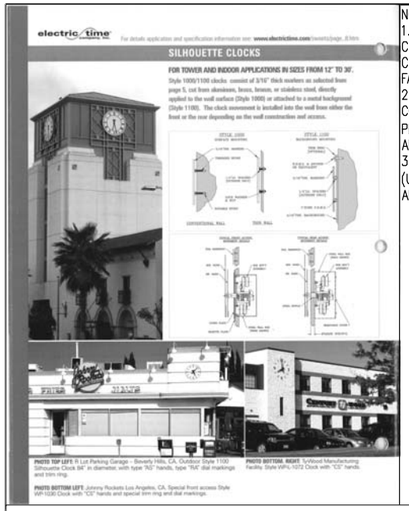
at&t Mobility
12900 PARK PLAZA DRIVE
CERRITOS, CA 90703

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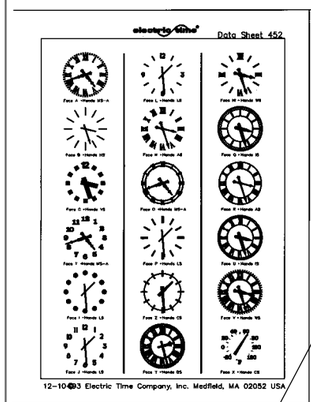
SCALE AS SHOWN | DESIGNED | DRAWN

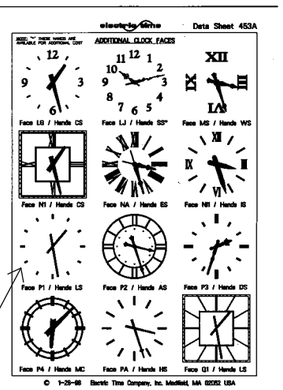
LICENSED ARCHITECT D.K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE	SHEET NUMBER
DETAILS	D04



NOTE:
1. GC SHALL COORDINATE WITH CLOCK MANUFACTURER AND AT&T CM PRIOR TO CONSTRUCTION AND FABRICATION.
2. GC SHALL INSTALL IN STRICT CONFORMANCE
PER MANUFACTURER'S SPECIFICATION AND INSTALLATION.
3. GC TO APPLY WATER PROOFING (UV RATED) CAULKING/SEALANT ON ALL BUILDING PENETRATION.

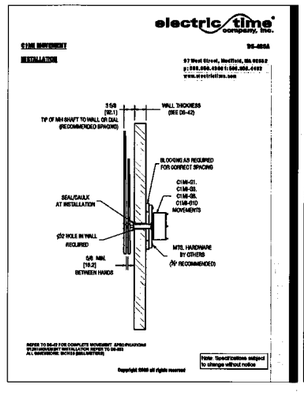


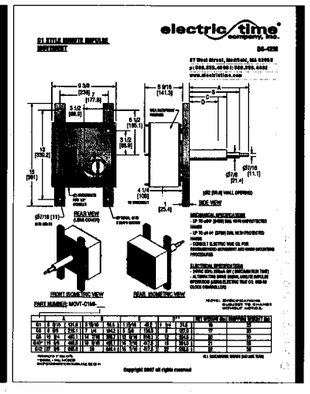


12-10-03 Electric Time Company, Inc. Medfield, MA 02052 USA

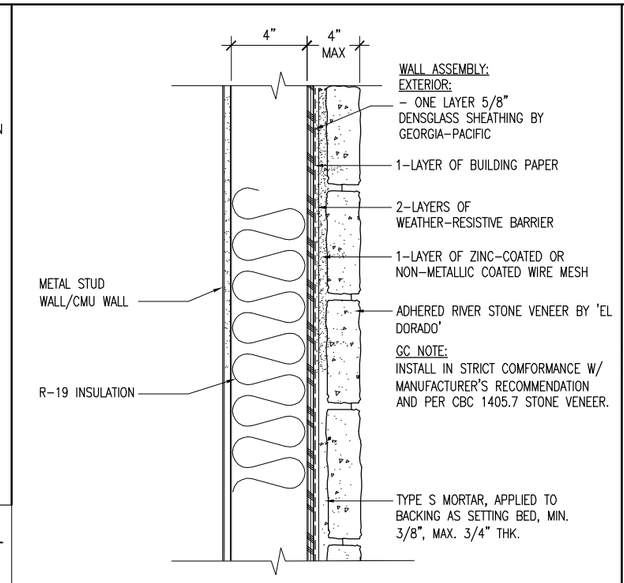
© 1-26-98 Electric Time Company, Inc. Medfield, MA 02052 USA

(N) 'AT&T' 7'ø CLOCK MODEL





CLOCK SPECIFICATIONS — SCALE: N.T.S — 8



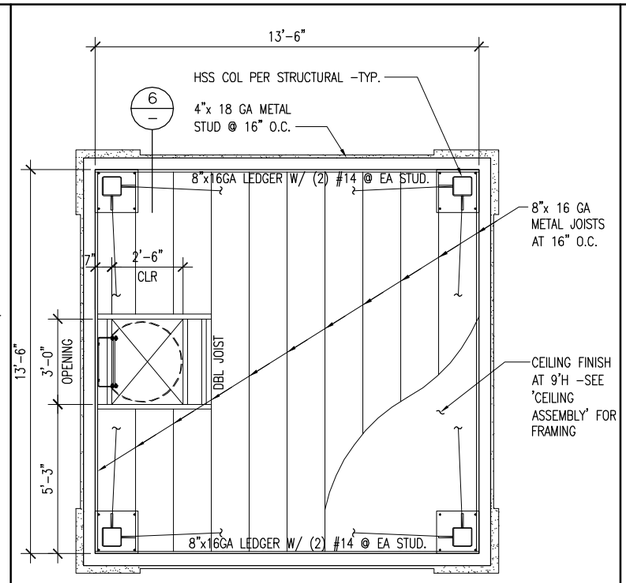
WALL ASSEMBLY:
EXTERIOR:
- ONE LAYER 5/8" DENSGLASS SHEATHING BY GEORGIA-PACIFIC
1-LAYER OF BUILDING PAPER
2-LAYERS OF WEATHER-RESISTIVE BARRIER
1-LAYER OF ZINC-COATED OR NON-METALLIC COATED WIRE MESH
ADHERED RIVER STONE VENEER BY 'EL DORADO'

GC NOTE:
INSTALL IN STRICT COMFORMANCE W/ MANUFACTURER'S RECOMMENDATION AND PER CBC 1405.7 STONE VENEER.

TYPE S MORTAR, APPLIED TO BACKING AS SETTING BED, MIN. 3/8", MAX. 3/4" THK.

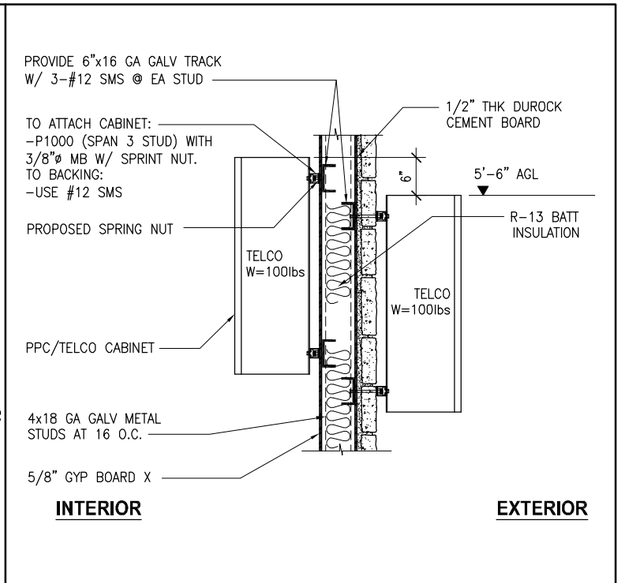
NOTE:
ALTERNATE ADHERED VENEER INSTALLATIONS MAY BE PROVIDED BY USE OF BOND-ENHANCED MORTARS AND BY THIN-SET CEMENTS OR ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS, AS VERIFIED BY TESTS OR APPROVED EQUAL.

ADHERED VENEER APPLICATION (STUD) — SCALE: N.T.S — 5

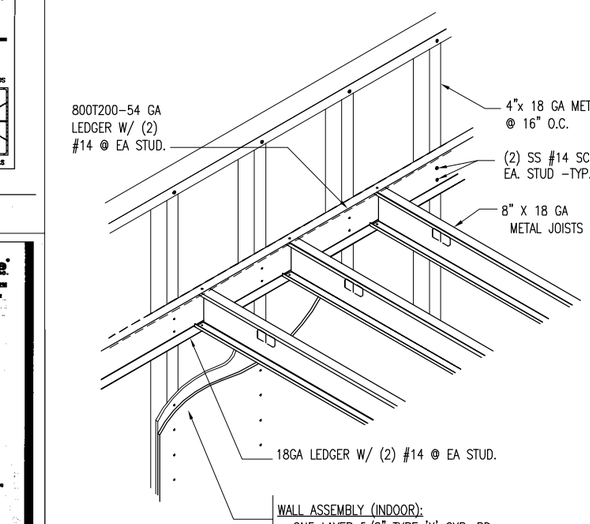


CEILING ASSEMBLY (INDOOR):
- ONE LAYER 5/8" TYPE 'X' GYP. BD.
- R-19 INSULATION
-GA FILE NO. FC 4503

CEILING FRAMING PLAN — SCALE: N.T.S — 3

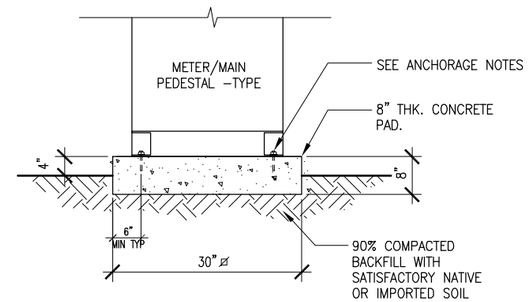


UTILTIY PANEL MOUNTING — SCALE: N.T.S — 1



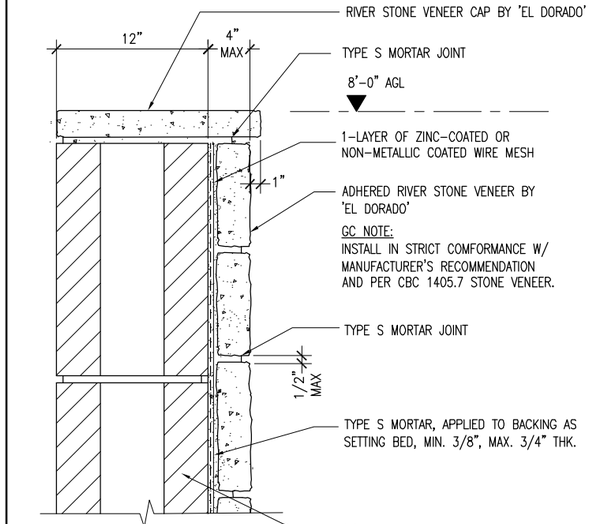
WALL ASSEMBLY (INDOOR):
- ONE LAYER 5/8" TYPE 'X' GYP. BD. BOTH SIDES
- R-13 INSULATION
- GA FILE NO. WP 8002

WALL FRAMING ASSEMBLY — SCALE: N.T.S — 6



ANCHORAGE NOTES:
1. USE 3/8"ø HILTI KB TZ WITH 3.5" EMB. MIN. (ICC ESR#1917), SPECIAL INSPECTION REQ'D.
2. CONTRACTOR TO VERIFY BOLTING TEMPLATE WITH CONDENSER MANUFACTURER PRIOR TO INSTALLATIO /CONSTRUCTION.

CONCRETE PAD — SCALE: N.T.S — 4



NOTE:
ALTERNATE ADHERED VENEER INSTALLATIONS MAY BE PROVIDED BY USE OF BOND-ENHANCED MORTARS AND BY THIN-SET CEMENTS OR ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS, AS VERIFIED BY TESTS OR APPROVED EQUAL.

IDENTIFICATION STAMP
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ADHERED VENEER APPLICATION (CMU) — SCALE: N.T.S — 2

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SCALE AS SHOWN | DESIGNED | DRAWN

LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE	SHEET NUMBER
DETAILS	D05

GENERAL NOTES:

1. DESIGN CRITERIA:

DESIGN CODE: 2010 CALIFORNIA BUILDING CODE (CBC)	
S_s = 1.93	SDC = D
S_1 = 0.789	WIND SPEED – 85 M.P.H.
F_a = 1.0	WIND EXPOSURE – B
F_v = 1.5	

2. ALL MATERIALS AND WORK PERFORMED SHALL CONFORM WITH THE REQUIREMENTS OF THE CODE AND GOVERNING BUILDING ORDINANCES.
3. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER THESE GENERAL NOTES.
4. WHERE A SECTION OR TYPICAL DETAIL IS SHOWN FOR ONE CONDITION, IT SHALL APPLY FOR ALL LIKE OR SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
5. NO CHANGES ARE TO BE MADE TO THESE PLANS WITHOUT THE KNOWLEDGE AND WRITTEN CONSENT OF THIS ENGINEER. UNAUTHORIZED CHANGES RENDER THESE DRAWINGS VOID.
6. ANY REFERENCE TO THE WORDS APPROVED, OR APPROVAL IN THESE DOCUMENTS SHALL BE HERE DEFINED TO MEAN GENERAL ACCEPTANCE OR REVIEW AND SHALL NOT RELIEVE THE CONTRACTOR AND/OR HIS SUB–CONTRACTORS OF ANY LIABILITY IN FURNISHING THE REQUIRED MATERIALS OF LABOR SPECIFIED.
7. THE CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE AND DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES INCLUDING, BUT NOT LIMITED TO, BRACING AND SHORING. OBSERVATION VISITS TO THE SITE BY FIELD REPRESENTATIVES OF THE ARCHITECT OF ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
8. GENERAL CONTRACTOR SHALL VISIT THE JOB SITE AND VERIFY ALL GRADES, DIMENSIONS, AND CONDITIONS PRIOR TO BIDDING AND COMMENCING CONSTRUCTION. ALL DIMENSIONS CONTROLLED BY EXISTING CONDITIONS SHALL BE VERIFIED BY THE CONTRACTOR AT THE SITE.
9. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES WHETHER SHOWN HEREON OR NOT, AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR SHALL BEAR ALL EXPENSE OF REPAIR OR REPLACEMENT IN CONJUNCTION WITH THE EXECUTION OF THIS WORK.
10. GENERAL CONTRACTOR SHALL NOTIFY THE ENGINEER AND ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES FOUND WITHIN THE CONTRACT DOCUMENTS, PRIOR TO STARTING WORK.

CONCRETE:

1. ALL CONCRETE MATERIALS AND WORKMANSHIP SHALL CONFORM TO CHAPTER 19A OF THE CODE AND TO ALL REQUIREMENTS OF ACI 301–05, "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS", EXCEPT AS MODIFIED BY THE SUPPLEMENT REQUIREMENTS BELOW.
2. MIX DESIGN REQUIREMENTS:
   A. CEMENT SHALL BE TYPE II.
   B. COMPRESSIVE STRENGTH = 3,000 PSI.
   C. CONCRETE SLUMP SHALL NOT EXCEED 5".
3. ALL REINFORCING STEEL SHALL BE SECURED IN POSITION AND INSPECTED BY THE BUILDING OFFICIAL PRIOR TO PLACING CONCRETE.
4. SEE DETAIL 6/S05 FOR REBAR SPLICES AND EMBEDMENT IN CONCRETE.

REINFORCING STEEL:

1. REINFORCING STEEL SHALL CONFORM TO ASTM A–615 GRADE 60 UNLESS OTHERWISE NOTED.
2. BARS SHALL BE CLEAN OF MUD, OIL, OR OTHER COATINGS LIKELY TO IMPAIR BONDING.
3. ALL REINFORCING SHALL BE SECURED IN PLACE PRIOR TO INSPECTIONS, PLACING CONCRETE, OR GROUTING MASONRY.
4. REINFORCING STEEL SHALL BE SPLICED AS SHOWN OR NOTED. SPLICES AT OTHER LOCATIONS SHALL BE REVIEWED BY THE STRUCTURAL ENGINEER. ALL VERTICAL WALL REINFORCEMENT SHALL BE CONTINUOUS BETWEEN SPLICE LOCATIONS SHOWN IN THE DETAILS.
5. SEE DETAIL 9/S05 FOR STANDARD BAR BEND DIMENSIONS.

FOUNDATION:

DESIGN IS BASED ON TABLE 1806A.2.

ALLOWABLE BEARING:	1500	PSF
LATERAL BEARING:	100	PSF
SLIDING RESISTANCE:	130	PSF

STRUCTURAL STEEL:

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE LATEST REVISED EDITION OF THE AISC MANUAL OF STEEL CONSTRUCTION, WHICH INCLUDES THE SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, THE CODE OF STANDARD PRACTICE AND THE AWS STRUCTURAL WELDING CODE. IDENTIFY AND MARK STEEL PER CBC 2203A.1..
2. STRUCTURAL STEEL SHOP DRAWINGS SHALL BE REVIEWED BY THE STRUCTURAL ENGINEER PRIOR TO FABRICATION.
3. MATERIAL SPECIFICATIONS:

W SHAPES:	ASTM A992 GRADE 50
C, M, ANGLE, BARS, AND PLATES:	ASTM 36
TUBE STEEL:	ASTM A500, GRADE B
PIPE COLUMNS:	ASTM A53, GRADE B

4. GROUTING OF COLUMN BASE PLATES: BASE PLATES SHALL BE DRYPACKED OR GROUTED WITH NON–SHRINK GROUT. MINIMUM COMPRESSIVE STRENGTH SHALL BE 4,000 PSI AT 28 DAYS. ALL SURFACES SHALL BE PROPERLY CLEANED OF FOREIGN MATERIAL PRIOR TO THE GROUTING.
5. ALL WELDING SHALL BE ACCOMPLISHED USING THE SHIELDED METAL ARC WELDING PROCESS WITH E70XX ELECTRODES OR THE SUBMERGED ARC WELDING PROCESS WITH E7X–EXXX ELECTRODES. LOW HYDROGEN ELECTRODES SHALL BE USED AND KEPT DRY, AND PARENT METALS SHALL BE PREHEATED IN ACCORDANCE WITH AWS STANDARDS.
6. ALL WELDING SHALL BE UNDER CONTINUOUS SPECIAL INSPECTION BY A REGISTERED SPECIAL INSPECTOR IN ACCORDANCE WITH CBC 1704A3. WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
7. ALL EXPOSED WELDS SHALL BE FILLED AND GROUND SMOOTH WHERE METAL COULD COME IN CONTACT WITH THE PUBLIC.
8. ALL SHOP AND FIELD BOLTED CONNECTIONS SHALL BE IN ACCORDANCE WITH ASTM A–307 USING UNFINISHED AMERICAN STANDARD REGULAR BOLTS, UNLESS OTHERWISE NOTED.
9. NO HOLES OTHER THAN THOSE SPECIFICALLY DETAILED SHALL BE ALLOWED THRU STRUCTURAL STEEL MEMBERS. BOLT HOLES SHALL CONFORM TO AISC SPECIFICATION, AND SHALL BE STANDARD HOLES UNLESS OTHERWISE NOTED. NO CUTTING OR BURNING OF STRUCTURAL STEEL WILL BE PERMITTED WITHOUT PRIOR CONSENT OF THIS ENGINEER.

FIBER REINFORCED POLYMER (FRP):

1. FIBER REINFORCED POLYMER (FRP) STRUCTURAL SHAPES SHALL BE PROVIDED BY STRONGWELL IN ACCORDANCE WITH LARR 25698 AND SHALL COMPLY WITH THE FOLLOWING PROPERTIES:

FLEXURE (F_b)	= 6,588 PSI (LENGTHWISE) = 2,612 PSI (CROSSWISE)
FLEXURAL MODULUS	= 1.88 x 10^6 PSI (LENGTHWISE) = 1.18 x 10^6 PSI (CROSSWISE)
TENSILE (Ft)	= 5,881 PSI (LENGTHWISE) = 1,606 PSI (CROSSWISE)
SHEAR	= 904 PSI
DENSITY	= .074 LBS/IN^3

2. ALL MATERIAL SHALL BE CLASS I FIRE RATED WITH FLAME SPREAD OF 25 MAXIMUM TESTED IN ACCORDANCE WITH ASTM/E84. THE USE OF ANTIMONY OXIDE IS NOT PERMITTED.
3. FIBER REINFORCED POLYMER (FRP) BOLTS, THREADED RODS, AND RELATED NUTS AND WASHERS SHALL BE PROVIDED BY STRONGWELL OR EQUAL, UNLESS OTHERWISE NOTED.
4. EPOXY ALL CONNECTIONS WITH MAGNOBOND 56 A/B BY MAGNOLIA PLASTICS, INC.

COLD FORMED STEEL:

1. STUDS AND JOISTS SHALL CONFORM TO ICC ER–1166P AND LARR 25889.
2. EXPOSED STUDS AND JOISTS SHALL BE GALVANIZED.
3. 33 AND 43 MIL THICK STUDS AND JOISTS SHALL BE FORMED WITH A MINIMUM YIELD STRESS OF 33 KSI.
4. 54 AND 68 MIL THICK STUDS AND JOISTS SHALL BE FORMED WITH A MINIMUM YIELD STRESS OF 50 KSI.

ABBREVIATIONS:

AB	–	ANCHOR BOLT	ID	–	INSIDE DIAMETER
AFF	–	ABOVE FINISH FLOOR	MB	–	MACHINE BOLT
BLK	–	BLOCK	MFR	–	MANUFACTURER
BN	–	BOUNDARY NAILING	MIN	–	MINIMUM
BTM	–	BOTTOM	(N)	–	NEW
CJ	–	CEILING JOIST	NS	–	NEAR SIDE
CLR	–	CLEAR	NTS	–	NOT TO SCALE
CONC	–	CONCRETE	o.c.	–	ON CENTER
CONT	–	CONTINUOUS	OD	–	OUTSIDE DIAMETER
DIM	–	DIMENSION	OH	–	OPPOSITE HAND
DBL	–	DOUBLE	PLCS	–	PLACES
DF	–	DOUGLAS FIR	PLY	–	PLYWOOD
DIA	–	DIAMETER	PT	–	PRESSURE TREATED
(E)	–	EXISTING	REINF	–	REINFORCEMENT
EA.	–	EACH	REQ'D	–	REQUIRED
EN	–	EDGE NAILING	RR	–	ROOF RAFTER
EQ	–	EQUAL	SHT'G	–	SHEATHING
EQUIP	–	EQUIPMENT	SIM	–	SIMILAR
FDN	–	FOUNDATION	SQ	–	SQUARE
FN	–	FIELD NAILING	STD	–	STANDARD
FRP	–	FIBER REINFORCED PLASTIC	STIFF	–	STIFFENER
FS	–	FAR SIDE	THK	–	THICK
FTG	–	FOOTING	T.O.	–	TOP OF
GLB	–	GLU–LAM BEAM	TS	–	TUBE STEEL
HD	–	HOLD DOWN	TYP	–	TYPICAL
HORIZ	–	HORIZONTAL	UON	–	UNLESS OTHERWISE NOTED
			VERT	–	VERTICAL

SPECIAL INSPECTION REQUIREMENTS:

1. THIS SECTION APPLIES TO THE STRUCTURAL PORTIONS OF THE PROJECT REQUIRING SPECIAL INSPECTION. REFER TO SECTION CBC 1704A FOR SPECIAL INSPECTOR'S DUTIES.
2. ALL TESTS AND INSPECTIONS SHALL BE PERFORMED BY AN INDEPENDENT TESTING AND INSPECTION AGENCY APPROVED BY DSA AND EMPLOYED BY THE OWNER OR ARCHITECT AND NOT THE CONTRACTOR PER CBC SECTION 1704A.1.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A SCHEDULE TO THE TEST AND INSPECTION FIRM TO FACILITATE THE PROPER COORDINATION OF WORK.
4. PORTIONS OF WORK REQUIRING SPECIAL INSPECTION:

   CONCRETE:

   A. CONTINUOUS INSPECTION AND TEST CYLINDERS FOR STRUCTURAL CONCRETE EXCEPT FOUNDATION CONCRETE OF 2500 PSI OR LESS PER SECTION 170A.4 (TABLE 1704A.4).

   REINFORCING STEEL:

   A. PLACING OF REINFORCING PER SECTION 1704A.4 (TABLE 1704A.4).

   WELDING:

   A. ALL STRUCTURAL WELDING PER CBC 1704A.3.1.
   B. REINFORCING STEEL WELDING PER 17041.4.2 (TABLE 1704A.4).

   BOLTING:

   A. ADHESIVE AND EXPANSION ANCHORS IN CONCRETE OR MASONRY.

   STRUCTURAL MASONRY:

   A. LEVEL 1 SPECIAL INSPECTION AS SPECIFIED IN CBC SECTION 1704A.5.3 (TABLE 1704A.5.1).

STRUCTURAL OBSERVATION:

1. STRUCTURAL OBSERVATION SHALL BE PERFORMED BY A REGISTERED PROFESSIONAL ENGINEER FOR THE FOLLOWING STRUCTURAL ELEMENTS:
   A. EQUIPMENT ANCHORAGE (AFTER COMPLETION OF INSTALLATION)

CONSTRUCTION NOTES

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LAKE FOREST, CA 92630
PHONE: (949) 215-3339
FAX: (949) 457-9375
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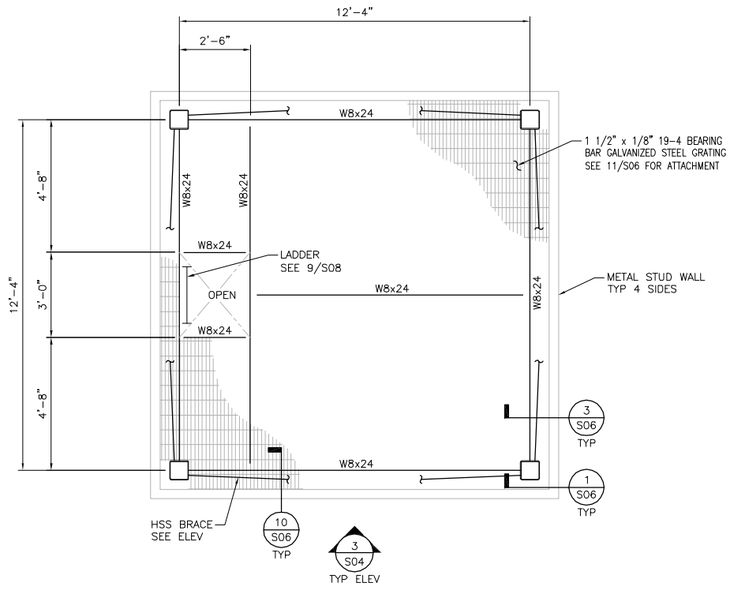
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REGISTERED PROFESSIONAL ENGINEER
L. SCOTT BETANCOURT
S.E. 4296
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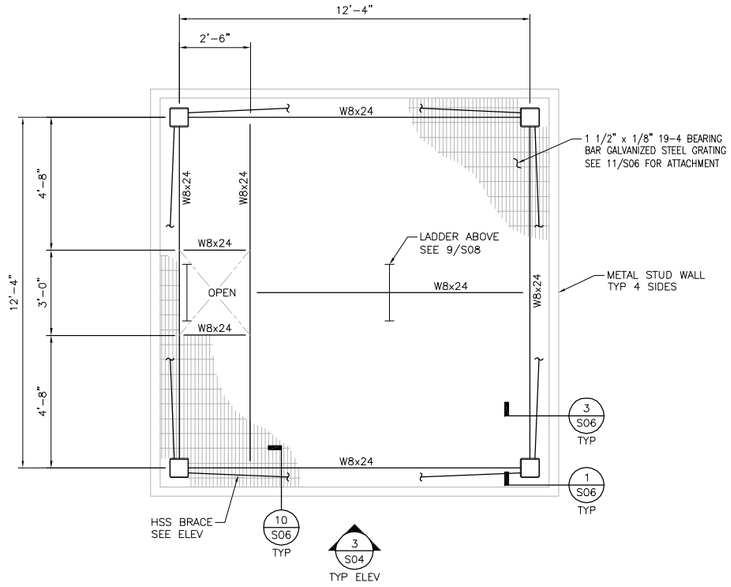
SHEET TITLE	SHEET NUMBER
CONSTRUCTION NOTES	S01

6 5 4 3 2 1



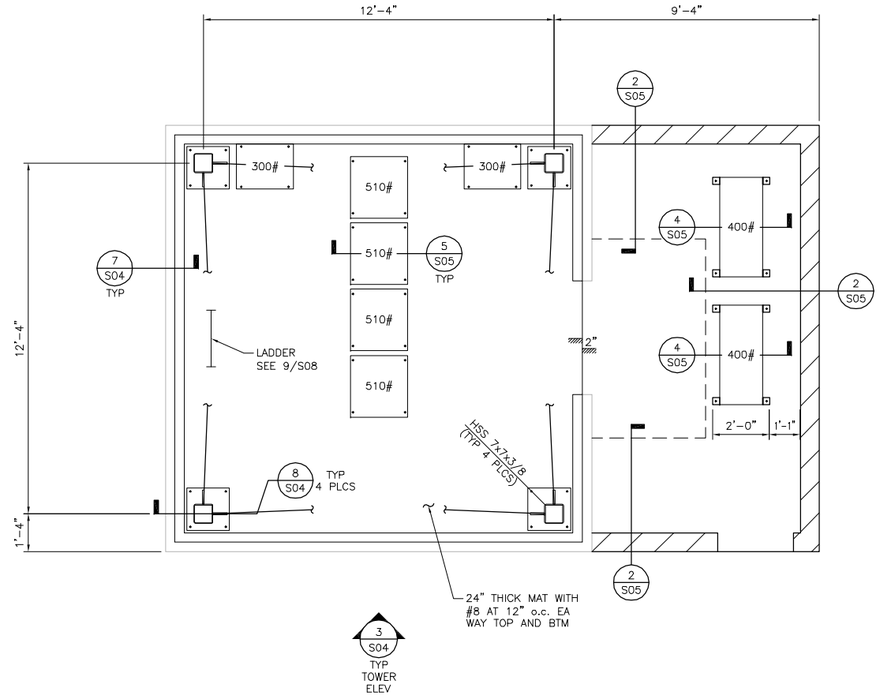
LEVEL 2 FRAMING PLAN

NORTH | SCALE: 3/8"=1'-0" | 0 1' 2' 4' 6' | 8



LEVEL 3 FRAMING PLAN

NORTH | SCALE: 3/8"=1'-0" | 0 1' 2' 4' 6' | 9



FOUNDATION PLAN

NORTH | SCALE: 3/8"=1'-0" | 0 1' 2' 4' 6' | 3

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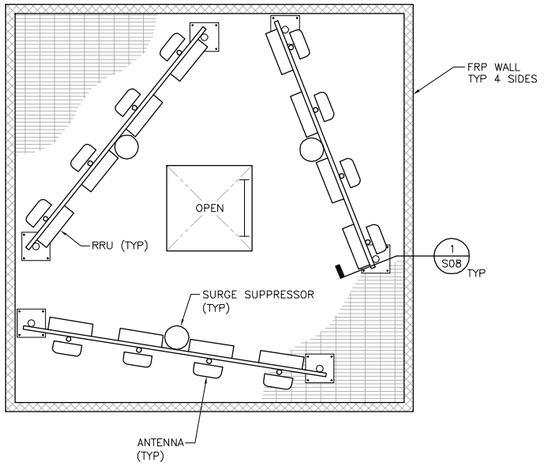
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REGISTERED PROFESSIONAL ENGINEER SCOTT BETANCOURT L S.E. 4296 STRUCTURAL STATE OF CALIFORNIA

SHEET TITLE: FOUNDATION PLAN AND TOWER FRAMING PLANS
SHEET NUMBER: S02

6 5 4 3 2 1

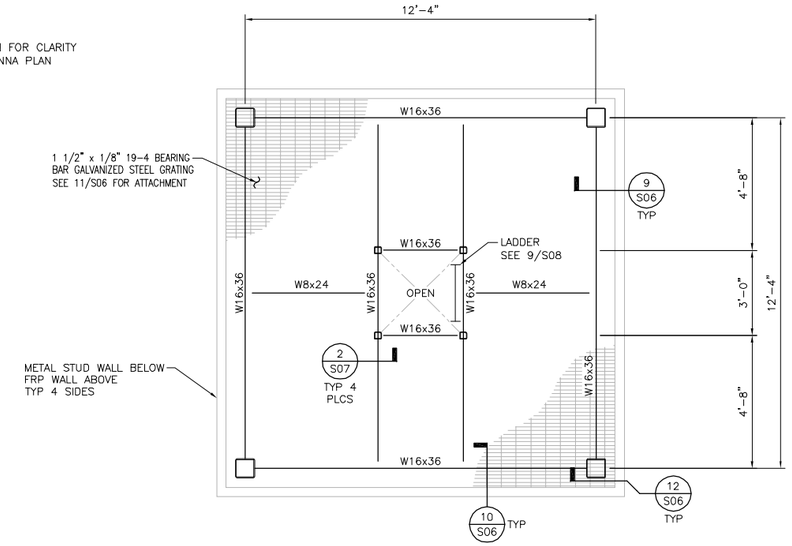


LEVEL 4 FRAMING PLAN

NORTH | SCALE: 3/8"=1'-0" | 0 1' 2' 4' 6'

8

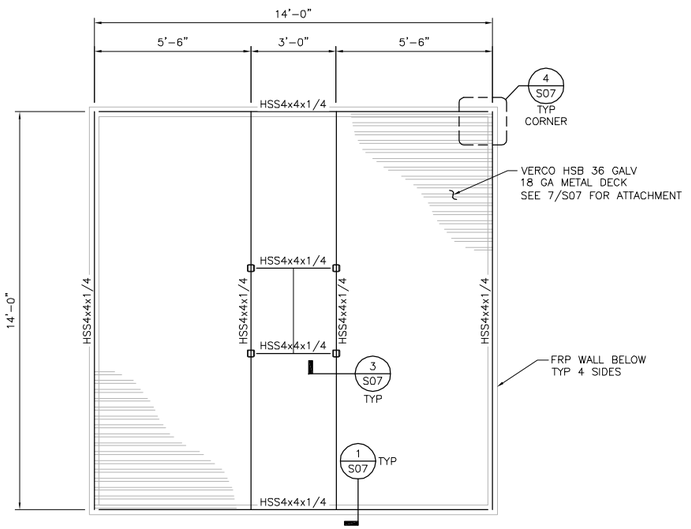
NOTE:
ANTENNAS NOT SHOWN FOR CLARITY
SEE 8/S03 FOR ANTENNA PLAN



LEVEL 4 FRAMING PLAN

NORTH | SCALE: 3/8"=1'-0" | 0 1' 2' 4' 6'

2



9 ROOF FRAMING PLAN

NORTH | SCALE: 3/8"=1'-0" | 0 1' 2' 4' 6'

3

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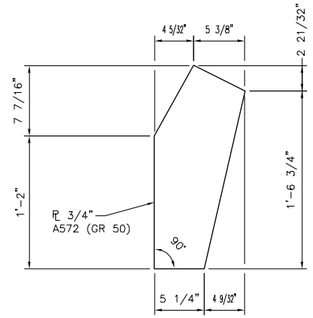
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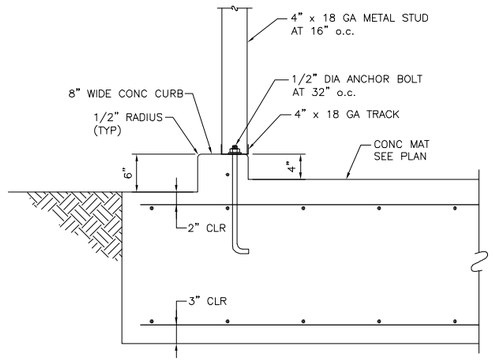
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SHEET TITLE: TOWER FRAMING PLANS
SHEET NUMBER: S03

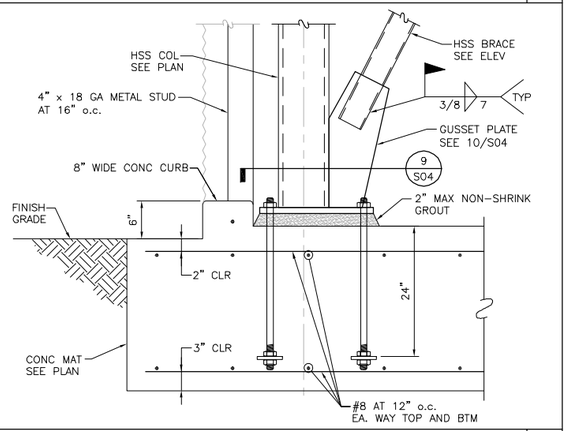
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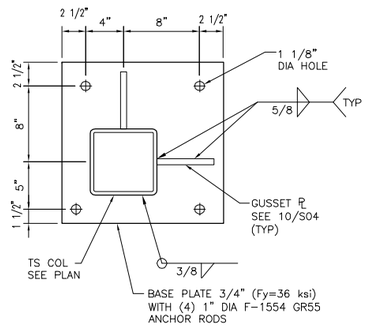
GUSSET PLATE | 10



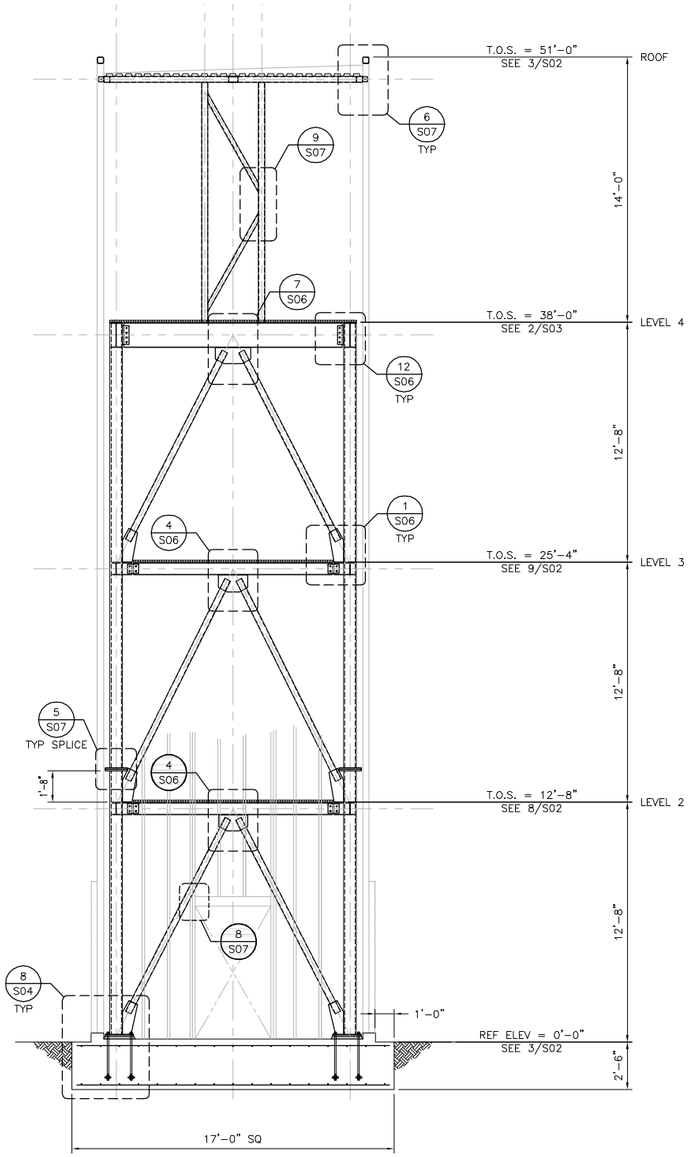
BEARING WALL FOOTING | 7



11 | COLUMN BASE | 8



12 | BASE PLATE | 9



TOWER ELEVATION | 3

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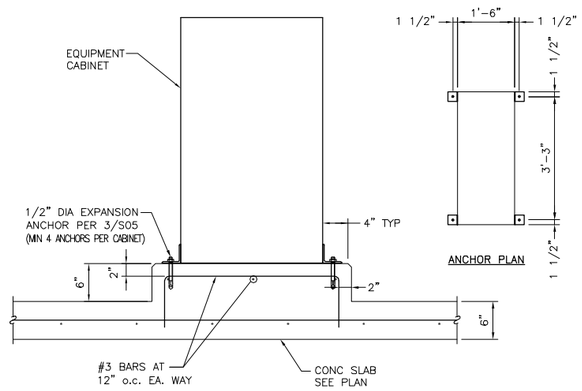
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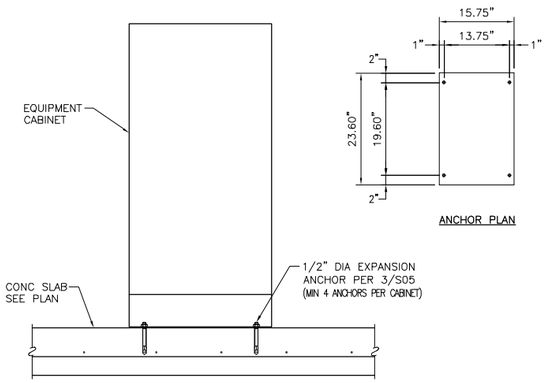
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SHEET TITLE: TOWER ELEVATION AND DETAILS
SHEET NUMBER: S04

6 5 4 3 2 1



10 | 7 | RAISED EQUIPMENT PAD | 4

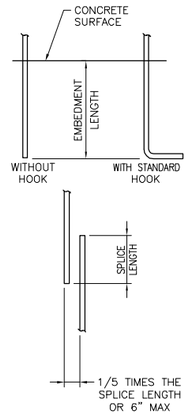


11 | 8 | EQUIPMENT ANCHORAGE | 5

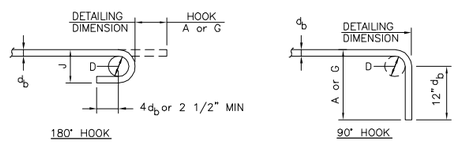
BAR SCHEDULE

REINFORCEMENT = GRADE 60			
BAR SIZE	EMBEDMENT		SPLICE LENGTH
	WITHOUT HOOK	WITH HOOK	
# 3	12"	8"	1'-9"
# 4	1'-2"	10"	2'-4"
# 5	1'-5"	1'-0"	2'-10"
# 6	1'-9"	1'-3"	3'-5"
# 7	2'-0"	1'-5"	5'-0"
# 8	2'-3"	1'-7"	5'-9"
# 9	2'-7"	1'-10"	6'-5"
# 10	2'-10"	2'-0"	7'-2"

NOTES:
1. THE ABOVE LENGTHS ARE FOR CAST-IN-PLACE AND PRECAST CONCRETE 2,000 PSI OR GREATER
2. ALL REINFORCING STEEL LAPS OR SPLICES SHALL BE AS INDICATED ON PLAN. WHERE LAP OR SPLICE LOCATIONS ARE NOT SPECIFICALLY INDICATED, LAPS OR SPLICES SHALL BE STAGGERED AT LEAST 2'-0" o.c.

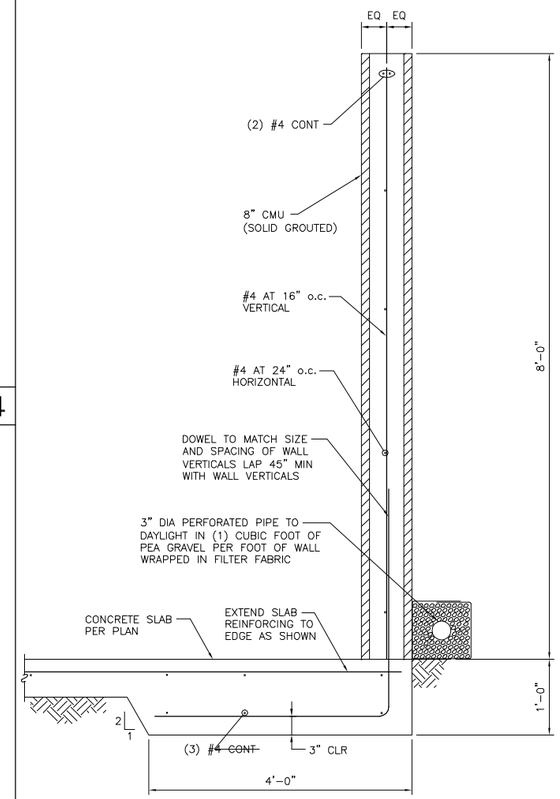


12 | STANDARD HOOK DIMENSIONS | 9 | REBAR EMBEDMENT AND SPLICES IN CONCRETE | 6



END HOOKS – ALL GRADES

BAR SIZE	D	180° HOOKS		90° HOOKS
		A or G	J	A or G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	1'-0"
#7	5 1/4"	10"	7"	1'-2"
#8	6"	11"	8"	1'-4"
#9	9 1/2"	1'-3"	11 3/4"	1'-7"
#10	10 3/4"	1'-5"	1'-1 1/4"	1'-10"
#11	12"	1'-7"	1'-2 3/4"	2'-0"
#14	18 1/4"	2'-3"	1'-9 3/4"	2'-7"
#18	24"	3'-0"	2'-4 1/2"	3'-5"



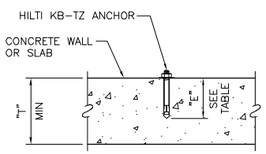
5 | CMU WALL SECTION | 2

NOTES:
1. SUBSTITUTION OF A HILTI KWIK BOLT TZ ANCHOR WITH OTHER EXPANSION ANCHORS MANUFACTURED BY HILTI OR BY OTHER MANUFACTURERS IS NOT ALLOWED WITHOUT THE WRITTEN APPROVAL OF THIS ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL BEAR THE ENTIRE COST OF REPLACEMENT OF NON-APPROVED ANCHORS.
2. THE CONTRACTOR SHALL ACCURATELY LOCATE ALL EXISTING REINFORCING BY X-RAY OR EQUIVALENT METHODS. NO REBAR OR TENDONS SHALL BE CUT. ALL EXPENSES RELATED TO REPAIR OF CUT REBAR OR TENDONS SHALL BE ENTIRELY AT THE EXPENSE OF THE CONTRACTOR.
3. SPECIAL INSPECTION IS REQUIRED FOR INSTALLATION OF ANCHORS.
4. NSTALLATION OF CONCRETE ANCHORS IN MASONRY IS NOT ALLOWED.
5. USE STAINLESS STEEL FOR EXPOSED APPLICATIONS. CARBON STEEL SHALL BE USED FOR INTERIOR APPLICATIONS ONLY.

ANCHOR SCHEDULE (1)

BOLT DIA	HOLE DIA	"E" EMBEDMENT	"T" THICKNESS
3/8"	3/8"	2"	4"
1/2"	1/2"	3 1/4"	4"
5/8"	5/8"	4"	6"
3/4"	3/4"	4 3/4"	6"

(1) INFORMATION SHOWN IN THIS TABLE IS IN ACCORDANCE WITH ICC REPORT ESR-1917.



12 | HILTI KWIK BOLT TZ EXPANSION ANCHOR | 3

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26170 ENTERPRISE WAY SUITE 400
LAKE FOREST, CA 92630
PHONE: (949) 215-3339
FAX: (949) 457-9375
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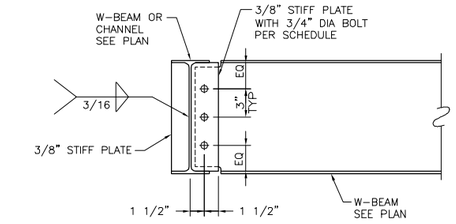
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SHEET TITLE: CONSTRUCTION DETAILS
SHEET NUMBER: S05

6 5 4 3 2 1

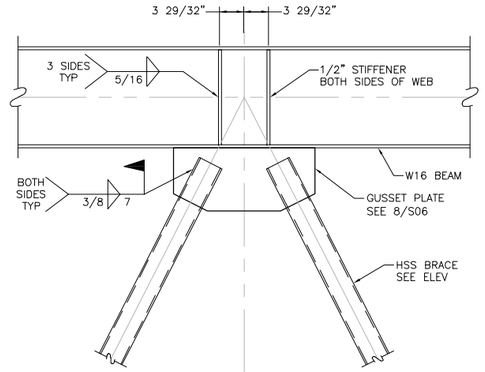


BOLTING SCHEDULE

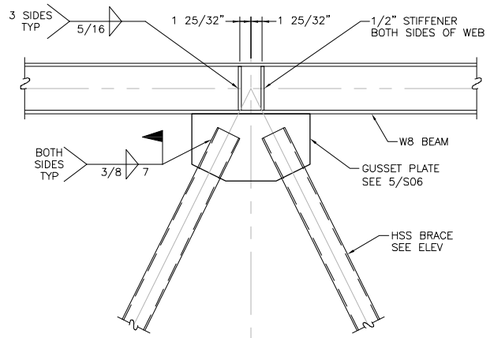
BEAM	BOLT QTY (1)
W8,W10	2
W12,W14	3
W16	4
W18	5

(1) BOLTS SHALL BE ASTM A325-N. BOLTS SHALL BE SNUG TIGHT. TORQUING NOT REQ'D. SPECIAL INSPECTION NOT REQ'D.

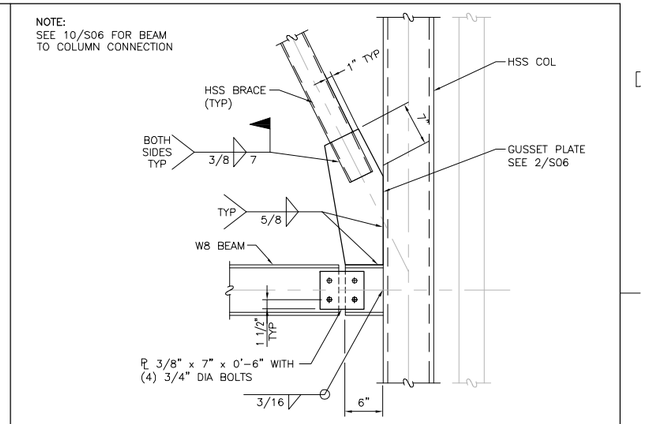
BEAM TO BEAM | 10



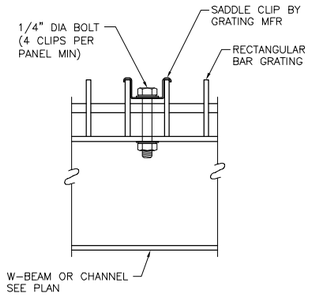
BRACE TO BEAM | 7



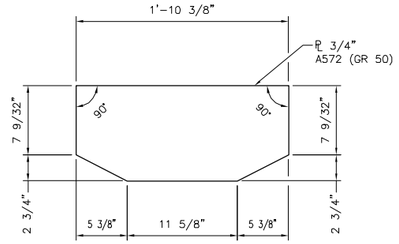
BRACE TO BEAM | 4



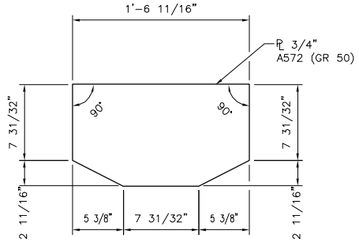
BEAM/BRACE TO COLUMN | 1



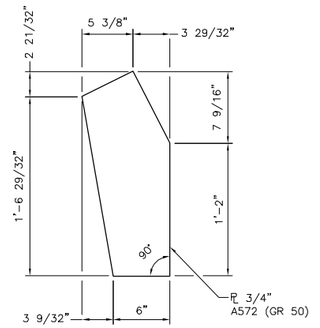
GRATING CLIP | 11



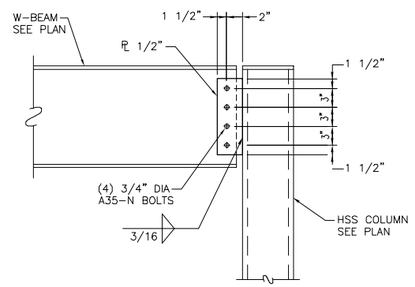
GUSSET PLATE | 8



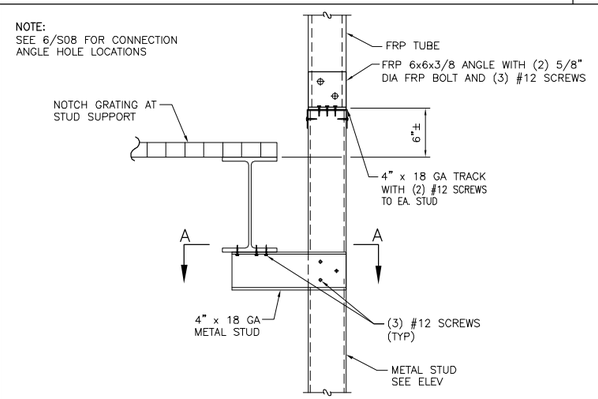
GUSSET PLATE | 5



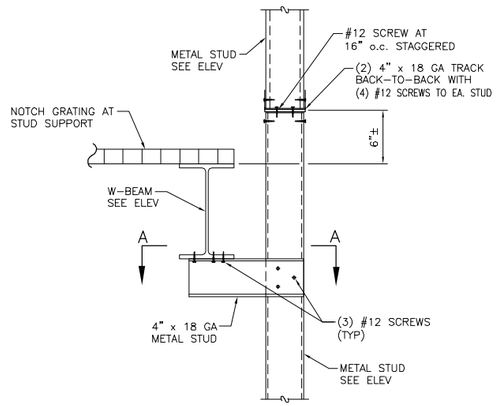
GUSSET PLATE | 2

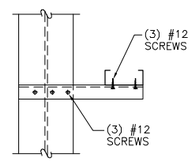


BEAM TO COLUMN | 12



METAL STUD CONNECTION | 9





SECTION A-A

METAL STUD CONNECTION | 3

next step DESIGN, INC
26170 ENTERPRISE WAY SUITE 400
LAKE FOREST, CA 92630
PHONE: (949) 215-3339
FAX: (949) 457-9375
NSD JOB #: 19-302

DCI PACIFIC
A|E|C WORKS
ARCHITECTURE | ENGINEERING | CONSULTING
32 EXECUTIVE PARK | SUITE 110 | IRVINE | CA 92614
T 949 475.1000 | 949 475.1001 F

NL0226
GOLDEN OAK COMMUNITY SCHOOL

25201 VIA PRINCESSA
SANTA CLARITA, CA 91387

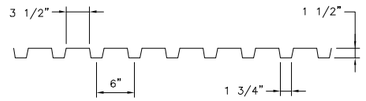
at&t
12900 PARK PLAZA DRIVE
CERRITOS, CA 90703

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	11/01/13	ISSUED FOR CD REVIEW AND COMMENT	GR	AT	SB

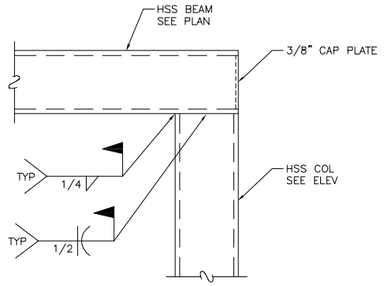
REGISTERED PROFESSIONAL ENGINEER — SCOTT BETANCOURT — L S.E. 4296 — STRUCTURAL — STATE OF CALIFORNIA

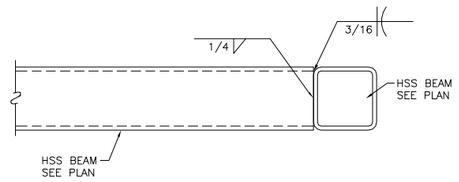
SHEET TITLE: **CONSTRUCTION DETAILS**

SHEET NUMBER: **S06**

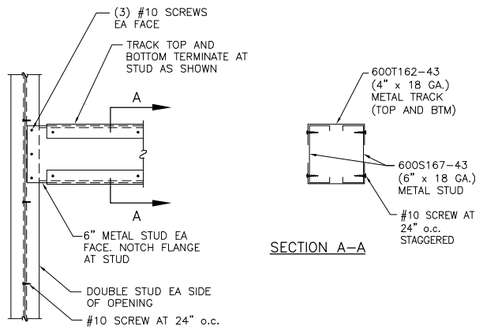


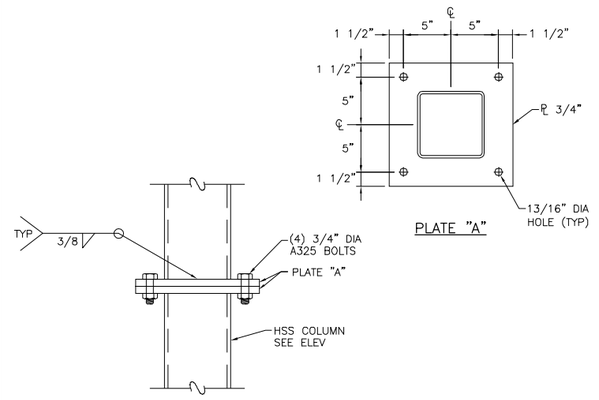
NOTES:
1. METAL DECK SHALL BE 18 GA VERCO B-36 CONFORMING TO ICC# ER-2078P OR EQUAL
2. DECK FASTENING:
   A. ATTACHMENT TO FRAMING PERPENDICULAR TO DECK: #10 SELF TAPPING SCREW AT EA. FLUTE
   B. ATTACHMENT TO FRAMING PARALLEL TO DECK: #10 SELF TAPPING SCREW AT 24" o.c.
   C. SEAM ATTACHMENT: #10 SELF TAPPING SCREW AT 24" o.c.
3. DECK SECTION PROPERTIES
   I+MIN/I-MIN (IN^4) 0.302/0.302
   S+MIN/S-MIN (IN^3) 0.321/0.336

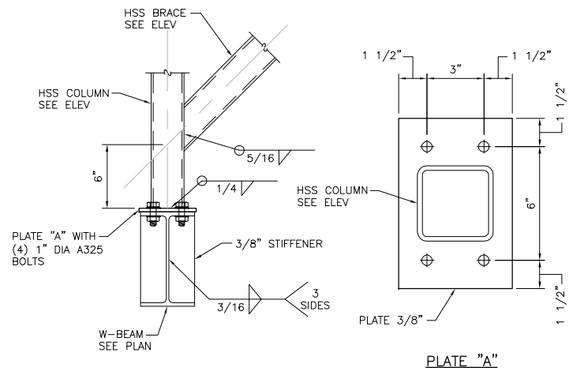




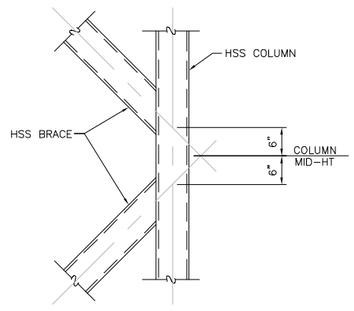
10 METAL DECK | 7 BEAM TO COLUMN | 4 TUBE STEEL BEAM TO TUBE STEEL BEAM CONNECTION | 1

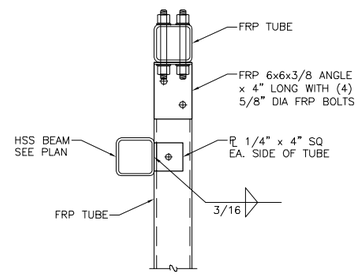


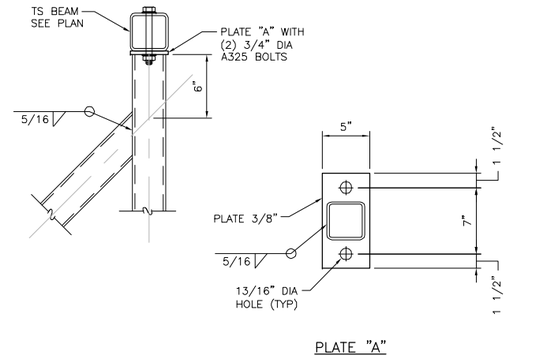




11 HEADER TO DOUBLE STUD | 8 COLUMN SPLICE | 5 COLUMN TO BEAM | 2







12 BRACE TO COLUMN | 9 FRP TUBE TO FRAME | 6 COLUMN TO BEAM | 3

next step DESIGN, INC
26170 ENTERPRISE WAY SUITE 400
LAKE FOREST, CA 92630
PHONE: (949) 215-3339
FAX: (949) 457-9375
NSD JOB #: 19-302

DCI PACIFIC
A|E|C WORKS
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32 EXECUTIVE PARK | SUITE 110 | IRVINE | CA 92614
T 949 475.1000 | 949 475.1001 F

NL0226
GOLDEN OAK COMMUNITY SCHOOL
25201 VIA PRINCESSA
SANTA CLARITA, CA 91387

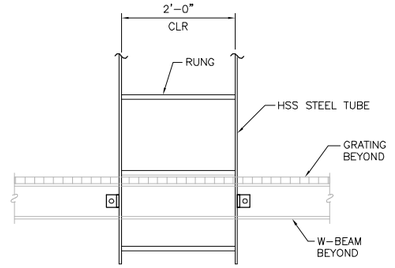
at&t
12900 PARK PLAZA DRIVE
CERRITOS, CA 90703

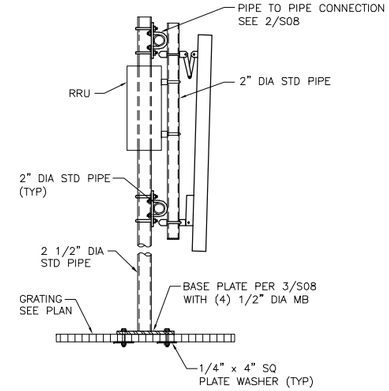
NO.	DATE	REVISIONS	BY	CHK	APP'D
A	11/01/13	ISSUED FOR CD REVIEW AND COMMENT	GR	AT	SB

REGISTERED PROFESSIONAL ENGINEER L. SCOTT BETANCOURT S.E. 4296 STRUCTURAL STATE OF CALIFORNIA

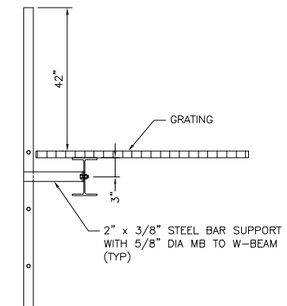
SHEET TITLE: CONSTRUCTION DETAILS
SHEET NUMBER: S07

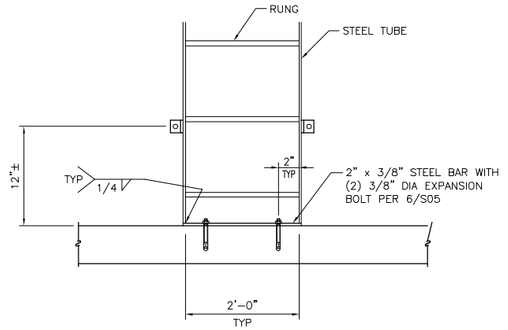
6 5 4 3 2 1

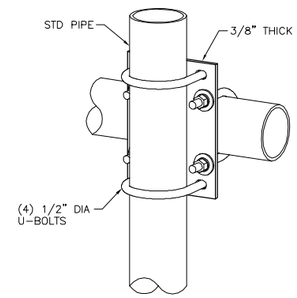




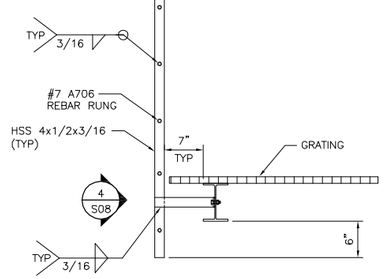
10 | 7 | LADDER ELEVATION | 4 | ANTENNA MOUNT | 1



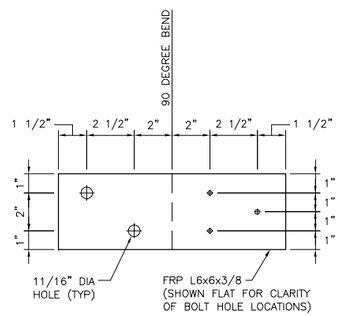


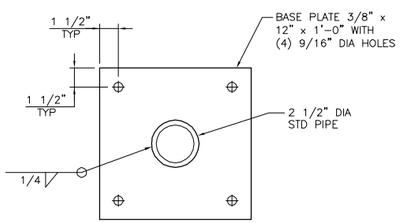


11 | LADDER ELEVATION | 5 | PIPE TO PIPE CONNECTION | 2



NOTE:
ATTACH LADDER PER 5/S08
AT CONC SLAB





12 | LADDER SECTION | 9 | FRP CONNECTION ANGLE BOLT LOCATIONS | 6 | POST BASE PLATE | 3

next step DESIGN, INC
26170 ENTERPRISE WAY SUITE 400
LAKE FOREST, CA 92630
PHONE: (949) 215-3339
FAX: (949) 457-9375
NSD JOB #: 19-302

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25201 VIA PRINCESSA
SANTA CLARITA, CA 91387

at&t
12900 PARK PLAZA DRIVE
CERRITOS, CA 90703

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	11/01/13	ISSUED FOR CD REVIEW AND COMMENT	GR	AT	SB

REGISTERED PROFESSIONAL ENGINEER
L. SCOTT BETANCOURT
S.E. 4296
STRUCTURAL
STATE OF CALIFORNIA

SHEET TITLE	SHEET NUMBER
CONSTRUCTION DETAILS	S08

6 5 4 3 2 1

(N) SCE 48"X54" PAD 120/240 1P 25kVA

(N) SCE U/G UTILITY TRENCH (APPROX LENGTH 283')

(N) SCE U/G UTILITY TRENCH (APPROX LENGTH 213')

(N) METER/MAIN ON PADESTAL 200A, 120/240V 1P -SCE TO FINALIZE LOCATION PRIOR TO CONSTRUCTION

(E) 5'X10.8'X7' SCE TUB STYLE PME; P5549355

(N) 'AT&T' POWER P.O.C.

GOLDEN VALLEY RD

(E) PROPERTY LINE

(N) SCE U/G UTILITY TRENCH (APPROX LENGTH 215')

(N) AT&T 15'x23' (345 SQ. FT.) TELECOM FACILITY, SEE SHEET C02 FOR EQUIPMENT AND ANTENNA INFO.

(E) PROPERTY LINE

(E) PROPERTY LINE

(E) PROPERTY LINE

A.P.N. 2841-006-903

(E) PROPERTY LINE

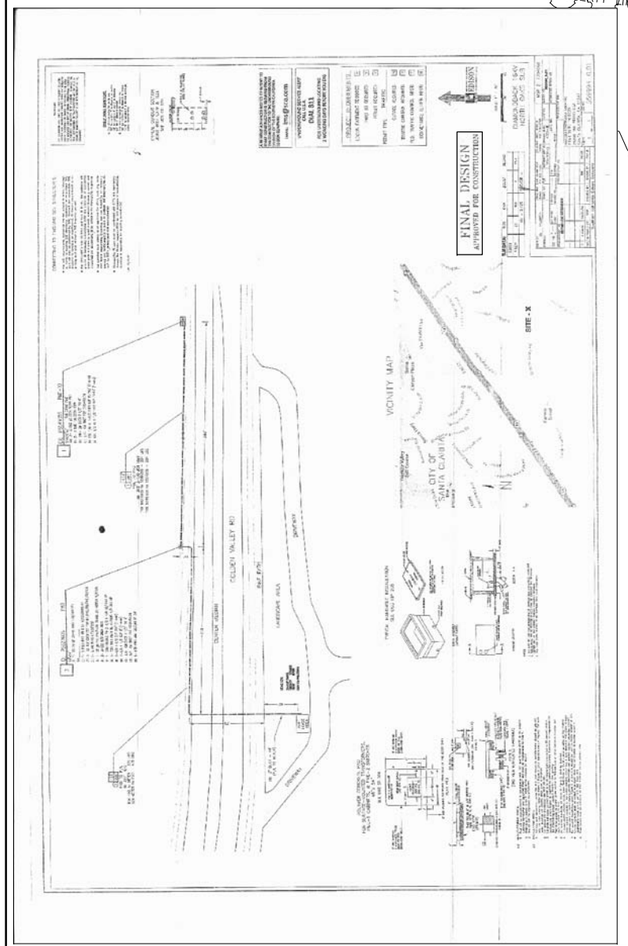
VIA PRINCESSA

(E) PROPERTY LINE

(E) PROPERTY LINE

(E) PROPERTY LINE

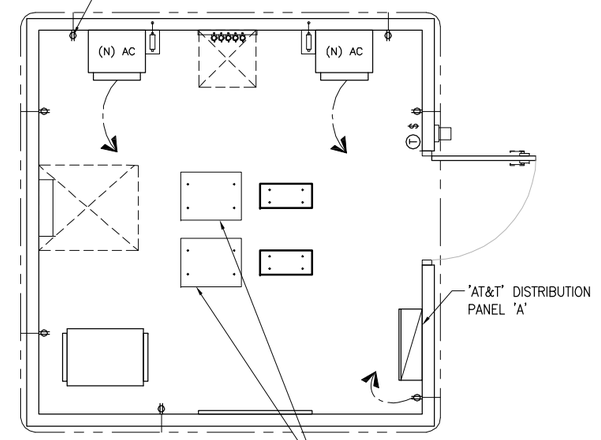
(E) PROPERTY LINE



UTILITY PLAN

NORTH | SCALE: 1/64"=1'-0" | 0 20' 40' 64' | 1

20A DUPLEX RECEPTACLE MOUNTED 18" ABOVE FLOOR, TYPICAL OF 7. 'P&S' PRODUCT #CR201 OR APPROVED EQUAL

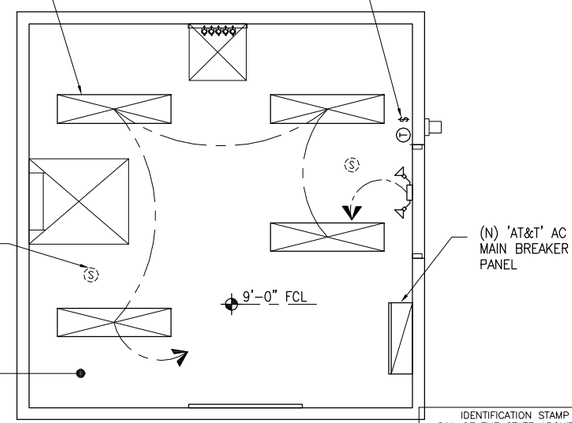


POWER LAYOUT PLAN

SCALE: 1/32"=1'-0" | 0 5' 10' 20' 32' | 2

2'x4' FLUORESCENT LIGHT FIXTURE, CEILING MOUNT, 1 TUBE, WITH WRAP AROUND ACRYLIC DIFFUSER, (4) MIN DRYWALL SCREWS AT CEILING JOIST PER FIXTURE -TYP

INTERMATIC FF34HH 4 HOUR 125-277V SPDT COMMERCIAL SERIES TIMER W/ HOLD FOR CONTINUOUS DUTY BY GLOBALINDUSTRIAL OR APPROVED EQUAL. INSTALLATION PER MANUF SPECS



IONIZATION SMOKE DETECTOR W/ ALARM RELAY, 2 TOTAL

(N) 'AT&T' AC MAIN BREAKER PANEL

3/D05 (N) CEILING SEE DETAIL

NOTE:
1. CBC SECTION 1205.3, ARTIFICIAL LIGHT. ARTIFICIAL LIGHT SHALL BE PROVIDED THAT IS ADEQUATE TO PROVIDE AN AVERAGE ILLUMINATION OF 10' CANDLES (107 LUX) OVER THE AREA OF ROOM AT A HEIGHT OF 30' ABOVE FLOOR LEVEL.

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
03 115460
AC_____FLS_____SS_____
DATE_____

LIGHTING LAYOUT PLAN

SCALE: 1/32"=1'-0" | 0 5' 10' 20' 32' | 3

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ARCHITECTURE | ENGINEERING | CONSULTING
32 EXECUTIVE PARK | SUITE 110 | IRVINE | CA 92614
T 949.475.1000 | 949.475.1001 F

VeloTera SERVICES, Inc.
7431 LAMPSON AVENUE
GARDEN GROVE, CA 92841

NL0226
GOLDEN OAK COMMUNITY SCHOOL
25201 VIA PRINCESSA
SANTA CLARITA, CA 91387

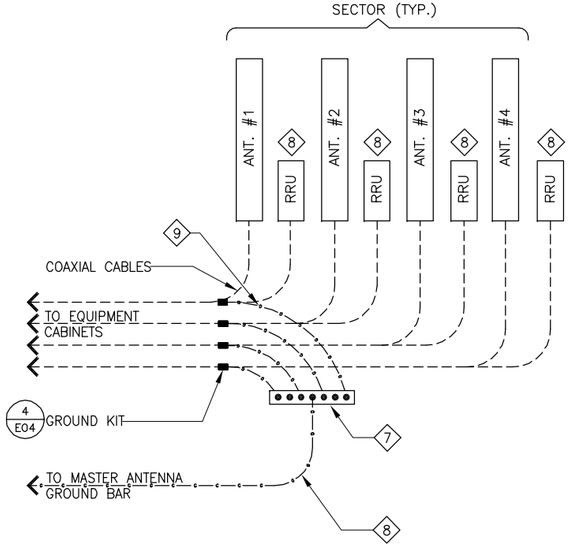
at&t Mobility
12900 PARK PLAZA DRIVE
CERRITOS, CA 90703

NO.	DATE	REVISIONS	BY	CHK	APP'D
4	10/31/14	REVISED PLANNING COMMENTS	MM3	BOK	DKD
3	06/09/14	REVISED STRUCTURAL DWGS PER DSA PLN CHK#3	JGD	BOK	DKD
2	05/06/14	REVISED PER PLAN CHECK#2	JGD	BOK	DKD
1	03/14/14	REVISED PER PLAN CHECK#1	JGD	BOK	DKD
0	11/19/13	REVISED PER DRM REDLINES (100% CD)	JGD	BOK	DKD

SCALE AS SHOWN | DESIGNED | DRAWN

LICENSED ARCHITECT D.K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE	SHEET NUMBER
UTILITY, POWER AND LIGHTING LAYOUT PLAN	E01



TYPICAL SCHEMATIC ANTENNA GROUNDING

SCALE: N.T.S | 4

PANEL SCHEDULE

SCALE: N.T.S | 3

MOUNTING SURFACE — **PANEL "A"** — 42000 A.I.C. SYM

120/240 VOLTS 1 PHASE 3 WIRE 60 HZ — MAIN 200A 2P — BUS 200A

VOLT AMPS PHASE A	VOLT AMPS PHASE B	LOAD	REC	LTG	POLE	BKR	CIR		CIR	BKR	POLE	LTG	REC	LOAD	VOLT AMPS PHASE A	VOLT AMPS PHASE B
4032		** HVAC			2	60	1		2	60	2			** HVAC	4032	
	4032	–			–	–	3		4	–	–			–		4032
2100		* RBS/BTS #1			2	50	5		6	50	2			* RBS/BTS #2	2100	
	2100	–			–	–	7		8	–	–			–		2100
2100		* RBS/BTS #3			2	50	9		10	50	2			* RBS/BTS #4	2100	
	2100	–			–	–	11		12	–	–			–		2100
100		LIGHTINGS		4	1	20	13		14	20	1		6	RECEPTACLES	1080	
	12	SMOKE DETECTOR			1	15	15		16					SPACE		
		SPACE					17		18							
							19		20							
							21		22							
							23		24							
							25		26							
							27		28							
							29		30							
							31		32							
							33		34							
							35		36							
							37		38							
							39		40							
		SPACE					41		42					SPACE		
8332	8244	VA/LINE													9312	8232

PHASE A= 17644 VA — PHASE B= 17304 VA

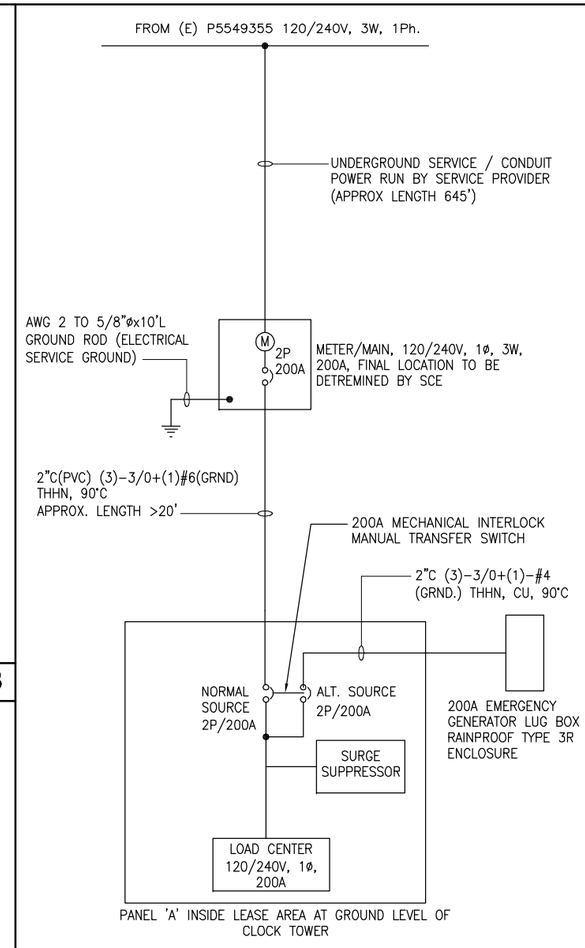
CONTINUOUS LOADS: 24864 x1.25= 31080

NON-CONTINUOUS LOADS: RECEPTACLES UP TO 10KVA 1080 x1.00= 1080; REMAINDER – x0.50= –; OTHER 112 x1.00= 112

TOTAL DESIGN KVA= 32.27 — TOTAL DESIGN AMPS= 134.47

*INDICATED CONTINUOUS LOAD TAKEN AT 125%

** REDUNDANT SYSTEM. ONLY ONE UNIT WILL OPERATE AT ANY GIVEN TIME



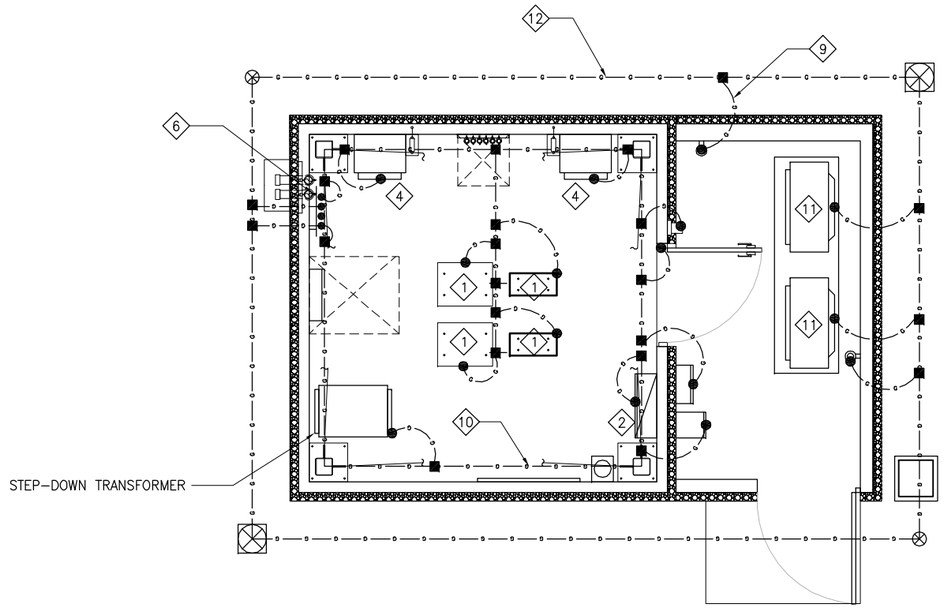
PANEL 'A' INSIDE LEASE AREA AT GROUND LEVEL OF CLOCK TOWER

KEYNOTES:

1. EQUIPMENT CABINETS/RACKS
2. POWER PANEL
3. #6 AWG GROUND WIRE TO ANTENNA GROUND BAR (1/E03)
4. A/C (1/M01)
5. MASTER ANTENNA GROUND BAR (2/E03)
6. EQUIPMENT GROUND BAR
7. ANTENNA GROUND BAR AT EACH SECTOR (2/E03)
8. RRU
9. #2 AWG INSULATED STRANDED GROUND WIRE ROUTED W/ COAX TO MASTER ANTENNA GROUND BAR
10. #2 AWG INSULATED STRANDED COPPER GROUND WIRE (HALO GROUND) CONNECTED TO MASTER GROUND BUS (5/E03)
11. CONDENSER UNIT LOCATED OUTSIDE LEASE AT GROUND
12. #2 AWG BARE SOLID TINNED COPPER WIRE GROUND RING BURRIED 18" MIN. BELOW GRADE (8/E03)

GROUNDING SYMBOLS

- GROUND TEST WELL
- GROUND ROD
- COMPRESSION TYPE CONNECTION
- CADWELD TYPE CONNECTION
- G — GROUND WIRE
- GROUND BAR



CONTRACTOR TO IMPLEMENT ALL GROUNDING REQUIREMENTS AS SPECIFIED BY CARRIER CONSTRUCTION AND INSTALLATION GUIDELINES

EQUIPMENT AND ANTENNA GROUNDING PLAN

SCALE: N.T.S | 2

SINGLE LINE DIAGRAM

SCALE: N.T.S | 1

GENERAL UTILITY NOTES:

1. UTILITY POINTS OF SERVICE AND WORK/MATERIALS SHOWN ARE BASED UPON INFORMATION PROVIDED BY THE UTILITY COMPANIES AND ARE FOR BID PURPOSES ONLY.
2. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR FINAL AND EXACT WORK/MATERIALS REQUIREMENTS AND CONSTRUCT TO UTILITY COMPANY ENGINEERING PLANS AND SPECIFICATIONS ONLY. CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT, PULL ROPES, CABLES, PULL BOXES, CONCRETE ENCASEMENT OF CONDUIT (IF REQUIRED), TRANSFORMER PAD, BARRIERS, POLE RISERS, TRENCHING, BACKFILL, PAY ALL UTILITY COMPANY FEES, AND INCLUDE ALL REQUIREMENTS IN SCOPE OF WORK.
3. SEE TITLE SHEET (T1) FOR UTILITY PROVIDERS FOR THIS PROJECT.

ELECTRICAL SERVICE NOTES:

1. SERVICE POWER SHALL BE 200A, 120/208-240V, 1ø, 3W.
2. PROVIDE A MIN. 36" WORK CLEARANCE IN FRONT OF TRANSFORMER (WHERE OCCURS), PANELS, AND SERVICE EQUIPMENT.
3. ALL BREAKERS IN THE PANEL ARE TO BE RATED 10,000 RMS SYMMETRICAL AMPS, 240V MAX, 75°C.
4. ALL WIRING SHALL BE RATED FOR 75°C.
5. CONDUIT REQUIREMENTS (TYP., U.N.O.):
   A. UNDERGROUND: PVC (SCH. 40 & SCH. 80 SWEEPS).
   B. INDOOR: EMT (RGS IN TRAFFIC AREAS).
   C. OUTDOOR (ABOVE GRADE): RGS

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ARCHITECTURE | ENGINEERING | CONSULTING
32 EXECUTIVE PARK | SUITE 110 | IRVINE | CA 92614
T 949.475.1000 | 949.475.1001 F

VeloTera SERVICES, Inc.
7431 LAMPSON AVENUE
GARDEN GROVE, CA 92841

NL0226
GOLDEN OAK COMMUNITY SCHOOL
25201 VIA PRINCESSA
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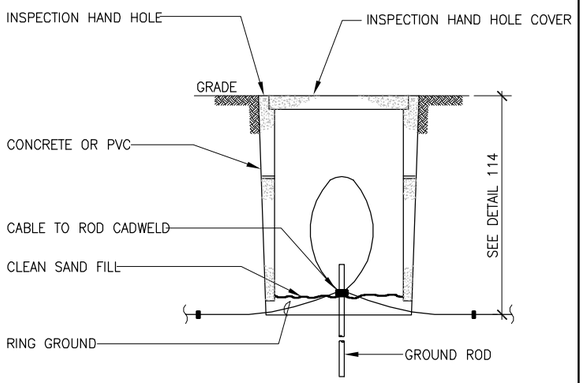
NO.	DATE	REVISIONS	BY	CHK	APP'D
4	10/31/14	REVISED PLANNING COMMENTS	MM3	BOK	DKD
3	06/09/14	REVISED STRUCTURAL DWGS PER DSA PLN CHK#3	JGD	BOK	DKD
2	05/06/14	REVISED PER PLAN CHECK#2	JGD	BOK	DKD
1	03/14/14	REVISED PER PLAN CHECK#1	JGD	BOK	DKD
0	11/19/13	REVISED PER DRM REDLINES (100% CD)	JGD	BOK	DKD

SCALE AS SHOWN | DESIGNED | DRAWN

LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE: ANTENNA AND EQUIPMENT GROUNDING PLAN AND SYMBOLS

SHEET NUMBER: E02

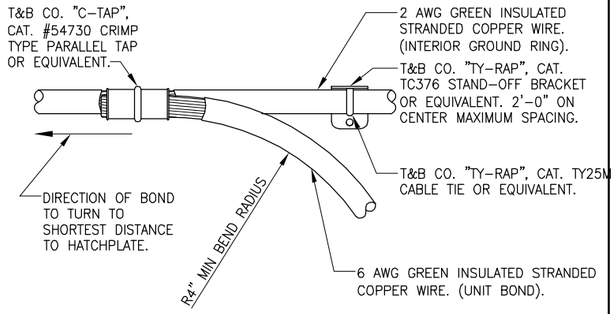


NOTE:

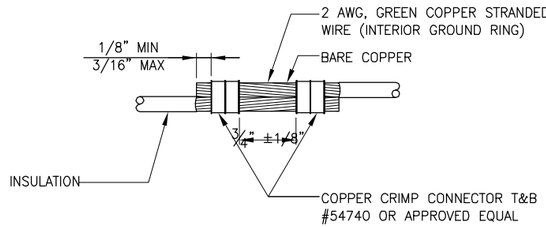
INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 6" IN WIDTH/DIAMETER

GROUND ROD WITH ACCESS AREA

DETAIL 7

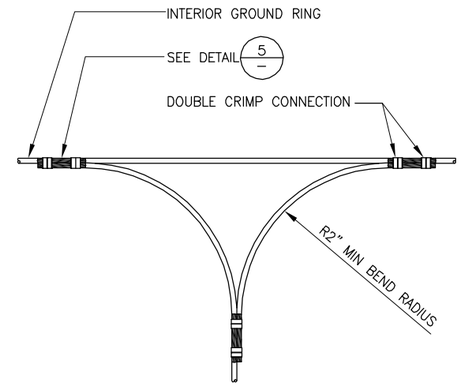


HALO GROUND RING WALL SUPPORT AND C-TAP DETAIL



HALO GROUND RING SPLICE DETAIL

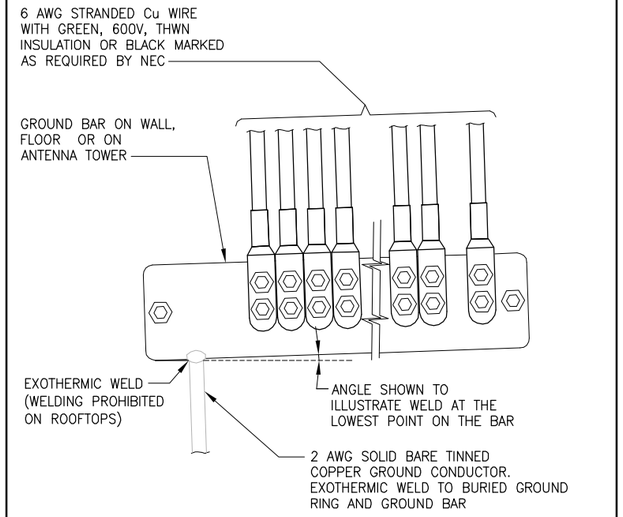
DETAIL 5



NOTE:
THIS DETAIL IS USED FOR A DOWN CONNECTION TO AN MGB/RGB.

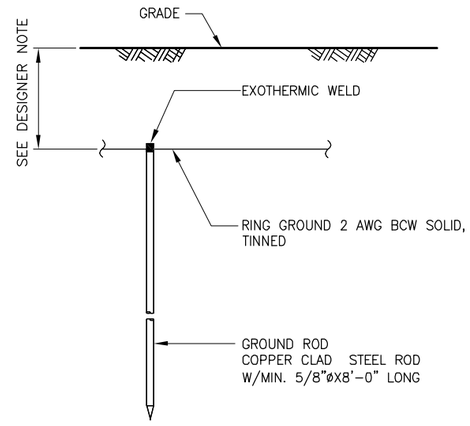
HALO NON-DIRECTIONAL GROUND RING SPLICE DETAIL

DETAIL 3



INSTALLATION OF GROUND WIRE TO COAX CABLE GROUND BAR

DETAIL 1

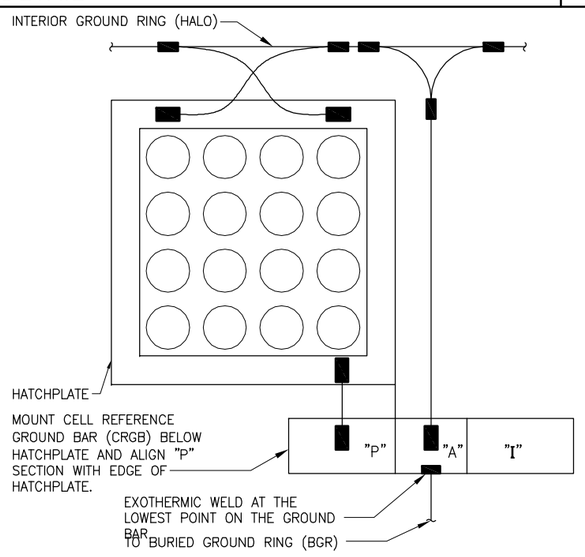


NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.

GROUND ROD

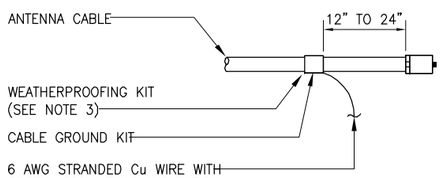
DETAIL 8



NOTE:
IF THERE IS LIMITED SPACE ON THE RIGHT SIDE OF THE HATCHPLATE, THE ABOVE SETUP MAY BE MIRRORED AS LONG AS THE "P" SECTION IS BELOW THE HATCHPLATE.

CELL REFERENCE GROUND BAR (CRGB) INSTALLATION DETAIL

CEILING WAVEGUIDE ENTRY PORT 6

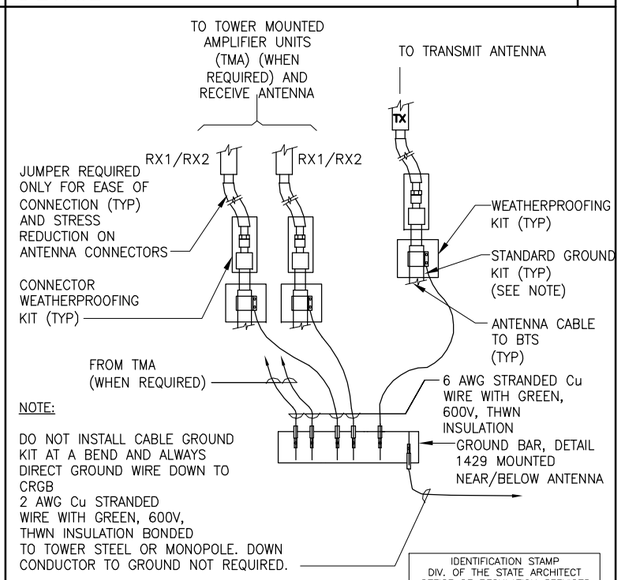


NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHERPROOFING SHALL BE (TYPE AND PART NUMBER) AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER AND APPROVED BY CONTRACTOR.

CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

DETAIL 4



CONNECTION OF GROUND WIRE TO GROUNDING BAR TOWER/MONOPOLE/ROOFTOP

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DETAIL 2

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ARCHITECTURE | ENGINEERING | CONSULTING
32 EXECUTIVE PARK | SUITE 110 | IRVINE | CA 92614
T 949.475.1000 | 949.475.1001 F

VeloTera SERVICES, Inc.
7431 LAMPSON AVENUE
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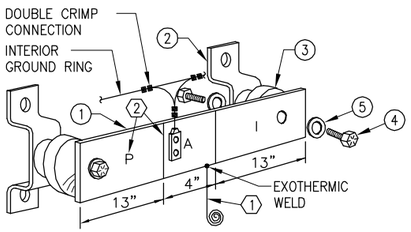
NO.	DATE	REVISIONS	BY	CHK	APP'D
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SCALE AS SHOWN | DESIGNED | DRAWN

LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE	SHEET NUMBER
ELECTRICAL DETAILS	E03

NEWTON INSTRUMENT COMPANY, INC. BUTNER, N.C. OR APPROVED EQUAL			
NO.	REQ.	PART NO.	DESCRIPTION
①	1	1/4"x4"x30"	SOLID GND. BAR
②	2	A-6056	WALL MTG. BRKT.
③	2	3061-4	INSULATORS
④	4	3012-1	5/8"-11x1" H.H.C.S.
⑤	4	3015-8	5/8 LOCKWASHER



EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" - SURGE PROTECTORS

CABLE ENTRY PORTS (HATCH PLATES) (2 AWG)
GENERATOR FRAMEWORK (IF AVAILABLE) (2 AWG)
TELCO GROUND BAR (2 AWG)
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (2 AWG)
+24V POWER SUPPLY RETURN BAR (2 AWG)
-48V POWER SUPPLY RETURN BAR (2 AWG)
RECTIFIER FRAMES.
COAX SUPPRESSION

SECTION "A" - SURGE ABSORBERS

INTERIOR GROUND RING (2 AWG)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (2 AWG)
METALLIC COLD WATER PIPE (IF AVAILABLE) (2 AWG)
BUILDING STEEL (IF AVAILABLE) (2 AWG)

SECTION "I" - ISOLATED GROUND ZONE

ALL COMMUNICATIONS EQUIPMENT FRAMES.
ISOLATED GROUND BAR – IGB (2 AWG)

DETAIL NOTES:

1. EXOTHERMICALLY WELD 2 AWG BARE TINNED SOLID COPPER CONDUCTOR TO GROUND BAR. ROUTE CONDUCTOR TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "I") WITH 1" HIGH LETTERS.

(RGB) REFERENCE GROUND BAR - DETAIL

ELECTRICAL NOTES

1. THE SEISMIC BRACING AND ANCHORAGE OF ELECTRICAL CONDUITS AND WIRE WAY SHALL BE IN ACCORDANCE WITH THE UNIFORM BUILDING CODE, CHAPTER 23 AND "GUIDELINE FOR SEISMIC RESTRAINTS OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS," PUBLISHED BY SMACNA AND PPIC, OR THE SUPERSTRUT-SEISMIC RESTRAINT, OR THE KIN-LINE SEISMIC RESTRAINT SYSTEM.
2. ALL ELECTRICAL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BE LISTED BY UNDERWRITER'S LABORATORIES (UL) AND BEAR THEIR LABEL, OR LISTED AND CERTIFIED BY A NATIONALLY RECOGNIZED TESTING AUTHORITY WHERE UL DOES NOT HAVE A LISTING. CUSTOM MADE EQUIPMENT SHALL HAVE COMPLETE TEST DATA SUBMITTED BY THE MANUFACTURER ATTESTING TO ITS SAFETY. IN ADDITION, THE MATERIALS, EQUIPMENT, AND INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF THE FOLLOWING: AMERICAN SOCIETY OF TESTING MATERIALS (ASTM) INSULATED POWER CABLE ENGINEERS ASSOCIATION (IPCEA) NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA) AMERICAN STANDARD ASSOCIATION (ASA) FIRE PROTECTION AGENCY (NFPA) AMERICAN NATIONAL STANDARD INSTITUTE (ANSI) CALIFORNIA ELECTRICAL CODE (CEC) – LATEST EDITION CALIFORNIA CODE OF REGULATIONS TITLE 24 (CCR) INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE) ALL LOCAL CODES AND ORDINANCES OF AGENCIES HAVING JURISDICTION. WHERE THE CODES HAVE DIFFERENT LEVELS OF REQUIREMENTS, THE MOST STRINGENT RULE SHALL APPLY.
3. THE CONTRACTOR SHALL VISIT THE SITE INCLUDING ALL AREAS INDICATED ON THE DRAWINGS. HE SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS AND BY SUBMITTING A BID, ACCEPTS THE CONDITIONS UNDER WHICH HE SHALL BE REQUIRED TO PERFORM HIS WORK.
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN A COMPLETE SET OF CONTRACT DOCUMENTS, ADDENDA, DRAWINGS AND SPECIFICATIONS. HE SHALL CHECK THE DRAWINGS OF THE OTHER TRADES AND SHALL CAREFULLY READ THE ENTIRE SPECIFICATIONS AND DETERMINE HIS RESPONSIBILITIES. FAILURE TO DO SO SHALL NOT RELEASE THE CONTRACTOR FROM DOING THE WORK IN COMPLETE ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS.
5. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS, FEES, CHARGES, AND INCIDENTAL COSTS NECESSARY FOR EXECUTION AND COMPLETION OF ELECTRICAL WORK, INCLUDING ALL CHARGES BY STATE, COUNTY AND LOCAL GOVERNMENTAL AGENCIES.
6. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER TRADES AT THE SITE. ANY COSTS TO INSTALL WORK TO ACCOMPLISH SAID COORDINATION WHICH DIFFERS FROM THE WORK AS SHOWN ON THE DRAWINGS SHALL BE INCURRED BY THE CONTRACTOR. ANY DISCREPANCIES, AMBIGUITIES OR CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT DURING BID TIME FOR CLARIFICATION. ANY SUCH CONFLICTS NOT CLARIFIED PRIOR TO BID SHALL BE SUBJECT TO THE INTERPRETATION OF THE ARCHITECT AT NO ADDITIONAL COST TO THE OWNER.
7. THE CONTRACTOR SHALL PROVIDE AND KEEP UP-TO-DATE A COMPLETE RECORD SET OF DRAWINGS. UPON COMPLETION OF THE WORK, A SET OF REPRODUCIBLE CONTRACT DRAWINGS SHALL BE OBTAINED FROM THE ARCHITECT, AND ALL CHANGES AS NOTED ON THE RECORD SET OF DRAWINGS SHALL BE INCORPORATED THEREON WITH BLACK INK IN A NEAT, LEGIBLE, UNDERSTANDABLE AND PROFESSIONAL MANNER. FAILURE TO KEEP RECORD DRAWINGS UP-TO-DATE SHALL CONSTITUTE CAUSE FOR WITHHOLDING OF PROGRESS PAYMENTS.
8. ALL INTERRUPTION OF ELECTRICAL POWER SHALL BE KEPT TO A MINIMUM. HOWEVER, WHEN AN INTERRUPTION IS NECESSARY, THE SHUTDOWN MUST BE COORDINATED WITH THE OWNER 14 DAYS PRIOR TO THE OUTAGE. ANY OVERTIME PAY SHALL BE INCLUDED IN THE CONTRACTOR'S BID. WORK IN EXISTING SWITCHBOARDS OR PANELBOARDS SHALL BE COORDINATED WITH THE OWNER PRIOR TO REMOVING ACCESS PANELS OR DOORS
9. SHOP DRAWINGS SHALL BE SUBMITTED FOR ITEMS INDICATED ON PLANS. SHOP DRAWINGS SHALL INCLUDE ALL DATA WITH CAPACITIES, SIZES, DIMENSIONS, CATALOG NUMBERS AND MANUFACTURER'S BROCHURES.
10. AFTER ALL REQUIREMENTS OF THE SPECIFICATIONS AND/OR THE DRAWINGS HAVE BEEN FULLY COMPLETED, REPRESENTATIVES OF THE OWNER WILL INSPECT THE WORK. THE CONTRACTOR SHALL PROVIDE COMPETENT PERSONNEL TO DEMONSTRATE THE OPERATION OF ANY ITEM OR SYSTEM TO THE FULL SATISFACTION. FINAL ACCEPTANCE OF THE WORK WILL BE MADE BY THE OWNER AFTER RECEIPT OF APPROVAL AND RECOMMENDATION OF ACCEPTANCE FROM EACH REPRESENTATIVE.
11. THE CONTRACTOR SHALL FURNISH A ONE YEAR WRITTEN GUARANTEE OF MATERIALS AND WORKMANSHIP FROM THE DATE OF SUBSTANTIAL COMPLETION.
12. ALL EQUIPMENT MOUNTED ON ROOF FOR CONNECTION TO PCS EQUIPMENT SHALL BE MOUNTED ON UNISTRUT STANDS UTILIZING APPROVED PITCH POCKETS, FLASHING, ETC.
13. ALL FINAL CONNECTIONS TO OWNER FURNISHED EQUIPMENT SHALL BE MADE BY THE CONTRACTOR.
14. COORDINATE WITH OTHER TRADES AS TO THE EXACT LOCATION OF THEIR RESPECTIVE EQUIPMENT. SUPPLY POWER AND MAKE CONNECTION TO EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS. REVIEW THE DRAWINGS OF OTHER TRADES AND LOCATION OF EQUIPMENT.
15. EXACT METHOD AND LOCATION OF CONDUIT PENETRATION AND OPENINGS IN CONCRETE WALLS OR FLOORS OR STRUCTURAL STEEL MEMBERS SHALL BE AS DIRECTED BY THE STRUCTURAL ENGINEER. PERFORM CORING, SAWCUTTING, PATCHING, AND REFINISHING OF EXISTING WALLS AND SURFACES WHEREVER IT IS NECESSARY TO PENETRATE. OPENINGS SHALL BE SEALED IN AN APPROVED METHOD TO MEET THE FIRE RATING OF THE PARTICULAR WALL, FLOOR OR CEILING. EXACT METHOD AND LOCATIONS OF CONDUIT PENETRATIONS AND OPENINGS IN CONCRETE WALLS OR FLOORS SHALL BE U.L. APPROVED. DO NOT CUT OR BREAK ANY EXISTING REINFORCING BARS IN EXISTING CONCRETE OR MASONRY. IF IN DOUBT REGARDING LOCATION OF REINFORCING, THEN CONTRACTOR, AT CONTRACTOR'S EXPENSE, SHALL UTILIZE X-RAY, ULTRA-SOUND, OR OTHER AVAILABLE TECHNOLOGY TO LOCATE EXISTING REINFORCEMENTS PRIOR TO DRILLING OR CORING OPERATIONS.
16. CONNECTIONS TO VIBRATING EQUIPMENT AND SEISMIC SEPARATIONS: LIQUID-TIGHT FLEXIBLE STEEL CONDUIT IN DRY INTERIOR LOCATIONS. LIQUID-TIGHT FLEXIBLE STEEL CONDUIT IN AREAS EXPOSED TO WEATHER, DAMP LOCATIONS, CONNECTIONS TO TRANSFORMER ENCLOSURES, AND FINAL CONNECTIONS TO MOTORS. PROVIDE A SEPARATE INSULATED EQUIPMENT GROUNDING CONDUCTOR IN FLEXIBLE CONDUIT RUNS. MAXIMUM LENGTH SHALL BE SIX FEET UNLESS OTHERWISE NOTED.
17. ROUTE EXPOSED CONDUIT AND CONDUIT ABOVE ACCESSIBLE CEILING SPACES PARALLEL AND PERPENDICULAR TO WALLS AND ADJACENT PIPING. ARRANGE CONDUIT TO MAINTAIN HEADROOM AND TO PRESENT A NEAT APPEARANCE.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAWCUTTING, TRENCHING, BACKFILLING, COMPACTION AND PATCHING OF CONCRETE AND ASPHALT AS REQUIRED TO PERFORM HIS WORK. ATTENTION IS CALLED TO THE FACT THAT THERE ARE EXISTING UNDERGROUND UTILITY LINES. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN TRENCHING FOR HIS WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER AND APPROVED REPAIR OF ANY AND ALL DAMAGES CAUSED BY HIM OR HIS WORK.
19. WHENEVER A DISCREPANCY IN QUANTITY OR SIZE OF CONDUIT, WIRE, EQUIPMENT DEVICES, CIRCUIT BREAKERS, GROUND FAULT PROTECTION SYSTEMS, ETC. (ALL MATERIALS), ARISES ON THE DRAWINGS OR SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL MATERIAL AND SERVICES REQUIRED BY THE STRICTEST CONDITIONS NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS TO ENSURE COMPLETE AND OPERABLE SYSTEMS AS REQUIRED BY THE OWNER AND ARCHITECT/ENGINEER.
20. UTILITY PENETRATIONS, OF ANY KIND, IN FIRE AND SMOKE PARTITIONS, NON-RATED CEILINGS, AND/OR NON-RATED WALLS, SHALL BE FIRESTOPPED AND SEALED WITH AN APPROVED MATERIAL SECURELY INSTALLED.
21. STRAIGHT FEEDER, BRANCH CIRCUIT, AND CONDUIT RUNS SHALL BE PROVIDED WITH SUFFICIENT PULL BOXES OR JUNCTION BOXES TO LIMIT THE MAXIMUM LENGTH OF ANY SINGLE CABLE PULL TO 100 FEET. PULL BOXES SHALL BE SIZED PER CODE OR AS INDICATED ON DRAWINGS. LOCATIONS SHALL BE DETERMINED IN THE FIELD OR AS INDICATED ON THE DRAWINGS.
22. MAXIMUM NUMBER OF CONDUCTORS IN OUTLET OR JUNCTION BOXES SHALL CONFORM TO THE CALIFORNIA ELECTRICAL CODE, ARTICLE 370-6.
23. IDENTIFICATION NAMEPLATES SHALL BE MICARTA 1/8 INCH THICK AND OF APPROVED SIZE WITH BEVELED EDGES AND ENGRAVED WHITE LETTERS A MINIMUM OF 1/4 INCH HIGH ON BLACK BACKGROUND. NAMEPLATES SHALL BE PROVIDED FOR ALL CIRCUITS IN THE SERVICE DISTRIBUTION AND POWER DISTRIBUTION SWITCHBOARDS OR PANELBOARDS, DISCONNECTING SWITCHES, TRANSFORMERS, TERMINAL CABINETS, TELEPHONE CABINETS, ETC. ALL NAMEPLATES SHALL BE ATTACHED WITH SCREWS. PULL BOXES, JUNCTION BOXES, AND DEVICE BOXES SHALL BE MARKED WITH A PERMANENT MARKER.
24. THE EXACT LOCATION OF ALL ELECTRICAL DEVICES AND EQUIPMENT SHALL BE COORDINATED WITH THE DETAILS, OR SECTIONS PRIOR TO INSTALLATION.
25. DRAWINGS ARE DIAGRAMMATIC ONLY. ROUTING OF CONDUITS, RACEWAYS, CABLE TRAYS, AND/OR LADDER RACKS SHALL BE AT THE DISCRETION OF THE CONTRACTOR UNLESS OTHERWISE NOTED AND SHALL BE COORDINATED WITH OTHER SECTIONS. DO NOT SCALE THE ELECTRICAL DRAWINGS FOR LOCATIONS OF ANY ELECTRICAL, ARCHITECTURAL, STRUCTURAL, CIVIL, OR MECHANICAL ITEMS OR FEATURES.
26. SPECIAL RECEPTACLE FOR CONNECTION TO PORTABLE EMERGENCY GENERATOR WHEN SPECIFIED SHALL BE 200 AMPERE, THREE-WIRE, THREE-POLE, REVERSE SERVICE, PIN AND SLEEVE TYPE WITH MOUNTING BOX. VERIFY TYPE OF EMERGENCY GENERATOR CONNECTION WITH CONSTRUCTION MANAGER.
27. RIGID GALVANIZED STEEL CONDUIT SHALL BE FULL WEIGHT THREADED TYPE. ELECTRICAL METALLIC TUBING (EMT) MAY BE USED IN WALLS OR CEILING SPACES WHERE NOT SUBJECT TO MECHANICAL DAMAGE. PVC SCHEDULE 40 MAY BE INSTALLED BENEATH SLAB OR BELOW GRADE. FLEXIBLE STEEL CONDUIT MAY BE USED AT OUTLET CONNECTIONS WITH NO RUNS LONGER THAN SIX FEET. AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE PROVIDED IN ALL CONDUITS.
28. RIGID GALVANIZED STEEL CONDUIT FITTINGS SHALL BE THREADED AND THOROUGHLY GALVANIZED. ELECTRICAL METALLIC TUBING (EMT) CONDUIT FITTINGS SHALL BE STEEL, RAINTIGHT THREADLESS COMPRESSION TYPE. DIE CAST, SET SCREW, OR INDENTER TYPES ARE NOT ACCEPTABLE. FLEXIBLE STEEL CONDUIT FITTINGS SHALL BE MALLEABLE IRON CLAMP, SQUEEZE TYPE OR STEEL TWIST-IN TYPE WITH INSULATED THROAT. SET SCREW TYPE IS NOT ACCEPTABLE.
29. ALL CONDUCTORS SHALL BE COPPER #10 AWG MINIMUM SIZE, TYPE THHN/THWN THERMOPLASTIC, 600 VOLT, 75 DEGREES CELSIUS WET AND 90 DEGREES CELSIUS DRY AND U.L. LISTED UNLESS NOTED OTHERWISE. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED.
30. JUNCTION AND PULL BOXES: FOR INTERIOR DRY LOCATIONS, BOXES SHALL BE GALVANIZED ONE-PIECE, DRAWN STEEL, KNOCKOUT TYPE WITH REMOVABLE MACHINE SCREW SECURED COVERS. FOR OUTSIDE, DAMP, OR SURFACE LOCATIONS, BOXES SHALL BE HEAVY CAST ALUMINUM OR CAST IRON WITH REMOVABLE, GASKETED, NON-FERROUS MACHINE SCREW SECURED COVERS. BOXES SHALL BE SIZED FOR THE NUMBER AND SIZES OF CONDUCTORS AND CONDUIT ENTERING THE BOX AND EQUIPPED WITH PLASTER EXTENSION RINGS WHERE REQUIRED. BOXES SHALL BE LABELED TO INDICATE PANEL AND CIRCUIT NUMBER, OR TYPE OF SIGNAL OR COMMUNICATIONS SYSTEM.
31. ALL OUTDOOR ELECTRICAL DEVICES OR EQUIPMENT SHALL BE OF WEATHERPROOF TYPE.
32. ALL CONNECTIONS TO GROUND BUSSES SHALL BE MADE W/CRIMP TYPE COMPRESSION CONNECTORS (2 HOLE LUGS). BUSS SHALL BE DRILLED TO ACCOMMODATE ALL CONNECTORS.

GROUNDING NOTES

1. ALL DETAILS ARE SHOWN IN GENERAL TERMS. ACTUAL GROUNDING INSTALLATION REQUIREMENTS AND CONSTRUCTION SHALL BE PERFORMED ACCORDING TO SITE CONDITIONS.
2. ALL GROUNDING CONDUCTORS: #2 AWG, SOLID, BARE, TINNED, COPPER WIRE UNLESS OTHERWISE NOTED.
3. GROUND BAR LOCATED ON EXTERIOR AND INTERIOR OF SHELTER SHALL BE PROVIDED, FURNISHED, AND INSTALLED BY THE SHELTER MANUFACTURER.
4. ALL BELOW GRADE CONNECTIONS SHALL BE EXOTHERMIC/CADWELD TYPE; ABOVE GRADE CONNECTIONS SHALL BE EXOTHERMIC/CADWELD, OR MECHANICAL (USE PROPER/BEST TYPE FOR EACH CONDITION).
5. GROUND RING (WHERE OCCURS) SHALL BE LOCATED A MINIMUM OF 24" BELOW GRADE, OR 6"(MINIMUM) BELOW THE FROST LINE.
6. INSTALL GROUND CONDUCTORS, AND GROUND RODS, MINIMUM OF 2'-0" FROM SHELTER CONCRETE SLAB, SPREAD FOOTING, OR FENCE.
7. ALL EXTERIOR AND/OR BELOW GRADE EXOTHERMIC/CADWELD GROUND CONNECTION SHALL BE TREATED WITH GALVANIZING COLD SPRAY.
8. ALL GROUNDING CONNECTIONS REQUIRED TO COMPLETE THIS PROJECT, WHETHER SHOWN HEREON OR NOT, SHALL BE MADE BY ELECTRICAL CONTRACTOR ACCORDING TO BEST FIELD PRACTICE AND COMPLY WITH ALL NEC REQUIREMENTS AND RECOMMENDATIONS FOR LIFE SAFETY.
9. OBSERVE N.E.C. AND LOCAL UTILITY REQUIREMENTS FOR ELECTRICAL SERVICE GROUNDING.
10. GROUNDING ATTACHMENT TO TOWER SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS, OR AT GROUNDING POINTS PROVIDED (2 MINIMUM).

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OFFICE OF REGULATION SERVICES
03 115460
AC_____FLS_____SS_____
DATE_____

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ARCHITECTURE | ENGINEERING | CONSULTING
32 EXECUTIVE PARK | SUITE 110 | IRVINE | CA 92614
T 949 475.1000 | 949 475.1001 F

VeloTera SERVICES, Inc.
7431 LAMPSON AVENUE
GARDEN GROVE, CA 92841

NL0226
GOLDEN OAK COMMUNITY SCHOOL
25201 VIA PRINCESSA
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CERRITOS, CA 90703

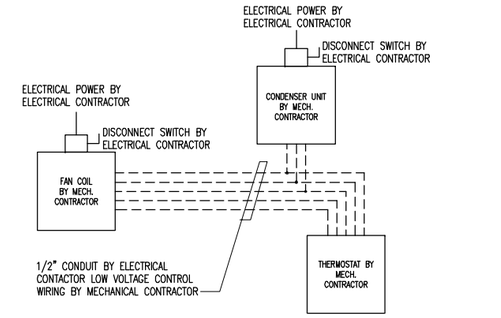
NO.	DATE	REVISIONS	BY	CHK	APP'D
4	10/31/14	REVISED PLANNING COMMENTS	MM3	BOK	DKD
3	06/09/14	REVISED STRUCTURAL DWGS PER DSA PLN CHK#3	JGD	BOK	DKD
2	05/06/14	REVISED PER PLAN CHECK#2	JGD	BOK	DKD
1	03/14/14	REVISED PER PLAN CHECK#1	JGD	BOK	DKD
0	11/19/13	REVISED PER DRM REDLINES (100% CD)	JGD	BOK	DKD

SCALE AS SHOWN | DESIGNED | DRAWN

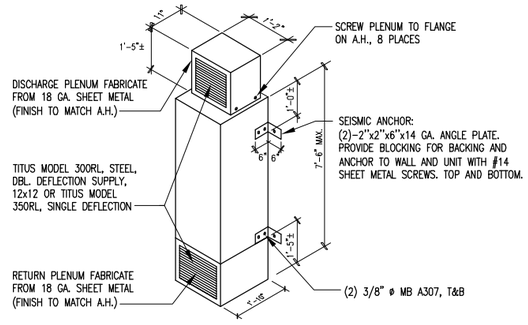
LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE: **ELECTRICAL AND GROUNDING NOTES, MASTER GROUND BUS BAR DETAIL**

SHEET NUMBER: **EN1**



SPLIT SYSTEM WIRING DIAGRAM 4



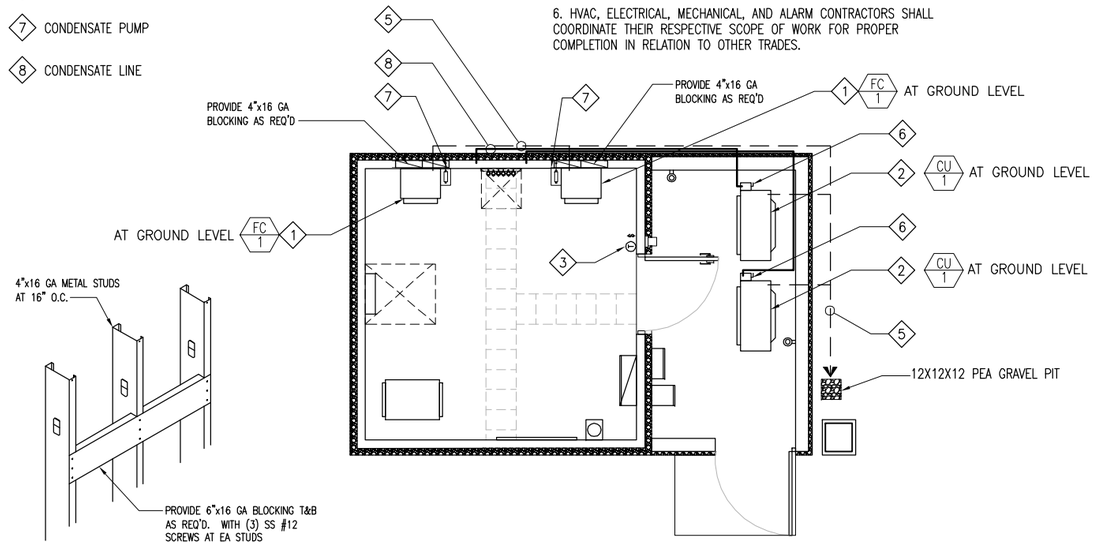
FAN COIL UNIT 2

KEYNOTES:

1. FAN COIL UNIT MOUNTED TO WALL WITH SUPPLY AND RETURN AIR GRILLES INSIDE EQUIPMENT ROOM, 2 TOTAL (2/–) (3/–)
2. CONDENSER UNITS MOUNTED ON CONCRETE PAD (7/D04)
3. THERMOSTAT AND LEAD/LAG CONTOLLER IN EQUIPMENT ROOM
4. CONDENSATE DRYING PAN TBD AT FIELD
5. REFRIGERANT LIQUID AND SUCTION LINES TO CONDENSER UNITS
6. FUSED DISCONNECT SWITCH FOR CONDENSER UNITS
7. CONDENSATE PUMP
8. CONDENSATE LINE

ELECTRICAL NOTES:

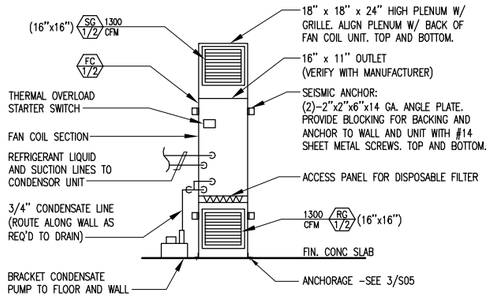
1. ALL CONTROL/WIRING DIAGRAMS ARE SCHEMATIC AND ARE INTENDED TO DEPICT ELECTRICAL SERVICE REQUIREMENTS AND SEQUENCE ONLY. REFER TO ELECTRICAL PLANS FOR ADDITIONAL ELECTRICAL WIRING AND CONTROL SYSTEMS.
2. ALL ELECTRICAL POWER WIRING SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
3. ALL CONTROL WIRING (INCLUDING CONDUIT) SHALL BE FURNISHED AND INSTALLED BY THE HVAC SUBCONTRACTOR.
4. INSTALL ELECTRICAL DEVICES, RELAYS, TIME SWITCHES, ETC., IN U.L. APPROVED ENCLOSURES WITH ELECTRICAL DEVICES WIRED TO TERMINAL STRIPS.
5. VERIFY ELECTRICAL CHARACTERISTICS WITH MANUFACTURER PRIOR TO BIDDING AND/OR PURCHASING.
6. HVAC, ELECTRICAL, MECHANICAL, AND ALARM CONTRACTORS SHALL COORDINATE THEIR RESPECTIVE SCOPE OF WORK FOR PROPER COMPLETION IN RELATION TO OTHER TRADES.



CU 1 / CU 2	OUTDOOR CONDENSER: CARRIER MODEL #24ACB4 BTUH TOTAL OUTPUT CAPACITY 60,000	ELECTRICAL: 208/230V, 1PH, 60HZ OPER. WT.: 337 LBS.		
	NOTES: PROVIDE EVAPORATOR FREEZE T-START, TIMEGROUND RELAY & REFRIGERANT FILTER DRYER			
FC 1 / FC 2	INDOOR FAN COIL UNIT: CARRIER MODEL #FY4ANB06000 2050 CFM @ 0.20" E.S.P.	ELECTRICAL: 208/230V, 1PH, 60HZ OPER. WT.: 200 LBS.		
CP 1 / CP 2 AS REQ'D	CONDENSATE PUMP: LITTLE GIANT MODEL #VCL-24ULS 3.5 GPM (210 GPH) @ 10' HEAD	ELECTRICAL: 120V, 1PH, 60HZ W/ 1 GAL. CAPACITY TANK OPER. WT.: 8 LBS.		

NOTES:
1. REFRIGERANT LINE SIZES AS INDICATED ARE NOMINAL ONLY, EXACT REFRIGERANT LINE SIZES AND EQUIPMENT METERING DEVICE (PISTON) SIZE SHALL BE DETERMINED BY THE CARRIER REPRESENTATIVE WHEN ORDERING EQUIPMENT
2. ENTIRE FAN COIL INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND SHALL BE COMPLETE WITH ALL COMPONENTS REQUIRED BY MANUFACTURER.

EQUIPMENT SCHEDULE 5



FAN COIL UNIT ELEVATION 3

TYP BLOCKING DETAIL
NTS

MECHANINCAL PLAN 1

STRUCTURAL NOTES

1. THE PERSON WITH OVERALL RESPONSIBILITY FOR CONSTRUCTION OR THEPERSON RESPONSIBLE FOR THE INSTALLATION OF REGULATED MANUFACTURED DEVICES SHALL POST, OR MAKE AVAILABLE WITH THE BUILDING PERMIT/S ISSUED FOR THE BUILDING, THE INSTALLATION CERTIFICATE /S FOR MANUFACTURED DEVICES REGULATED BY THE APPLIANCE STANDARDS OR PART 6. SUCH INSTALLATION CERTIFICATE/S SHALL BE MADE AVAILABLE TO THE ENFORCEMENT AGENCY FOR ALL APPROPRIATE INSPECTIONS. THESE CERTIFICATES SHALL:

A) IDENTIFY FEATURES REQUIRED TO VERIFY COMPLIANCE WITH THE APPLIANCE STANDARDS AND PART 6.

B) INCLUDE A STATEMENT INDICATING THAT THE INSTALLED DEVICES CONFORM TO THE APPLIANCE STANDARDS AND PART 6 AND THE REQUIREMENTS FOR SUCH DEVICES GIVE IN THE PLANS AND SPECIFICATIONS APPROVED BY THE LOCAL ENFORCEMENT AGENCY.

C) STATE THE BUILDING PERMIT NUMBER UNDER WHICH THE CONSTRUCITON OR INSTALLATION WAS PERFORMED

3. FIELD FABRICATION FENESTRATION PRODUCTS AND EXTERIOR DOORS SHALL BE CAULKED BETWEEN THE FENESTRATION PRODUCTS OR EXTERIOR DOOR AND THE BUILDING, AND SHALL BE WEATHERSTRIPPED.

4. JOINTS AND OTHER OPENINGS IN THE BUILDING ENVELOPE THAT ARE POTENTIAL SOURCES OF AIR LEAKAGE SHALL BE CAULKED, GASKETED, WEATHERSTRIPPED, OR OTHERWISE SEALED TO LIMIT INFILTARATION AND EXFILTRATION.

5. THE OPAQUE PORTIONS OF FRAMED DEMISING WALLS IN NONRESIDENTIAL BUILDINGS SHALL HAVE INSULATION WITH AN INSTALLED R-VALUE OF NO LESS THAN R-11 BETWEEN FRAMING MEMBERS.

6. THE BUILDER SHALL PROVIDE THE BUILDING OWNER OR THE PERSON/S RESPONSIBLE FOR BUILDING MAINTENANCE (IN CASE OF MULTI-TENANT OR CENTRALLY OPERATED BUILDINGS) AT OCCUPANCY THE FOLLOWING:

A) OPERATING INFORMATION. A LIST OF THE HEATING, COOLING, WATER HEATING AND LIGHTING SYSTEMS & FEATURES, MATERIALS, COMPONENTS, AND MECHANICAL DEVICES, CONSERVATION OR SOLAR DEVICES INSTALLED INTHE BUILDING, AND INSTRUCTINOS ON HOW TO USE THEM EFFICIENTLY.

B) MAINTENENCE INFORMATION. REQUIRED ROUTINE MAINTENANCE ACTION SHALL BE CLEARLY STATED AND INCORPORATED ON A READILY ACCESSIBLE LABEL. THE LABEL MAY BE LIMITED TO IDENTIFYING THE MAINTENANCE MANUAL.

C) VENTILATION INFORMATION. A DESCRIPTION OF THE QUANTITIES OF OUTDOOR AND RECIRCULATED AIR THAT THE VENTILATION SYSTEM IS DESIGNED TO PROVIDE TO EACH AREA.

MECHANICAL STRUCTURAL NOTES

1. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL REQUIREMENTS OF THE LATEST UNIFORM MECHANICAL CODE, UNIFORM BUILDING CODE AND ALL APPLICABLE LOCAL CODES AND REGULATIONS.
2. NOTHING ON THE DRAWINGS SHALL BE DEEMED AS PERMISSION TO VIOLATE THESE REQUIREMENTS.
3. CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR AS REQUIRED FOR ANY MODIFICATIONS REQUIRED BY INSPECTING AUTHORITIES, WITHOUT ADDITIONAL COST TO THE OWNER.
4. CONTRACTOR SHALL VISIT THE SITE TO VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING BID.
5. CONTRACTOR SHALL COORDINATE THE MECHANICAL INSTALLATION WITH THE WORK OF ALL OTHER TRADES, AND REPORT ANY INTERFERENCE TO THE PROJECT MANAGER FOR CORRECTION BEFORE CONSTRUCTION.
6. IT IS THE INTENTION OF THESE PLANS TO PROVIDE A COMPLETE AND OPERABLE SYSTEM. CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR TO ACCOMPLISH THIS RESULT.
7. CONTRACTOR SHALL PAY FOR ALL PERMITS, INSPECTIONS AND TESTS AS REQUIRED BY AUTHORITIES.
8. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS. MANUFACTURERS MAINTENANCE LABEL SHALL BE ATTACHED TO ALL EQUIPMENT.
9. ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED. CONTRACTOR SHALL OBTAIN APPROVAL OF THE OWNER, BEFORE ORDERING ANY SUBSTITUTIONS.
10. CONTRACTOR SHALL CUT, BORE AND TRIM EXISTING CONSTRUCTION AS REQUIRED AND PROVIDE ALL PATCHING AND FINISHING AS REQUIRED TO MATCH EXISTING WALL, FLOOR OR ROOF.
11. THE ENTIRE JOBSITE SHALL BE MAINTAINED CLEAN OF ALL DEBRIS AND TRASH RELATED TO HIS WORK.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL PERSONS DURING CONSTRUCTION.
13. ALL REFRIGERANT PIPING SHALL BE TYPE "L" COPPER.
14. PROVIDE ALL SUPPORTS AND ANCHORS FOR PIPING AND EQUIPMENT, PER THE LATEST EDITION OF "SMACNA GUIDELINE FOR SEISMIC RESTRAINT OF MECHANICAL AND PIPING SYSTEMS".
15. ALL EQUIPMENT AND MATERIALS INSTALLED EXPOSED TO THE WEATHER SHALL BE WEATHERPROOF. ALL PENETRATIONS THRU THE ROOF OR EXTERIOR WALL SHALL BE FLASHED AND MADE WEATHERTIGHT.
16. CONTRACTOR SHALL SUBMIT FOUR (4) COPIES OF SHOP DRAWINGS FOR ALL EQUIPMENT, INCLUDING ELECTRICAL REQUIREMENTS TO THE PROJECT MANAGER FOR APPROVAL BEFORE ORDERING.
17. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL OF THE OWNER BEFORE BEGINNING WORK IN ANY AREA, FOR WORK TO BE PERFORMED AND THE LENGTH OF TIME ANY PORTION OF THE EXISTING SYSTEM WILL BE OUT OF SERVICE.
18. CONTRACTOR SHALL TEST THE COMPLETE SYSTEM IN ACCORDANCE WITH ALL CODE REQUIREMENTS, AND PROVIDE ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR TEST. ANY DEFECT DISCLOSED BY THE TEST SHALL BE CORRECTED AND RE-TESTED AT NO ADDITIONAL COST TO THE OWNER.
19. CONTRACTOR SHALL CHECK, START-UP AND TEST THE SYSTEM IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURERS RECOMMENDATIONS.
20. CONTRACTOR SHALL CHARGE, TEST AND BALANCE THE UNITS TO THE AIR QUANTITIES SPECIFIED ON THE DRAWINGS, PLUS OR MINUS FIVE (5) PERCENT.
21. CONTRACTOR SHALL SUBMIT FOUR (4) COPIES OF THE TEST DOCUMENTATION TO THE PROJECT MANAGER.
22. CONTRACTOR SHALL IDENTIFY ALL PIPING AND VALVES FOR SERVICE, FLOW DIRECTION AND PRESSURE, WITH PLASTIC MARKERS AND TAGS.
23. CONTRACTOR SHALL AFFIX PLASTIC MAINTENANCE LABELS TO ALL EQUIPMENT AND EXHAUST FANS.
24. CONTRACTOR SHALL SUBMIT THREE (3) COPIES OF THE OPERATION AND MAINTENANCE MANUAL OF ALL EQUIPMENT, TO THE PROJECT MANAGER, PRIOR TO ACCEPTANCE OF THE WORK. MANUAL SHALL BE BOUND IN BOOK FORM AND INDEXED, INCLUDING PARTS LISTS, MAINTENANCE INTERVALS, ETC. AND NAME, ADDRESS AND PHONE NUMBER OF ALL SUPPLIERS.
25. CONTRACTOR SHALL PROVIDE NINETY (90) DAY MAINTENANCE SERVICE, INCLUDING ALL PARTS AND LABOR AND A SUMMARY REPORT TO THE OWNER AFTER EACH VISIT.
26. CONTRACTOR SHALL FURNISH ALL CERTIFICATES OF FINAL INSPECTION AND APPROVALS FROM ALL INSPECTING AUTHORITIES, TO THE PROJECT MANAGER.
27. CONTRACTOR SHALL MAINTAIN ONE (1) SET OF "AS-BUILT" DRAWINGS AT THE JOBSITE FOR REVIEW BY THE PROJECT MANAGER. ANY CHANGES OR MODIFICATIONS SHALL BE INDICATED IN RED INK. AT COMPLETION OF THE WORK CONTRACTOR SHALL SUBMIT COMPLETED "AS-BUILT" PLANS TO THE PROJECT MANAGER.
28. CONTRACTOR SHALL GUARANTEE ALL WORK, MATERIALS, INSTALLATION AND SYSTEM OPERATION FOR ONE (1) YEAR AFTER ACCEPTANCE BY THE OWNER, WITH NO ADDITIONAL COST TO THE OWNER.
29. ALL DUCTWORK AND CONNECTIONS SHALL BE CONSTRUCTED OF NEW GALVANIZED SHEET METAL, IN STRICT ACCORDANCE WITH THE LATEST EDITIONS OF "SMACNA" AND "UMC".
30. ALL BRANCH DUCT SHALL BE PROVIDED WITH BALANCING DAMPERS.
31. SUPPORTS AND HANGERS SHALL BE LOCATED ADJACENT TO FITTINGS, IN ADDITION TO, AT PIPE OFF-SETS, CHANGE OF DIRECTIONS, AT ENDS OF BRANCHES, AT THE BASE OF RISERS AND ALONG ALL PIPING AS REQUIRED TO PREVENT SAGS, BENDS OR VIBRATIONS. LATERAL BRACING SHALL BE PROVIDED AT EVERY FOURTH HANGER WHERE HANGER RODS ARE MORE THAN 18" IN LENGTH.

MATERIAL SPEC

1. CONDENSATE PIPING, AND REFRIGERANT PIPING SHALL BE TYPE "L" COPPER, CONDENSATE PIPING FITTINGS SHALL BE WROUGHT COPPER, SOLDERED WITH 95% TIN SOLDER. REFRIGERANT PIPING FITTINGS SHALL BE HARD DRAWN WROUGHT COPPER, SOLDERED WITH "SIL-FOS" SILVER SOLDER. TRAPS SHALL BE INSTALLED IN HOT GAS LINES, SO AS TO COLLECT CONDENSED REFRIGERANT OIL DURING THE "OFF" CYCLE OF THE UNIT.
2. ALL REFRIGERATION HOT GAS AND SUCTION LINES SHALL BE INSULTED WITH NOMINAL 1/2" WALL THICKNESS, FLEXIBLE ELASTOMERIC, CLOSED-CELL PIPE INSULATION, FLAME SPREAD RATING OF LESS THAN 25 WHEN TESTED BY ASTM E84. "ARMAFLEX" OR APPROVED EQUAL. ALL EXPOSED OUTDOOR INSULATION SHALL BE COVERED WITH 0.018" ALUMINUM JACKET AND STAINLESS STEEL BANDS, FASTENED AT 8" ON CENTERS.
3. CONDENSATE DRAIN PIPING SHALL BE INSULATED WITH "ARMAFLEX PLUS".
4. SUPPORTS AND HANGERS SHALL BE LOCATED ADJACENT TO FITTINGS, IN ADDITION TO, AT PIPE OFF-SETS, CHANGE OF DIRECTION, AT ENDS OF BRANCHES, AT THE BASE OF RISERS AND ALONG ALL PIPING AS REQUIRED TO PREVENT SAGS, BENDS OR VIBRATIONS. LATERAL BRACING SHALL BE PROVIDED AT EVERY FOURTH HANGER, WHERE HANGER RODS ARE MORE THAN 18" IN LENGTH.

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32 EXECUTIVE PARK | SUITE 110 | IRVINE | CA 92614
T 949 475.1000 | 949 475.1001 F

VeloTera SERVICES, Inc.
7431 LAMPSON AVENUE
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SANTA CLARITA, CA 91387

at&t Mobility
12900 PARK PLAZA DRIVE
CERRITOS, CA 90703

NO.	DATE	REVISIONS	BY	CHK	APP'D
4	10/31/14	REVISED PLANNING COMMENTS	MM3	BOK	DKD
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2	05/06/14	REVISED PER PLAN CHECK#2	JGD	BOK	DKD
1	03/14/14	REVISED PER PLAN CHECK#1	JGD	BOK	DKD
0	11/19/13	REVISED PER DRM REDLINES (100% CD)	JGD	BOK	DKD

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LICENSED ARCHITECT D. K. DO C-18015 EXP. 11/15 STATE OF CALIFORNIA

SHEET TITLE	SHEET NUMBER
MECHANICAL PLAN AND DETAILS	M01

VeloTera SERVICES, Inc.

at&t

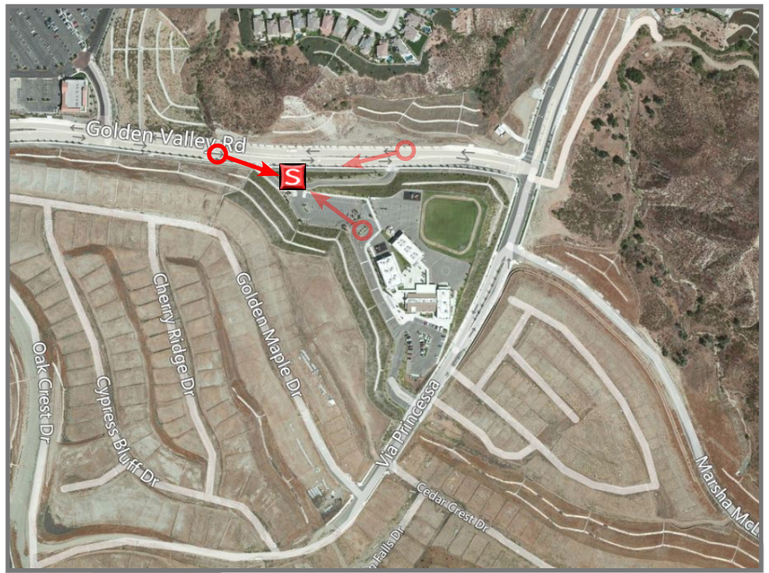
NLO226

Golden Oak Community School

25201 Via Princesa Santa Clarita CA 91387

ARTISTIC engineering
AEsims.com
877.9AE.sims

View 1



Location ©2013 Google Maps



Existing



Proposed Looking southeast from Golden Valley Road

Accuracy of photo simulation based upon information provided by project applicant.

VeloTera SERVICES, Inc.

at&t

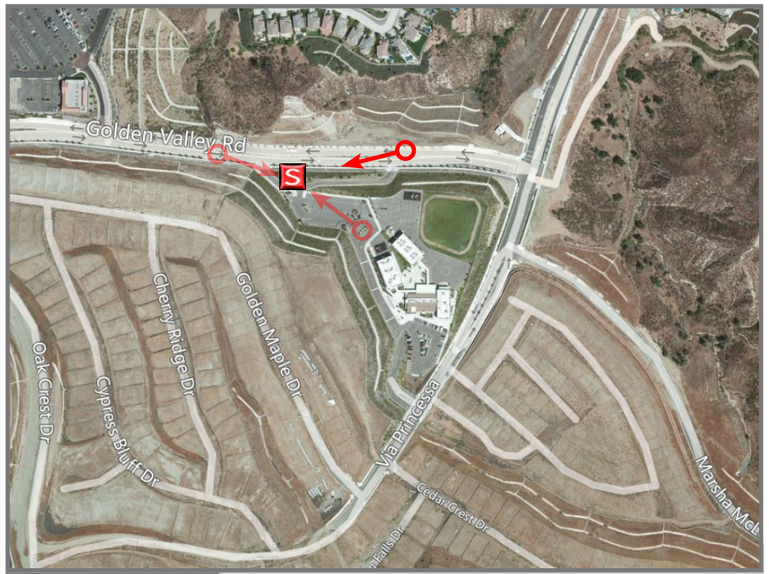
NL0226

Golden Oak Community School

25201 Via Princesa Santa Clarita CA 91387

ARTISTIC engineering
AEsims.com
877.9AE.sims

View 2



Location ©2013 Google Maps



Existing



Proposed Looking southwest from Golden Valley Road

Accuracy of photo simulation based upon information provided by project applicant.

VeloTera SERVICES, Inc.

at&t

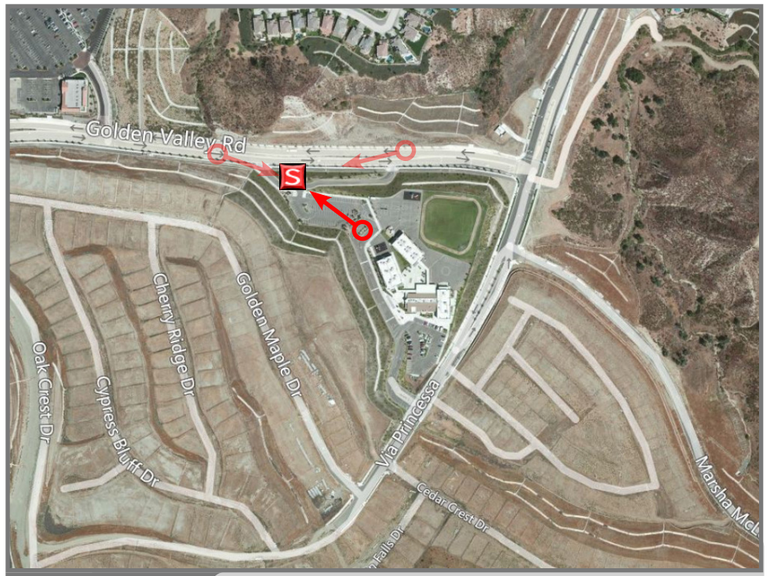
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AEsims.com
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View 3



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Existing



Proposed Looking northwest from parking lot

Accuracy of photo simulation based upon information provided by project applicant.

CITY OF SANTA CLARITA
NEGATIVE DECLARATION

MASTER CASE NO:	Master Case 14-198
PERMIT/PROJECT NAME:	Conditional Use Permit 14-017, Development Review 14-017
APPLICANT:	AT&T 12900 Park Plaza Drive Cerritos, CA 90703
LOCATION OF THE PROJECT:	The proposed wireless communication facility would be located at Golden Oak Elementary School, 25201 Via Princessa, in the City of Santa Clarita, Los Angeles County, California. APN: 2841-061-903
DESCRIPTION OF THE PROJECT:	The applicant is requesting a Conditional Use Permit and Development Review to allow for the installation of an unmanned wireless telecommunication facility within a new clock tower at Golden Oak Elementary School in the community of Canyon Country within the City of Santa Clarita. The new wireless telecommunication facility is proposed to contain the following: 1) A 52' high 15' by 15' wide clock tower concealing twelve 8-foot long antennas; 2) An 8' by 15' CMU block wall will house the associated equipment and will be attached to the clock tower.

Based on the information contained in the Initial Study prepared for this project, and pursuant to the requirements of Section 15070 of the California Environmental Quality Act (CEQA), the City of Santa Clarita

[ ] City Council [X] Planning Commission [ ] Director

finds that the project as proposed or revised will have no significant effect upon the environment, and that a Negative Declaration shall be adopted pursuant to Section 15070 of CEQA.

Mitigation measures for this project
[X] Are Not Required [ ] Are Attached [ ] Are Not Attached

Jeff Hogan, AICP
PLANNING MANAGER

Prepared by: _____ Mike Ascione, Assistant Planner II
(Signature) (Name/Title)

Approved by: _____ James Chow, Associate Planner
(Signature) (Name/Title)

Public Review Period From March 17, 2015 To April 7, 2015.
Public Notice Given On March 17, 2015

[X] Legal Advertisement [X] Posting of Properties [X] Written Notice

CERTIFICATION DATE: _____

ENVIRONMENTAL ASSESSMENT
(Initial Study)
CITY OF SANTA CLARITA

Project Title and Master Case Number:

Wireless Communications Facility - AT&T
Master Case #14-198
Conditional Use Permit #14-017
Development Review #14-017

Lead Agency Name and Address:

City of Santa Clarita
Community Development Department
23920 Valencia Boulevard, Suite 140
Santa Clarita, CA 91355

Contact Person and Phone Number:

Mike Ascione, Assistant Planner II
City of Santa Clarita
Community Development Department
(661) 255-4330

Project Location:

The proposed wireless communication facility would be located at Golden Oak Elementary School, 25201 Via Princessa, in the City of Santa Clarita, Los Angeles County, California. APN: 2841-061-903

Applicant/Owner Name and Address:

AT&T
12900 Park Plaza Drive
Cerritos, CA 90703

Consultant Information:

Vance Pomeroy
Velotera Services
29319 121st Street East
Juniper Hills, CA 93543

Property Owner:

Sulphur Springs School District

General Plan Designation:

Public Institutional (PI)

Zoning Designation(s):

Public Institutional (PI)

Description of project and project setting:

The applicant is requesting a Conditional Use Permit and Development Review to allow for the installation of an unmanned wireless telecommunication facility within a new clock tower at Golden Oak Elementary School in the community of Canyon Country within the City of Santa Clarita.

The City of Santa Clarita's Unified Development Code requires the approval of a Conditional Use Permit for a wireless communications facility, above 35 feet in height, and located in the Public/Institutional zone.

The new wireless telecommunication facility is proposed to contain the following:

1) A 52' high, 15' by 15' wide clock tower, concealing twelve 8-foot long antennas;
2) A 8' high, 8' by 15' CMU block wall will house the associated equipment and will be attached to the base of the clock tower.

The proposed project complies with the standards set forth within the City's Unified Development Code related to wireless facilities.

Surrounding Land Uses:

Zoning (Uses):
North: UR2 (Single Family Residential and Vacant)
East: UR2 (Vacant)
South: UR2 (Vacant)
West: UR2 (Vacant)

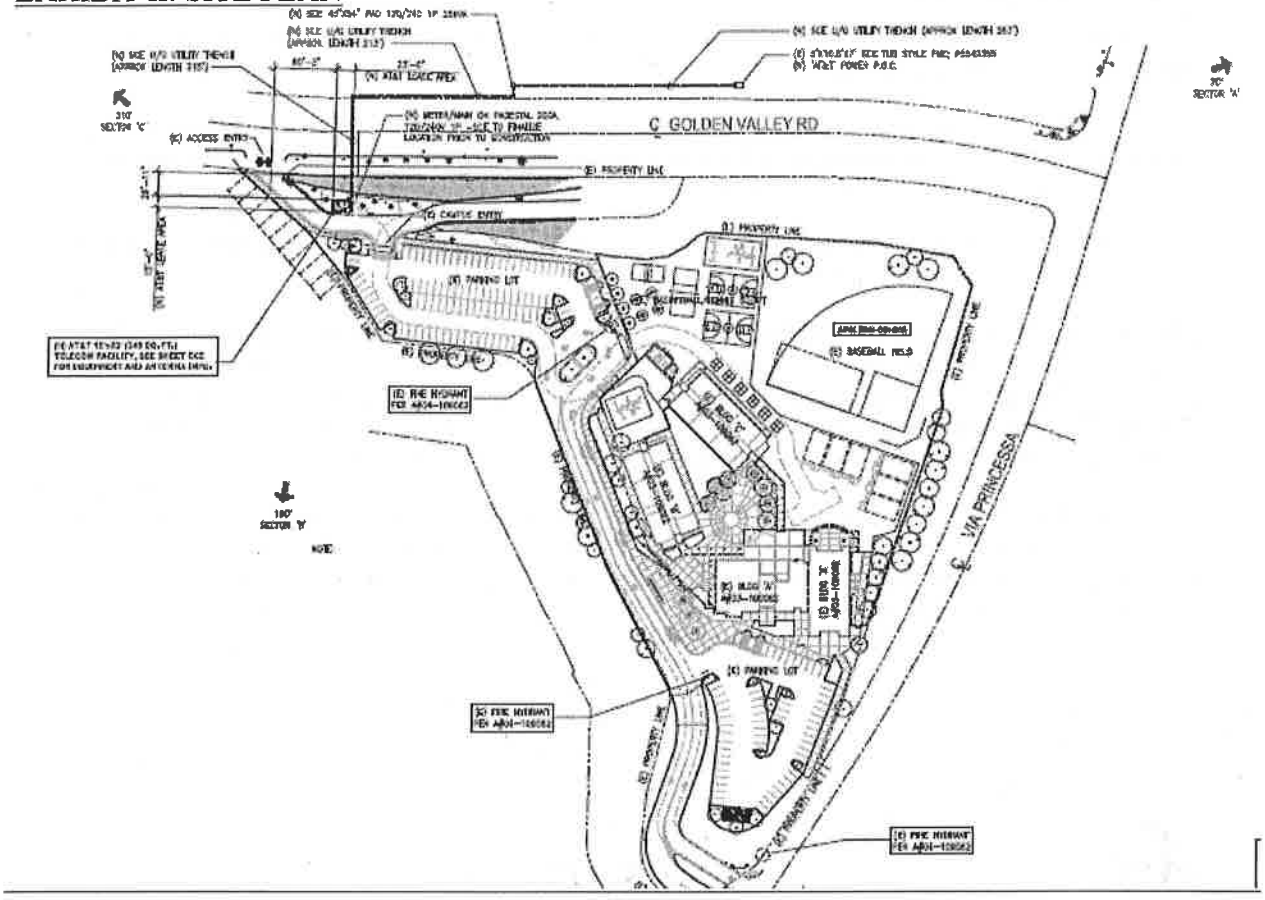
Other public agencies whose approval is required:

Los Angeles County Fire Department
Federal Communications Commission (FCC)

EXHIBIT I: LOCATION MAP


GOLDEN VALLEY RD
Project location
HADEN MTWY
VIA PRINCESSA
CALYPSO LN
CHINA BERRY
DEROHLIN
MARSHALL MCKEAN PKWY
PEARL BUSH LN
CEDAR CREST DR
CYPRESS BLUFF DR
CHERRY RIDGE DR
GOLDEN MAPLE DR

EXHIBIT II: SITE PLAN



ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be affected by this project, involving at least one impact that is a "Potentially Significant Impact" or a "Less Than Significant Impact with Mitigation" as indicated by the checklist on the following pages.

[ ]	Aesthetics	[ ]	Agricultural and Forestry Resources	[ ]	Air Quality
[ ]	Biological Resources	[ ]	Cultural Resources	[ ]	Geology/Soils
[ ]	Greenhouse Gas Emissions	[ ]	Hazards & Hazardous Materials	[ ]	Hydrology & Water Quality
[ ]	Land Use & Planning	[ ]	Mineral Resources	[ ]	Noise
[ ]	Population and Housing	[ ]	Public Services	[ ]	Recreation
[ ]	Traffic & Transportation	[ ]	Utilities & Service Systems	[ ]	Mandatory Findings of Significance

B. DETERMINATION:

On the basis of this initial evaluation:

[X] I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

[ ] I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A MITIGATED NEGATIVE DECLARATION will be prepared.

[ ] I find that the proposed project MAY have a significant impact on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

[ ] I find that the proposed project MAY have a significant effect(s) on the environment, but at least one effect 1) has been mitigated adequately in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets, if the effect is a "potentially significant impact" or "potentially significant unless mitigated." An ENVIRONMENTAL IMPACT REPORT, but it must analyze only the effects that remain to be addressed.

[ ] I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.



Mike Ascione, Assistant Planner II — 3-16-15 — Date



James Chow, Associate Planner — 3/16/15 — Date

C. EVALUATION OF ENVIRONMENTAL IMPACTS:

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS - Would the project:					
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b)	Substantially damage scenic resources, including, but not limited to, primary/secondary ridgelines, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d)	Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☐	☒
e)	Other _____	☐	☐	☐	☐
II. AGRICULTURE RESOURCES - In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:					
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	☐	☐	☐	☒
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c)	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d)	Result in the loss of forest land or conversation of forest land to non-forest use?	☐	☐	☐	☒
e)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or	☐	☐	☐	☒

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
	conversion of forest land to non-forest use?				
f)	Other _____	☐	☐	☐	☐

III. AIR QUALITY - Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b)	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e)	Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
f)	Other:	☐	☐	☐	☐

IV. BIOLOGICAL RESOURCES - Would the project:

a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☒
c)	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with	☐	☐	☐	☒

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
	established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? Oak trees?	☐	☐	☐	☒
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒
g)	Affect a Significant Ecological Area (SEA) or Significant Natural Area (SNA) as identified on the City of Santa Clarita ESA Delineation Map?	☐	☐	☐	☒
V. CULTURAL RESOURCES - Would the project:					
a)	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c)	Directly or indirectly destroy or impact a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d)	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒
VI. GEOLOGY AND SOILS – Would the project:					
a)	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☐
	i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
	ii) Strong seismic ground shaking?	☐	☐	☒	☐
	iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
	iv) Landslides?	☐	☐	☒	☐
b)	Result in substantial wind or water soil erosion or the	☐	☐	☒	☐

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
	loss of topsoil, either on or off site?				
c)	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), creating substantial risks to life or property?	☐	☐	☐	☒
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f)	Change in topography of a primary or secondary ridgeline?	☐	☐	☐	☒
g)	Move or generate grading of earth exceeding 100,000 cubic yards?	☐	☐	☐	☒
VII. GREENHOUSE GAS EMISSIONS – Would the project:					
a)	Generate greenhouse gas emissions, either directly or indirectly, that may have significant impact on the environment??	☐	☐	☐	☒
b)	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases)?	☐	☐	☐	☒
VIII. HAZARDS AND HAZARDOUS MATERIALS - Would the project:					
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving explosion or the release of hazardous materials into the environment (including, but not limited to oil, pesticides, chemicals, fuels, or radiation)?	☐	☐	☒	☐
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d)	Be located on a site which is included on a list of hazardous materials sites complied pursuant to Government Code Section 65962.5 and, as result,	☐	☐	☐	☒

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
	would it create a significant hazard to the public or to the environment?				
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐
i)	Exposure of people to existing sources of potential health hazards (e.g. electrical transmission lines, gas lines, oil pipelines)?	☐	☐	☒	☐
IX. HYDROLOGY AND WATER QUALITY - Would the project:					
a)	Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e)	Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage	☐	☐	☐	☒

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
	systems or provide substantial additional sources of polluted runoff?				
f)	Otherwise substantially degrade water quality?	☐	☐	☐	☒
g)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h)	Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
k)	Changes in the rate of flow, currents, or the course and directions of surface water and/or groundwater?	☐	☐	☐	☒
l)	Other modification of a wash, channel, creek, or river?	☐	☐	☐	☒
m)	Impact Stormwater Management in any of the following ways:	☐	☐	☐	☒
	i) Potential impact of project construction and project post-construction activity on storm water runoff?	☐	☐	☐	☒
	ii) Potential discharges from areas for materials storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor work areas?	☐	☐	☐	☒
	iii) Significant environmentally harmful increase in the flow velocity or volume of storm water runoff?	☐	☐	☐	☒
	iv) Significant and environmentally harmful increases in erosion of the project site or surrounding areas?	☐	☐	☐	☒
	v) Storm water discharges that would significantly impair or contribute to the impairment of the beneficial uses of receiving waters or areas that provide water quality benefits (e.g., riparian corridors, wetlands, etc.)?	☐	☐	☐	☒
	vi) Cause harm to the biological integrity of drainage systems, watersheds, and/or water bodies?	☐	☐	☐	☒

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
	vii) Does the proposed project include provisions for the separation, recycling, and reuse of materials both during construction and after project occupancy?	☐	☐	☐	☒
X. LAND USE AND PLANNING - Would the project:					
a)	Disrupt or physically divide an established community?	☐	☐	☐	☒
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c)	Conflict with any applicable habitat conservation plan, natural community conservation plan, and/or policies by agencies with jurisdiction over the project?	☐	☐	☐	☒
XI. MINERAL AND ENERGY RESOURCES - Would the project:					
a)	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b)	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
c)	Use nonrenewable resources in a wasteful and inefficient manner?	☐	☐	☐	☒
XII. NOISE - Would the project result in:					
a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would	☐	☐	☐	☒

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
	the project expose people residing or working in the project area to excessive noise levels?				
f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XIII. POPULATION AND HOUSING — Would the project:					
a)	Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b)	Displace substantial numbers of existing housing, Necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c)	Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XIV. PUBLIC SERVICES - Would the project result in:					
a)	Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, acceptable service ratios, response times or other performance objectives for any of the public services:				
	i) Fire protection?	☐	☐	☐	☒
	ii) Police protection?	☐	☐	☐	☒
	iii) Schools?	☐	☐	☐	☒
	iv) Parks?	☐	☐	☐	☒
XV. RECREATION - Would the project:					
a)	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b)	Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC — Would the project:					
a)	Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b)	Conflict with an applicable congestion management program, including, but not limited to level of service standard and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d)	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e)	Result in inadequate emergency access?	☐	☐	☐	☒
f)	Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒
g)	Hazards or barriers for pedestrians or bicyclists?	☐	☐	☐	☒
XVII. UTILITIES AND SERVICE SYSTEMS - Would the project:					
a)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒

		Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
e)	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f)	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g)	Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE:

a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☒
c)	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Section and Subsections
Evaluation of Impacts

I. AESTHETICS

I a. No Impact.

The City of Santa Clarita lies within Southern California's Santa Clarita Valley, which is bounded by the San Gabriel Mountains to the south and east, the Santa Susanna Mountains to the southwest, and the mountains of the Los Padres and Angeles National Forests to the north. The surrounding natural mountains and ridgelines, some of which extend into the City, provide a visual backdrop for the City. Other scenic resources within or visible from the City include the Santa Clara River corridor, forested/vegetated land, and a variety of canyons and natural drainages in portions of the City.

The proposed project is not located on a significant ridgeline and would not damage any scenic resources and would not interrupt any views of scenic resources. Therefore, the proposed project would have no impact on scenic vistas.

I b. No Impact.

The only roadway within the City of Santa Clarita that is identified in the California Department of Transportation's State Scenic Highway program is the Interstate 5 (I-5) freeway, which is designated as an "Eligible State Scenic Highway". This designated eligible segment of the I-5 Freeway extends from the I-210 Freeway interchange to the SR126/Newhall Ranch Road interchange. SR 126 from the City's boundary at the I-5 west to SR 150 in Ventura County is also designated an "Eligible State Scenic Highway". The proposed project is not visible from either the I-5 freeway or SR 126. Therefore, the proposed project would have no impacts on scenic resources within a state scenic highway.

I c. Less than Significant Impact.

The project consists of the installation of an unmanned wireless telecommunication facility concealed within a 52' high clock tower. Ground mounted equipment will be screened through a combination of the clock tower and a new CMU wall stuccoed to match the clock tower. The overall design and colors of the clock tower will match the design and colors of the existing school on the subject property. Therefore, the proposed wireless facility will have a less than significant impact on the visual character of the site and its surroundings.

I d. No Impact.

The proposed project does not include any outdoor lighting and would not be a new source of light or glare. Therefore, the proposed project would have no light or glare impacts.

II. AGRICULTURAL RESOURCES

II a. No Impact.

The project site is zoned Public Institutional and currently contains a public school. Surrounding uses include single family residential. The project site is not used for agricultural purposes nor has soils suitable for agricultural purposes. The project would not convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance. Therefore, the proposed project would have no impact to Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.

II b. No Impact.

The project area does not contain land subject to a Williamson Act contract nor would the project conflict with existing zoning for agricultural uses. Therefore, there would be no impact.

II c. No Impact.

The project area is located in a non-forested area, developed sub-urban area, and has no potential to cause the rezoning/reduction of forest land, timberland, or timberland production. Therefore, the project would have no impact.

II d. No Impact.

The project area does not contain any forest land nor would the project result the conversion of forest land to non-forest uses. Therefore, there would be no impact.

II e. No Impact.

The project does not have the potential to result in the conversion of farmland to non-agricultural use because no such lands or resources exist in the project area, nor could the project result the conversion of forest lands to non-forest use. Therefore, there would be no impact.

III. AIR QUALITY

III a. Less Than Significant Impact.

The City of Santa Clarita is within the South Coast Air Basin (SCAB), which is bounded by the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east, and the Pacific Ocean to

the south and west. The air quality in the SCAB is managed by the South Coast Air Quality Management District (SCAQMD).

The SCAB has a history of recorded air quality violations and is an area where both state and federal ambient air quality standards are exceeded. Because of the violations of the California Ambient Air Quality Standards (CAAQS), the California Clean Air Act requires triennial preparation of an Air Quality Management Plan (AQMP). The AQMP analyzes air quality on a regional level and identifies region-wide attenuation methods to achieve the air quality standards. These region-wide attenuation methods include regulations for stationary-source polluters; facilitation of new transportation technologies, such as low-emission vehicles; and capital improvements, such as park-and-ride facilities and public transit improvements.

The most recently adopted plan is the 2012 AQMP, adopted on December 7, 2012. This plan is the South Coast Air Basin's portion of the State Implementation Plan (SIP). This plan is designed to implement the California Clean Air Act and in turn implements the Federal Clean Air Act administered by the EPA. The AQMP accommodates population growth and transportation projections based on the predictions made by the Southern California Association of Governments (SCAG). Thus, projects that are consistent with employment and population forecasts are consistent with the AQMD.

The proposed project is consistent with the Zoning and General Plan Land Use designations for the site. As a result, the project is consistent with the growth expectations of the region. The proposed project is therefore consistent with the AQMP, and would have a less than significant impact.

III b. Less than Significant Impact.

Santa Clarita is located in a non-attainment area, an area that frequently exceeds national ambient air quality standards. However, the project itself is well below the South Coast Air Quality Management District's (SCAQMD) land use, construction, and mobile emission thresholds for significant air quality impacts, according to the 1993 updated SCAQMD's CEQA Air Quality Handbook. Therefore, the proposed project would not result in significant air quality impacts related to the air quality standards.

III c. Less than Significant Impact.

The proposal does not include the use of a back-up diesel generator as part of this project. Therefore, no impacts would result from the use of a self-powered emergency generator. As discussed is Section III.b), the proposed project would not exceed the thresholds of significance established by the SCAQMD. The SCQAMD established these thresholds in consideration of cumulative air pollution in the SCAB. As such, projects that do not exceed the SCAQMD's thresholds are not considered to not significantly contribute to cumulative air quality impacts.

III d. Less than Significant Impact.

Certain residents, such as the very young, the elderly and those suffering from certain illnesses or disabilities, are particularly sensitive to air pollution and are considered sensitive receptors. In addition, active park users, such as participants in sporting events, are sensitive air pollutant receptors due to increased breathing rates. Land uses where sensitive air pollutant receptors congregate include schools, day care centers, parks, recreational areas, medical facilities, rest homes, and convalescent care facilities.

The project site is located at a public school and is adjacent to residences which are considered sensitive receptors. The use of machinery and minimal grading for the installation of the facility are anticipated to create minimal dust, emissions, and/or objectionable odors. These temporary impacts would be further reduced through compliance with applicable Building and Safety and SCAQMD Rule 403 requirements that control the short-term, intermittent impacts related to grading and construction. Therefore, any potential impacts are considered less than significant. No long-term, permanent impacts are anticipated.

III e. No Impact.

The proposed use of the site and the surrounding uses are not shown on Figure 5-5 "Land Uses Associated with Odor Complaints" of the 1993 SCAQMD's CEQA Air Quality Handbook. Therefore, the proposed project would have no odor-related impacts.

IV. BIOLOGICAL RESOURCES

IV a-g. No Impact.

The proposed project will be constructed on a developed property that contains a public school. The property does not contain any significant biological habitat. Existing trees (none are protected oaks) will remain on site. The proposal does not include the modification of any habitat and would not otherwise affect any candidate, sensitive

or special status species identified by the Department of Fish and Game or the U.S. Fish and Wildlife Service. Further, the proposal will not have any adverse effect on any riparian habitat, wetlands as defined by Section 404 of the Clean Water Act, or other biological resources as the proposed project is located on land that is located in a developed residential portion of the City. The parcel contains no significant habitat or wilderness area and the project will not affect the wildlife or other biological resources.

The proposed project will not alter any wildlife corridor or migratory fish corridor and will not affect any regulation or code protecting such resources. Therefore, the proposed project is not anticipated to have an impact to biological resources.

V. CULTURAL RESOURCES

V a-d. No Impact.

The proposed wireless facility will not impact cultural resources in the City of Santa Clarita. The construction of the facility is in areas that have been previously disturbed and the project grading is expected to be limited to placement of foundations for the clock tower and equipment enclosure and will not alter any unique geological feature, paleontological resource, any human remains, or affect any other historical or archeological resource. The proposed project is in compliance with the City's General Plan and associated regulations for the preservation of historical and culturally significant resources. Therefore, no impact to archeological, historical or cultural resource would be caused by the proposed project.

VI. GEOLOGY AND SOILS

VI a.i No Impact.

The project site is not located within an Alquist-Priolo Earthquake Fault Zone or within any other fault zones identified on Exhibit S-1 of the City's General Plan. Regardless, the proposed project is required to comply with the California Building Code that establishes regulations for structures in potentially hazardous areas, in order to withstand impacts caused from localized earthquake activity. Therefore, the proposed project would not expose people or structures to potential adverse effects from the rupture of a known earthquake fault and would cause no associated impacts.

VI a.ii Less than Significant Impact.

The City of Santa Clarita is within a seismically active region of southern California. Consequently, the proposed wireless facility will likely be subject to strong seismic ground shaking. However, the risks of earthquake damage can be minimized through proper engineering, design, and construction. The proposed structures are required to be

built according to the Uniform Building Code and other applicable codes, and are subject to building inspection during and after construction. Conforming to these required standards will ensure the proposed project would not result in significant impacts due to strong seismic ground shaking.

VI a. iii No Impact.

The project site is not located within a seismic-related liquefaction zone as identified on Exhibit S-3 of the City's General Plan. Therefore, the project will have no impacts related seismic related ground failure.

VI a. iv Less than Significant Impact.

The project site is not located within an identified landslide hazard area. Additionally, minor grading for the placement of foundations of the clock tower and equipment enclosure would occur as part of this project on the existing flat area, however, any changes would be required to meet all applicable City codes and will be subject to a grading and building inspection prior to completion. Conforming to these required standards will ensure the proposed project would not result in significant impacts due to landslides.

VI b. Less than Significant Impact.

During construction of the proposed project, the soils on-site may become exposed, and thus subject to erosion. However, the project is required to comply with existing regulations that reduce erosion potential. The proposed project will comply with SCAQMD Rule 403, which as described in Section III of this report would reduce the potential for wind erosion. Similarly, water erosion during construction would be substantially reduced by complying with the National Pollutant Discharge Elimination System (NPDES). As further detailed in Section VIII of this report, NPDES requires the construction of the project to incorporate Best Management Practices (BMPs) to reduce erosion and prevent eroded soils from washing offsite. Thus, the potential to increase erosion during any construction activity would be effectively be non-existent through the required compliance activities, thus having a less than significant impact. Operation of the proposed wireless facility would not cause wind or water erosion or the loss of topsoil.

VI c. Less than Significant Impact.

The project site is not located within an area of landslides or other unstable soils. Any grading or construction impacts are expected to be minimal. The applicant will be required to submit soil reports and construct the wireless facility to all current City codes, and

requirements ensuring soil stability. Thus, the project is expected to have less than significant impact as it relates to being constructed on unstable soil, and is not expected to become unstable as a result of the project.

VI d. No Impact.

The project will not significantly alter existing soil conditions and would not be located on expansive soil. All construction activities will be done in accordance with applicable Engineering and Building and Safety requirements. Therefore, no impacts will result from the project.

IV e. No Impact.

The project site is an unmanned facility not requiring water service, thus not requiring any connection to the City's sewer and water systems and not requiring the need for septic tanks or alternative wastewater disposal systems. Therefore, the project will have a will have no impact.

IV f. No Impact.

The topography of the proposed wireless facility will not change as the project will require minimal amounts of grading to place the foundations for the clock tower or the ground mounted equipment. No change in ground surface relief features are anticipated, and no designated ridgelines will be impacted. Therefore, no impact will result from this project.

IV g. No Impact.

The project will require minimal site preparation limited to installation of foundations for the clock tower and ground mounted equipment shelter. All proposed construction activities will not exceed 10,000 cubic yards of soil movement. Therefore, no impacts will result from the project.

VII. GREENHOUSE GAS EMISSIONS

VII a-b. No Impact.

"Greenhouse gases" (so called because of their role in trapping heat near the surface of the earth) emitted by human activity are implicated in global climate change. These greenhouse gases contribute to an increase in the temperature of the earth's atmosphere. The principal greenhouse gases (GHGs) include carbon dioxide (CO_2), methane, and nitrous oxide. Collectively GHGs are measured as carbon dioxide equivalent (CO_2e).

Fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of GHG emissions, accounting for approximately half of GHG emissions globally. Industrial and commercial sources are the second largest contributors of GHG emissions with about one-fourth of total emissions.

California has passed several bills and the Governor has signed at least three executive orders regarding greenhouse gases. GHG statues and executive orders (EO) include Assembly Bill (AB) 32, Senate Bill (SB) 1368, Executive Order (EO) S-03-05, EO S-20-06 and EO S-01-07.

AB 32, the California Global Warming Solutions Act of 2006, is one of the most significant pieces of environmental legislation that California has adopted. Among other things, it is designed to maintain California's reputation as a "national and international leader on energy conservation and environmental stewardship." Most notably AB 32 mandates that by 2020, California's GHG emissions be reduced to 1990 levels.

In August, 2012 the City Council of the City of Santa Clarita passed the Santa Clarita Climate Action Plan (CAP). The CAP demonstrated that the City of Santa Clarita will be able to reduce local greenhouse gas emissions to a level consistent with AB 32. This will be accomplished by implementing the goals, objectives and policies of the General Plan and by continuing to implement existing programs. Therefore, the CAP is consistent with the General Plan.

The proposed wireless facility is consistent with the General Plan in that the facility will be providing supporting services to the surrounding residences in compliance with General Plan policy LU 4.4.4 requiring the protection and enhancement of public utility facilities for all valley residents. The proposed project is consistent with the General Plan, and the General Plan is consistent with the CAP, therefore the project is also consistent with the CAP. Thus, the project will have no impact as it relates to greenhouse gas emissions.

VIII. HAZARDS AND HAZARDOUS MATERIALS

VIII a. No Impact.

The project does not involve the use or storage of hazardous substances other than the small amounts of cleaning agents required for normal maintenance of the wireless facility and equipment enclosure and small amounts of diesel fuel for the emergency backup generator. The project must adhere to applicable zoning and fire

regulations regarding the use and storage of any hazardous substances. Further there is no evidence that the site has been used for underground storage of hazardous materials.

VIII b. Less than Significant Impact.

The site is not known or expected to contain any underground storage tanks (USTs), aboveground storage tanks (ASTs), gas lines, or other hazardous material conduits or storage facilities. The project site is not included on a list of hazardous materials sites compiled pursuant to 65962.5. There exists no evidence of industrial abuse, legal/illegal dumping, mining, or oil and gas exploration/production. Furthermore, the project does not propose any industrial uses, waste treatment/storage facilities, power plants, or other land uses that are typically associated with hazardous material accidents. The project consists of a wireless communication facility. The Telecommunications Act of 1996 requires the Federal Communications Commission (FCC) to prescribe and make effective regulations governing the environmental effects of RF emissions for telecommunication facilities. The operation of the wireless facility would be in compliance with these regulations. The proposed project would not create a hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Therefore, the project will have a less than significant impact.

VIII c. No Impact.

The project site is located on a property containing a public elementary school. However, as discussed in Section VII.a) of this report, the proposed uses are not anticipated to store, use, or generate substantial amounts of hazardous materials, and are not anticipated to utilize any acutely hazardous materials. Therefore, the project would have no related impacts.

VIII d. No Impact.

The site is not found on any list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (http://www.envirostor.dtsc.ca.gov/public/default.asp) and, as a result, would not create a significant hazard to the public or the environment.

VIII e. No Impact.

There are no airports located within two miles of the project site; and the project site is not within an airport land use plan. Therefore, the project would not result in a safety hazard for people residing or

working in proximity to an airport, and the proposed project would have no associated impacts.

VIII f. No Impact.
The project site is not within the vicinity of a private airstrip. There are no airplane transportation facilities, public or private, within two miles of the project site. Therefore, the project would not result in a safety hazard for people residing or working in proximity to a private airstrip, and the proposed project would have no associated impacts.

VIII g. No Impact.
The construction and operation of the proposed project would not place any permanent or temporary physical barriers on any existing public streets. Furthermore, the project site is not utilized by any emergency response agencies, and no emergency response facilities exist in the project vicinity. The project would be adding additional wireless telecommunication services to a portion of the Santa Clarita Valley that would aid in wireless communication during an emergency situation. Therefore, the proposed project would have no adverse impact to emergency response planning.

VIII h. Less than Significant Impact.
As shown on City's Fire Hazards Zone map (Exhibit S-6 of the City's General Plan), the project site is within a fire hazard area. The project site will be developed in accordance with Fire Code requirements and will not present any additional risk of will not present any additional risk of wild land fires to people or structures within the immediate vicinity..

VIII i. Less than Significant Impact.
The site is not known or expected to contain any electrical transmission lines, gas lines, oil lines, or other hazardous material conduits or storage facilities. The proposed project includes the addition of an unmanned wireless facility. The proposed facilities are designed in compliance with all Federal Communication Commission (FCC) regulations and standards governing any environmental effects of emissions. Therefore, the proposed project would have a less than significant impact as it relates to exposing people to existing sources of potential health hazards.

IX. HYDROLOGY AND WATER QUALITY

IX a-m. No Impact.
The proposed project includes the construction of an unmanned wireless facility concealed within a clock tower. The project will not

result in additional waste discharges, will be built in accordance with the National Pollutant Discharge Elimination System (NPDES) requirements and will meet water quality standards. The project would not substantially deplete groundwater supplies or interfere with groundwater recharge as there is no increase in impermeable surfaces. The facility would not substantially alter the drainage pattern of the site area or contribute to runoff that would exceed the capacity of the area. Further, the proposed project is not anticipated to impact any 100-year flood hazard area, river, water body, levee, dam, tsunami, drainage pattern, or runoff of Stormwater Management systems. Therefore, the proposed project is not anticipated to have an impact to hydrology and water quality.

X. LAND USE AND PLANNING

X a. No Impact.

The General Plan designates the project site as Public Institutional (PI) with a zoning designation of PI. The project consists of an unmanned wireless communication facility that would not disrupt or physically divide and established community because no residences exist on the project site. In addition, the project will not impact existing supporting residential roads and sidewalks that connect the existing community. Therefore, the project would have no related impacts.

X b. No Impact.

The project site is not part of a specific plan or redevelopment plan, and the City of Santa Clarita is not within the Coastal Zone, as described in the Coastal Zone Management Act of 1966, or any other plan designed with the purpose of avoiding or mitigating an environmental effect. The project site is zoned PI and is consistent with the PI zone with the approval of a Conditional Use Permit. Therefore, the proposed project would not cause impacts due to conflicts with applicable land use plans, policies, or regulations.

X c. No Impact.

The project site is not within a Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved environmental resource conservation plan. Therefore, the project would not conflict with any adopted environmental conservation plans, and the project would have no related impacts.

XI. MINERAL AND ENERGY RESOURCES

XI a-c. No Impact.

Gold mining and oil production historically have been the principal mineral extraction activities in and around the Santa Clarita Valley.

Other minerals found in the planning area include construction aggregate, titanium, and tuff. Mineral resources and extraction areas are shown in the City's General Plan. The proposed project is not known to contain mineral resources and will not affect any of the mineral resources in Santa Clarita. Therefore, there would be no impact.

XII. NOISE

XII a-d. Less than Significant Impact.

The project site is in the vicinity of residences, which are classified as sensitive noise receptors. The impacts of noise levels as it relates to this project are anticipated to only be short-term during construction and are expected to be negligible due to a minor amount of construction with no demolition or major grading being required for the facility. The City of Santa Clarita's Wireless Ordinance restricts the noise emitted from wireless facilities to a no net increase. An analysis has been submitted to show that a no net increase of noise will occur with the proposed wireless facility. In addition, no groundborne vibration or groundborne noise levels are expected to be emitted by this project. Therefore, the project would have a less than significant impact as it relates to noise and groundborne vibration.

XII e-f. No Impact.

There are no airports, airfields, or airport land use plans within the City. Therefore, the proposed project would cause no impacts related to airport noise.

XIII. POPULATION AND HOUSING

XIII a-c. No Impact.

The proposed project is an unmanned wireless facility, and as such, is not anticipated to induce any population growth in the Santa Clarita Valley, either directly or indirectly, nor would the project cause displacement of existing homes or people. The project does not alter the City's population projections and are consistent with the City's General Plan. Therefore, the proposed project would have no impact to population and housing.

XIV. PUBLIC SERVICES

XIV a. (i-iv) No Impact.

The construction of the proposed wireless communication facility will not create any additional demand for public services including fire, police, schools, public facilities and maintenance or other governmental services because there will be no employees reporting to this facility. Fire and police protection services will be able to meet the needs of the project and the surrounding area with existing

resources. Therefore, no impacts to public services will result from the project.

XV. RECREATION

XV a-b. No Impact.

The project would not increase the use of existing neighborhood park, regional park or other recreational facilities such that substantial physical deterioration of any facility would occur or be accelerated. The proposal includes the installation of an unmanned wireless communication facility which is not known to increase demand of neighborhood parks. No expansion or construction of additional parks would be required as a result of this project. Therefore, this project will result in no impacts to recreational facilities.

XVI. TRANSPORTATION/TRAFFIC

XVI a-b. No Impact.

The proposed wireless facility is unmanned and would not result in an in increase in traffic. The project would require occasional maintenance; however, it is not expected to generate more than one trip per month to and from the project site. As a result, the project will not conflict with any applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, or decrease the performance or safety of such facilities and does not conflict with any applicable congestion management system. Therefore, no impacts would result from this project.

XVI c-g. No Impact.

The project area is not within an airport land use plan or within two miles of public airport or public use airport. Consequently, the proposed project would not affect any airport facilities and would not cause a change in the directional patterns of aircraft. The project would not change the roadway network, thereby eliminating any chance of creating curves or dangerous intersections, or introducing farm equipment to the area. A maintenance road and emergency access is currently provided to the site, and the proposed placement of the equipment on the project site will not inhibit access or circulation of emergency services to the project site, nor would they conflict with adopted policies or programs regarding public transit, bicycle or pedestrian facilities, or in any other way decrease the performance and safety of such facilities. Therefore, no impacts would result from this project.

XVII. UTILITIES AND SERVICE SYSTEMS

XVII a-g. No Impact.

The proposed wireless facility would be unmanned and would not require connection to water utilities or generate any solid waste. The project would not result in the construction of new or expansion of existing water or wastewater treatment facilities nor exceed the wastewater treatment requirements of the Regional Water Quality Control Board. The project impacts would be minimal in nature and are not anticipated to increase any storm water drainage or require the construction or expansion of existing facilities. The only solid waste anticipated as a result of the project would be minimal and directly result from the construction of the project. Any waste created during construction would be disposed of in compliance with federal, state and local statutes. Therefore, the project would have no impacts.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

XVIII a. No Impact.

The proposed project will not impact the environment, will not lead to a substantial reduction in habitat of a fish or wildlife species, or reduce, restrict or eliminate any number of rare, threatened or endangered species or eliminate important examples of the major periods of California history or prehistory because none of these features exist on the site. Therefore, there would be no impact.

XVIII b. No Impact.

The proposed wireless facility would not have impacts that are individually limited, but cumulatively considerable. The proposed facility would be installing antennas concealed within a clock tower with ground mounted equipment screened by screen walls and existing landscape. No aspects of the project proposal would result in cumulative impacts. The proposed use would not be intensifying the use of the site. Therefore, no impacts would occur from this project.

XVIII c. No Impact.

The project does not have environmental effect which will cause substantial adverse effects on human beings, either directly or indirectly. Therefore, no impacts will result from this project.

Sulphur Springs Union School District
Serving Grades - K – 6

27000 Weyerhaeuser Way, Santa Clarita, CA 91351 661-252-5131 www.sssd.k12.ca.us

Canyon Springs Community School
Leona Cox Community School
Pinetree Community School
Fair Oaks Ranch Community School
Mint Canyon Community School
Sulphur Springs Community School
Golden Oak Community School
Mitchell Community School
Valley View Community School

July 1, 2014

Dear Mr. Cole,

I am writing to you regarding the monument cell tower projects planned for two of our district schools; Fair Oaks Ranch Community School and Golden Oak Community School.

ATT initially met with District representatives in May 2013 to determine if there was interest in and support for construction of a cell tower on each of the two sites. Through meetings with site administrators, staff and parent committees, and a presentation to the District's Board of Trustees, it was determined that there is overwhelming support and excitement about construction of cell towers designed as school monument clock towers. The Board of Trustees discussed notification of the community and took action to approve the agreement for construction of the monument cell towers at two publically noticed meetings.

The agreement between the District and ATT for the construction of cell towers has a number of benefits to the schools and the District. The most notable benefits include:

- Provision of a clock tower at no cost to the District will serve as an additional monument sign with the name of the school visible from two sides; enhancing school pride, identifying the school's location, and providing a real life opportunity for students to practice the skill of telling time.

- The Lease Agreement provides an ongoing revenue stream to the District that supports District operations.

- Improved signal strength will increase the safety of students and staff in the event of an emergency because the signal strength available for cell communications at the two schools is currently weak or poor.

Letters were distributed to homeowners in the area around the school soliciting input and allowing for comment. No communications in oral or written form were received in response to the notification letters. The plans for both schools have been submitted and approved by the Division of the State Architect, the state agency that has jurisdiction for all aspects of school construction. ATT has advised the District that the City of Santa Clarita Planning Commission believes it should be the agency approving construction of the cell towers because the Commission does not believe the towers are for school purposes. We believe we have clearly identified the ways in which the cell towers meet the purpose of enhancing school pride, school safety, and District operations. With the clarification of the benefit to the District and the District's belief that DSA is the appropriate authorizing agency, we look forward to your support in removing any barriers that would further delay the construction of the cell towers at Fair Oaks Ranch Community School and Golden Oak Community School.

Sincerely,

Robert Nolet

Dr. Robert Nolet
Superintendent

CITY OF SANTA CLARITA
COMMUNITY DEVELOPMENT DEPARTMENT
23920 Valencia Boulevard, Suite 302
Santa Clarita, CA 91355

NOTICE OF PUBLIC HEARING AND NOTICE OF INTENT TO ADOPT A NEGATIVE DECLARATION

APPLICATION: Master Case No. 14-198; Conditional Use Permit 14-017; Development Review 14-017; Initial Study 14-008

PROJECT APPLICANT: AT&T

PROJECT LOCATION: 25201 Via Princessa (APN: 2841-061-903)

PROJECT DESCRIPTION: The applicant is requesting a Conditional Use Permit and Development Review for the construction of a wireless communications facility located at 25201 Via Princessa at Golden Oak Elementary School, in the community of Canyon Country. The proposal includes the construction of a 52-foot tall clock tower structure, with twelve antennas concealed inside, and the associated equipment concealed at the base of the tower. The clock tower will be located on the western portion of the property, adjacent to Golden Valley Road.

ENVIRONMENTAL REVIEW: A Draft Negative Declaration has been prepared for this proposed project and is available for a public review period, during which the City of Santa Clarita Community Development Department will receive comments, beginning at noon on March 17, 2015, and ending at noon on April 7, 2015. During the public review period, a copy of the Negative Declaration and all supporting documents will be located at the Permit Center located in the City Hall Building at 23920 Valencia Boulevard, Suite 120, Santa Clarita, CA 91355. A copy of the draft Negative Declaration (without all supporting documents) will be posted at the Santa Clarita Library, Valencia Branch, during the public review period noted above.

The City of Santa Clarita Planning Commission will conduct a public hearing on this matter on the following date:

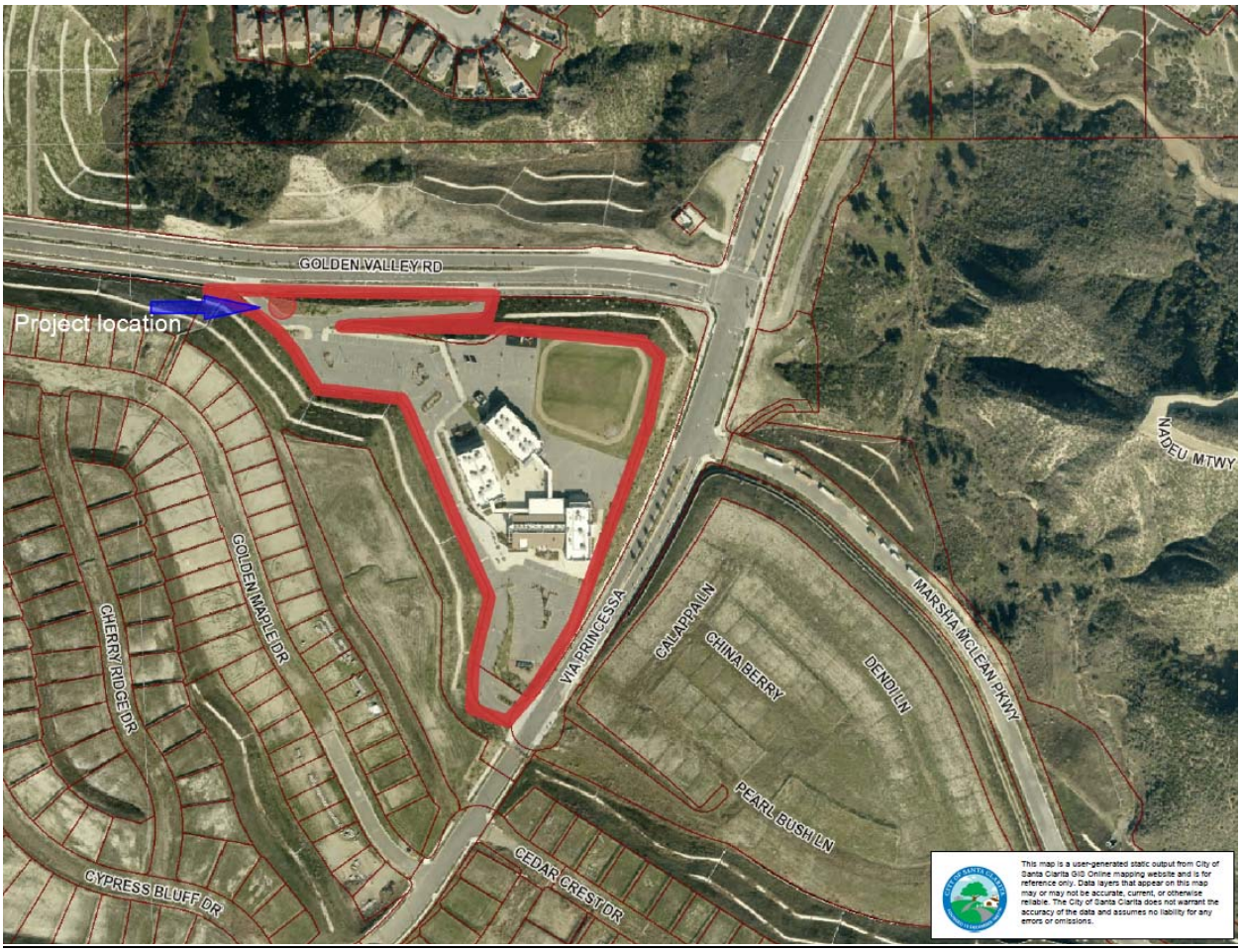
DATE: Tuesday, April 7, 2015
TIME: At or after 6:00 p.m.
LOCATION: City Hall, Council Chambers
23920 Valencia Blvd., First Floor
Santa Clarita, CA 91355

If you wish to challenge the action taken on this matter in court, you may be limited to raising only those issues you or someone else raised at the public hearings described in this notice, or written correspondence delivered to the City of Santa Clarita at, or prior to, the public hearings. If you wish to have written comments included in the materials the Planning Commission receives prior to the public hearing, it must be submitted to the Community Development Department by Friday, March 27, 2014.

For further information regarding this proposal, you may contact the project planner at the City of Santa Clarita, Permit Center, 23920 Valencia Blvd., Suite 140, Santa Clarita, CA 91355. Telephone: (661) 255-4330. Website: www.santa-clarita.com/planning. Send written correspondence to: 23920 Valencia Blvd., Suite 302, Santa Clarita, CA 91355. Project Planner: Mike Ascione, Assistant Planner II, mascione@santa-clarita.com.

Jeff W. Hogan, AICP
Planning Manager

Posted: Santa Clarita City Hall Permit Center, Santa Clarita Public Library (Valencia Branch)
Published: The Signal, March 17, 2015.



Environmental Noise Assessment Report

Site No. NL0226
Golden Oak Community School
25201 Via Princessa
Santa Clarita, CA

EBI Project No. 62145924
November 25, 2014



Prepared for:

AT&T Mobility, LLC
12900 Park Plaza Drive
3rd Floor
Cerritos, CA 90703

Prepared by:

EBI Consulting
environmental | engineering | due diligence

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APPENDICES

Appendix A Equipment Specifications
Appendix B CadnA® Environmental Noise Model Results
Appendix C Sound Monitoring Data & Notes

1.0 EXECUTIVE SUMMARY

AT&T proposes to locate an unstaffed wireless telecommunications facility at site number NL0226 (site name Golden Oak Community School). This site is located on the property of the Golden Oak Community School in a mixed use area at 25201 Via Princessa, Santa Clarita, CA, and is herein referred to as NL0226.

A study of the noise impact from the proposed climate controlled and power equipment on the site vicinity was performed by EBI Consulting.
Existing sound levels at the nearest property line were measured on November 12, 2014. Acoustic modeling was done to assess the potential change in existing sound levels and predict post construction daytime and nighttime sound levels. This report evaluates the compliance for the 25201 Via Princessa site in relation to the Wireless Facility Requirements of the Santa Clarita Municipal Code Section 17.17.040.

Based on the results of this study, EBI concludes that the NL0226 project will be in compliance with the Wireless Facility Requirements of the Santa Clarita Municipal Code Section 17.17.040. concerning the sound level limits at all project property lines.

2.0 BACKGROUND

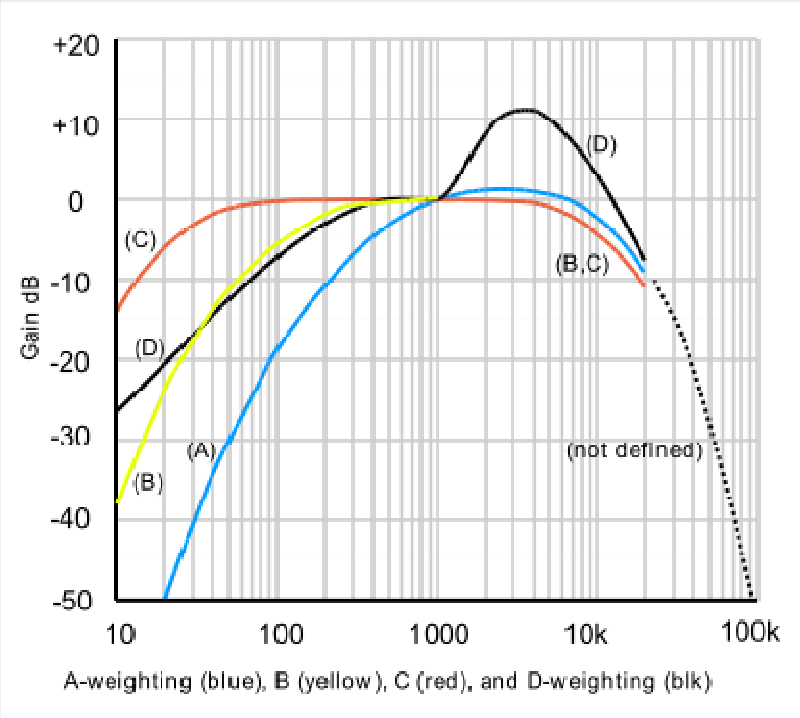
All sounds originate from a source. The sound energy, produced by a source, creates variations in air pressure which travel in all directions much like a wave ripples across the water. The "loudness" or intensity of a sound is a function of the sound pressure level, defined as the ratio of two pressures: the measured sound pressure from the source divided by a reference pressure (i.e. threshold of human hearing). Sould level measurements are most commonly expressed using the decibel (dB) scale. The decibel scale is logarithmic to accommodate the wide range of sound intensities the human ear is capable of responding to. On this scale, the threshold of human hearing is equal to 0 dB, while levels above 140 dB can cause immediate hearing damage.

One property of the decibel scale is that the combined sound pressure level of separate sound sources is not simply the sum of the contributing sources. For example, if the sound of one source of 70 dB is added to another source of 70 dB, the total is only 73 dB, not a doubling to 140 dB. In terms of human perception of sound, a 3 dB difference is the minimum perceptible change for broadband sounds (i.e. sounds that include all frequencies). A difference of 10 dB represents a perceived halving or doubling of loudness.

Environmental sound is commonly expressed in terms of the A-weighted sound level (dBA). The A-weighting is a standard filter to make measured sound levels more nearly approximate the frequency response of the human ear. Table 1 shows the adjustments made at each octave band frequency to contour un-weighted sound levels (dB) to A-weighted sound levels (dBA).

TABLE 1 - A-WEIGHTED OCTAVE BAND ADJUSTMENT (±dB)

Octave Band Center Frequency (Hz)	32	64	125	250	500	1000	2000	4000	8000	16000
A-weighting Adjustment (±dB)	-39.4	-26.2	-16.1	-8.6	-3.6	0.0	+1.2	+1.0	-1.1	-6.6



Environmental sound varies depending on environmental conditions. Some sounds are sharp impulses lasting for short periods of time, while others rise and fall over longer periods of time. There are various measures (metrics) of sound pressure designed for different purposes. The Leq, or equivalent sound level, is the steady-state sound level over a period of time that has the same acoustic energy as the fluctuating sound that was measured over the same period. The Leq is commonly referred to as the average sound level and is calculated automatically by the sound level meter using methods defined in ANSI S1.4-1983[1].

[1] American National Standards Institute, ANSI S1-4-1983, American National Standard Specification for Sound Level Meters, 1983

3.0 REGULATORY REQUIREMENTS

The City of Santa Clarita has a Wirless Facility Requirement as stated in Section 17.17.040 of the municipal code:

"Within residential zones, sound proofing measures shall be used to reduce noise caused by the operation of wireless facilities and all accessory equipment to a level which would have a no-net increase in ambient noise level."

4.0 SITE DESCRIPTION

The site NL0226 will be located on the property of the Golden Oak Community School in a proposed clock tower at 25201 Via Princessa, Santa Clarita, CA.
Two FB4C Base Series Fan Coils Sizes 018-060 and four Alpha cabinets are proposed for installation at ground level in side the clock tower. Two Puron 24ACB7 condensers are proposed for installation at ground level within the concrete masonry wall unit structure. Figure 1 presents the proposed equipment cabinet location, monitoring locations, property line and nearest residential area. According to aerial photographs, the nearest private residential structure is approximately 530 feet north of the proposed installation.



FIGURE 1 – SITE SCHEMATIC AND MONITORING LOCATIONS

Golden Oak Community School
NL0226
25201 Via Princessa, Santa Clarita, CA
Site Visit Date: November 12, 2014

5.0 AMBIENT SOUND LEVELS

Short-term (20 minute) sound monitoring, day and night, was performed in the area surrounding the proposed location on November 12, 2014. See Figure 1.
All sound level measurements were taken with a Casella CEL-633 real-time octave-band sound level analyzer, which was equipped with a precision condenser microphone having an operating range of 5 dB to 140 dB, and an overall frequency range of 3.5 to 20,000 Hz. The meter meets or exceeds all requirements set forth in the American National Standards Institute (ANSI) Standards for Type 1 for quality and accuracy. Prior to and immediately following both measurement sessions, the sound analyzer was calibrated (no level adjustment was required) with an ANSI Type 1 calibrator, which has an accuracy traceable to the National Institute of Standards and Technology (NIST). All instrumentation was laboratory calibrated per ANSI recommendations. For all measurement sessions the microphone was fitted with an environmental windscreen to negate the effect of air movement and tri-pod mounted at a height of 1.3 meters above grade, and measurements were made away from any vertical reflecting surfaces in compliance with ANSI Standards S12.9[2]. All data were downloaded to a computer following the measurement session. The sound data are shown in Appendix C and are summarized in Table 3.

TABLE 3 – AMBIENT SOUND LEVEL MONITORING RESULTS
NOVEMBER 12, 2014

Location	Description	Time	L_{eq} (dBA)
Loc-1	Property Line	1:24 - 1:44 p.m.	58.5
		10:46 – 11:06 p.m.	52.8

[2] Acoustical Society of America, ANSI Standard S12.9-1992, "Quantities and Procedures for Description and Measurement of Environmental Sound"

6.0 MODELED POST CONSTRUCTION NOISE LEVELS

The Cadna/A® computer noise model was used for computing sound levels from the proposed equipment throughout the surrounding community. An industry standard, employing ISO 9613-2 methodology, Cadna/A was developed to provide estimates of sound levels at distances from specific noise sources taking into account the effects of terrain features, including relative elevations of noise sources, receivers, and intervening objects (buildings, hills, trees), and ground effects due to areas of hard ground (pavement, water) and soft ground (grass, field, forest). In addition to computing sound levels at specific receiver positions, Cadna/A can compute noise contours showing areas of equal and similar sound level.

As input, Cadna/A incorporated a *geometric model* of the study area, reference *noise source* levels. Cadna/A uses a *sound propagation model* to project noise levels from equipment operations into the surrounding community. The three-dimensional geometric model of the study area was developed from aerial photography and digital terrain information obtained from Google Earth.

Complete modeling output sheets from the EBI-ENM are contained in Appendix B. Table 5 summarizes the results of the acoustic modeling.

Predictive post-construction noise levels were calculated for site NL0226 using published sound power levels and acoustical specifications for two FB4C Base Series Fan Coils Sizes 018-060, four Alpha cabinets and two Puron 24ACB7 condensers. Noise specifications for proposed equipment are summarized in Table 4.
In addition barrier calculations were performed in the modeling analysis to reflect acoustical attenuation provided by the exterior walls of the clock tower and concrete masonry wall unit.

TABLE 4 – ACOUSTIC SOURCES

Source Name	Description	Equipment Noise
		Sound Power Level (dBA)
FB4C Base Series	Coil Fan	61.4
FB4C Base Series	Coil Fan	61.4
Alpha Equipment	Power Cabinets	60
Alpha Equipment	Power Cabinets	60
Alpha Equipment	Power Cabinets	60
Alpha Equipment	Power Cabinets	60
Puron 24ACB7	Condenser	74
Puron 24ACB7	Condenser	74

TABLE 5 – POST CONSTRUCTION SOUND LEVEL RESULTS

Location	Existing Condition (dBA)		Equipment Noise Impact (dBA)	Future Condition (dBA) and Increase (±dB) w/ Proposed Equipment	
	Daytime	Nightime	24/7	Daytime	Nighttime
Loc-1 Property Line	58.5	52.8	20.9	58.5 (+0)	52.8 (+0)

7.0 RESULTS AND CONCLUSIONS

The equipment cabinet installation at 25201 Via Princessa will comply with the Wireless Facility Requirements of the Santa Clarita Municipal Code Section 17.17.040.

As shown in Table 5, worst-case predictive modeling indicates the proposed installation will result in a no-net-increase condition, at the nearest property line, and therefore at all adjacent residential areas, as per the Santa Clarita Wireless Facility Requirements outlined in 17.17.040.

Worst-case modeling methodologies are based on the manufacturer-provided equipment specifications. Manufacturer specifications include a decibel rating, which reflects the maximum decibel output the equipment will produce when running at full capacity. All modeled equipment is assumed to be running at full capacity, twenty-four hours per day.

8.0 LIMITATIONS

This report was prepared for the use of AT&T Mobility. The conclusions provided by EBI are based solely on the information provided by the client. The observations in this report are valid on the date and time of the investigation. Reported noise levels contained herein are a factor of meteorological and environmental conditions present at the time of the site survey, and represent "typical" site noise levels. Measurement and calculations contained in this report should be considered accurate to within one decibel. Any additional information that becomes available concerning the site should be provided to EBI so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report and has been designed to address the Wireless Facility Requirements of the Santa Clarita Municipal Code Section 17.17.040.

9.0 REVIEWER CERTIFICATION

I, Cynara Canantella, state that:

- I am an employee of Envirobusiness Inc. (d/b/a EBI Consulting), which provides acoustic survey and compliance services to the wireless communications industry. I have reviewed the data collected during the site survey which is incorporated into this Site Compliance Report such that the information contained in this report is true and accurate to the best of my knowledge.

Sincerely,
By EBI Consulting



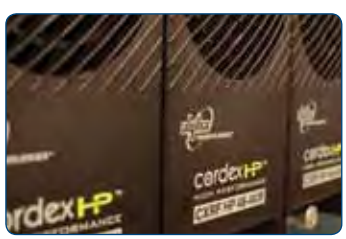
Cynara Cannatella
Senior Engineer

APPENDIX A

EQUIPMENT SPECIFICATIONS

Alpha Power Solutions

TOTAL POWER SOLUTIONS BY ALPHA TECHNOLOGIES LTD.









member of The Group™

Power


alpha
TECHNOLOGIES
7700 Riverfront Gate



Alpha Technologies Ltd.

Company Overview

For over 35 years, Alpha Technologies has been the industry pioneer and global leader in AC and DC power. Our distinctive excellence is the ability to innovate and deliver optimized solutions for our customers' unique powering challenges. Our wide portfolio of high-quality, feature-rich products can be customized to suit almost any application and installation environment, offering the best performance and lowest total cost of ownership in the industry.

The Alpha Group

The Alpha Group represents an alliance of independent companies who share a common philosophy – to create world class powering solutions.

Collectively, Alpha Group members develop and manufacture AC, DC and renewable power conversion protection and standby products. Applications for these products include Broadband, Telecom, Commercial, Industrial and Distributed Generation for a worldwide customer base. In addition to these core specialties, our companies provide a complete range of installation and maintenance services.

Members of The Alpha Group include Alpha Technologies Ltd., Alpha Technologies Inc., Alpha Energy, Alpha Industrial Power, Altair Advanced Industries, Inc., Mitra Innovations S.A. and OutBack Power Technologies, Inc.


TECHNOLOG



Market Overview

Alpha Technologies Ltd's core target markets include the Telecom, Traffic, Security, Renewable Energy and Smart Grid sectors. In addition, across the Alpha Group, the broadband cable sector remains a significant focal point.

In the Telecom sector, Alpha's* DC solutions have long been the standard for reliability and efficiency, built on superior communications and control functionality inherent in its Cordex™ family of controllers. Today, much of Alpha's ongoing research and development investments are directed at developing the next generation of DC power solutions. These products will not only continue to provide Alpha's class-leading reliability, but also help drive OPEX savings by way of greater efficiency and the innovative use of renewable energy technology.

In the emerging Traffic market, where fewer than 10% of North American intersections are backed up, Alpha is amongst the market leaders providing back up power and power conditioning for traffic lights, controllers and highway signage. To date, over half of the states in America have standardized on Alpha UPS's for these applications, resulting in Alpha systems already backing up over 15,000 intersections.

In the Security sector, there is a growing recognition that without effective back-up power most security systems are fundamentally flawed. In other words, No Power = No Security. Alpha has been at the forefront of increasing this awareness, with innovative solutions for almost every type of critical indoor and outdoor security application.

Renewable Energy solutions are rapidly gaining favor due to their versatility; improving economics and positive impact on the environment. Alpha not only offers a variety of renewable solutions, but also brings its considerable experience in backing up critical systems to the emerging Renewable Energy industry as they too need 7x24x365 power assurance.

The Smart Grid sector is beginning to take shape and Alpha is well positioned to address the emerging powering requirements for the Smart Grid networks and devices.

In all these markets, Alpha's success lies in our ability to deliver total power solutions that solve our customers' unique powering challenges and to provide exceptional customer service and support.

*formerly Argus Technologies, 1986 to 2010


Cordex HP
HIGH PERFORMANCE
CXRF 48-1.2kW

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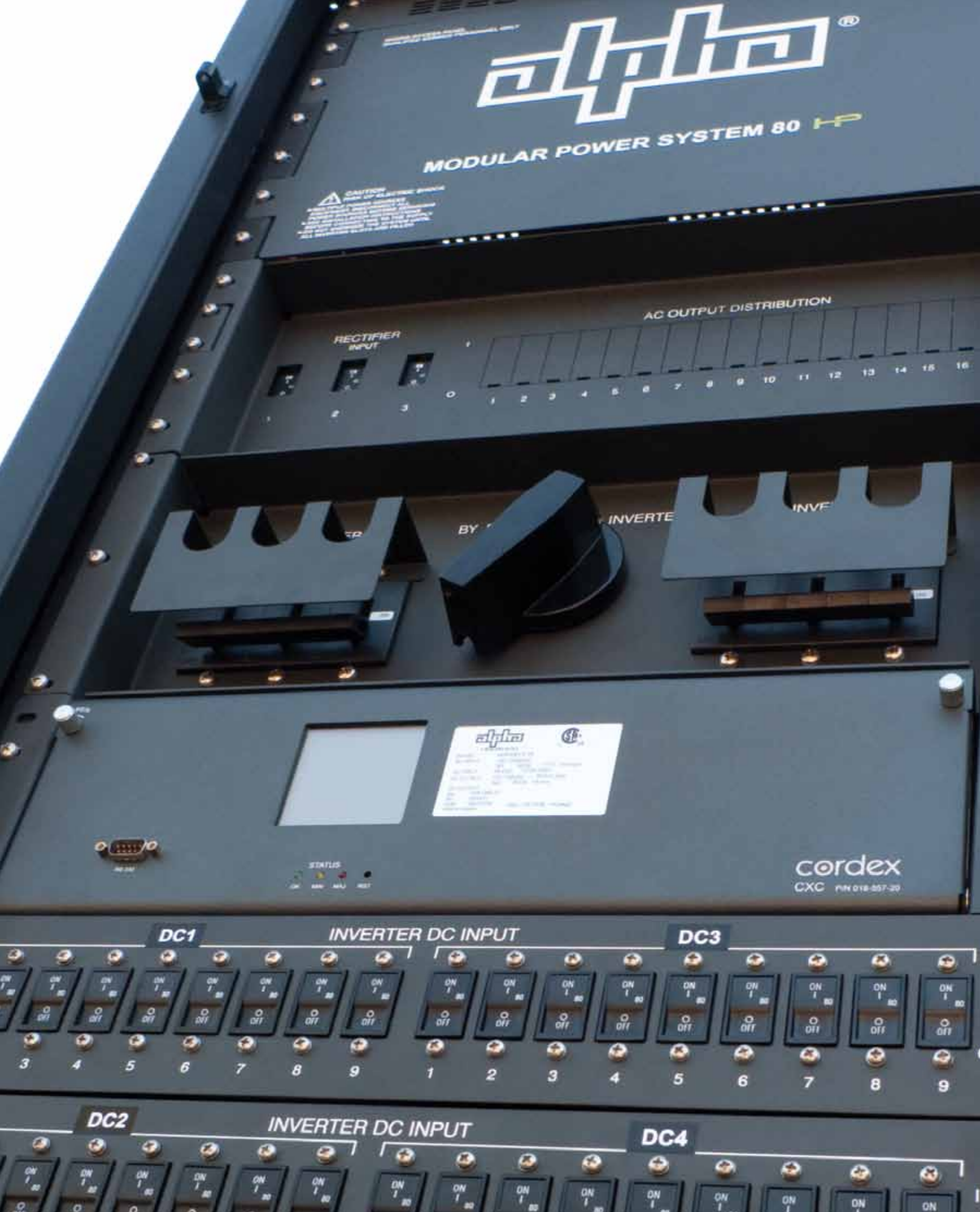
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NEW = Product released in 2011

HP = High Performance products offering exceptional efficiency, functionality and reliability


MODULAR POWER SYSTEM 80 HP
AC OUTPUT DISTRIBUTION
RECTIFIER INPUT
STATUS
cordex
CXC
DC1
INVERTER DC INPUT
DC3
DC2
INVERTER DC INPUT
DC4



Standard Solutions

Alpha has over 35 years of experience providing ruggedized, fully integrated indoor and outdoor AC and DC power solutions. With multiple options for standardized and custom system integration, Alpha has the ability to provide the ideal system for virtually any power and site installation scenario.

By coupling advanced power technology with an enormous selection of system components, Alpha can easily configure optimized and reliable system solutions up to an impressive 10,000 Amps.

cordex HP™
HIGH PERFORMANCE

Cordex HP represents Alpha's next generation of High Performance Solutions that are "Best in Class" in:

- Power density, flexibility and functionality
- Efficiency
- High temperature operation
- Reducing total cost of ownership (CAPEX and OPEX)

With a variety of products now available or in the development pipeline, the HP branded products illustrates The Alpha Group's engineering commitment to designing smarter, greener power electronics for the future.



DC Power Solutions

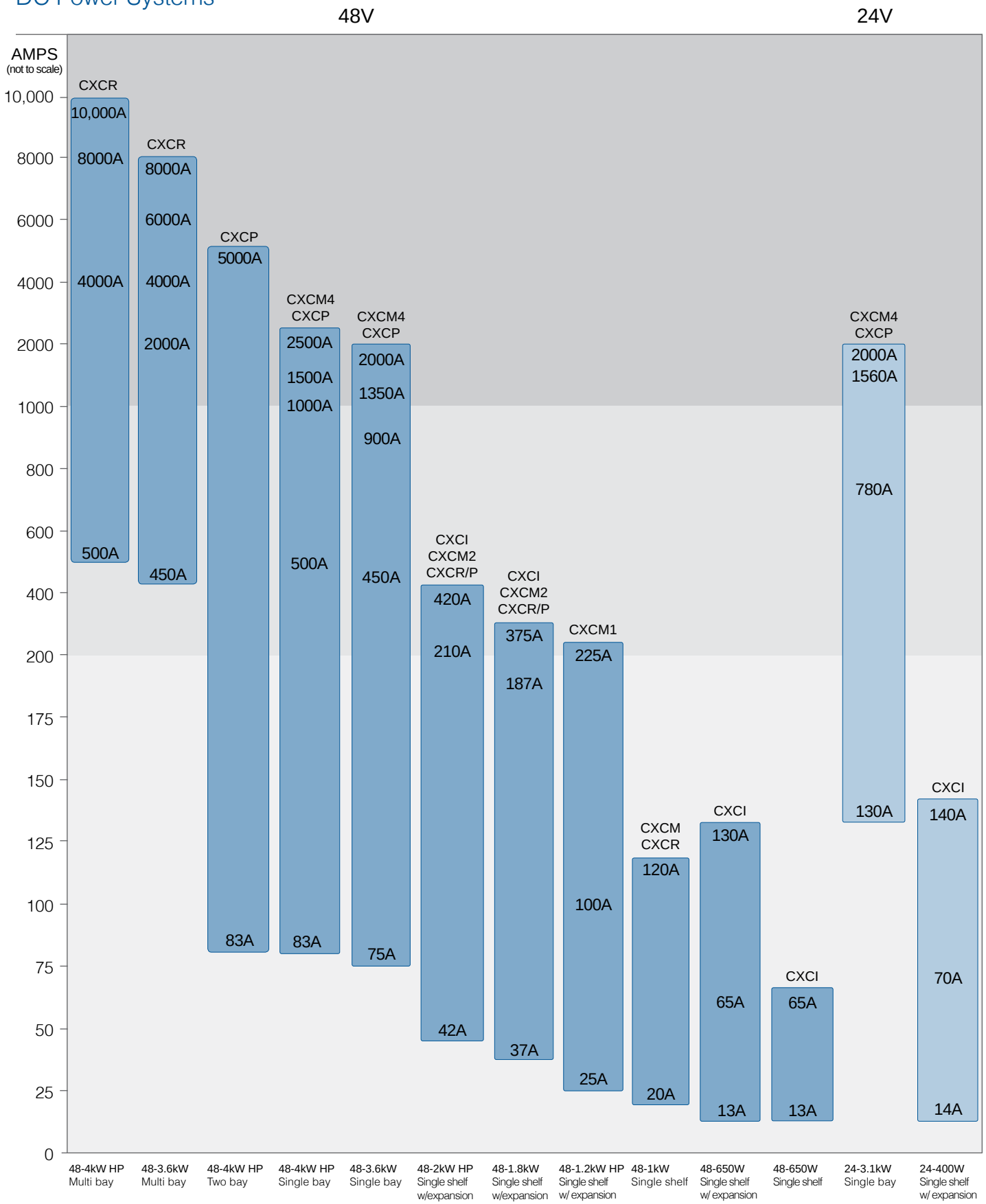
Alpha builds on its extensive experience in serving the Telecom, Data Center, Cable TV, Security and Traffic markets to deliver the broadest assortment of DC power solutions. From multi-bay systems for large switching offices to small shelf systems that can mount on a wall or occupy a single rack space, Alpha's DC power solutions integrate leading-edge power conversion technology and Cordex controllers with distribution options to serve a broad variety of applications.

Alpha's shelf systems provide a complete power solution in a rack mount package. The systems incorporate a Cordex™ controller, rectifiers and distribution options in a compact shelf design. Distribution can be located inside the shelf for applications with a few loads, or adjoined in integrated panels for those sites where additional distribution positions are needed. In either case, optional accessories such as Low Voltage Disconnects (LVD's), shunts and temperature compensation are common options on most integrated solutions.

For medium to large system applications, Alpha offers a complete line of standard AC and DC system solutions designed to maximize space and cost savings. System options include various relay rack structures, custom distribution configurations, multiple voltage output designs and front accessibility. As with shelf systems, the standard accessories such as LVD's, shunts and temperature compensation are available.

On top of this extensive line of standard products, Alpha continues its legacy of designing new solutions to meet your exact need. Capitalizing on our experience in multiple markets plus our technical and application know-how, Alpha is ready to demonstrate our desire to earn your business with quick-to-market customized solutions that meet your unique requirements.

DC Power Systems



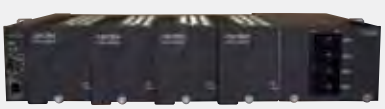
Cordex™ 650W
48Vdc Modular Rectifier Shelf Systems



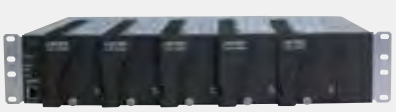
Cordex™ 2.6kW Shelf Power System

- Multiple 48V configurations up to 67A for various 48Vdc applications
- Convection cooled design for high reliability in harsh industrial environments
- Front access options for space restricted enclosures
- Integrated DC system capability with controller and distribution module options

Cordex™ 48-650W Rectifier Shelves



19/23in 2RU universal mount
Cordex™ 2.6kW shelf power system
P/N: 030-728-20
Rectifiers: .....4 x CXRC 48-650W
Controller: .....1 x CXCI
Distribution: .....(4) AM bullet type breakers



19/23in 2RU universal mount
Cordex™ 3.2kW bulk power system with CXCI controller
Optional LVD shunt with battery breaker
P/N: 030-782-20
Rectifiers: .....5 x CXRC 48-650W
Controller: .....1 x CXCI
Distribution: .....Bulk power for external distribution



23in 2RU front access
Cordex™ 2.6kW front access shelf power system
P/N: 030-722-20
Rectifiers: .....4 x CXRC 48-650W
Controller: .....1 x CXCI
Distribution: .....(4) AM bullet (10) GMT fuse



19in 2RU front access
Cordex™ 1.9kW front access shelf power system
P/N: 030-727-20
Rectifiers: .....3 x CXRC 48-650W
Controller: .....1 x CXCI
Distribution: .....(4) AM plug-in (10) GMT fuse

Shelves

19" Shelves
Dimensions:
mm: .....89H x 435W x 302D
inches: .....3.5H x 17.1W x 11.9D
Weight: 6.9kg (15.5lbs)

23" Front Access Shelf
Dimensions:
mm: .....89H x 544W x 307D
inches: .....3.5H x 21.42W x 12.0D
(excludes optional fan tray and baffle)
Weight: .....16.8kg (37lbs) (fully equipped with four rectifiers)

Note: Shelf P/Ns DO NOT include modules or distribution breakers
Weights DO NOT include modules
Dimensions do not include mounting bracket

Communication ports:
CAN: .....Interface to control rectifiers. Smart peripherals
Ethernet: .....10/100 Base-T for TCIP/SNMP features

Environmental

Temperature:
Standard: .....-40 to 50°C (-40 to 122°F)
Storage: .....-40 to 85°C (-40 to 185°F)
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 3000m (-1640 to 9840ft)
Cooling: .....Natural or forced convection, vertical airflow

Related Components

Cordex™ 650W 48Vdc rectifier: See page 96
Cordex™ controller CXCI: See page 83
AM plug-in breakers: See page 125
GMT style fuses: See page 125

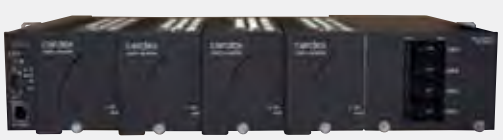
Cordex™ 400W
24Vdc Modular Rectifier Shelf Systems



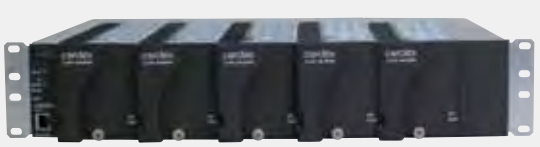
Cordex™ 1.6kW Shelf Power System

- Multiple 24V configurations up to 70A for various 24Vdc applications
- Convection cooled design for high reliability in harsh industrial environments
- Wide range AC input for multiple worldwide AC services
- Integrated system capability with shelf controller and DC distribution

Cordex 24-400W Rectifier Shelves



19/23in 2RU universal mount
Cordex™ 1.6kW shelf power system with CXCI controller and bullet breaker distribution
P/N: 030-763-20
Rectifiers: .....4 x CXRC 24-400W
Controller:.....1 x CXCI
Distribution:.....(4) AM bullet type breakers



19/23in 2RU universal mount
Cordex™ 2kW bulk power system with CXCI controller
P/N: 030-773-20
Rectifiers: .....5 x CXRC 24-400W
Controller:.....1 x CXCI
Distribution:.....Bulk power for external distribution panel

Shelves

Dimensions:
mm:.....89H x 435W x 302D
inches:.....3.5H x 17.1W x 11.9D
Weight:.....6.9kg (15.5lbs)

Note: Shelf P/Ns DO NOT include modules or distribution breakers
Weights DO NOT include modules
Dimensions do not include mounting bracket

Communication ports:
CAN:.....Interface to control rectifiers. Smart peripherals
Ethernet:.....10/100 Base-T for TCIP/SNMP features

Environmental

Temperature:
Standard:.....-40 to 50°C (-40 to 122°F)
Storage:.....-40 to 85°C (-40 to 185°F)
Humidity:.....0 to 95% RH non-condensing
Elevation:.....-500 to 3000m (-1640 to 9840ft)
Cooling:.....Natural or forced convection, vertical airflow

Related Components

Cordex™ 400W 24Vdc rectifier: See page 104
Cordex™ controller CXCI: See page 83
AM plug-in breakers: See page 125

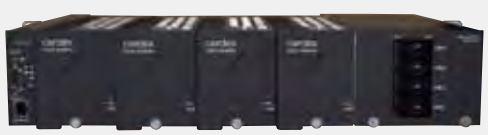
Cordex™ 250W
12Vdc Modular Rectifier Shelf Systems



Cordex™ 1kW Shelf Power System

- 83A capacity modular system for various 12Vdc applications
- Convection cooled design for high reliability in harsh industrial environments
- Wide range AC input for multiple worldwide AC services
- Integrated system capability with shelf controller and DC distribution

Cordex 12-250W Rectifier Shelves



19/23in 2RU universal mount
Cordex™ 1000W shelf power system with CXCI controller and bullet breaker distribution
P/N: 030-770-20
Rectifiers: .....4 x CXRC 12-250W
Controller: .....1 x CXCI
Distribution: .....(4) AM bullet type breakers

Shelves

Dimensions:
mm: .....89H x 435W x 302D
inches: .....3.5H x 17.1W x 11.9D
Weight: 6.9kg (15.5lbs)

Note: Shelf P/Ns DO NOT include modules or distribution breakers
Weights DO NOT include modules
Dimensions do not include mounting bracket

Communication ports:
CAN: .....Interface to control rectifiers. Smart peripherals
Ethernet: .....10/100 Base-T for TCIP/SNMP features

Environmental

Temperature:
Standard: .....-40 to 50°C (-40 to 122°F)
Storage: .....-40 to 85°C (-40 to 185°F)
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 3000m (-1640 to 9840ft)
Cooling: .....Natural or forced convection, vertical airflow

Related Components

Cordex™ 250W 12Vdc rectifier: See page 106
Cordex™ controller CXCI: See page 83
AM plug-in breakers: See page 125

Cordex™ 1kW
48Vdc Modular Rectifier Shelf Systems



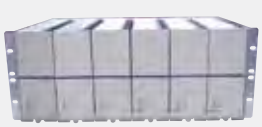
Cordex™ 4kW Shelf Power System

- Multiple configurations up to 125A for various 48Vdc applications
- Convection cooled design for high reliability in harsh industrial environments
- Wide range AC input for multiple worldwide AC services
- Integrated system capability with modular controller and DC distribution

Cordex 48-1kW Rectifier Shelves



19/23in center mount
Cordex™ 5kW bulk power system with plug in controller
P/N: 030-706-20
Rectifiers: .....5 x CXRC 48-1kW
Controller:.....CXCM
Distribution: .....Bulk power for external distribution panel



19in flush mount
Cordex™ 6kW bulk power system
P/N: 030-707-20
Rectifiers: .....6 x CXRC 48-1kW
Controller:.....Requires CXCR rack mount controller
Distribution: .....Bulk power for external distribution panel



23in center mount
Cordex™ 4kW shelf power system with plug in controller and bullet type breaker distribution
P/N: 030-704-20 L0
Rectifiers: .....4 x CXRC 48-1kW
Controller:.....1 x CXCM
Distribution: .....Integrated plug-in breakers and GMT fuse option

Shelves

19" & 19/23"
Dimensions:
mm:.....177H x 444W x 302D
inches:.....6.9H x 17.5W x 11.9D
Weight: 7.5kg (16.5lbs)

23"
Dimensions:
mm:.....177H x 543W x 302D
inches:.....6.9H x 21.4W x 11.9D
Weight: 10.2kg (22.5lbs)

Note: Shelf P/Ns DO NOT include rectifier modules or distribution breakers
Weights DO NOT include modules
Dimensions do not include mounting brackets

Communication ports:
CAN: .....Interface to control rectifiers
Ethernet: .....10/100 Base-T for TCIP/SNMP features

Related Components

Cordex™1kW 48Vdc rectifier: See page 97
Cordex™ controller CXCM: See page 84
AM plug-in breakers: See page 125
GMT style fuses: See page 125

Cordex™ HP 1.2kW
Modular 1RU Rectifier Shelf Systems



Cordex HP 1.2kW Shelf System with GMT Distribution

- Multiple 48V configurations up to 125A for various 48Vdc applications
- High efficiency design for reduced operating expenses
- High temperature rated fan-cooled design for harsh outdoor installations
- Wide range AC input and IEC line cords for multiple AC services
- Front access options for space restricted enclosures

Cordex 48-1.2kW Rectifier Shelves



19/23in 1RU shelf system with GMT distribution
P/N: 030-851-20
Rectifiers: .....3 x CXRF HP 48-1.2kW
Controller: .....1 x CXCM1
Distribution: .....(8) GMT fuse, battery shunt, optimal battery LVD



19/23in 1RU universal mount (Bulk Power with CXC)
P/N: 030-835-20
Rectifiers: .....4 x CXRF HP 48-1.2kW
Controller: .....1 x CXCM1
Distribution: .....Bulk power for external distribution



19/23in 1RU universal mount (Bulk Power)
P/N: 030-845-20
Rectifiers: .....5 x CXRF HP 48-1.2kW
Controller: .....N/A (External)
Distribution: .....Bulk power for external distribution

Environmental

Temperature:
Standard: .....-40 to 65°C (-40 to 149°F)
Extended: .....-40 to 80°C (-40 to 176°F) de-rated output
Storage: .....40 to 80°C (-40 to 176°F)
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 2800m (-1640 to 9186ft)
Cooling: .....Fan cooled (front to rear)

Shelves

Dimensions:
mm: .....44H x 440W x 305D
inches: .....1.75H x 17.3W x 12.0D
*Note: Rectifier front handle adds additional 12.5mm/0.49" Depth)

Weight:
Shelf: 3.0kg (6.6lbs)
Rectifier: 1.23kg (2.7lbs)
Note: Shelf P/Ns DO NOT include modules or distribution breakers
Dimensions do not include mounting bracket

Communication ports: .....CAN: Interface to control rectifiers and smart peripherals
Ethernet: .....10/100 Base-T for TCIP/SNMP features

Related Components

877-690-19: .....5-15P (120V) line cord, 2.5m
877-671-19: .....Universal line cord, flying leads, 3.5m
747-622-20-000: .....Blank plate
567-837-19: .....Kydex rear cover
036-201-20-000: .....CXCM1 I/O terminal block kit

Cordex HP™ 1.2kW 48Vdc rectifier : See page 98
Cordex™ controller CXCM1: See page 85
GMT style fuses: See page 125

Cordex™ HP 1.2kW
Front Access Rectifier Shelf System

cordex HP™ HIGH PERFORMANCE



Cordex™ HP 1.2kW Front Access System

- Up to 100A capacity @ 48Vdc for various small power applications
- High efficiency design for reduced operating expenses
- High temperature rated fan-cooled design for harsh outdoor installations
- Wide range AC input and IEC line cords for multiple AC services
- Front access options for space restricted enclosures

P/N: 030-834-20

Electrical

Input voltage
Operating: .....90 to 300Vac
[See output power for power derating]
Input current
(per module):.....7.5A maximum (176 to 300Vac)
6.0A maximum (90 to 176Vac)
Efficiency:.....>93% at 240Vac input and 40-100% load

Power output
(per module):.....1200W (176 to 300Vac input)
600W (110 to 130Vac Input)
*Power de-rated linearly from 1200-600W (176 to 130Vac input)
*Power de-rated linearly from 600-500W (110 to 90Vac input)

Current output
(per module):.....25A@ 48Vdc (176 to 300Vac input)
12.5A @ 48Vdc (110 to 130Vac Input)

Performance / Features

Rectifiers:.....Cordex HP 48-1.2kW

Distribution:
Module: .....(10) GMT fuse positions
(4) AM plug-in breakers
Battery low voltage disconnect
Battery shunt

Supervisory:.....CXCM1 controller

Mechanical

Dimensions:
mm:.....88H x 440W x 305D
inches:.....3.5H x 17.3W x 12.0D
*Note: Rectifier front handle adds additional 12.5mm/0.49" Depth)

Mounting:..... 19" or 23" rack, 6" offset (center),
EIA rack spacing
Weight:
Shelf:.....4.55kg (10lbs)
Rectifier: 1.23kg (2.7lbs)

Environmental

Temperature:
Standard:.....-40 to 65°C (-40 to 149°F)
Extended:.....-40 to 80°C (-40 to 176°F) de-rated output
Storage:.....-40 to 80°C (-40 to 176°F)
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 2800m (-1640 to 9186ft)
Cooling:.....Fan cooled (front to rear)
Heat dissipation: .....1232 BTU hour/system max.

Standards

Safety: .....CSA C22.2 No 60950-1-03
CE:.....EN60950
NEBS:.....GR-1089-CORE
GR-63-CORE
NEBS certification pending

Related Components

877-690-19: .....5-15P (120V) line cord, 2.5m
877-790-19:.....120/240Vac Universal line cord,
flying leads, 3.5m
747-622-20-000:.....Blank plate

Cordex HP™1.2kW 48Vdc rectifier: See page 98
Cordex™ controller CXCM1: See page 85
GMT style fuses: See page 125

CXPS-HD 48-1.2-100
Standard 48Vdc Power System

cordex HP™ HIGH PERFORMANCE

NEW



CXPS-HD 48-1.2-100 Power System

- Integrated 48V, 100A system packages
- Ultra compact, high density (HD) design using the latest mini 1RU circuit breakers
- High efficiency design for reduced operating expenses
- High temperature rated, fan-cooled design for harsh outdoor installations
- Wide range AC input and IEC line cords for multiple AC services

P/N: 0530081

Electrical

Input:
- Voltage: ..... 176 to 312Vac (nominal)
  90 to 176Vac (de-rated O/P power)
- Current: ..... 7.5A max (176 to 300Vac) per module
  6.0A max (90 to 176Vac) per module
- Frequency: ..... 45 to 66Hz
- Efficiency: ..... >93% (50-100% load @ nominal voltage)
- Power factor: ..... >.99

Output:
- Current:
  - System: ..... 100A max @ 48Vdc (nominal I/P)
    50A max @ 48Vdc (115Vac)
  - Rectifier: ..... 25A max @ 48Vdc (nominal I/P)
    12.5A max @ 48Vdc (115Vac)
    (subject to de-rating below 110Vac)
- Power:
  - System: ..... 4,800W max @ nominal I/P
    2,400W @ 115Vac I/P
  - Rectifier: ..... 1200W max @ nominal I/P
    600W @ 115Vac
    (subject to de-rating below 110Vac)

Performance / Features

Configurations:
- 0530081-002: ..... 100A System with LVBD
- 0530081-003: ..... 100A System without LVBD

Rectifier: ..... Up to 4x 48V-1.2kW rectifier positions

Distribution: 10x load breaker positions
(mini breaker, plug-in style)
4x battery breaker positions
(mini breaker, plug-in style)
225A Low voltage disconnect option
200A Battery shunt

Controller: ..... CXCM1 Modular controller (included)

Mechanical

Dimensions:
- mm: ..... 90H x 438W x 381D
- inches: ..... 3.5H x 17.24W x 15D

Weight:
- System: 18.3kg (40.4lbs)
- Rectifier: ..... 1.23kg (2.7lbs) each

Mounting: ..... 19/23" universal mount (center or flush)

Connnections:
- Load breaker: ..... 10x sets, ¼"-20 studs on ⅝" centers
- Battery breaker: ..... 4x sets, ¼"-20 studs on ⅝" centers
- Return bar: ..... 14x sets, 10-32 studs on ⅝" centers
- Alarm: ..... Screw terminal 1.31mm2 to 0.128mm2 (#16 to #26 AWG)
- Access: Front access for operation and maintenance

Environmental

Temperature: ..... -40 to 65°C (-40 to 149°F)
-40 to 75°C (-40 to 167°F) de-rated output

Humidity: ..... 0 to 95% RH non-condensing

Elevation: ..... -500 to 2800m; to 4000m with temperature de-rated to 40°C (-1640 feet to 9186 feet; to 13124 feet with temperature de-rated to 104°F) with de-rated output

Related Components

010-619-20-041	Cordex HP 1.2kW 48Vdc Rectifier Module
018-598-20-043	Cordex CXCM1
877-690-19:	5-15P (120V) Line Cord, 2.5M
877-790-19:	Universal Line Cord, Flying leads, 3.5M
747-095-20-072	Temperature sensor assembly 12 ft, ¼" lug
747-095-20-075	Temperature sensor assembly 12 ft, ⅜" lug
747-622-20-000:	Blank Plate

See Page 125 for circuit breakers

CXPS-HD 48-1.2-225
Standard 48Vdc Power System

cordex HP™ HIGH PERFORMANCE

NEW



CXPS-HD 48-1.2-225 Power System

- Integrated 48V, 225A system packages
- Ultra compact, high density (HD) design using the latest mini 1RU circuit breakers
- High efficiency design for reduced operating expenses
- High temperature rated, fan-cooled design for harsh outdoor installations
- Wide range AC input and IEC line cords for multiple AC services

P/N: 0530081

Electrical

Input:
- Voltage: ..... 176 to 312Vac (nominal)
  90 to 176Vac (de-rated O/P power)
- Current: ..... 7.5A max (176 to 300Vac) per module
  6.0A max (90 to 176Vac) per module
- Frequency: ..... 45 to 66Hz
- Efficiency: ..... >93% (50-100% load @ nominal voltage)
- Power factor: ..... >.99

Output:
- Current:
  - System: ..... 225A max @ 48Vdc (nominal I/P)
    112.5A max @ 48Vdc (115Vac)
  - Rectifier: ..... 25A max @ 48Vdc (nominal I/P)
    12.5A max @ 48Vdc (115Vac)
    (subject to de-rating below 110Vac)
- Power:
  - System: ..... 10,800W max @ nominal I/P
    5,400W @ 115Vac I/P
  - Rectifier: ..... 1200W max @ nominal I/P
    600W @ 115Vac
    (subject to de-rating below 110Vac)

Performance / Features

Configurations:
- 0530082-002: ..... 225A System with LVBD
- 0530082-003: ..... 225A System without LVBD

Rectifier: ..... Up to 9x 48V-1.2kW rectifier positions

Distribution: 10x load breaker positions
(mini breaker, plug-in style)
4x battery breaker positions
(mini breaker, plug-in style)
225A Low voltage disconnect option
200A Battery shunt

Controller: ..... CXCM1 Modular controller (included)

Mechanical

Dimensions:
- mm: ..... 133H x 438W x 381D
- inches: ..... 5.25H x 17.24W x 15D

Weight:
- System: 21.3kg (47lbs)
- Rectifier: ..... 1.23kg (2.7lbs) each

Mounting: ..... 19/23" universal mount (center or flush)

Connnections:
- Load breaker: ..... 10x sets, ¼"-20 studs on ⅝" centers
- Battery breaker: ..... 4x sets, ¼"-20 studs on ⅝" centers
- Return bar: ..... 14x sets, 10-32 studs on ⅝" centers
- Alarm: ..... Screw terminal 1.31mm2 to 0.128mm2 (#16 to #26 AWG)
- Access: Front access for operation and maintenance

Environmental

- Temperature: ..... -40 to 65°C (-40 to 149°F)
  -40 to 75°C (-40 to 167°F) de-rated output
- Humidity: ..... 0 to 95% RH non-condensing
- Elevation: ..... -500 to 2800m; to 4000m with temperature de-rated to 40°C (-1640 feet to 9186 feet; to 13124 feet with temperature de-rated to 104°F) with de-rated output

Related Components

010-619-20-041	Cordex HP 1.2kW 48Vdc Rectifier Module
018-598-20-043	Cordex CXCM1
877-690-19:	5-15P (120V) Line Cord, 2.5M
877-790-19:	Universal Line Cord, Flying leads, 3.5M
747-095-20-072	Temperature sensor assembly 12 ft, ¼" lug
747-095-20-075	Temperature sensor assembly 12 ft, ⅜" lug
747-622-20-000:	Blank Plate

See Page 125 for circuit breakers

CXPS 48-1.2-225
Standard 48Vdc Power System

cordex HP™ HIGH PERFORMANCE

- Integrated 48V, 225A system package with front access distribution
- High efficiency design for reduced operating expenses
- High temperature rated fan-cooled design for harsh outdoor installations
- Wide range AC input and IEC line cords for multiple AC services
- Flexible ordering options including configurations with racks and battery trays



CXPS 48-1.2-225 Power System

P/N: 053-691-20

Electrical

Input:
- Voltage:
  - Operating: ..... 208/220/240Vac (Continuous Operation 90 to 300Vac)
  - Extended (High): ..... 277 to 300Vac (de-rated power factor)
  - Extended (Low): ..... 90 to 176Vac (de-rated output power)
- Current: ..... 7.5A max per module (176 to 300Vac) 6A max per module (90 to 176Vac)
- Frequency: ..... 45 to 66Hz
- Efficiency: ..... >93% (50-100% load @ nominal voltage)
- Power factor: ..... >.99

Output:
- Current:
  - System: ..... 225A max @ nominal I/P 112.5A @ 115Vac I/P
  - Rectifier: ..... 25A @ 48Vdc (nominal I/P) 12.5A @ 48Vdc (115Vac) (Subject to de-rating below 110Vac)

Power:
- System: ..... 10,800W max @ nominal I/P 5400W @ 115Vac I/P
- Rectifier: ..... 1200W max @ nominal I/P 600W @ 115Vac (Subject to de-rating below 110Vac)

Performance / Features

Configurations:
- 053-691-20-000: ..... Base system with 19/23" universal mounting
- 053-691-20-040: ..... System mounted in 23", 44RU Z4 rack with 2x battery trays for 2x 48V strings
- 053-691-20-031: ..... System mounted in 19", 44RU Z4 rack with 3x battery trays for 3x 48V strings
- Rectifier: ..... Up to 9x HP 48V-1.2kW rectifier positions
- Distribution: ..... 14x load breaker positions (mid-trip, plug-in style) 4x battery breaker positions (series-trip, plug-in style) Low voltage disconnect

Shunt:
- Controller: ..... CXCM1 Modular Controller Shunt

Mechanical

Dimensions:
- mm: ..... 222H x 438W x 376D
- inches: ..... 8.75H x 17.24W x 14.8D (-000 configuration - excludes mounting brackets, rear cover, and module handle)

Weight:
- System: 21.3kg (47lbs)
- Rectifier: ..... 1.23kg (2.7lbs) each

Mounting: ..... 19/23" universal mount (center or flush)

Connnections:
- Load breaker: ..... 14x sets, ¼"-20 studs on ⅝" centers
- Battery breaker: ..... 4x sets, ¼"-20 studs on ⅝" centers
- Return bar: ..... 18x sets, ¼" holes on ⅝" centers
- Alarm: ..... Screw terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- CXCM1 input: ..... 25-pin D-Sub cable
- Access: ..... Front access after installation

Environmental

Temperature: ..... -40 to 65°C (-40 to 149°F) -40 to 75°C (-40 to 167°F) de-rated output
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 2800m; to 4000m with temperature de-rated to 40°C (-1640 feet to 9186 feet; to 13124 feet with temperature de-rated to 104°F) with de-rated output

Related Components

877-690-19: ..... 5-15P (120V) line cord, 2.5m
877-671-19: ..... Universal Imc cord, flying leads, 3.5m
747-622-20-000: ..... Blank plate
470-347-10: ..... 100A battery breaker
747-503-20: ..... 150A battery breaker
747-504-20: ..... 250A battery breaker

Cordex HP™ 1.2kW 48Vdc rectifier: See page 98
Cordex™ controller CXCM1: See page 85
AM plug-in breakers: See page 125

CXPS 48-1.8-i
Standard 48Vdc Power System

cordex HP™ HIGH PERFORMANCE

- Integrated 48V, 167A system package with front access distribution
- High temperature rated fan-cooled design for harsh outdoor installations
- Wide range AC input for multiple worldwide AC services
- Flexible ordering options including configurations with racks and battery trays



CXPS 48-1.8-i Power System

Specifications shown for Cordex™ 48-2kW rectifier

P/N: 053-990-20

Electrical

Input:
- Voltage: ..... 187 to 312Vac (nominal)
  90 to 187Vac (de-rated O/P power)
- Current: ..... 12A @ 240Vac (per module)
  12A @ 120Vac (per module)
- Frequency: ..... 45 to 66Hz
- Efficiency: ..... >94.2 peak @ 240Vac
- Power factor: ..... >.99

Output:
- Current:
  - System: ..... 167A max @ nominal I/P
    104A max @ 120Vac I/P
  - Rectifier: ..... 41.7A @ 48Vdc (nominal I/P)
    26A @ 48Vdc (120Vac)
    (de-rated linearly to 18.75A @ 90Vac)
- Power:
  - System: ..... 8000W max @ nominal I/P
    5000W @ 120Vac I/P
  - Rectifier: ..... 2000W max @ nominal I/P
    1250W (120Vac)

Performance / Features

Configurations:
- 053-990-20-000: ..... Base system with 19/23" universal mounting
- 053-990-20-040: ..... System mounted in 23", 44RU Z4 rack with 2x battery trays for 2x 48V strings
- 053-990-20-031: ..... System mounted in 19", 44RU Z4 rack with 3x battery trays for 3x 48V strings

Rectifier: ..... Up to 4x rectifier positions

Distribution: ..... 14x load breaker positions (mid-trip, plug-in style)
4x battery breaker positions
(series-trip, plug-in style)
Low voltage disconnect
Shunt

Controller: ..... CXCI integrated controller

Mechanical

Dimensions:
- mm: ..... 222H x 438W x 305D
- inches: ..... 8.75H x 17.24W x 12D
  (-000 configuration - excludes mounting brackets, rear cover, and module handle)

Weight:
- System: 19kg (42lbs)
- Rectifier: ..... 2.3kg (5.1lbs) each

Mounting: ..... 19/23" universal mount (center or flush)

Connnections:
- Load breaker: ..... 14x sets, ¼"-20 studs on ⅝" centers
- Battery breaker: ..... 4x sets, ¼"-20 studs on ⅝" centers
- Return bar: ..... 18x sets, ¼" holes on ⅝" centers
- Rectifier input: ..... HOT: 2x sets, ⅜" holes on 1" centers
  RTN: 2x sets, ⅜" holes on 1" centers
- Alarm: ..... Screw terminal 1.31mm² to 0.128mm²
  (#16 to #26 AWG)
- CXCI input: ..... 25-pin D-Sub cable
- Access: ..... Front access after installation

Environmental

Temperature: ..... -40 to 55°C (-40 to 131°F)
-40 to 75°C (-40 to 167°F) de-rated output
~1800W @ 65°C (149°F)

Humidity: ..... 0 to 95% RH non-condensing

Elevation: ..... -500 to 2000m (-1640 to 6600ft)
-500 to 4000m (-1640 to 13100ft)
with de-rated output

Related Components

- 058-156-20: ..... 23" battery tray expansion kit
  (for use with -040 configuration)
- 058-157-20: ..... 19" battery tray expansion kit
  (for use with -031 configuration)
- 470-347-10: ..... 100A battery breaker
- 747-503-20: ..... 150A battery breaker
- 747-504-20: ..... 250A battery breaker

Cordex HP™ 2kW 48Vdc rectifier: See page 100
Cordex™ 1.8kW 48Vdc rectifier: See page 99
Cordex™ controller CXCI: See page 83
AM plug-in breakers: See page 125

CXPS 48-1.8-M2
Standard 48Vdc Power System

cordex HP™ HIGH PERFORMANCE

- Integrated 48V, 292A system package with front access distribution
- High temperature rated fan-cooled design for harsh outdoor installations
- Wide range AC input for multiple worldwide AC services
- Modular controller with touch screen display for full local system control
- Flexible ordering options including configurations with racks and battery trays



CXPS 48-1.8-M2 Power System

Specifications shown for Cordex™ 48-2kW rectifier

P/N: 053-991-20

Electrical

Input:
- Voltage: ..... 187 to 312Vac (nominal)
  90 to 187Vac (de-rated output power)
- Current: ..... 12A @ 240Vac (per module)
  12A @ 120Vac (per module)
- Frequency: ..... 45 to 66Hz
- Efficiency: ..... >94.2% peak @ 240Vac
- Power factor: ..... >.99

Output:
- Current:
  - System: ..... 292A max @ nominal I/P
    182A max @ 120Vac I/P
  - Rectifier: ..... 41.7A @ 48Vdc (nominal I/P)
    26A @ 48Vdc (115 to 135Vac)
    (de-rated linearly to 18.75A @ 90Vac)
- Power:
  - System: ..... 14000W max @ nominal I/P
    8750W @ 120Vac I/P
  - Rectifier: ..... 2000W max @ nominal I/P
    1250W (120Vac)
    (de-rated linearly to 900W @ 90Vac)

Performance / Features

Configurations:
- 053-991-20-000: ..... Base system with 19/23" universal mounting
- 053-991-20-040: ..... System mounted in 23", 44RU Z4 rack with 2x battery trays for 2x 48V strings
- 053-991-20-031: ..... System mounted in 19", 44RU Z4 rack with 3x battery trays for 3x 48V strings

Rectifier: ..... Up to 7 rectifier positions

Distribution: ..... 14x load breaker positions (mid-trip, plug-in style)
4x battery breaker positions
(series-trip, plug-in style)
Low voltage disconnect
Shunt

Controller: ..... CXCM2 modular controller

Mechanical

Dimensions:
- mm: ..... 310.8H x 438W x 305D
- inches: ..... 12.25H x 17.24W x 12D
  (-000 configuration - excludes mounting brackets, rear cover and module handle)

Weight:
- System: 28kg (62lbs)
- Rectifier: ..... 2.3kg (5.1lbs) each

Mounting: ..... 19/23" universal mount (center or flush)

Connnections:
- Load breaker: ..... 14x sets, ¼"-20 studs on ⅝" centers
- Battery breaker: ..... 4x sets, ¼"-20 studs on ⅝" centers
- Return bar: ..... 18x sets, ¼" holes on ⅝" centers
- Rectifier input: ..... HOT: 2x sets, ⅜" holes on 1" centers
  RTN: 2x sets, ⅜" holes on 1" centers
- Alarm: ..... Screw terminal 1.31mm² to 0.128mm²
  (#16 to #26 AWG)
- CXCM2 input: ..... 3x DB-style cable connections
- Access: ..... Front access after installation

Environmental

Temperature: ..... -40 to 55°C (-40 to 131°F)
-40 to 75°C (-40 to 167°F) de-rated output
~1800W @ 65°C (149°F)

Humidity: ..... 0 to 95% RH non-condensing

Elevation: ..... -500 to 2000m (-1640 to 6600ft)
-500 to 4000m (-1640 to 13100ft)
with de-rated output

Related Components

058-156-20: ..... 23" battery tray expansion kit
(for use with -040 configuration)

058-157-20: ..... 19" battery tray expansion kit
(for use with -031 configuration)

470-347-10: ..... 100A battery breaker

747-503-20: ..... 150A battery breaker

747-504-20: ..... 250A battery breaker

Cordex HP™ 2kW 48Vdc rectifier: See page 100
Cordex™ 1.8kW 48Vdc rectifier: See page 99
Cordex™ controller CXCM2: See page 86
AM plug-in breakers: See page 125

CXPS-M 1200
Modular Mid Capacity Power System

cordex HP HIGH PERFORMANCE

NEW

- -48V distributed power solution for CO's, MSC's, Data Center and Cable Headend facilities
- Each 1200A bay combines rectifiers, battery termination and distribution
- Dual voltage and options using high efficiency DC to DC converter
- High efficiency modular rectifiers reduce operating costs
- Compact front access design reduces floor space footprint
- Flexible low voltage load or battery disconnect, circuit breaker, TPS and TPL fuse options



CXPS-M 1200

Electrical

Rectifier shelf AC input: ....Single Phase, 208 to 277Vac
Dual 3 Phase, 208 to 240Vac (w/o neutral)
Dual 3 Phase, 360 to 480Vac (with neutral)
Rectifier Voltage:.....208 to 277Vac
Primary output voltage:.....+24V or -48V
Secondary output voltage:-48V or +24V
Max. output Power: .....57.6kW One bay system
Max. bus capacity: .....1,200A (primary), 600A (secondary)

Distribution and Termination

Modular distribution consists of up to 4 distribution modules.

Each module contains 2 banks of 12 plug-in bullet positions, 2 banks of 3 positions TPL fuses or 1 bank of 12 plug-in bullet positions/1 bank of 3 positions TPL fuses combination.

Fuses
GMT:.....10 positions, up to 10A (max.)
TPL: .....24 position, 61 to 800A (max.)
TLS/TPS plug-in bullet: ..96 positions (max.)

Breakers
AM plug-in bullet: .....96 positions (max.)

Output termination
GMT Fuse:.....0.34 to 2.5mm² (14 to 22AWG)
TPL fuse:.....2 hole ⅜" dia. on 1" centers
6 fuse positions; dual cable landing
18 fuse positions; single cable landing
TLS/TPS/AM breaker: ....1 pole and 2 pole are ¼" dia. on ⅝" centers
3 pole are ⅜" dia. on 1" centers

Internal Ground bar:.....¼" dia. on ⅝" centers
External Ground bar:.....⅜" dia. on 1" centers (optional)

Battery:.....6 sets ⅜" dia. on 1" centers per polarity

Mechanical

Mounting: .....Standard center mount 23" relay rack

Dimensions (one bay):
mm:.....2133H x 660W x 482D
Inches:.....84H x 26W x 19D

Weight:
System: .....227kg (500lbs) approx
Rectifier: .....8.5kg (19lbs) each

Environmental

Temperature: .....0 to 50°C (32 to 122°F)
Humidity: .....0 to 95% RH non-condensing
Elevation:.....-500 to 2800m (-1640 to 9186ft)

System Level Alarms and Controls

Alarms/control parameters are user-programmable through built-in digital supervisory unit. See Cordex datasheet #048-631-10 for detailed information on alarms and controls.

Indicators: .....LCD with touch screen
System OK (green LED)
System minor alarm (yellow LED)
System major alarm (red LED)

Load Disconnect: .....48Vdc/600A x N mounted on load side of each TPL fuse or each group of 12 Plug-in bullet positions

Alarm Connections: .....0.34 to 2.5mm² (14 to 22AWG)

Related Components

010-623-20.....Cordex HP 4kW 48Vdc rectifier
037-053-20-000 .....External ground bar kit (one per bay)
520-059-10.....Plug In Bullet TPS/TLS Fuse Holder 1-125A

See page 125 for a list of available circuit breakers

CXPS-D 48-5000

Modular High Capacity Distributed Power System

cordex HP™ HIGH PERFORMANCE

NEW

- -48V distributed power solution for CO's, MSC's, Data Center and Cable Headend facilities (DPCO)
- Each 2500A bay combines rectifiers, battery termination and distribution
- Dual bay kit links two 2500A bays doubling capacity, breakers and termination
- High circuit count distribution eliminates BDFB's and reduce installation costs
- High efficiency modular rectifiers reduce operating costs
- Compact front access design reduces floor space footprint
- Flexible low voltage load or battery disconnect, circuit breaker, TPS and TPL fuse options



Typical Single Bay 2,500A Distributed Power System

Electrical

Rectifier shelf AC input: ....Single Phase, 208 to 277Vac
Dual 3 Phase, 208 to 240Vac (w/o neutral)
Dual 3 Phase, 360 to 480Vac (with neutral)
Rectifier Voltage:.....208 to 277Vac
Max. output Power: .....120kW One bay system
240kW Two bay system
Max. bus capacity: .....2,500A One bay system
5,000A Two bay system

Distribution and Termination

Modular distribution consists of up to 4 distribution modules.

Each module contains 2 banks of 12 plug-in bullet positions, 2 banks of 3 positions TPL fuses or 1 bank of 12 plug-in bullet positions/1 bank of 3 positions TPL fuses combination.

Fuses
GMT:.....10 positions, up to 10A (max.)
TPL: .....24 position, 61 to 800A (max.)
TLS/TPS plug-in bullet: ..96 positions (max.)

Breakers
AM plug-in bullet: .....96 positions (max.)

Output termination
GMT Fuse:.....0.34 to 2.5mm² (14 to 22AWG)
TPL fuse:.....2 hole ⅜" dia. on 1" centers
6 fuse positions; dual cable landing
18 fuse positions; single cable landing
TLS/TPS/AM breaker: ....1 pole and 2 pole are ¼" dia. on ⅝" centers
3 pole are ⅜" dia. on 1" centers

Internal Ground bar:.....¼" dia. on ⅝" centers
External Ground bar:.....⅜" dia. on 1" centers (optional)

Battery:.....4 sets ½" dia. on 1 ¾" centers per polarity

Mechanical

Mounting: .....Standard center mount 23" relay rack

Dimensions (one bay):
mm:.....2133H x 660W x 482D
Inches:.....84H x 26W x 19D

Weight:
System: .....227kg (500lbs) approx
Rectifier:.....8.5kg (19lbs) each

Environmental

Temperature:.....0 to 50°C (32 to 122°F)
Humidity:.....0 to 95% RH non-condensing
Elevation:.....-500 to 2800m (-1640 to 9186ft)

System Level Alarms and Controls

Alarms/control parameters are user-programmable through built-in digital supervisory unit. See Cordex datasheet #048-631-10 for detailed information on alarms and controls.

Indicators: .....LCD with touch screen
System OK (green LED)
System minor alarm (yellow LED)
System major alarm (red LED)

Load Disconnect:.....48Vdc/600A x N mounted on load side of each TPL fuse or each group of 12 Plug-in bullet positions

Alarm Connections: .....0.34 to 2.5mm² (14 to 22AWG)

Related Components

010-623-20.....Cordex HP 4kW 48Vdc rectifier
037-053-20-000 .....External ground bar kit (one per bay)
520-059-10.....Plug In Bullet TPS/TLS Fuse Holder 1-125A

See page 125 for a list of available circuit breakers

CXDS-M 1200
Modular Distribution System

NEW

- Modular distribution solution for CO's, MSC's Data Center and Cable Headend facilities
- Single and dual feed options with a maximum rating of 1200A per feed
- Compact front access design reduces floor and rack space footprint
- Flexible input feed, circuit breaker, TPS and TPL fuse options
- Remote access, monitoring and data logging via Cordex™ controller



CXDS-M 1200

Electrical

System Voltage: .....+12V, -24V, +24V and -48V
Single Input: .....1200A maximum
Dual Input
common return: .....2x 1200A maximum
Dual input
isolated return: .....2x 600A maximum

Distribution and Termination

Modular distribution consists of up to 4 distribution modules in a 23" rack configuration and 2 modules in a 19" configuration.

Each module contains 2 banks of 12 plug-in bullet positions, 2 banks of 3 positions TPL fuses or 1 bank of 12 plug-in bullet positions/1 bank of 3 positions TPL fuses combination.

Fuses
- GMT: .....10 positions, up to 10A (max.)
- TPL: .....24 position, 61 to 800A (max.)
- TLS/TPS plug-in bullet: ..96 positions (max.)

Breakers
- AM plug-in bullet: .....96 positions (max.)

Output termination
- GMT Fuse: .....0.34 to 2.5mm² (14 to 22AWG)
- TPL fuse: .....2 hole ⅜" dia. on 1" centers
  6 fuse positions; dual cable landing
  18 fuse positions; single cable landing
- TLS/TPS/AM breaker: ....1 pole and 2 pole are ¼" dia. on ⅝" centers
  3 pole are ⅜" dia. on 1" centers

Internal Ground bar: .....¼" dia. on ⅝" centers
External Ground bar: .....⅜" dia. on 1" centers (optional)

Battery: .....4 sets ½" dia. on 1 ¾" centers per polarity

Mechanical

Mounting: .....Standard flush or center mount 19" or 23" relay rack mounting options
Dimensions (one module):
- mm: .....263H x 660W x 482D
- Inches: .....10.5H x 26W x 19D

Weight:
- Module: .....27.2kg (60lbs) approx

Environmental

Temperature: .....0 to 50°C (32 to 122°F)
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 2800m (-1640 to 9186ft)

System Level Alarms and Controls

Alarms/control parameters are user-programmable through built-in digital supervisory unit. See Cordex datasheet #048-631-10 for detailed information on alarms and controls.

Indicators: .....LCD with touch screen
System OK (green LED)
System minor alarm (yellow LED)
System major alarm (red LED)

Load Disconnect: .....48Vdc/600A x N mounted on load side of each TPL fuse or each group of 12 Plug-in bullet positions

Alarm Connections: .....0.34 to 2.5mm² (14 to 22AWG)

Related Components

037-053-20-000 .....External ground bar kit (one per bay)
520-059-10 .....Plug In Bullet TPS/TLS Fuse Holder 1-125A

See page 125 for a list of available circuit breakers

CXPS 48-1T
Standard 48Vdc System

- Integrated 48V, 417A system package with front access distribution
- High temperature rated fan-cooled design for harsh outdoor installations
- Modular controller with touch screen display for full local control over system
- Flexible ordering options including configurations with racks and battery trays
- Optional rectifier expansion kits for future growth potential



CXPS 48-1T 23"
Rail Mount Power System

Specifications shown for Cordex™ 48-4.0kW rectifier

P/N: 053-392-20 (with LVD)
P/N: 053-692-20 (no LVD)

Electrical

Input:
- Voltage: ..... 187 to 320Vac
- Current: ..... 17.5A @ 240Vac nominal (per rectifier module)
- Frequency: ..... 45 to 66Hz
- Power factor: ..... >.99

Output:
- Voltage: ..... 44 to 60Vdc
- Current: ..... System: 417A
  (expandable to 600A with additional CXRF shelf)
  Rectifier: 83.3A @ 48Vdc
- Power: ..... System: 20kW
  (expandable to 28.8kW with additional CXRF shelf)
  Rectifier: 4000W max

Performance / Features

Configurations:
- 053-692-20-000: ..... Base system with 23" mounting
- 053-692-20-020: ..... System mounted in 44RU zone 4 seismic rack
- 053-692-20-030: ..... System mounted in 44RU Z4 rack with 3x battery trays for 3x 48V strings

Rectifier: ..... Up to 5x rectifier positions
Distribution: ..... 24x AM plug-in breaker positions (no LVD)
18x AM plug-in breaker positions (with LVD)
10x GMT type fuse positions
Shunt
Low voltage disconnect
Controller: ..... CXCM4 modular controller

Mechanical

Dimensions:
- mm: ..... 488H x 584W x 477D
- inches: ..... 19.25H x 23W x 18.8D
  (-000 configuration - excludes mounting brackets)

Weight: 49.8kg (110lbs)
Mounting: ..... 23" center mount

Connnections:
- Load breaker: ..... Hot: ¼"-20 studs on ⅝" centers
  Return: ¼" holes on ⅝" centers
- GMT fuses: ..... Screw Terminal 1.31mm² to 0.128mm²
  (#16 to #26 AWG)
- Battery terminations: ..... ⅜" holes on 1" centers
  4x sets per polarity
- Rectifier Input: ..... ⅜" holes on 1" centers
- Alarm connections: ..... Screw terminal 1.31mm² to 0.128mm²
  (#16 to #26 AWG)
- Access: ..... Cable: top or bottom
  User: front access after installation

Environmental

Temperature: ..... -40 to 65°C (-40 to 149°F)
-40 to 75°C (-40 to 167°F) de-rated output
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 2800m (-1640 to 9186ft)
-500 to 4000m (-1640 to 13124ft) with de-rated output

Related Components

058-716-20: ..... Expansion kit, rectifier shelf
(shipped loose only)

Cordex HP™ 4kW 48Vdc rectifier: See page 102
Cordex™ 3.6kW 48Vdc rectifier: See page 101
Cordex™ controller CXCM4: See page 87
AM plug-in breakers: See page 125
GMT style fuses: See page 125

CXPS 48-2T
Standard 48Vdc System



CXPS 48-2T 23"
Rail Mount Power System

- Integrated 48V, 916A system package with front access distribution
- High temperature rated fan-cooled design for harsh outdoor installations
- Modular controller with touch screen display for full local control over system
- Flexible ordering options including configurations with racks and battery trays
- Optional rectifier expansion kits for future growth potential

Specifications shown for Cordex™ 48-4.0kW rectifier

P/N: 053-393-20 (with LVD)
P/N: 053-693-20 (no LVD)

Electrical

Input:
- Voltage: ..... 187 to 320Vac
- Current: ..... 17.5A @ 240Vac nominal (per rectifier module)
- Frequency: ..... 45 to 66Hz
- Power factor: ..... >.99

Output:
- Voltage: ..... 44 to 60Vdc
- Current: ..... System: 916A
  (expandable to 1200A with additional CXRF shelf)
  Rectifier: 83.3A @ 48Vdc
- Power: ..... System: 44kW
  (expandable to 57.6kW with additional CXRF shelf)
  Rectifier: 4000W max

Performance / Features

Configurations:
- 053-693-20-000 ..... Base system with 23" mounting
- 053-693-20-020 ..... System mounted in 44RU zone 4 seismic rack
- 053-693-20-030 ..... System mounted in 44RU Z4 rack with 3x battery trays for 3x 48V strings

Rectifier: ..... Up to 11x rectifier positions
Distribution: ..... 48x AM plug-in breaker positions (no LVD)
38x AM plug-in breaker positions (w/LVD)
10x GMT type fuse positions
Shunt
Low voltage disconnect
Controller: ..... CXCM4 modular controller

Mechanical

Dimensions:
- mm: ..... 755H x 584W x 477D
- inches: ..... 29.7H x 23W x 18.8D
  (-000 configuration - excludes mounting brackets)

Weight: 70.3kg (155lbs)
Mounting: ..... 23" center mount

Connnections:
- Load breaker: ..... Hot: ¼"-20 studs on ⅝" centers
  Return: ¼" holes on ⅝" centers
- GMT fuses: ..... Screw terminal 1.31mm² to 0.128mm²
  (#16 to #26 AWG)
- Battery terminations: ..... ⅜" holes on 1" centers
  4x sets per polarity
- Rectifier input: ..... ⅜" holes on 1" centers
- Alarm connections: ..... Screw terminal 1.31mm² to 0.128mm²
  (#16 to #26 AWG)
- Access: ..... Cable: Top or bottom
  User: front access after installation

Environmental

Temperature: ..... -40 to 65°C (-40 to 149°F)
-40 to 75°C (-40 to 167°F) de-rated output
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 2800m (-1640 to 9186ft)
-500 to 4000m (-1640 to 13124ft)
with de-rated output

Related Components

058-716-20: ..... Expansion kit, rectifier shelf
(shipped loose only)

Cordex HP™ 4kW 48Vdc rectifier: See page 102
Cordex™ 3.6kW 48Vdc rectifier: See page 101
Cordex™ controller CXCM4: See page 87
AM plug-in breakers: See page 125
GMT style fuses: See page 125

CXPS 24-2T
Standard 24Vdc System



CXPS 24-2T
23" Rail Mount Power System

- Integrated 24V, 1200A system package with front access distribution
- High temperature rated fan-cooled design for harsh outdoor installations
- Modular controller with touch screen display for full local control over system
- Flexible ordering options including configurations with racks and battery trays
- Optional converter expansion kits for dual voltage system configurations

P/N: 053-390-20

Electrical

Input:
- Voltage: ..... 176 to 312Vac
- Current: ..... 14.6A @ 240Vac nominal (per rectifier module)
- Frequency: ..... 45 to 66Hz
- Power factor: ..... >.99

Output:
- Voltage: ..... 21 to 29Vdc
- Current: ..... System: 1200A max (distribution limited)
  Rectifier: 115A @ 27Vdc
- Power: ..... System: 28.8kW max
  Rectifier: 3100W max

Performance / Features

Configurations:
- 053-390-20-000 ..... Base system with 23" mounting
- 053-390-20-010 ..... System mounted in 22RU (½ height) battery mount rack
- 053-390-20-020 ..... System mounted in 44RU Zone 4 seismic rack
- 053-390-20-030 ..... System mounted in 44RU Z4 rack with 3x battery trays for 6x 24V strings

Rectifier: ..... Up to 11x 24V-3.1kW rectifier positions
Distribution: ..... 38x AM plug-in breaker positions
10x GMT type fuse positions
Shunt
Low voltage disconnect
Controller: ..... CXCM4 modular controller

Mechanical

Dimensions:
- mm: ..... 755H x 584W x 477D
- inches: ..... 29.7H x 23W x 18.8D
  (-000 configuration - excludes mounting brackets)

Weight: 70.3kg (155lbs)
Mounting: ..... 23" center mount

Connnections:
- Load breaker: ..... Hot: ¼"-20 studs on ⅝" centers
  Return: ¼" holes on ⅝" centers
- GMT fuses: ..... Screw Terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- Battery terminations: ..... ⅜" holes on 1" centers
  4x sets per polarity
- Rectifier input: ..... ⅜" holes on 1" centers
- Alarm connections: ..... Screw terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- Access: ..... Cable: top or bottom
  User: front access after installation

Environmental

Temperature: ..... -40 to 65°C (-40 to 149°F)
-40 to 75°C (-40 to 167°F) de-rated output
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 2800m (-1640 to 9186ft)
-500 to 4000m (-1640 to 13124ft) with de-rated output

Related Components

038-257-20: ..... Cordex™ converter CXDF 24-48/2kW upgrade kit: See page 59

Cordex™ 3.1kW 24Vdc rectifier: See page 105
Cordex™ controller CXCM4: See page 87
AM plug-in breakers: See page 125
GMT style fuses: See page 125

CXPS 24-4T
Standard 24Vdc System



CXPS 24-4T
Power System

- Integrated 24V, 1430A rack system with front access distribution
- Modular controller with touch screen display for full local control over system
- Expandable distribution center for future load growth
- Optional converter expansion kits for dual voltage system configurations
- Optional rectifier expansion kits for future growth potential

P/N: 053-391-20

Electrical

Input:
- Voltage: ..... 176 to 312Vac
- Current: ..... 14.6A @ 240Vac nominal (per rectifier module)
- Frequency: ..... 45 to 66Hz
- Power factor: ..... >.99

Output:
- Voltage: ..... 21 to 29Vdc
- Current: ..... System: 1430A (expandable to 2000A with additional CXRF shelf)
  Rectifier: 115A @ 27Vdc
- Power: ..... System: 34.1kW (expandable to 48.0kW)
  Rectifier: 3100W max

Performance / Features

Configurations:
- 053-391-20-020: ..... System mounted in 44RU zone 4 seismic rack

Rectifier: ..... Up to 11x 24V-3.1kW rectifier positions

Distribution: ..... 58x AM plug-in breaker positions (expandable to 78x positions)
10x GMT type fuse positions
Shunt
Low voltage disconnect

Controller: ..... CXCM4 modular controller

Mechanical

Dimensions:
- mm: ..... 2134H x 648W x 533D
- inches: ..... 84H x 25.5W x 21D (includes rack)

Weight: 172kg (379lbs)

Mounting: ..... 23" center mount

Connnections:
- Load breaker: ..... Hot: ¼"-20 studs on ⅝" centers
  Return: ¼" holes on ⅝" centers
- GMT fuses: ..... Screw terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- Battery terminations: ..... ⅜" holes on 1" centers
  5x Sets per polarity
- Rectifier input: ..... ⅜" holes on 1" centers
- Alarm connections: ..... Screw terminal 1.31mm² to 0.128mm² (#16 to #26 AWG)
- Access: ..... Cable: top or bottom
  User: front access after installation

Environmental

Temperature: ..... -40 to 65°C (-40 to 149°F)
-40 to 75°C (-40 to 167°F) de-rated output

Humidity: ..... 0 to 95% RH non-condensing

Elevation: ..... -500 to 2800m (-1640 to 9186ft)
-500 to 4000m (-1640 to 13124ft) with de-rated output

Related Components

058-736-20: ..... Cordex™ rectifier CXRF 24-3.1kW expansion shelf kit

038-257-20: ..... Cordex™ converter CXDF 24-48/2kW upgrade kit: See page 59

Cordex™ 3.1kW 24Vdc rectifier: See page 105
Cordex™ controller CXCM4: See page 87
AM plug-in breakers: See page 125
GMT style fuses: See page 125

Cordex™ 432kW
Large Power System

- Scalable large 48Vdc power system up to 10,000A capacity
- Various distribution configuration options available
- Internal bussing between rectifiers and distribution (no overhead bus requirements)
- Rack mount controller with touch screen display for full local control over system
- Expansion rectifier and distribution bays for future growth potential



Typical 48-108kW System

P/N: 025-999-20

Electrical

AC input:.....Single phase, 208 to 277Vac
Dual 3 phase, 208 to 240Vac (without neutral)
Dual 3 phase, 360 to 480Vac (with neutral)
Rectifier voltage:.....208 to 277Vac
Max. bus capacity:.....10,000A system
2,000A per bay

Performance / Features

System level alarms/controls: Alarms/control parameters are user-programmable through built-in digital supervisory unit.

Indicators:.....LCD with touch screen
System OK (green LED)
System minor alarm (yellow LED)
System major alarm (red LED)

Alarm connections: .....0.34 to 2.5mm² (14 to 22AWG)

Load disconnect:.....48Vdc/1200A x N mounted on load side (optional)

Mechanical

Enclosure:.....1.095mm (14 gauge) steel
Mounting:.....Standard 23" relay rack (flush rack mount) in box bay
Dimensions:
cm:.....213H x 71W x 71D
inches:.....84H x 28W x 28D
Weight:.....Approx. 272kg (600lbs) per bay (no rectifiers)

Environmental

Temperature:.....0 to 50°C (32 to 122°F)
Humidity:.....0 to 95% RH non-condensing
Elevation:.....-500 to 2800m (-1640 to 9186ft)

Distribution

Fuses:
TPL:.....2 position, 61 to 800A breakers
GJ/GJ1P:.....1 pole up to 225A, 2 pole 250 to 400A, 3 pole 450 to 700A
Output termination:
TPL fuse:.....2 hole ½" dia. on 1¾" centers or 2 hole ⅜" dia. on 1" centers
GJ breaker:.....1 pole and 2 pole are ⅜" to 16, 3 pole are 2 hole, ½" dia. on 1¾" centers or ⅜" dia. on 1" centers
Ground bar:.....Overhead buss ground, 15 sets of 2 hole ½" dia. on 1¾" centers (basic system)

Related Components

Cordex HP™ 4kW 48Vdc rectifier: See page 102
Cordex™ 3.6kW 48Vdc rectifier: See page 101
Cordex™ controller CXCR: See page 88
GJ breakers: See page 125
TPL fuses: See page 125

Cordex™ 3.3kW System

125/220V High Voltage Integrated Systems

- 125/220Vdc 3.3kW capacity solution for industrial and utility applications
- Convection cooled design for high reliability in industrial environments
- Wide range AC input for multiple worldwide AC services
- Integrated system solution with CXC controller and distribution



Cordex™ 125-3.3kW System

125V P/N: 030-788-20
220V P/N: 030-789-20

Electrical

Input voltage:
- Nominal: ..... 208 to 277Vac
- Operating: ..... 176 to 320Vac
- Extended: ..... 176 to 150Vac (de-rated to 75%)

Phase: ..... 1 or 3
Frequency: ..... 45 to 66Hz
Power factor: ..... >0.99
Efficiency: ..... >93% (50 to 100% load)
Output voltage: ..... 90 to 160Vdc
Current: ..... 8.8A per module @ 125Vdc,
5A per module @ 220Vdc,
up to 3 modules per shelf
Load regulation: ..... Static <+0.5%
Line regulation: ..... Static <+0.1%
Transient response: ..... <+2% for 10 to 100% load step.
10ms recovery time.
Wide band noise: ..... <10mVrms
<80mVp-p
Insulation: ..... 2.5kVac input-earth
3kVac input-output
2kVac output-earth
0.5kVac signals-earth

Performance / Features

User interface:
- GUI: ..... Use Internet Explorer browser to access GUI through ethernet or RS-232 port
- Display: ..... Full graphic LCD, 160 x 160 pixels, with backlight and contrast adjustment
- Controls: ..... LCD touch screen with virtual alpha numeric and numeric keyboards
- Indicators: ..... System OK—green LED
Minor alarm—yellow LED
Major alarm—red LED
- Audio: ..... Built in speaker for alarms and messages
- Language: ..... Multi language support including Chinese

Communication ports:
- RS-232 (DB-9): ..... Craft port on front panel for local PC connection
- CAN OUT (RJ-12 offset): CAN communication BUSS to optional smart peripheral modules
- RS-485 (RJ-12 offset): .... For future service options
- Ethernet (RJ-45): ..... 10/100 Base T with half/full duplex

Alarms:
- Output: ..... 6 potential free form C contacts
- Input: ..... 4 digital inputs
- GFD: ..... Ground fault detect
- SNMP: ..... SNMP agent provides real time system status to the network management software

Data logging:
- Daily statistics: ..... Minimum, maximum and average on input channels, with date and time stamp
Battery current, rectifier current, and AC mains voltage for last 90 days
- Event log: ..... On all events such as alarms, power on, any change of state of the digital inputs, or other miscellaneous events
- Battery log: ..... Battery health history on last 20 discharges, time of discharge, and battery capacity
- Control functions: ..... Automatic, scheduled (periodic) or manual equalize
Automatically terminated equalize charge
Battery current terminate equalize
Dynamic charge current control
Battery capacity and runtime prediction
Auto or manual battery test

DC Output Panel: ..... 2 x 2 Pole, 32A breakers (10KAIC) with alarm monitoring

AC Input (not a service entrance):
- Single phase: ..... 1 x 2-pole 10KAIC (30KAIC option)
- Three phase: ..... 1 x 3-pole delta connection 10KAIC
1 x 3-pole wye connection 10KAIC

Mechanical

Charger enclosure: ..... Wall or rack mount
Dimensions:
- inches: ..... 12.2H x 17.1W x 11.9D
- mm: ..... 309H x 434W x 302D

Weight: ..... 12.59kg (27.76lbs)*
Enclosure: ..... NEMA 1 (charcoal finish)

Environmental

Temperature range:
- Operating: ..... -40 to 50˚C (-40 to 122˚F)
- Extended: ..... Rectifier de-rated to 600W @ 65˚C (149˚F)

Humidity: ..... 0 to 95% RH non-condensing
Cooling: ..... Natural convection
Heat dissipation: ..... <900 BTU per hour/system

Agency Compliance

Safety: ..... CSA C22.2 No. 60950-00 3rd edition
CE
EMC: ..... ICES-003 Class A
FCC Part 15, Class A, FCC Part 68
EN 55022 Class AA (CISPR 22)
EN 61000-4-2 ESD
EN 61000-4-3 Radiated Immunity
EN 61000-4-4 EFRT/Burst
EN 61000-4-6 Conducted Immunity

*Rectifier module not included system weight

CXPS 24→48-i
24 to 48V DC-DC Converter System



CXPS 24→48-i Power System

- Integrated 8kW capacity 24-48Vdc converter system with front access distribution
- Support for small to medium 48Vdc loads from legacy 24V power system
- Integrated Cordex CXCi for advanced local and remote monitoring and control
- Internal low voltage shutdown for cost effective integration into existing systems
- Universal 19/23" mounting for flexible installation options into existing racks

P/N: 053-997-20

Electrical

Input:
- Voltage: ..... +21 to +30Vdc
- Current:
  - System: ..... Feed A: <188A @ +24V input (216A max)
    Feed B: <188A @ +24V input (216A max)
  - Converter: ..... <94A @ +24V input (108A max)
- Efficiency: ..... >88% (50-100% load @ nominal voltage)

Output:
- Current:
  - System: ..... 148A max @ 54Vdc
  - Converter module: ..... 37A max @ 54Vdc
- Power:
  - System: ..... 8000W max @ 54Vdc output
  - Converter module: ..... 2000W max @ 54Vdc output

Performance / Features

Configurations:
- 053-997-20-000: ..... Base system with 19/23" universal mounting

Converter: ..... Up to 4x CXDF 24-48/2kW converter positions
Distribution: ..... 18x load breaker positions (mid-trip, plug-in style)
Shunt:
- Controller: ..... CXCi integrated Controller

Mechanical

Dimensions:
- mm: ..... 222H x 438W x 310D
- inches: ..... 8.75H x 17.24W x 12.2D
  (-000 configuration - excludes mounting brackets, rear cover, and module handle)

Weight:
- System: 19kg (42lbs)
- Rectifier: ..... 2.8kg (6.2lbs) each
- Mounting: ..... 19/23" universal mount (center or flush)

Connnections:
- Load breaker: ..... 18x sets, ¼"-20 studs on ⅝" centers
- Return bar: ..... 18x sets, ¼" holes on ⅝" centers
- Alarm: ..... Screw terminal 1.31mm² to 0.128mm²
  (#16 to #26 AWG)
- CXCi input: ..... 25-pin D-Sub cable
- Access ..... Front access after installation

Environmental

Temperature: ..... -40 to 65°C (-40 to 149°F)
-40 to 75°C (-40 to 167°F) de-rated output
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 2800m (-1640 to 9186ft)

Related Components

Cordex CXDF 24-48/2kW: See page 111
Cordex controller CXCI: See page 83
AM plug-in breakers (load): See page 125

CXPS 48→24-i

48 to 24V DC-DC Converter System

NEW



CXPS 48→24-i Power System

- Integrated 8kW capacity 48-24Vdc converter system with front access distribution
- Support for small to medium 24Vdc loads from legacy 48V power system
- Integrated Cordex CXCi for advanced local and remote monitoring and control
- Internal low voltage shutdown for cost effective integration into existing systems
- Universal 19/23" mounting for flexible installation options into existing racks

P/N: 0530039-001

Electrical

Input:
- Voltage: ..... -42 to -60Vdc
- Current:
  - System: ..... Feed A: <96A @ +24V input (110A max)
    Feed B: <96A @ +24V input (110A max)
  - Converter: ..... <48A @ +24V input (105A max)
- Efficiency: ..... >88% (50-100% load @ nominal voltage)

Output:
- Current:
  - System: ..... 296A max @ 54Vdc
  - Converter module: ..... 74A max @ 54Vdc
- Power:
  - System: ..... 8000W max @ 54Vdc output
  - Converter module: ..... 2000W max @ 54Vdc output

Performance / Features

Configurations:
- 0530039-001: ..... Base system with 19/23" universal mounting

Converter: ..... Up to 4x CXDF 24-48/2kW converter positions
Distribution: ..... 18x load breaker positions (mid-trip, plug-in style)
Shunt:
- Controller: ..... CXCi integrated Controller

Mechanical

Dimensions:
- mm: ..... 222H x 438W x 310D
- inches: ..... 8.75H x 17.24W x 12.2D
  (-000 configuration - excludes mounting brackets, rear cover, and module handle)

Weight:
- System: 19kg (42lbs)
- Rectifier: ..... 2.8kg (6.2lbs) each
- Mounting: ..... 19/23" universal mount (center or flush)

Connnections:
- Load breaker: ..... 18x sets, ¼"-20 studs on ⅝" centers
- Return bar: ..... 18x sets, ¼" holes on ⅝" centers
- Alarm: ..... Screw terminal 1.31mm² to 0.128mm²
  (#16 to #26 AWG)
- CXCi input: ..... 25-pin D-Sub cable
- Access ..... Front access after installation

Environmental

Temperature: ..... -40 to 65°C (-40 to 149°F)
-40 to 75°C (-40 to 167°F) de-rated output
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 2800m (-1640 to 9186ft)

Related Components

Cordex CXDF 48-24/2kW: See page 112
Cordex controller CXCI: See page 83
AM plug-in breakers (load): See page 125



Line Powering Solutions

Alpha's CSM36, CSM46 and CSM 56 series converters are reliable, field proven options for remote network powering. Using an elevated DC voltage to transmit power long distances over twisted pair copper infrastructure, these converters are a great solution for remote site powering where AC utility is not available, or battery maintenance is cost prohibitive. Alpha's line power converters feature built-in current limiting and ground-fault protection to ensure the highest level of safety for technicians. Alpha's line power converters have been used to power remote DSLAMs, mini-DSLAMs and Fiber to the Home ONTs (Optical Network Terminals), enabling carriers to capitalize on the low cost and maintenance of a centralized battery plant.

CSM36
-48Vdc to +/-190Vdc Converter



CSM35 19"
Converter Shelf

- 48V to +/-190V DC-DC Up Converter for remote/line powering applications (RFT-V)
- Utilize existing copper pair network for distributing power
- Reduce truck rolls and operating expenses with no batteries at remote site
- Very high reliability convection-cooled design with optional fan tray

P/N: 012-552-20

Electrical

Input voltage: .....-40 to -60Vdc
Output voltage:.....±190Vdc
Power: .....90W minimum per output
Efficiency:.....>88% (50 to 100% load)
90% typical
Regulation:.....<-0.5% no load to full load
<±0.05% line
Noise:
Wide band: .....<300mVp-p to 100MHz
<100mVRMS to 10MHz
Acoustic:.....<60dBa @ 1m (3ft)

Performance / Features

Indicators: .....Power on
DC input OK
Converter fail alarm major
Converter fail alarm minor
Current limit
Protection:.....Power limiting
Input/output fuses
Input inrush current limiting
Output transient and OSP
Input high and low voltage shutdown
Current limit/short circuit fold back
Thermal shutdown
Input transient
5mA ground fault interrupt option

Mechanical

Power module
Dimensions:
mm:.....114H x 31.75W x 254D
inches: .....4.5H x 1.25W x 10D

Environmental

Temperature:
Optional:.....-40 to 65°C (-40 to 149°F)*
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 2800m (-1640 to 9186ft)
*Fan module required for high temp operation above 50°C (122°F)

Shelves

19" shelf (12 modules) P/N: 030-702-20

Shelf cooling (48Vdc fan tray) P/N: Shelf list option 99

Top air baffle P/N: Shelf list option 96

Analog supervisory module P/N: 018-562-20

Assembly, cable, OP, DC power 5FT, CSM36 P/N: 8700288-001

19" shelf (12 modules)
Dimensions:
mm:.....132H x 432W x 314D
inches:.....5.2H x 17W x 12.36D
Weight: .....11.4kg (25lbs) fully equipped

Analog supervisory module
Alarm relays: .....Form C major
Form C minor
LED:.....System ok (green)
Minor alarm (yellow)
Major alarm (red)

Agency Compliance

CSA: .....C22.2 60950-1 (NRTL/C)
C22.2 60950-21
UL: .....60950-1 (NTRL)
60950-21 (RFT-V circuit)
FCC: .....47 CFR part 15
Class B radiated EMI
Class A conducted EMI
EN: .....55022 (CISPR 22)
Class B radiated EMI
Class A conducted EMI
61000-4-2, -3, -4, -6
60950 (CE)
Bellcore: GR-63-CORE
GR-1089-CORE
GR-1089 Class A2 (with GFI) or A3
NEBS:.....*Consult factory on system application*

CSM46
+/-190Vdc to -48Vdc Converter



CSM46 10-Module Shelf

- +/-190V to 48V DC-DC Down Converter for remote/line powering applications (RFT-V)
- Utilize existing copper pair network for distributing power
- Reduce truck rolls and operating expenses with no batteries at remote site
- High reliability convection-cooled design and compact 1RU footprint

P/N: 012-554-20

Electrical

Input voltage: ..... 195 to 380Vdc (+/- 97.5 to +/- 190Vdc)
Input current: ..... 240mA +/- 2%
Efficiency: ..... >85%
Output power: ..... Up to 75W
(de-rates linearly with input voltage)
Output voltage: ..... -50 to -55Vdc
Output current: ..... 1.5A max
(de-rates linearly with input voltage)
Noise: ..... <500mv p-p to 20MHz
<250mVrms to 20MHz

Performance / Features

Indicators:
- Converter A: ..... I/P OK (green LED)
- Converter A: ..... O/P OK (green LED)
- Converter B: ..... I/P OK (green LED)
- Converter B: ..... O/P OK (green LED)

Test points:
- Converter A: ..... I/P voltage
- Converter B: ..... I/P voltage

Protection: ..... Input fuses
Input current limit
Input transient portection
Input high and low voltage shutdown
Thermal shutdown
Output parallel diodes
Output OVP
Reverse polarity protection
Miscellaneous: ..... Alarm masking switch for disabling shelf level alarming

Mechanical

Dimensions:
- mm: ..... 42H x 23W x 280D
- in: ..... 1.65H x .9W x 11D

Weight: 0.67kg (1.5lbs)

Environmental

Temperature: ..... -40 to 75°C (-40 to 167°F) with external airflow
Humidity: ..... 0 to 95% NC

Shelves

10-Module shelf P/N: 030-831-20

Mechanical

Dimensions:
- mm: ..... 45H x 273W x 311D
- in: ..... 1.75H x 10.75W x 12.25D
(excludes connectors and mounting brackets)

Weight: 4.87kg (10.8lbs)

Performance / Features

Access: ..... Front access
Connections:
- Input: ..... 50-pin amp-champ style connector and wireharness
- Output: ..... Anderson SBS50 and molex style options and wireharness
- Alarm: ..... Flying leads or molex style connector and wireharness
- Chassis gnd: ..... ¼" studs on ⅝" C

Alarms: ..... Major form C relay
Minor form C relay
Note: Relays are field replaceable

Agency Compliance

Safety: ..... CSA/UL 60950-1
CSA/UL 60950-21 (RFT-V circuit)
CE IEC/EN 60950
EMI: ..... Class A radiated
GR-1089 issue 3 (applicable sections)

CSM56
+/-190Vdc to -48Vdc Compact Converter

NEW



CSM56 Backup Module

- +/-190V to 48V DC-DC Down Converter for remote/line powering applications (RFT-V)
- Utilize existing copper pair networks for distributing power
- Reduce truck rolls and operating expenses with no batteries at remote site
- Provide at least four (4) seconds of backup power to ensure load equipment can ride through brief converter resets

P/N: 013-034-20

Electrical

Input voltage:	200 to 390Vdc (+/- 100 to +/- 195Vdc)
Input current:	0.25A (dc) maximum per input
Efficiency:	>85% @ 10% load
Output power:	250W nominal 375W maximum (derates linearly with input voltage)
Output voltage:	-50 to -55Vdc with inputs operational
Output current:	7.5A @ 50V (derates linearly with input voltage) 7.8A @ 45V
Noise:	<100mVRMS to 20MHz (wide band) <500mVp-p to 20MHz
Acoustic Noise:	< 45 dBa at 1m (3 ft)
Backed up output voltage:	-46Vdc ±3%
Duration backup:	350W for > 3.2 seconds @ -40°C (-40°F) 350W for > 6.4 seconds @ 25°C (77°F) 30 seconds maximum duration at low load

Performance / Features

Converter Status LED:	Green – Outputs OK and inputs OK Yellow – Outputs OK and one or more inputs NOT OK Red or Off – Output NOT OK
Test Points:	Converter output voltage
Status LED	Green – charged Green, flashing – charging Red – failed

Mechanical

Dimensions:	
mm:	86H x 223x 239D, w/ fastener 86H x 223x 264D, w/ handle
in:	3.4H x 8.8W x 9.4D, w/ fastener 3.4H x 8.8W x 10.4D, w/ handle
Weight:	2.84kg (6.26lbs)
Mounting:	Slides and fastens into Lucent Stinger® DSLAM cabinet

Environmental

Temperature:	
Natural convection:	-40 to 40°C (-40 to 104°F)
with 200 LFM airflow	-40 to 60°C (-40 to 140°F)
Humidity:	0 to 95% RH non-condensing

Agency Compliance

Safety	CSA/EN/IEC/UL 60950-1 CSA/UL/IEC 60950-21 (RFT-V)
EMC	ICES-003
FCC	47 CFR Part 15 Class B
NEBS	Telcordia GR-1089-CORE
Telcordia:	GR-57-CORE GR-909-CORE SR-332 TA-NWT-001500 GR-950-CORE

AlphaCap 350 and 665
Short Duration Backup Supply Module

NEW



AlphaCap 350

- Provide 3 to 10 seconds of backup power (holdup) of 48Vdc to remote loads such as xDSL and FTTx equipment to ensure maximum reliability
- Supply 350W and 750W, respectively, of continuous power ouput
- Ensure load equipment can ride through brief converter resets
- Reduce truck rolls and operating expenses with no batteries at remote site

AlphaCap 350 P/N: 013-012-20

Electrical

Input voltage: .....-48 to -56 Vdc
Input current (charge): .....100 mA ±10% max
Backed up output voltage: -46Vdc ±3%
Power: .....350W maximum
Duration backup:.....can be ordered with three (3) different levels
2.5, 4, or 10 seconds

Mechanical

Dimensions:
mm:.....44H x 152Wx 305D
inches:.....1.7H x 6W x 12D
Mounting: .....L-shaped brackets for wall mounting

Environmental

Temperature:
Operating .....-40 to 55°C (-40 to 131°F)
Storage:.....-40 to 85˚C (-40 to 185˚F)

Humidity: .....0 to 95% RH non-condensing

Agency Compliance

Safety .....UL 60950-1
CSA C22.2 No. 60950
FCC .....47 CFR Part 15 Class A
Telcordia:.....GR-1089-CORE (where applicable)

AlphaCap 665 P/N: 013-015-20

Electrical

Input voltage: .....-48 to -56 Vdc
Input current (charge): .....160 mA ±10% max
Backed up output voltage: -46Vdc ±3%
Power: .....665W nominal, 750W maximum
Duration backup:.....4.5 seconds, 665 W @ 5 to 55°C
3 seconds minimum, 665 W @ -40 to 65°C
30 seconds maximum duration at low load
3.8 seconds, 750 W load

Mechanical

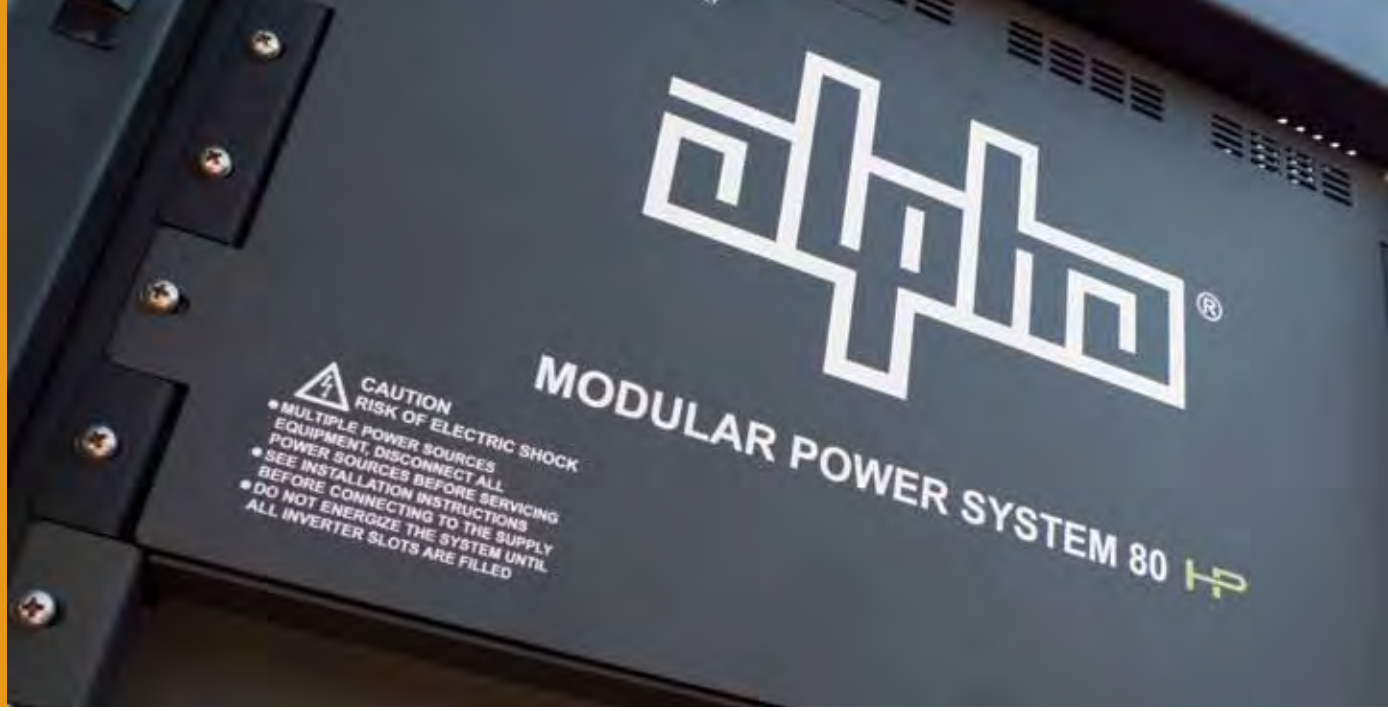
Dimensions:
mm:.....43H x 183Wx 350D
inches:.....1.7H x 7.2W x 13.8D
Mounting: .....L-shaped brackets for wall mounting

Environmental

Temperature:
Nominal: .....5 to 55°C (41 to 131°F)
Extended:.....-40 to 65°C (-40 to 149°F)
Storage:.....-40 to 85˚C (-40 to 185˚F)
Humidity: .....0 to 95% RH non-condensing

Agency Compliance

Safety .....UL 60950-1
CSA C22.2 No. 60950
FCC .....47 CFR Part 15 Class A
Telcordia:.....GR-1089-CORE (where applicable)



AC Power Solutions

Alpha offers the latest technology in modular power systems to support small to mid-sized critical AC loads in a variety of standard and custom configurations.

Alpha's Modular Power System 80HP (AMPS80 HP) and 24 HP (AMPS24 HP) offer Telecom-grade AC power for critical loads in central offices, switching stations, cable headends and data centers. These systems offer 99.999% system availability, up to 94% power efficiency and optimal power density through a scalable, modular platform with integrated, intelligent system control.

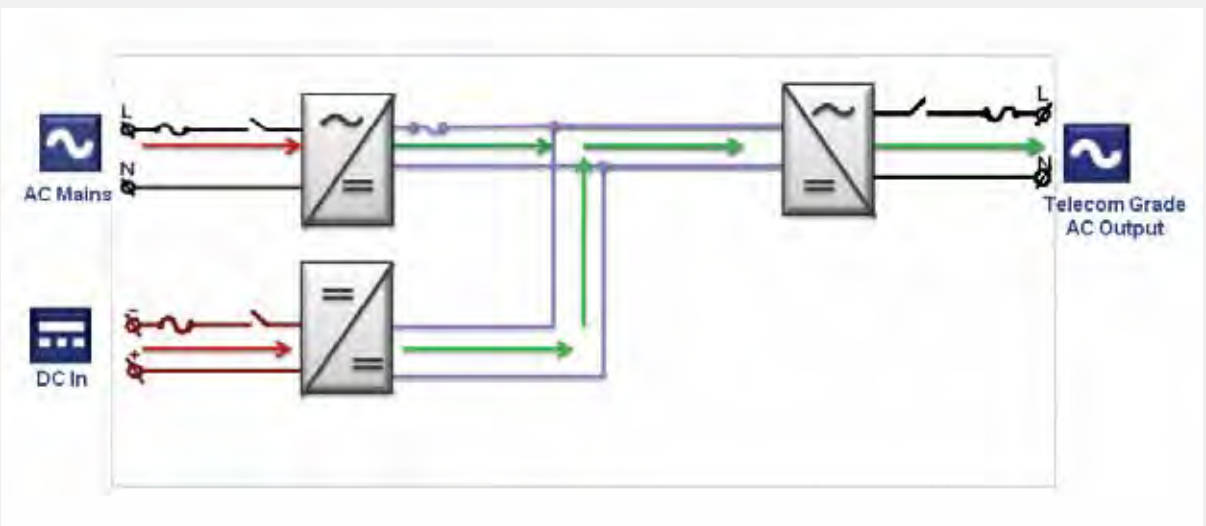
AMPS80 HP and AMPS24 HP are offered in 3-phase, 2-phase and single-phase UPS or Inverter configurations and may be configured to provide N+1 redundancy per phase. A smart unified controller with integrated SNMP interface monitors and manages both inverter and rectifier modules through a web based GUI and local LCD touch screen.

For less demanding applications, the INEX inverter is a fully integrated single phase system specifically designed to backup critical AC loads. With proven Alpha reliability and flexibility, the system may be configured to provide N+1 redundancy. An optional static transfer switch allows automatic transfer of power in less than a quarter of a cycle. A user friendly interface displays real time information, making the system easy to configure and manage.

AMPS Topology

AMPS HP is a revolutionary high performance technology that combines the high reliability of a telecom-grade inverter system with a highly efficient UPS.

Each AMPS module includes a reliable 48Vdc-to-120Vac inverter as well as an AC-to-DC rectifier. When AC Mains is available, AC power is converted to a high-voltage DC bus, which is then converted back to AC. In this high-performance 'HP' mode, AMPS delivers fully conditioned, line-regulated telecom-grade AC power with 94% system efficiency.

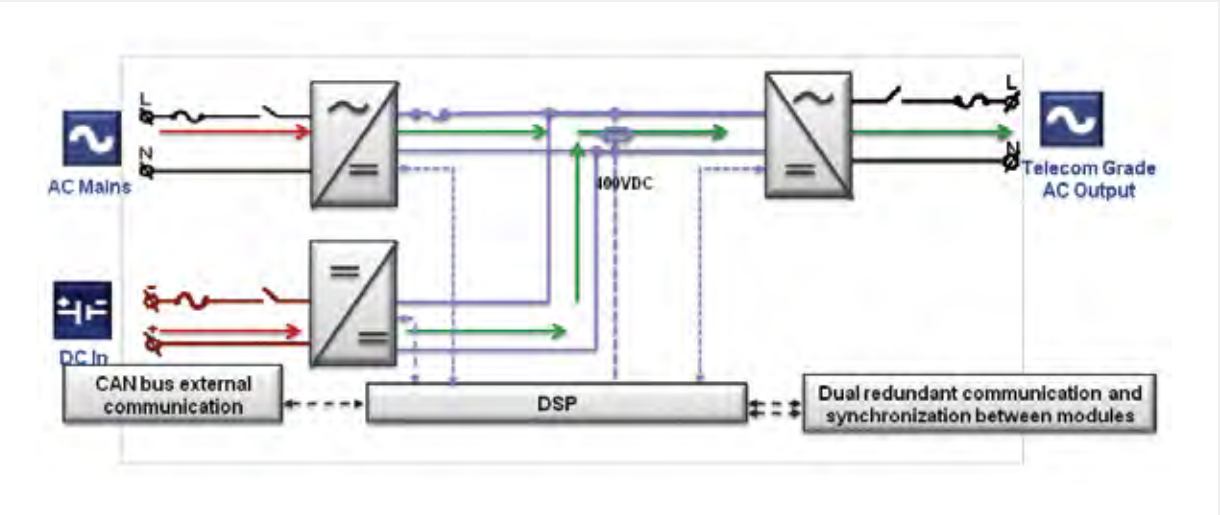


When AC Mains is unavailable, DC battery power is converted to AC with zero transfer time. An intelligent high voltage DC bus decides when to draw power, and how much power to draw, from AC or DC source. During AC input brown-out condition, output power is supplemented by battery power.

In case of a fault, advanced DSP controls allow the AMPS module to isolate itself, while the rest of the system continues to power the load (with reduced output). Hence, the 'system' static switch, which is the single point of failure in conventional systems, is eliminated.

AMPS modules also feature a 'Boost' over-current feature with 10 times the rated current capacity for 20ms, allowing it to trip breakers downstream, thus protecting the load.

Traditionally, customers have had two AC powering options – online AC UPS or Telecom grade (-48Vdc) inverters. While online AC UPS may offer higher power efficiency (up to 95%), they are able to do so by bundling hundreds of small capacity batteries (with only 3 to 5 year design life) into high voltage (240Vdc or 400Vdc) battery packs. Hence, while an AC UPS is able to offer high efficiency, it is much less reliable and uses higher voltages. To improve system uptime, UPS manufacturers offer maintenance contracts to maintain the system and replenish batteries. Hence, operational savings gained through higher power efficiency of the UPS are quickly consumed by expensive maintenance contracts.



Compared with online AC UPS, Telecom grade inverters offer much higher system reliability; utilizing DC power plants and Telecom-grade batteries. However, system efficiency is compromised and is typically in the low '80's, resulting in higher operating costs. Telecom grade inverter systems also require a DC power system with oversized rectifiers, resulting in higher capital investments. Since battery reliability is the biggest concern of MSO power engineers, both UPS and Telecom grade inverter systems deploy Static Transfer Switches (STS), which allow the power system to bypass DC mode to Mains (AC mode) in case of battery failure. When the STS bypasses to AC mode, unregulated AC power is passed to the loads, which may be highly hazardous for sensitive electronic communications loads. In both AC UPS and Telecom grade inverter system topologies, the STS becomes the "single point of failure", because if it fails to bypass DC when there is a battery failure, critical loads might get dropped, resulting in significant loss of revenue, damage to reputation and penalties for MSO's. Moreover, the STS must be sized at the time of installation and the site's future expansion is limited by the STS's rated capacity, thus making the UPS or Telecom grade inverter system much less scalable.

Compared to AC UPS and Telecom grade inverter systems, AMPS offers 94% power efficiency while utilizing the existing highly reliable DC power plant, including batteries with a 10 to 20 year design life. Elimination of a physical STS eliminates the single point of failure as each module has an AC input and a DC input at all times. When AC power is available, AMPS modules provide clean, regulated power to critical communications equipment and in case of brownouts or power outages; battery power is provided to the loads with zero transfer time. Hence, critical communication loads are assured of receiving clean, filtered AC power at all times. Elimination of the physical STS in AMPS also allows for a highly scalable, flexible architecture where N+1 redundancy is possible, resulting in high power density and allowing MSO's to utilize premium real estate for revenue generating equipment. Hence, by combining the high efficiency of an online AC UPS with the high system reliability and performance of a Telecom grade inverter system, AMPS offers the best of both worlds.

AMPS80 HP
Modular AC Power System



AMPS80 HP

- Innovative, modular inverter system for critical facilities and Telecom applications
- Single, dual and three phase configurations with up to 75kVA/60kW capacity
- High performance AC power system offering 99.999% availability for mission critical applications
- 94% efficiency, 15 year design life and module MTBF (Mean Time Between Failures) greater than 200,000 hours results in class-leading TCO (Total Cost of Ownership)
- Intelligent system controller with integrated SNMP for local and remote management of AC power modules, optional rectifier modules, batteries and other peripherals
- Hot swappable 2.5kVA/2.0kW AC power modules and optional 1.8kW rectifier modules (for charging batteries) offer total flexibility, scalability and low MTTR (Mean Time To Repair)
- Small footprint system offers up to 75kVA/60kW in a single 19" box bay rack, freeing up valuable rack and floor space

Consult your Alpha representative for P/N configurations

Features

- System controller with integrated SNMP communications
- Top AC and DC feed access; bottom DC feed access (All user connections are front accessible)
- AC input and output breaker/disconnect switch
- Industrial grade surge suppression (rated to 40kA)

Mechanical

Dimensions:
mm:.....2134H x 600W x680D
inches:.....84H x 23.6W x 26.75D
System weight
(without modules): 270kg (595lbs)

Module dimensions:
mm:.....88.9H x 102W x435D
inches:.....3.5H x 4W x 17.13D
Module weight:.....5kg (11lbs)

Clearance:
Front: 100cm (33in)
Rear:.....30cm (12in) minimum
Sides:.....900mm (36in) to the left of the system
Top:.....30cm (12in)

Environmental

Temperature:
Operating (full load):.....-20 to 40°C (-4 to 104°F)
Storage:.....-40 to 70°C (-40 to 158°F)
Relative humidity:.....Up to 95%, non-condensing
Operating altitude: .....Up to 2,000m (6,562ft) above sea level

Options

- Up to 8 x 1.8kW rectifier modules
- Internal maintenance bypass switch
- Inverter DC input breakers
- Service-entrance grade surge suppression:140kA rating, per phase
- Lockable rack front-door
- Batteries (various sizes and technologies)

Agency Compliance

Safety:.....UL1778 (2nd Ed); CSA C22.2 No. 107.3-05 UPS General Safety
EMC: .....FCC CFR47 Part 15 Class A; ICES-003

Nominal Specifications

Model:	AMPS80-3-75	AMPS80-3-30	AMPS80-2-40	AMPS80-1-20
P/N	**Consult your Alpha representative for P/N configurations**			
Input & output phase	120/208V 3-ph	120/208V 3-ph	120/240V or 120/208V 2-ph	120V single ph
Output capacity	7,500 to 75,000VA	7,500 to 30,000VA	5,000 to 40,000VA	2,500 to 20,000VA
Output power (resistive load)	6,000 to 60,000W	6,000 to 24,000W	4,000 to 32,000W	2,000 to 16,000W
Maximum output current	208A rms per phase	83A rms per phase	168A rms per phase	168A rms
Max. no. of 2,500VA/ 2,000W inverter modules	30	12	16	8
Min. no. of 2,500VA/ 2,000W inverter modules	3	3	2	1
Technology	Proprietory HP technology. Each inverter module has DC input and AC input			
Static switch	Not required; each module has built-in DSP controlled static switch functionality			
Efficiency	94% AC-to-AC; 90% DC-to-AC (from 50 to 100% full resistive load)			
Waveform	Pure sine wave			
Output power factor	0.8 (can run capacitive & inductive loads)			
Transfer time	Zero transfer time			
Warranty	2 year standard (1 and 3 year optional extensions)			
Inverter Module AC Output				
Power rating	2,500VA/2,000W			
Voltage range (AC)	90 – 140V			
Voltage accuracy	±2%			
Frequency	60Hz (same as input frequency)			
Inverter frequency accuracy	0.03%			
Input power factor	>99%			
THD (resistive load)	<1.5%			
Transient load recovery time	0.4ms			
Soft start time	20s			
Maximum crest factor at nominal power	3.5			
Short circuit overload capacity	10 x I_n for 20msec (AC-to-AC mode)			
Short term overload capacity	150% for 5 seconds			
Permanent overload capacity	110%			
Synchronization range	57 – 63Hz			
Inverter Module DC Output				
Nominal voltage	48Vdc			
Voltage range (max)	40 – 60Vdc (User Adjustable)			
Max. DC Input Current				
@48Vdc	1375A	550A	734A	366A
@40Vdc	1700A	680A	900A	450A
Voltage ripple	<2mV/<38 dbrnc			
System Controller with Integrated SNMP				
Control & monitoring	Configure, control and monitor inverter and rectifier modules via Internet Explorer 7 onwards			
Display	LCD touch-screen display (160 x 160 pixels) OK/Major/Minor 3-Color LED display Web based GUI via ethernet			
Communication ports	RJ45 ethernet port RS232 Port (Front)			

AMPS24 HP
Modular AC Power System

HP™ NEW

- Innovative, modular inverter system for critical applications
- Single, dual and three phase configurations with up to 24kVA/19.2kW capacity
- 93% system efficiency for operational savings and reduced carbon footprint
- 'HP' technology engineered to deliver high efficiency, high system reliability and low upfront cost of ownership
- Intelligent system controller with integrated SNMP and ½ VGA color touchscreen LCD panel for full system management, locally and remotely
- High power density yields space for revenue generating equipment



AMPS24 HP

Features

- 3i + 1R system: Up to 3 x 1500VA/1200W inverter modules and 1 x 1800W rectifier module per shelf (1150W for single phase)
- 4i system: Up to 4 x 1500VA/1200W inverter modules per shelf
- System controller with integrated SNMP communications
- 5.7" VGA (640 x 480) color touch screen LCD panel
- Removable covers for ease of installation
- Industrial grade surge suppression
- Inverter AC input and AC output breakers
- Inverter DC breakers (1 breaker per shelf)
- Internal make-before-break rotary maintenance bypass switch

System Controller with integrated SNMP

Control and Monitoring:
Configure, control and monitor inverter and rectifier modules remotely via Internet Explorer 7 onwards and Firefox 3.6 onwards

Display:
- 5.7" VGA (640 x 480) color touch screen LCD display
- OK/Major/Minor 3-Color LED display
- Web based GUI via Ethernet

Communication Ports: .....RJ45 Ethernet Port

Controller I/Os:
Voltage inputs:.....1
Temperature inputs: 2
Current inputs:.....1
Digital inputs:.....6
Relay outputs:.....6

Mechanical

System dimensions:
mm:.....622H* x 443W** x 432D
inches:.....24.5H* x 17.44W** x 17D

Weight
(without modules):.....52.16kg (115lbs)*

Module dimensions
mm:.....88.9H x 102W x 300D (inverter)/235D (rectifier)
inches:.....3.5H x 4W x 12.5D (inverter)/9.25D (rectifier)
Module weight:.....2.4kg (5.3lbs) inverter/2.8kg (6.2lb) rectifier

Environmental

Operating Temperature (full load):... -20 to 50°C (-4 to 122°F)
Storage Temperature:..... -40 to +70°C (-40 to 158°F)
Relative Humidity:..... Up to 95%, non-condensing
Operating Altitude:..... Up to 1500m (4,900ft) above sea level

Options

- Open relay racks and box bay racks for mounting
- Front terminal UPS or Telecom batteries

*Height and weight for 4-shelf system; other models vary in height and weight

**Mounting ears for 19" or 23" racks

Agency Compliance

Safety:.....UL1778 (2nd Ed); CSA C22.2 No. 107.3-05 UPS General Safety
EMC: .....FCC CFR47 Part 15 Class A; ICES-003

AMPS24 HP Systems using 3i+1R Shelves (UPS)					
Model*	**AMPS24-3-13.5-H3**	**AMPS24-2-18-H4**	**AMPS24-2-9-H2**	**AMPS24-1-9-H2**	**AMPS24-1-4.5-H1**
Input & output phase	120/208V 3-ph	120/240V or 120/208V 2-ph		120V single ph	
Nominal output power (max)	4500 to 13500VA	3000 to 18000VA	3000 to 9000VA	1500 to 9000VA	1500 to 4500VA
Output power (resistive load)	3600 to 10800W	2400 to 14400W	2400 to 7200W	1200 to 7200W	1200 to 3600W
Maximum output current	37.5A rms per phase	75A rms per phase	37.5A rms per phase	75A rms per phase	37.5A rms
Max. no. of 1500VA/1200W inverter modules per system	9	12	6	6	3
Min. no. of 1500VA/1200W inverter modules per system	3	2	2	1	1
Max. no. of 1800W rectifier modules per system	3	4	2	2	1

AMPS24 HP Systems using 4i Shelves (Inverter)					
Model**	**AMPS24-3-18-3i**	**AMPS24-2-24-4i**	**AMPS24-2-12-2i**	**AMPS24-1-12-2i**	**AMPS24-1-6-1i**
Input & output phase	120/208V 3-ph	120/240V or 120/208V 2-ph		120V single ph	
Nominal output power (max)	4500 to 18000VA	3000 to 24000VA	3000 to 12000VA	1500 to 12000VA	1500 to 6000VA
Output power (resistive load)	3600 to 14400W	2400 to 19200W	2400 to 9600W	3600 to 9600W	2400 to 4800W
Maximum output current	50A rms per phase	100A rms per phase	50A rms per phase	100A rms per phase	50A rms per phase
Max. no. of 1500VA/1200W inverter modules per system	12	16	8	8	4
Min. no. of 1500VA/1200W inverter modules per system	3	2	2	1	1

Technology	Proprietory HP technology
Static switch	Not required; each module DSP controlled static switch functionality
Efficiency	93% AC-to-AC; 90% DC-to-AC (from 50 to 100% full resistive load)
Waveform	Pure sine wave
Output power factor	0.8 (can run capacitive & inductive loads)
Transfer time	Zero transfer time
Warranty	2 years (1 and 3 year optional extensions)

*Model Descriptor: AMPS24 - [Phase] - [Maximum kVA] - [Number of 3i + 1R Shelves]
**Model Descriptor: AMPS24 - [Phase] - [Maximum kVA] - [Number of 4i Shelves]

INEX™ System
48V Modular Inverter System



INEX™ System

- Versatile modular design provides flexibility for different power applications
- Expandable capacity up to 18kVA with N+1 redundancy configuration
- "All master" dynamic mechanism eliminates single point failure to optimize reliability
- Hot swappable operation allows module addition or removal without powering down
- High power density and high efficiency

The INEX inverter series is an integrated telecommunications power system, including inverter, static switch, LCD display controller and interface modules. With a versatile “building block” design and N+1 redundant configuration, the INEX inverter system facilitates complex telecommunications and industrial power demands, and provides ultimate flexibility for your current and future power requirements.

N+1 parallel redundancy allows power capacity expandable up to 24kVA. INEX “all master” dynamic mechanism automatically shares and re-organizes critical loads to prevent interruption should any inverter module fail. The DSP-microprocessing controller gives real-time system status through a comprehensive LCD display, and allows programmable settings through the display panel. With a communication interface module installed, you can further control and monitor the system remotely.

Consult your Alpha representative for P/N configurations

Electrical

Inverter Module

DC input:
- Nominal voltage: 48Vdc
- Operating range: .....40.5Vdc ~ 58Vdc
- Input protection: .....Reverse polarity protection
- Psophometric noise voltage: .....≤1.0mV ITU-T O.41 (16.66~6000Hz)

AC output:
- Power rating:.....1500VA/1200W
- Waveform: .....Pure sine wave
- Power factor: 0.8
- Nominal output voltage: .110/115/120Vac, 208/220/230/240Vac
- Voltage variation:.....Max ±2%
- Output frequency: 50/60Hz
- Crest factor:.....3:1
- THD: .....<3%, linear load
<5%, non-linear load
- Efficiency:.....Min 88%
- Isolation AC-enclosure:..Basic isolation (Pri-Gnd) 2121Vdc/1min
- Dynamic response: .....<±10%
- Over load protection:.....1.5*Inom >20s
1.25*Inom temperature controlled

STS Module

Input:
- Over voltage threshold:.....Adjustable between
127 to 138Vac for 120Vac systems, the default value is 132Vac
233 to 252Vac for 220Vac systems, the default value is 242Vac
- Under voltage threshold:.....Adjustable between
100 to 114Vac for 120Vac systems, the default value is 108Vac
176 to 209Vac for 220Vac systems, the default value is 198Vac
- Backfeed protection:.....Comply with safety requirement
- Redundant power:.....Startup power-on by priority
- Design: .....Source or alternative

Output:
- Nominal output voltage:.....Same as utility or the output of inverter modules
- Permissible frequency area: .....Max. +/-2.5%
(inverter synchronization)
- Transfer time:.....Typical ¼ cycle
- Rated power: .....50A and 100A options
& 208/220/230/240Vac
- Operation methods: .....Inverter priority/mains priority

Environmental

- Operating temperature: ....-20 to 70°C (-4 to 158°F)
-5 to 58°C (23 to 122°F) with full performance
- Storage temperature:.....-40 to 85°C (-40 to 185°F)
- Humidity: .....90% RH non-condensing
- Audible noise: 55dB

Controller Module

Input:
- Nominal voltage: 48Vdc
- Operating range: .....30Vdc ~ 72Vdc
- Over current protection: 2A fuse

Human interface:
- LCD: .....Resolution (line X array)
4 X 16 charactor
- LED indicator:.....3 colored indicators for normal, warning and fault display
- Alarm: .....Audio alarm when inverter, STS, controller module operate abnormally

System parameter:
- Baud Rate:.....Setting controller com port baud rate
- Keypad tones: .....Setting keypad tones
- Time & date: .....Setting current time and date
- Setting password: .....Setting system password
- Brightness: .....Setting LCD brightness
- Default: .....Change current system parameters to default value

Mechanical

Inverter Module

Dimension:
- mm:.....270D x 215W x 43.8H
- inches:.....10.63D x 8.46W x 1.72H

Weight:.....3.0kg (6.61lbs)

STS Module

50A Dimension:
- mm:..... 270D x 215W x 43.8H
- inches:.....10.63D x 8.46W x 1.72H

Weight:..... 2.0kg (4.4lbs)

100A Dimension:
- mm:.....265D x 215W x 84H
- inches:.... 10.5D x 8.46W x 3.3H

Weight:..... 4.2kg (9.2lbs)

Controller Module

Dimensions:
- mm:.....277D x 87.9W x 43.5H
- inches:.....10.9D x 3.46W x 1.71H

Weight:.....1.0kg (2.2lbs)

Hot-swap Chassis

19/23" mounting brackets

Inverter chassis dimension:
- mm:.....329.5D x 440W x 44H
- inches:.....13D x 17.32W x 1.73H

Weight:.....2.5kg (5.5lbs)

STS & controller chassis dimension:
- mm:.....329.5D x 440W x 44H
- inches:.....13D x 17.32W x 1.73H

Weight:.....3.4kg (7.5lbs)

Communication Interface

- RS-232×1: .....Communicate with PC
- RS-485×2:.....Communicate with supervision
- Dry contact×5: .....Communicate with external monitor
- USB×1: .....Communicate with PC

Agency Compliance

- Safety: .....EN 60950-1, UL 60950-1, IEC 60950-1, CSA C22.2 No. 60950-1
- EMC: .....EN 55022:1998
- Certifications:.....UL, CE
- RoHS:.....Compliant

Media System
2RU 3kVA Inverter System

NEW



Media Inverter

- Revolutionary ‘GREEN’ technology provides 93% system efficiency
- Up to 3kVA/2.4kW of highly reliable, Telecom-grade AC power
- 2RU shelf system provides high power density
- Flexible mounting options for 19” or 23” box bay or open relay racks
- Seamless integration with Alpha’s CXC controllers via CAN bus

Consult your Alpha representative for P/N configurations

General Specifications

Efficiency:.....93% AC-to-AC; 90% DC-to-AC (from 50 to 100% full resistive load)
Waveform:.....Pure sine wave
Output power factor: .....0.8 (can run capacitive & inductive loads)
Transfer time: .....Zero transfer time
Module MTBF:.....>200,000hrs
Warranty:.....1 year

Inverter Module AC Output

Power rating:.....1500VA/1200W
Nominal voltage: 120Vac
Voltage accuracy: .....±2%
Frequency: .....60Hz (same as input frequency)
Inverter frequency accuracy:.....0.03%
THD (resistive load): .....<1.5%
Transient load recovery time: .....0.4 ms
Soft start time:.....20s
Maximum crest factor (nominal power): 3.5
Short circuit overload capacity:.....10 x I n for 20msec (AC-to-AC mode)
Short term overload capacity:.....150% for 5 seconds
Permanent overload capacity:.....110%
Synchronization range:.....57 - 63Hz
Heat dissipation: .....286 BTU per hour in AC-to-AC mode
410 BTU per hour in DC-to-DC mode

Inverter Module Input

Nominal AC voltage: 120Vac
Input power factor: .....>99%
Nominal DC voltage: 48Vdc
Maximum DC voltage range: .....40 - 60Vdc (user adjustable)
Voltage ripple: .....<2mV/<38 dbrnc

Monitoring and Control

- T2S Controller may be seamlessly integrated with Cordex CXC controller via CAN bus
- Dry contacts on shelf
- Status LEDs on modules

Environmental

Operating Temperature (full load): .....-20 to 50°C (-4 to 122°F)
Storage Temperature:.....-40 to +70°C (-40 to 158°F)
Relative Humidity:.....Up to 95%, non-condensing
Operating Altitude:.....Up to 1500m (4,900ft) above sea level

Mechanical

Dimensions:
mm:.....89H x 448Wx 317.5D
inches:.....3.5H x 17.65W x 12.5D
Weight:.....12.7kg (5.3lbs)
.....(including 2 x Media modules)

Agency Compliance

Safety:.....UL 1778 (Ed.4)
EMC (immunity:.....IEC 1000-4
EMC (emission):.....FCC PART 15



UPS Solutions

With over 35 years of experience in the global outdoor market, Alpha is the leader in providing a complete line of AC powering solutions from indoor to rugged outdoor applications. This includes hardened outdoor enclosures, uninterruptible power supply (UPS) modules, specialty batteries, accessories and generators that can be custom integrated to meet your application.

A truly rugged UPS system has many distinguishing characteristics, including conformal coated printed circuit boards (PCBs) which protect against exposure to moisture and dust, and carefully selected components to operate reliably in extreme temperatures. In addition, products and solutions are designed to meet outdoor installation, shock and vibration standards. Alpha's UPS solutions also offer superior communication capabilities including remote monitoring via SNMP web-based communication. Real-time alerts and reports on UPS status can be sent to multiple email addresses, or can be monitored from your PC, Internet-connected mobile phone or PDA, each with selectable event severity levels
to trigger different notifications of events, faults and alarms.

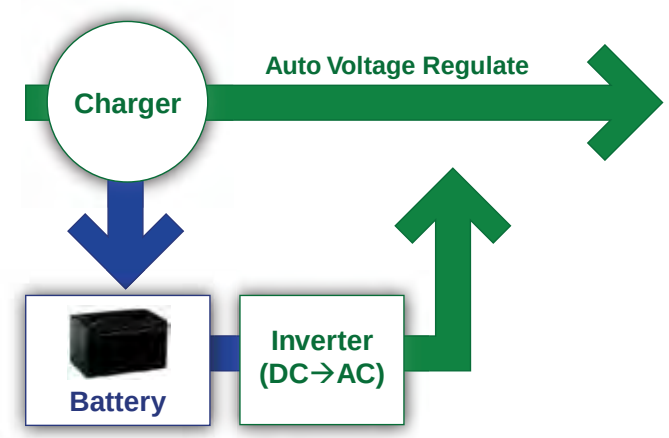
Alpha also offers a complete range of indoor UPS products providing the Alpha reliability, functionality and efficiency you have come to depend on.

UPS Topologies

The diagrams below will help you understand the different topologies used in Alpha's UPS products.

Line Interactive

In normal operation, when AC line voltage is present, power is filtered for voltage spikes and output voltage is regulated. Some electricity is used to keep the batteries fully charged. When the AC line voltage is lost or falls outside the input range, AC power is supplied from the batteries through the inverter.



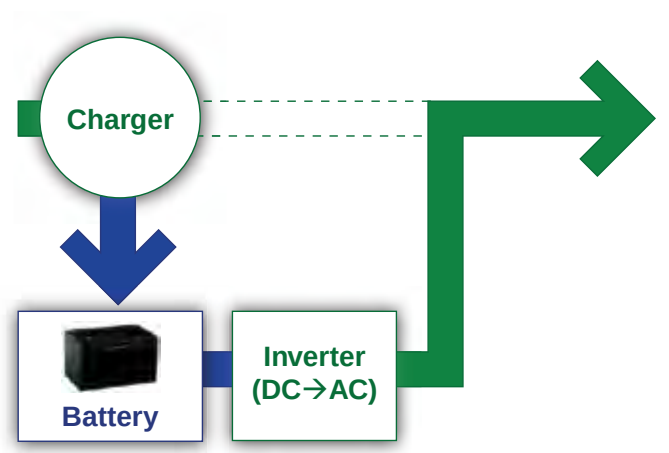
Advantages of line-interactive topology

- Automatic Voltage Regulation (AVR)
- Higher efficiency (less costly to operate) – Less power is consumed because inverter only operates during outages or extreme voltage fluctuations when acceptable AC input is present.
- Higher reliability – Lower component count and lower operating temperatures.

Double Conversion

In normal operation, all incoming AC power is rectified to DC power, supplying the DC bus. The output inverter then inverts the DC power to AC power to support the critical loads. When the AC input is lost or goes out of range, the UPS draws power from its battery so that AC output is not affected. Because the AC input with its spikes, voltage blips and anomalies is first converted to DC, there is less need for using the battery when these AC input variances occur. Less battery usage preserves battery capacity for extended outages and extends battery service life.

Maximizing battery service life and the cost associated with it can offset the advantage of the lower initial purchase and operating costs of a line-interactive UPS thus making the overall cost similar. Situations that might call for a double-conversion on-line UPS are those that require power factor correction (PFC), small physical size or loads where any transfer time is unacceptable.

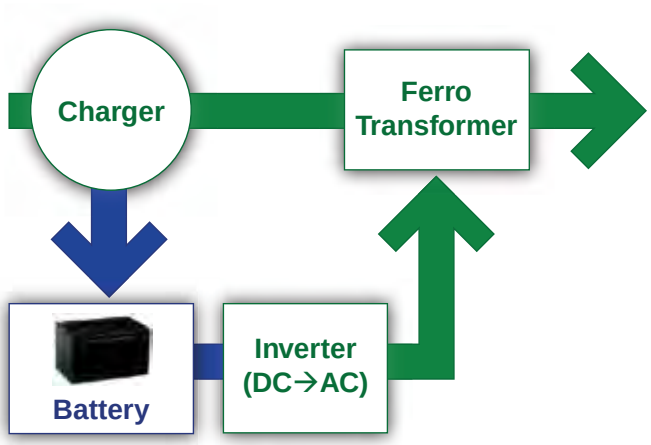


Advantages of double-conversion topology

- Operates less often from battery when the input voltage is highly distorted or wildly fluctuating
- Power factor correction (PFC) provided, regardless of load type
- More compact and lightweight, especially at higher power levels

Controlled Ferroresonant

The Ferroresonant Topology is similar to a Line Interactive topology with the addition of a ferroresonant transformer to offer constant output voltage regardless of the state of the input voltage. In both normal mode and battery mode, all output is first filtered through a ferroresonant transformer isolating the output. This also provides for a seamless transfer to UPS power and offers galvanic isolation to isolate the output from the input. Auto Voltage Regulation (AVR) is managed through Buck and Boost Mode.



Advantages of controlled ferroresonant topology

- Best spike and surge protection with output isolation
- Zero transfer time
- Good MTBF as inverter is in standby mode except during outages
- Batteries are not used in a brown-out condition

Uninterruptible Power Supply selection guide

To help us design an Uninterruptible Power Supply (UPS) solution for your specific application, please review the following questions prior to contacting your Alpha representative:

What is the type of application and what specific systems/devices will be backed up?

PBX, cell site, server, traffic, parking, security or other.

What are the environmental conditions?

Indoor: Controlled environment, air conditioned, dust free
Outdoor: Non-controlled environment: snow, rain, elevation, humidity, dust etc.
Minimum ambient temperature surrounding the UPS
Maximum ambient temperature surrounding the UPS

Where will the UPS be located (country, city/town)?

What are the power requirements?

Volt-amps (VA) or Watts required by load
Input voltage to UPS and output voltage(s) to load
Frequency (Hz) 50 or 60
Type of loads: Motor loads, inductive loads

How much backup time is required?

The amount of time in hours or minutes the UPS will operate on batteries when the utility power fails
The expected frequency of utility power failures: eg., once/year, twice/month

How will the UPS be mounted?

Indoor applications: rack, tower, wall
Outdoor applications: pole, ground (is a pedestal required?), or wall

What are the input/output configuration requirements?

Input plug type or terminal block
Output receptacle type(s) or terminal block

Are any accessories required?

Bypass Switch (auto/manual), Ethernet/SNMP, Battery Heater Mats, Battery Management System, Enclosures, Racks

What warranty/service needs are required?

Is extended warranty required? Periodic or special servicing needs? Installation/commissioning services?

What quantities are needed?

Number of units required and when

FXM 350
UPS Module

NEW



FXM 350

- 350W/VA total output uninterruptible power supply module in small form factor provides cost efficient solution for various applications
- Multiple AC and DC output options, including 120Vac, 24Vac and 48/24/12Vdc makes this UPS suitable for applications with diverse loads*
- External communication via USB port and Ethernet SNMP interface provides local or remote monitoring and control
- Independently programmable and dry contact relays allow tracking and controlling of key functions
- Wide Automatic Voltage Regulation (AVR) range allows continuous operation without transferring to backup mode during voltage surge or sag
- A wide operating temperature range of -40 to 74°C (-40 to 165°F) is suitable for the most extreme operating environments
- Optional distribution enables easy integration with both AC and DC devices

Electrical

North America

Battery string voltage:.....48/24Vdc
Input:
Voltage: .....Nominal 120Vac
Range: 84 to 142V
(without transferring to battery mode)
Current:.....3.1A nominal
Frequency: .....60Hz +/- 5Hz
Charger current:
0-6A selectable in 1A increments (24Vdc battery bus version)
0-4A selectable in 1A increments (48Vdc battery bus version)
Regulation:.....±10% over full input voltage range
Waveform:.....Pure sine wave
Output:
Voltage: 120Vac, 24Vac, 48/24/12Vdc*
Current:.....2.92A nominal
Power at 50°C:.....350 W/VA

International

Battery string voltage:.....48/24Vdc
Input:
Voltage: .....Nominal 230Vac
Range: 150 to 328V
Current:.....1.6A nominal
Frequency: .....50Hz +/- 5Hz
Charger current:
0-6A selectable in 1A increments (24Vdc battery bus version)
0-3A selectable in 1A increments (48Vdc battery bus version)
Regulation:.....±10% over full input voltage range
Waveform:.....Pure sine wave
Output:
Voltage: 230Vac, 24Vac, 24Vdc, 48Vdc*
Current:.....1.52A nominal
Power at 50°C:.....350 W/VA

Mechanical

Dimensions:
mm:.....89H x 340W x 198D
Inches:.....3½H x 13⅜W x 7.8D
Weight:.....8.62kg (19lbs)

Environmental

Operating
temperature range*:.....-40 to 74°C (-40 to 165°F)
Audible noise @ 25°C:.....45dBa @ 1 metre (39in)
*Derates after 60°C)

Performance

Typical output voltage THD: ...<5%
Typical efficiency:..... >95% (resistive load)
Typical transfer time:..... <5ms

Agency Compliance

Electrical safety:.....UL1778, CSA22.2, No. 107.3, EN60950-1-2

Marks:

EMI:.....FCC Class A / CISPR22

*Some output voltages may require distribuion; 48Vdc output requires 48V battery string

FXM 650
UPS Module



FXM 650

- Clean, uninterruptible backup power ensures your system will remain running during power outages
- Wide range Automatic Voltage Regulation without going to batteries lengthens battery life, even during periods of surge or sag in the line voltage
- External communications via RS-232 port or (optional) Ethernet SNMP interface provides local or remote monitoring and control
- Independently programmable and dry contact relays allow tracking and controlling of key functions
- A wide operating temperature range of -40 to 74°C (-40 to 165°F) is suitable for the most extreme operating environments
- Temperature compensated battery charging protects batteries from over charging at extreme temperatures, extending the life of the battery
- White text on blue display improves readability in bright daylight

Consult your Alpha representative for P/N configurations

Electrical

North America

Battery string voltage: 24Vdc/48Vdc
Nominal voltage: 120Vac
Nominal frequency: .....Auto-sensing
Input:
  Current: .....5.6A nominal
  Voltage: .....85 to 175Vac
Output:
  Current: .....5.4A nominal (no charge current)
  Voltage regulation: .....+/- 10% over input voltage range
  Power at 55°C: 650W/VA
  Charge current: .....10A max

International

Battery string voltage: 24Vdc
Nominal voltage: 230Vac
Nominal frequency: .....Auto-sensing
Input:
  Current: .....3.0A nominal
  Voltage range: .....150 to 328Vac
Output:
  Current: .....2.8A nominal
  Voltage regulation .....+/- 10% over input voltage range
  Power at 55°C: 650W/VA

Mechanical

Dimensions:
  mm: .....88H x 432W x 229D
  inches: .....3.47H x 17W x 9D
Weight: 11kg (25lbs)

Environmental

Operating
temperature range*: .....-40 to 74°C (-40 to 165°F)
Audible noise @ 25°C: .....45dBa @ 1 metre (39in)
*Derates after 55°C

Performance

Typical output voltage THD: <3%
Typical efficiency: .....>98% (resistive load)
Typical transfer time: .....<5ms

Agency Compliance

Electrical safety: .....UL1778, CSA 22.2 No 107.3-03
Marks: .....$_{C}$CSA$_{US}$/CE**
EMI: .....Class A FCC/CISPR
[EN 50091-2:1995]

**CE applies to 230 Vac version only

FXM 1100
UPS Module



FXM 1100

- Clean, uninterruptible backup power ensures your system will remain running during power outages
- Wide range Automatic Voltage Regulation without going to batteries lengthens battery life, even during periods of surge or sag in the line voltage
- External communications via RS-232 port or (optional) Ethernet SNMP interface provides local or remote monitoring and control
- Independently programmable and dry contact relays allow tracking and controlling of key functions
- A wide operating temperature range of -40 to 74°C (-40 to 165°F) is suitable for the most extreme operating environments
- Temperature compensated battery charging protects batteries from over charging at extreme temperatures, extending the life of the battery
- White text on blue display improves readability in bright daylight

Consult your Alpha representative for P/N configurations

Electrical

North America

Battery string voltage:.....48Vdc
Nominal voltage: 120Vac
Nominal frequency:.....Auto-sensing
Input:
  Current:.....9.7A nominal
  Voltage: .....85 to 175Vac
Output:
  Current:.....9.2A nominal
  Voltage regulation: .....+/- 10% over input voltage range
  Power at 50°C:.....1100W/VA

International

Battery string voltage:.....48Vdc
Nominal voltage: 230Vac
Nominal frequency:.....Auto-sensing
Input:
  Current:.....8.0A nominal
  Voltage range: .....150 to 328Vac
Output:
  Current:.....5.1A nominal
  Voltage regulation .....+/- 10% over input voltage range
  Power at 50°C:.....1100W/VA

Mechanical

Dimensions:
  mm:.....133H x 394W x 222D
  inches:.....5.22H x 15.5W x 8.75D
Weight:.....16kg (35lbs)

Environmental

Operating
temperature range*:.....-40 to 74°C (-40 to 165°F)
Audible noise @ 25°C:.....45dBa @ 1 metre (39in)
*Derates after 55°C

Performance

Typical output voltage THD: <3%
Typical efficiency:.....>98% (resistive load)
Typical transfer time:.....<5ms

Agency Compliance

Electrical safety:.....UL1778, CSA 22.2 No 107.3-03
Marks: .....$_{c}CSA_{US}$/CE**
EMI: .....Class A FCC/CISPR
[EN 50091-2:1995]

**CE applies to 230Vac version only

FXM 2000
UPS Module



FXM 2000

- Clean, uninterruptible backup power ensures your system will remain running during power outages
- Wide range Automatic Voltage Regulation without going to batteries saves energy and lengthens battery life, even during periods of surge or sag in the line voltage
- External communications via RS-232 port or (optional) Ethernet SNMP interface provides local or remote monitoring and control
- Independently programmable and dry contact relays allow tracking and controlling of key functions
- Event and alarm logging with time and date stamping simplifies and accelerates troubleshooting
- A wide operating temperature range of -40 to 74°C (-40 to 165°F) is suitable for the most extreme operating environments
- Temperature compensated battery charging protects batteries from over charging at extreme temperatures, extending the life of the battery
- White text on blue display improves readability in bright daylight

Consult your Alpha representative for P/N configurations

Electrical

North America

Battery string voltage: 48Vdc
Nominal voltage: 120Vac
Nominal frequency: ..... Auto-sensing
Input:
  Current: ..... 17.5A nominal
  Voltage: ..... 85 to 150Vac
Output:
  Current: ..... 16.7A nominal
  Voltage regulation: ..... +/- 10% over input voltage range
  Power at 50°C: 2000W/VA

International

Battery string voltage: 48Vdc
Nominal voltage: 230Vac
Nominal frequency: ..... Auto-sensing
Input:
  Current: ..... 9.15A nominal
  Voltage range: ..... 150 to 281Vac
Output:
  Current: ..... 8.7A nominal
  Voltage regulation ..... +/- 10% over input voltage range
  Power at 50°C: 2000W/VA

Mechanical

Dimensions:
  mm: ..... 133H x 394W x 222D
  inches: ..... 5.22H x 15.5W x 8.75D
Weight: 16kg (35lbs)

Environmental

Operating
temperature range*: ..... -40 to 74°C (-40 to 165°F)
Audible noise @ 25°C: ..... 45dBa @ 1 metre (39in)
*120Vac module derates after 50°C. 230Vac module derates after 55°C

Performance

Typical output voltage THD: <3%
Typical efficiency: ..... >98% (resistive load)
Typical transfer time: ..... <5ms

Agency Compliance

Electrical safety: ..... UL1778, CSA 22.2 No 107.3-03
Marks: ..... $_{C}$CSA$_{US}$/CE**
EMI: ..... Class A FCC/CISPR [EN 50091-2:1995]

**CE applies to 230 Vac version only

Micro Secure 100
UPS System



Micro Secure 100

- All weather protection with durable outdoor NEMA 3R rated plastic enclosure
- Enhanced battery life with wide-range Automatic Voltage Regulation
- Local or remote monitoring and control through RS-232 port or (optional) SNMP Ethernet interface
- Independently programmable relays allow tracking and controlling of key functions
- Simplified troubleshooting through event and alarm logging with time and date stamping
- Maximum mounting flexibility for accommodation of space requirements*

Consult your Alpha representative for P/N configurations

Electrical

North America

Battery string voltage: 24Vdc
Input:
  Nominal voltage: 120Vac
  Nominal frequency: 60Hz
  Current: 2.0A
  Voltage range: .....85 to 150Vac
Output current: .....0.83A @ 120Vac
  4.2A @ 24Vac

International

Battery string voltage: 24Vdc
Input:
  Nominal voltage: 230Vac
  Nominal frequency: 50Hz
  Current: 1.0A
  Voltage range: .....154 to 323Vac
Output current:
  4.2A @ 24Vac: .....0.43A @ 230Vac

Mechanical

Dimensions:
  mm: .....292H x 381W x 152D
  inches: .....11.5H x 15W x 6D
Weight
(with 4 x 9Ah batteries): 20.4kg (45lbs)

Environmental

Operating
temperature range*: .....-40 to 50°C (-40 to 122°F)
Audible noise @ 25°C: .....45dBa @ 1 metre (39in)

Performance

Run time**: 2 hrs 15 mins @ full load

Agency Compliance

Electrical safety: .....UL1778, CSA 22.2 No. 107.1
Marks: .....$_{C}$CSA$_{US}$, CE***
EMI: .....Class A FCC/CISPR, EN50091-1-2, EN60950
NEMA: 3R

*Mounting brackets sold separately
**Using 4 x 9AH batteries @ 25°C.
***CE applies to 230 Vac version only

Micro 350
UPS and enclosure

NEW

- Integrated backup power system designed to operate in extreme environments and provide maximum flexibility in ensuring critical loads remain up and running during power outages
- 350W/VA total output in AC and/or DC including 120Vac, 24Vac, 48Vdc, 24Vdc and 12Vdc enables application with diverse load requirements*
- Temperature compensated battery charging and battery heater mat option provides prolonged battery life and operation at extreme temperatures
- Wide range of input with Automatic Voltage Regulation (AVR) extends battery life by not reverting to batteries during periods of surge or sag in utility power voltage
- External communication via USB port and Ethernet SNMP interface provides local or remote monitoring and control
- Optional distribution panel enables easy integration with both AC and DC devices



Micro 350

Electrical

North America

Battery string voltage:.....48Vdc/24Vdc
Input voltage: .....Nominal 120Vac
Range: 84 to 142V
(without transferring to backup mode)
Input current:.....3.1A nominal
Input frequency: .....60Hz +/- 5Hz
Charger current:
0-6A selectable in 1A increments (24Vdc battery bus version)
0-4A selectable in 1A increments (48Vdc battery bus version)
Output voltage:.....120Vac, 24Vac, 48Vdc/24Vdc*
Regulation: .....±10% over full input voltage range
Waveform: .....Pure sine wave
Output current:.....2.92A nominal
Output power at 50°C: .....350 W/VA

International

Battery string voltage:.....48/24Vdc
Input voltage: .....Nominal 230Va
Range: 150 to 328V
Input current:.....1.6A nominal
Input frequency: .....50Hz +/- 5Hz
Charger current:
0-6A selectable in 1A increments (24Vdc battery bus version)
0-3A selectable in 1A increments (48Vdc battery bus version)
Output voltage:.....230Vac, 24Vac, 24Vdc, 48Vdc*
Regulation: .....±10% over full input voltage range
Waveform: .....Pure sine wave
Output current:.....1.52A nominal
Output power at 50°C: .....350 W/VA

*Output voltages depend on specific unit. Contact your Alpha Sales Representative to determine the unit best suited to your needs.

Performance

Typical output voltage THD: ...<5%
Typical efficiency:..... >95% (resistive load)
Typical transfer time:..... <5ms
Runtime: ..... 2 x 50Ah
Batteries; ..... 2hrs 15 mins

Mechanical

	**Alpha Micro**		
	Dimensions	mm	500H x 358W x 294D
		inches	19.7H x 14.1W x 11.6D
	Weight (without batteries)		25kg (56lbs)
	**Alpha Micro XL**		
	Dimensions	mm	776H x 358W x 294D
		inches	30.6H x 14.1W x 11.6D
	Weight (without batteries)		29kg (65lbs)
	**Alpha Micro XL3**		
	Dimensions	mm	1330H x 358W x 294D
		inches	52.4H x 14.1W x 11.6D
	Weight (without batteries)		33kg (74lbs)

Environmental

Temperature range:..... -40 to 50°C (-40 to 122°F) de-rated up to 74°C
Humidity: .....15% to 95% RH non condensing
Audible noise@25°C: .....<45dBa @ 1 metre (39in)

Agency Compliance

Electrical safety:..... UL1778, CSA22.2, No.107.3, CE: EN60950-1-2

Marks:

EMI: .....FCC Class A / CISPR22

Alpha Micro 1000
UPS and enclosure

- Compact, integrated UPS system provides clean, uninterruptable backup power
- Wide range Automatic Voltage Regulation without going to batteries extends battery life, even during periods of surge or sag in voltage from utility power
- External communications via RS-232 port or (optional) Ethernet SNMP interface provides local or remote monitoring control
- Independently programmable control and report relays allow tracking and controlling of key functions
- Event and alarm logging with time and date stamping simplifies and accelerates troubleshooting
- A wide operating temperature range of -40 to 74°C (-40 to 165°F)* is suitable for most extreme operating environments
- Temperature compensated battery charging protects batteries from over charging at extreme temperatures



Micro 1000

Consult your Alpha representative for P/N configurations

Electrical

North America

Battery string voltage:.....48Vdc
Input:
Nominal voltage: 120Vac
Nominal frequency:.....60Hz
Current:.....8.8A nominal
Voltage range: .....85 to 175Vac
Output:
Current:.....8.3A nominal
Voltage regulation: .....+/- 10% over input voltage range
Power @ 50°C:.....1000W/VA

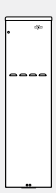
International

Battery string voltage:.....48Vdc
Input:
Nominal voltage: 230Vac
Nominal frequency:.....50Hz
Current:.....4.6A nominal
Voltage range: .....150 to 328Vac
Output:
Voltage: 230Vac
Current:.....4.3A nominal
Voltage regulation: .....+/- 10% over input voltage range
Power @ 50°C:.....1000W/VA

Performance

Typical output voltage THD: <3%
Typical efficiency:.....>98% (resistive load)
Typical transfer time:.....<5ms
Run time**: .....4 x 50Ah batteries - 1 hrs 14 mins (Micro XL)

Mechanical

	**Alpha Micro**		
	Dimensions	mm	500H x 358W x 294D
		inches	19.7H x 14.1W x 11.6D
	Weight (without batteries)		19.7kg (43.4lbs)
	**Alpha Micro XL**		
	Dimensions	mm	776H x 358W x 294D
		inches	30.6H x 14.1W x 11.6D
	Weight (without batteries)		19.7kg (49.8lbs)
	**Alpha Micro XL3**		
	Dimensions	mm	1330H x 358W x 294D
		inches	52.4H x 14.1W x 11.6D
	Weight (without batteries)		22.6kg (69.2lbs)

Environmental

Temperature range:..... -40 to 50°C (-40 to 122°F) de-rated up to 74°C
Humidity: .....15% to 95% RH non condensing
Audible noise@25°C: .....<45dBa @ 1 metre (39in)

Agency Compliance

Electrical safety:.....UL1778, CSA 22.2 No. 107.3, EN50091-1-2, EN60950
Marks: .....$_{C}CSA_{US}$, CE***
EMI: .....Level A FCC, CISPR22, EN55022
NEMA: 3R

* This applies to the UPS module only. Batteries may require a heater mat at lower temperatures. Output power derates after 50°C

**Run time on battery power can vary based on loads, temperature and battery. Other battery options are available.

***CE applies to 230Vac version only

CFR®
Indoor UPS Solutions

- 1kVa to 3kVa
- One of the highest MTBF in the UPS industry - lowers total cost of ownership
- Complete input to output isolation provides complete surge and lightning protection for sensitive loads
- The CFR's controlled output voltage design provides efficiency ratings up to 92%, saving energy
- Features a RS-232 communication port and is SNMP and modem compatible for monitoring from any Internet connection location



CFR

Consult your Alpha representative for P/N configurations

Electrical

Input
- Operating voltage range: ..... -23 to 10%
- Frequency operating range:..... ±1.4Hz
- Power factor ..... 0.95 to 0.99
- Current THD: ..... 5% Typical

Output:
- Waveform: ..... Pure sine wave
- Voltage regulation: ..... ±1%
- Typical voltage THD: ..... <5% 1kVA to 5kVA

Inverter frequency stability: ..... ±0.1%
Spike attenuation: ..... 2000 to 1

Environmental

Operating temperature: ..... 0 to 40°C (32 to 104°F)
Audible noise: ..... 40dBA Typical @ 1m

Communications

All Alpha CFR products feature RS-232 communication ports and are SNMP and modem compatible. The following is a list of optional communication, monitoring and control products:

SNMP agent: Furnishes real time UPS/power status to Network Power Management Software.

Application Specific Models

CFR-NT: Specifically designed to be compatible with Northern Telecom Meridian telephone switches and other telephony products
CFR-E: 50Hz configuration

Plug and receptacle diagram

5-15P	5-15R	CS6361
5-30P	5-30R	Terminal block
5-20P	5-20R	British
5-50P	L5-15R	Schuko
L5-15P	L5-20R	Australian
L5-30P	L5-30R	
L6-30P	L6-20R	
	L6-30R	

Warranty

UPS warranty: .....24 month limited warranty
Battery:.....24 month limited warranty

Agency Compliance

Lightning & surge protection: .....ANSI C62.41-1980 (IEEE 587)

Nominal Specifications

Model number:		CFR 1000 CFR 1000 E	CFR 1500 CFR 1500 E CFR 1500 NT	CFR 2000 CFR 2000 E CFR 2000 NT	CFR 2500 CFR 2500 E CFR 2500 NT	CFR 3000 CFR 3000 E CFR 3000 NT
Output power rating		1000VA/750W	1500VA/1000W	2000VA/1334W	2500VA/1667W	3000VA/2000W
60Hz models (CFR, CFR-NT & CFR-M)						
Input voltage (Vac) nominal		120	120/208/240	120/208/240	120/208/240	120/208/240
Output voltage (Vac) nominal		120	120/208/240	120/208/240	120/208/240	120/208/240
50Hz nodels (CFR-E)						
Input/Output voltage (Vac) nominal		230	230	230	230	230
Typical efficiency - AC/AC 100% load		90%	90%	90%	90%	90%
Typical heat output - line mode		284 BTU/h	427 BTU/h	398 BTU/h	636 BTU/h	758 BTU/h
Mechanical						
Dimensions	inches	10H x 8.5W x 20D	21H x 8.5W x 22.5D	21H x 8.5W x 22.5D	21H x 8.5W x 22.5D	21H x 8.5W x 29.5D
	mm	254H x 216W x 508D	533H x 216W x 571D	533H x 216W x 571D	533H x 216W x 571D	533H x 216W x 749D
60Hz weight		42kg (92lbs)	69kg (151lbs)	78kg (171lbs)	84kg (185lbs)	128kg (283lbs)
60Hz ship weight		44kg (97lbs)	73kg (162lbs)	83kg (182lbs)	91kg (200lbs)	142kg (312lbs)
50Hz weight		42kg (93lbs)	74kg (163lbs)	82kg (181lbs)	86kg (190lbs)	142kg (313lbs)
50Hz ship weight		44kg (98lbs)	79kg (174lbs)	87kg (192lbs)	93kg (205lbs)	151kg (332lbs)
Internal battery runtime 100%*		12min	18min	15min	10min	27min
Internal battery recharge time (to 80% of capacity)		5hrs typical	5hrs typical	5hrs typical	5hrs typical	5hrs typical
Extended battery runtime options*						
A. External Battery Pack		EBP 24C	EBP 48A	EBP 48A	EBP 48A	EBP 48A
Total runtime**		2hrs 12min	1hr 39min	1hr 10min	52min	1hr 15min
B. External Battery Pack		EBP 24E	EBP 48E	EBP 48E	EBP 48E	EBP 48E
Total runtime**		5hrs 12min	3hrs 45min	2hrs 48min	2hrs 10min	2hrs 30min
60Hz power connector options†						
Input: CFR, CFR-C, CFR-M, CFR-RM models		5-15P	5-15P T. B. L5-15P	5-20P T. B. L5-20P	5-30P L5-30P L6-30P T. B.	5-30P L5-30P L6-30P Terminal Block
CFR-NT models		N/A	L6-30R	L6-30R	L6-30R	L6-30
Output: CFR, CFR-C, CFR-M, CFR-RM models		5-15R L5-15R	5-15R 5-20R 6-20R L5-15R L5-20R L5-30R L6-20R 5-30R L6-30R T. B.	5-15R 5-20R 6-20R L5-15R L5-20R L5-30R L6-20R 5-30R L6-30R T. B.	5-15R 5-20R 6-20R L5-15R L5-20R L5-30R L6-20R 5-30R L6-30R T. B.	5-15R 5-20R 6-20R L5-15R L5-20R L5-30R L6-20R 5-30R L6-30R Terminal Block
CFR-NT models		N/A	5-15R 2-L6-30R	5-15R 2-L6-30R	5-15R 2-L6-30R	5-15R 2-L6-30R
50Hz power connector options†						
Input /Output: CFR-E models		British Australian Schuko	British Australian Schuko	British Australian Schuko	British Australian Schuko T.B.	British Australian Schuko T.B.

* Battery runtimes are calculated at 100% rated loads and will vary according to battery age, loads, temperature and other factors.
** Total runtime include the internal batteries and the External Battery Pack (EBP) at 100% load.
*** Contact factory for 5kVA configurations.
† Refer to Plug and Receptacle Diagram: See page 54

- Maximum power protection for complete isolation and uninterruptible power, assuring the ongoing performance of sensitive medical equipment
- Meets demanding UL 60601-1 medical safety standards, allowing use in most medical and healthcare environments
- Low current leakage supports patient vicinity equipment
- Optional external battery packs greatly extend backup time
- Generator compatibility meets even the longest runtime requirements

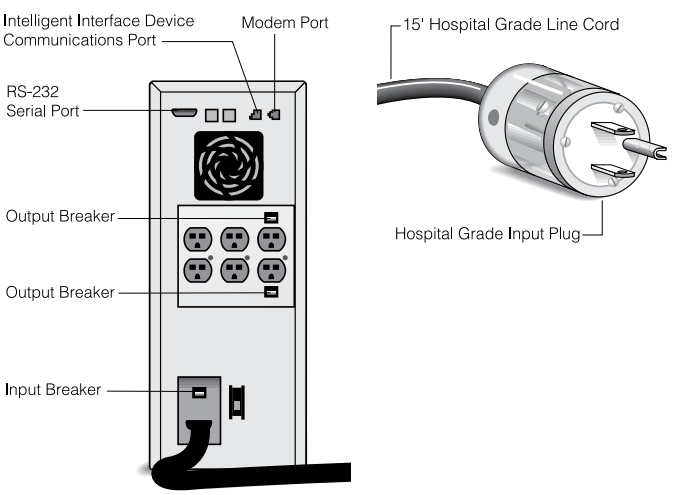


Output Power Connector Configuration Options

1) Any combination of 3 or less duplex receptacles.
2) Any combination of 2 or less single receptacles.
3) Any duplex receptacle with any single receptacle.
4) Single terminal block.
(Other Configurations may be available)

Agency Compliance

Marks: .....CSA 107.1-01, CAN/CSA 601.1-M90
Safety: .....UL 1778 (2nd Edition), UL Std No 60601-1 (1st Edition)



AlphaMED back panel

Power Connector Options

Input: Hospital Grade NEMA STD		
5-15P	5-15P	5-20P
L5-15P	5-20P	6-15P
	6-15P	6-20P
	6-20P	

Output: Hospital Grade NEMA STD			
5-15R	5-15R	5-20R	6-20R
L5-15R	5-15R	5-20R	6-20R

Nominal Specifications

Model number		AlphaMED® 1000 AlphaMED® 1000E	AlphaMED® 1500 AlphaMED® 1500E	AlphaMED® 2000 AlphaMED® 2000E	AlphaMED® 2500 AlphaMED® 2500E	AlphaMED® 3000 AlphaMED® 3000E
Output power rating		1000VA/750W	1500VA/1000W	2000VA/1334W	2500VA/1667W	3000VA/2000W
Input/Output voltage (Vac)		120	120/208/240*	120/208/240*	120/208/240*	120/208/240*
Nominal		230	230	230	230	230
Typical efficiency - AC/AC 100% load		90%	90%	90%	90%	90%
Typical THD		5%	5%	5%	5%	5%
Typical heat output - Line mode			427 BTU/h	398 BTU/h	636 BTU/h	758 BTU/h
Audible noise at 1m		<38dBA	<38dBA	<39dBA	<39dBA	<39dBA
Waveform		sine	sine	sine	sine	
Noise attenuation						
Common mode (100k to 1MHz)		-120dB	-120dB	-120dB	-120dB	-120dB
Normal mode (100k to 1MHz)		-60dB	-60dB	-60dB	-60dB	-60dB
Operation temperature		0 to 40˚C (32 to 104˚F)	0 to 40˚C (32 to 104˚F)	0 to 40˚C (32 to 104˚F)	0 to 40˚C (32 to 104˚F)	0 to 40˚C (32 to 104˚F)
Mechanical						
Dimensions	inches	10H x 8.5W x 20D	21H x 8.5W x 22.5D	21H x 8.5W x 22.5D	21H x 8.5W x 22.5D	21H x 8.5W x 29.5D
	mm	254H x 216W x 508D	533H x 216W x 571D	533H x 216W x 571D	533H x 216W x 571D	533H x 216W x 749D
Weight		42kg (92lbs)	69kg (151lbs)	78kg (171lbs)	84kg (185lbs)	128kg (283lbs)
Internal battery runtime**			18min	15min	10min	27min
Max. battery charger current		3A	3A	3A	3A	3A
Battery recharge time		5 hrs typical	5hrs typical	5hrs typical	5hrs typical	5hrs typical
Extended battery run time options*						
A. External Battery Pack (EBP)		EBP 24C	EBP 48A	EBP 48A	EBP 48A	EBP 48A
Total runtime***		2hts 12min	1hr 39min	1hr 10min	52min	1hr 15min
B. External Battery Pack (EBP)		EBP 24E	EBP 48E	EBP 48E	EBP 48E	EBP 48E
Total runtime***		5hrs 12min	3hrs 45min	2hrs 48min	2hrs 10min	2hrs 30min

* Factory configured

** Battery runtimes are calculated at 100% load and will vary according to battery age, loads, temperature and other factors.

*** Total runtime include the internal batteries and the External Battery Pack (EBP).

EBP Options

Alpha's plug-in External Battery Packs provide extended backup for all CFR models including AlphaMEDs. All battery packs are shipped fully assembled and include interconnecting cables. Longer runtimes are obtained by cascading additional battery cabinets.

Available for CFR 1500, 2500, 3000

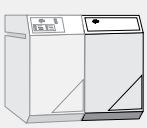
Battery pack 48V



EBP 48A
Dimensions:
inches: ... 10.5H x 8.5W x 10.5D
mm: ..... 267H x 216W x 267D
Weight: 58kg (127lbs)
Capacity: 33Ah



EBP 48E
Dimensions:
inches: ... 21.5H x 8.5W x 21.5D
mm: ..... 546H x 216W x 546D
Weight: 141kg (312lbs)
Capacity: 88Ah



EBP 1275-48R
Dimensions:
inches: ..... 30.3H x 22.0W x 31.5D
mm: ..... 770H x 660W x 800D
Weight: 411kg (905lbs)
Capacity: 264Ah

Sentra 750 - 3000
Line-interactive Sine Wave UPS

NEW

- Highly efficient line interactive sine wave UPS with 0.9 outout power factor
- Rack/tower convertible design with rotating LCD panel provides compact and flexible form factor
- Advanced Automatic Voltage Regulation (AVR) lenghtens battery life
- USB and RS232 interfaces, plus customer definable slot, provide additional communication flexibilty
- Hot swappable battery function facilitates ease of maintenance



Sentra Rack Configuration



Sentra Tower Configuration

Technical Specifications

Models	Sentra 750	Sentra 1000	Sentra 1500	Sentra 2200	Sentra 3000
Input					
Acceptable Voltage Range	83-159Vac or 160-300Vac				
Voltage Window	110/120/127Vac or 220/230/240Vac +/-25%				
Frequency	45~65Hz (auto-sensing)				
Phase	Single phase + ground				
Output					
Voltage Range (Vac) Battery Mode	110/120/127Vac or 220/230/240Vac +/-5%				
Frequency	50/60Hz Auto-sensing				
Capacity	750VA/750W	1000VA/900W	1500VA/1350W	2100VA/1920W	3000VA/2700W
Wave Form	Pure Sine Wave				
Transfer Time	4-6ms typical				
Efficiency	Line Mode: Up to 95%; Boost/Buck Mode: Up to 94%				
Cold Start	Yes				
Battery					
Type	Sealed Lead Acid Maintenance-free				
Capacity	12V/7AH	12V/7AH	12V/9AH	12V/7AH	12V/9AH
Quantity	3	3	3	6	6
Voltage	36V	36V	36V	72V	72V
Autonomy (80% load)	8.5 mins	6.8 mins	5.1 mins	5.0 mins	5.1 mins
Recharge Time	5 hours to 90% after complete discharge at 100% load				
Display					
Status on LCD	Line bypass, AVR Boost(Buck), Backup, Battery Level, Battery Low, Load				
	Level, Battery Fault, UPS Fault				
Status on LED	Line Mode, Battery Mode & Fault				
Self-diagnostics	Upon Power On and Software Control				

Protection						
Overload	Line Mode	>100%-110% buzzer alarms only				
		>110%-120% for 10 min. and then shutdown				
		>120% shutdown after 1 cycle				
	Battery Mode	>100%-120% buzzer alarms only				
		>120%-130% shutdown after 10 sec.				
		>130% shutdown after 1 cycle				
Short Circuit	Line Mode	Resettable Breaker				
	Battery Mode	Electronic Circuit				
Battery Low		Alarm and Switch Off				
EPO		UPS shuts down immediately				
Battery		Electronic System of Management of Battery Discharge				
Heat Dissipation		48W	48W	72W	105W	143W
Alarms						
Acoustics & display		Mains Fault, Low Battery, Overload and Fault conditions				
Mechanical						
Dimensions	mm	88H x 440W x 412D			88H x 440W x x 657D	
	inches	3.5H x 17.3W x 16.2D			3.5H x 17.3W x 25.9D	
Input Connectors	120Vac	NEMA5-15P			NEMA 5-20P	NEMA L5-30P
	230Vac	IEC-320-C14			IEC-320-C20	
Output Connectors	120Vac	(8) NEMA 5-15R			(6) NEMA 5-15R (2) NEMA 5-20R	(5) NEMA 5-15R (2) NEMA 5-20R (1) NEMA L5-30R
	230Vac	(8) IEC-320-C13			(8) IEC-320-C13, (1) IEC-320-C19	
Net Weight	120Vac	19.7kg (43lbs)	19.7kg (43lbs)	21.1kg (47lbs)	34.6kg (76lbs)	38.2kg (84lbs)
	230Vac	15kg (33lbs)	19.4kg (43lbs)	20.9kg (46lbs)	33.8kg (75lbs)	37.2kg (82lbs)
Environment						
Operating Temperature		0 to 40°C (30 to 104°F)				
Warning Temperature		The battery design life is based on a temperature of 25°C (77°F)				
		Ambient temperature above this range will affect battery life				
Altitude		0-2000M up to 40°C (104°F); 0~3000M up to 35°C (95°F)				
Humidity		90% RH Maximum, No Condensing				
Noise		Line Mode: 40 dB Max; Bat. Mode: 45 dB Max.				
Computer Interface						
Interface Type		Standard RS232 and USB				
Communication Slot		Dry Contact Card or SNMP card				
Compatible Platforms		Windows 95/98/NT/2000/XP/Vista/Win7, Novell Netware, Linux, Mac				
Agency Compliance						
Quality		ISO 9001 certified manufacturing				
Security		EN62040-1-1, UL1778				
Standard EMC		EN62040-2, EN61000-3-2, FCC Class A				
Marking		CE, UL, cUL, FCC				

Sentra XL 1000 - 3000
Line-interactive Sine Wave UPS

NEW

- Highly efficient line interactive sine wave UPS with 0.9 outout power factor
- Optional external battery cabinets with "daisy-chainable" connections and dependable high rate charger provide extended backup and optimal runtime
- Rack/tower convertible design with rotating LCD panel provides compact and flexible form factor
- Advanced Automatic Voltage Regulation (AVR) lengthens battery life
- Hot swappable battery function facilitates ease of maintenance
- USB and RS232 interfaces, plus customer definable slot, provide additional comunication flexibility



Sentra XL Rack Configuration



Sentra XL Tower Configuration

Specifications

Models	Sentra XL 1000	Sentra XL 1500	Sentra XL 2200	Sentra XL 3000
Input				
Acceptable Voltage Range	83-159Vac or 160-300Vac			
Voltage Window	110/120/127Vac or 220/230/240Vac +/-25%			
Frequency	45~65Hz (auto-sensing)			
Phase	Single phase + ground			
Output				
Voltage Range Battery Mode	110/120/127Vac or 220/230/240Vac +/-5%			
Frequency	50/60Hz Auto-sensing			
Capacity	1000VA/900W	1500VA/1350W	2100VA/1920W	3000VA/2700W
Wave Form	Pure Sine Wave			
Transfer Time	4-6ms typical			
Efficiency	Line Mode: Up to 95%; Boost/Buck Mode: Up to 94%			
Cold Start	Yes			
Battery				
Type	Sealed Lead Acid Maintenance-free			
Capacity	12V/7AH	12V/9AH	12V/7AH	12V/9AH
Quantity	4	4	8	8
Voltage	24V	24V	48V	48V
Autonomy (80% load)	8.6 mins	7.1 mins	7.9 mins	7.3 mins
Recharge Time	5 hours to 90% after complete discharge at 100% load			
Display				
Status on LCD	Line bypass, AVR Boost (Buck), Backup, Battery Level, Battery Low, Load			
	Level, Battery Fault, UPS Fault			
Status on LED	Line Mode, Battery Mode & Fault			
Self-diagnostics	Upon Power On and Software Control			

Protection					
Overload	Line Mode	>100%-110% buzzer alarms only			
		>110%-120% for 10 min. and then shutdown			
		>120% shutdown after 1 cycle			
	Battery Mode	>100%-120% buzzer alarms only			
		>120%-130% shutdown after 10 sec.			
		>130% shutdown after 1 cycle			
Short Circuit	Line Mode	Resettable Breaker			
	Battery Mode	Electronic Circuit			
Battery Low		Alarm and Switch Off			
EPO		UPS shuts down immediately			
Battery		Electronic System of Management of Battery Discharge			
Heat Dissipation		96W	108W	192W	216W
Alarms					
Acoustics & display		Mains Fault, Low Battery, Overload and Fault conditions			
Mechanical					
Dimensions	mm	88H x 440W x 491D		88H x 440W x 701D	
	inches	3.5H x 17.3W x 19.3D		3.5H x 17.3W x 19.3D	
Input Connectors	120Vac	NEMA 5-15P		NEMA 5-20P	NEMA L5-30P
	230Vac	IEC-320-C14		IEC-320-C20	
Output Connectors	120Vac	(6) NEMA 5-15R		(4) NEMA 5-15R, (2) NEMA 5-20R	(4) NEMA 5-15R, (2) NEMA 5-20R, (1) NEMA L5-30R
	230Vac	(6) IEC-320-C13		(6) IEC-320-C13, (1) IEC-320-C19	
Net Weight	120Vac	25kgs (51lbs)	27.8kgs (61lbs)	41.8kgs (92lbs)	47.8kgs (105lbs)
	230Vac	25kgs (51lbs)	27.8kgs (61lbs)	42kgs (93lbs)	46.2kgs (102lbs)
Environment					
Operating Temperature		0 to 40°C (30 to 104°F)			
Warning Temperature		The battery design life is based on a temperature of 25°C (77°F)			
		Ambient temperature above this range will affect battery life			
Altitude		0-2000M up to 40°C (104°F); 0~3000M up to 35°C (77°F)			
Humidity		90% RH Maximum, No Condensing			
Noise		Line Mode: 40 dB Max; Bat. Mode: 45 dB Max.			
Computer Interface					
Interface Type		Standard RS232 and USB			
Communication Slot		Dry Contact Card or SNMP card			
Compatible Platforms		Windows 95/98/NT/2000/XP/Vista/Win7, Novell Netware, Linux, MAC			
Agency Compliance					
Quality		ISO 9001 certified manufacturing			
Security		EN62040-1-1, UL1778			
Performance		EN62040-3			
Standard EMC		EN62040-2, EN61000-3-2, FCC Class A			
Marking		CE, UL, cUL, FCC			

Continuity 1000-3000
Convertible Indoor On-line UPS Series

NEW

- Feature rich on-line UPS series with rack / tower convertible design with rotating LCD panel enabling easy integration into a wide variety of applications and locations
- Wide input power frequency and voltage window accommodates broad operating range for different working requirements
- Advanced digital control technology achieves higher reliability and greater immunity from utility power problems
- Emergency shutdown control through EPO complies with national safety regulations and local code
- Programmable receptacles enable flexible power backup
- Powerful built-in charger shortens battery charging time and extends runtime
- Hot swappable battery allows replacement without interruption to critical loads



Continuity Rack Configuration



Continuity Tower Configuration

Specifications

Models	Continuity 1000	Continuity 2000	Continuity 3000
Input			
Voltage Window	60~144Vac for 120V system		
Frequency	50/60+/-5% (Auto Sensing)		
Phase/Wire	Single, Line + Neutral + Ground		
Power Factor	>0.99 (Full Load)		
Output			
Voltage	100/110/115/120/127Vac		
Voltage Regulation	<±0.1% until low battery warning		
Capacity	1000VA/800W	2000VA/1600W	3000/2400W
Power Factor	0.8* Lagging		
Wave Form	Sine Wave, THD<3% (no load to full load)		
Frequency Stability	±0.1% unless synchronized to line		
Frequency Regulation	3Hz or 1Hz (Setting by software)		
Transfer Time	0 m sec		
Crest Factor	3:1		
Efficiency (AC to AC)	>85%		>88%
Autonomy (80% load)	7.9 mins		6.5 mins
DC Start	Yes		
Battery			
Type	Sealed Lead Acid Maintenance Free		
Capacity	7Ah		9Ah
Quantity	3	6	
Voltage	36Vdc	72Vdc	
Recharge Time	3 hours to 90%		
Built-in Charger (max. Charging Current)	1.8A	2.1A	2.7A

Display	
LED	Normal, Battery, Bypass, Programmable Outlet 1, Programmable Outlet 2, Self-Test, Battery Weak & Bad, Site Wiring Fault , Fault, Overload, and Load/Battery Level conditions.
Key	On button / Off button (Test / Alarm silence button)
Self-Diagnostics	Upon Power On and Software Control

Communication Slots	Relay contact board or SNMP card

Display		
LED		Normal, Battery, Bypass, Programmable Outlet 1, Programmable Outlet 2, Self-Test, Battery Weak & Bad, Site Wiring Fault , Fault, Overload, and Load/Battery Level conditions.
Key		On button / Off button (Test / Alarm silence button)
Self-Diagnostics		Upon Power On and Software Control
Protection		
Overload AC Mode & Backup Mode (delay before switching to bypass)		<105% continuously. >106%~120% for 30 seconds transfer to bypass >121%~150% for 10 seconds transfer to bypass >150% immediately transfer to bypass Buzzer continuously alarms
Bypass Mode		<105% continuously. >106%~120% for 250 seconds shut down >121%~130% for 125 seconds shut down >131%~135% for 50 seconds shut down >136%~145% for 20 seconds shut down >146%~148% for 5 seconds shut down >149%~157% for 2 seconds shut down >158%~176% for 1 seconds shut down >177%~187% for 0.32 seconds shut down >188% for 0.16 seconds shut down Buzzer continuously alarms
Short Circuit		Hold Whole System
Overheat		AC Mode: Switch to Bypass; Backup Mode: UPS shuts down immediately
Battery Low		Alarm and Switch Off
EPO		UPS shuts down immediately
Battery		Advanced Battery Discharge Management (ABDM)
Noise Suppression	115V System	400 Joules
	230V System	300 Joules

Models		**Continuity 1000**	**Continuity 2000**	**Continuity 3000**
Alarms				
Audible and Visual		Line Failure, Battery Low, Overload, System Fault Conditions		
Mechanical				
Dimensions	mm	440W x 88H x 405D	440W x 88H x 650D	
	inch	17.3W x 3.5H x 16D	17.3W x 3.5H x 25.6D	
Outlets 120Vac		6 x NEMA 5-15R	2x5-15R + 2 x 5-20R	4x5-15R + 1xL5-30R
Outlets 230Vac		6 x IEC320-C13		4 x IEC320-C13 1 x IEC320-C19
Net Weight		15.1kg (33.3lbs)	27.9kg (61.5lbs)	29.7kg (65.4lbs)
Environment				
Operating Temperature		0-40°C (32-104°F)**		
Altitude		0~2000m/6600ft up to 40°C (104°F), 3000m/9900ft up to 35°C (95°F)		
Humidity		90% RH Maximum, Non-Condensing		
Noise		<50dB (at 1 meter/3.3ft)		
Computer Interface				
Interface Type		Standard RS232 and USB		
Communication Slot		Dry Contact Card or SNMP card		
Agency Compliance				
Quality Assurance		ISO9001 Certified Company		
Safety Standard		EN62040-3 complied		
Performance		EN62040-3 complied		
EMC Standard		EN62040-2, EN61000-3-2, EN61000-3-3, FCC Class A		
Marks		CE, UL, cUL, FCC		

Battery Pack

Model		**BP Continuity 1000**	**BP Continuity 2000**	**BP Continuity 3000**
Battery Type		7Ah		9Ah
Maximum Quantity		12pcs		
Output Voltage		36Vdc	72Vdc	
Weight Without Batteries		8kg (17.7lbs)		
Weight With Batteries		38kg (83.7lbs)		
Dimensions	mm	88H x 440W x 650D		
	inch	3.5H x 17.3W x 25.6D		

*Based on load(%)- 0~33/33~66/66~100% respectively. ** Operation 0~3°C (54°F) if the power factor is at 0.8.Specifications are subject to change without prior notice.

Continuity 6K-10K
Indoor On-line UPS Series

NEW

- Feature rich on-line UPS series with superior output power factor, enabling energy efficient system performance
- Simple parallel installation simplifies the setup of N+1 redundant systems
- Up to 4 units working in parallel increases potential power output capacity
- Smart ECO mode allows automatic transfer to inverter supply, maximizing efficiency
- LCD / LED display panel provides user-friendly interface to UPS
- Emergency shutdown control through EPO complies with national safety regulations and local code
- Hot swappable battery allows replacement without interruption to critical loads



Continuity Rack Configuration



Continuity Tower Configuration

Specifications

Models	Continuity 6K	Continuity 10K
Input		
Voltage Window	160~280Vac	
Frequency	45-65Hz	
Phase/Wire	Single, Line + Ground	
Power Factor	Up to 0.99 at 100% Linear Load	
Current THD (100% linear load)	<7%	
Output		
Voltage Window	200/208/220/240Vac Selectable (208/120Vac optional)	
Voltage Adjustment	Nominal +1%, +2%, +3%, -1%, -2% or -3%	
Voltage Regulation	±1%	±2%
Capacity	6000VA/5400W	10000VA/9000W
Rated Power Factor	0.9 Lagging	0.9 Lagging
Wave Form	Sine Wave, THD<3% (no load to full load)	
Frequency Stability	±0.2% (Free Running)	
Frequency Regulation	±1Hz; ±3Hz	
Transfer Time	0ms	
Crest Factor	3:1	
Efficiency (AC to AC, Normal)	Up to 90%	
Efficiency (AC to AC, ECO)	Up to 95%	
Autonomy (80% load with 1 external battery pack)	7.1 mins	4.8 mins
DC Start	Yes	
Display		
Status On LED + LCD	Line Mode, Backup Mode, ECO Mode, Bypass Supply, Battery Low, Battery Bad/Disconnect, Overload, Transferring with interruption & UPS Fault.	
Readings on LCD	Input Voltage, Input Frequency, Output Voltage, Output Frequency, Load Percentage, Battery Voltage & Inner Temperature.	
Self-Diagnostics	Upon Power-on, Front Panel Setting & Software Control, 24-hour routine checking	

Alarms			
Audible and Visual		Line Failure, Battery Low, Transfer to Bypass, System Fault Conditions	
Protection			
Overload (w/simulated thermal tripping I-T Curve)		Inverter Supply: 105%~150% for 160 seconds ~ 2 cycles before switching bypass. Bypass Supply: 105%~200% for 500 seconds ~8 cycles before stopping supply load.	
Short Circuit		Switch off Immediately	
Overheat		AC Mode: Switch to Bypass Backup Mode: Switch off the UPS	
Battery Low		Alarm and Switch Off	
Noise Suppression		Complies with EN62040-2	
Spike Suppression		Complies with EN61000-4-5	
Heat Dissipation (At Full Linear Load)	Without Isolated Transformer Module	<450W	10K: <600W 10KP: <550W
	With Isolated Transformer Module	<615W	10K: <1100W 10KP: <1050W
Leakage Current		<3mA at Full Load	
Models		**Continuity 6K**	**Continuity 10K**
Mechanical			
Dimensions	mm	132H x 440W x 543D	132H x 440W x 680D
	inch	5.2H x 17.3W x 21.3D	5.2H x 17.3W x 26.8D
Input/Output Connection		Hardwire	
External Battery Connection		Plug-in & Play	
Net Weight		24kg (52.9lbs)	26.0kg (57.3lbs)
Environment			
Operating Temperature		0-40°C (32-104°F)	
Temperature Warning		The battery design life is based on a temperature of 25°C (77°F), Ambient temperature above this range will affect battery life	
Altitude		0~2000M/6600ft up to 40°C (104°F), 3000M/9900ft up to 35°C (95°F)	
Humidity		90% RH Maximum, Non-Condensing	
Noise		<50dB (at 1M/3.3ft)	
Computer Interface			
Interface Type		Standard RS232	
Communication Slot		2nd RS232, USB, RS485, Dry Contact Card or SNMP Card	
Agency Compliance			
Quality Assurance		ISO9001 Certified	
Safety Standard		EN62040-1-1, UL1778	
EMC Standard		EN62040-2, EN61000-3-2, EN61000-3-3, FCC Class A	
Marks		CE, cUL, UL	

Battery Pack

Model		**BP Continuity 6K**	**BP Continuity 6K**
Battery Type		7Ah	9Ah
Maximum Quantity		20pcs	
Output Voltage		240Vdc	
Weight Without Batteries		18.0kg (39.7lbs)	
Weight With Batteries		52kg (115lbs)	68.0kg (149.8lbs)
Dimensions	mm	132H x 440W x 680D	
	inch	5.2H x 17.3 x 26.8D	

Electrical Receptacles

Electrical receptacles, outlets and wall sockets are used in a variety of residential, general-purpose, commercial, industrial, laboratory and hospital applications. Several blade or pin types are available. Straight (non-locking) electrical receptacles are inserted at a right angle to the plane of the matching device face. By contrast, locking receptacles fix or lock a plug in place when the plug is inserted and then rotated. Electrical receptacles provide maximum voltage and maximum current ratings. Typically, devices are designed for either single-phase or three-phase power.

Below are diagrams to help identify plugs and receptacles for your electrical applications. Consult your Alpha representative for part numbers.

NEMA configurations for plugs and receptacles

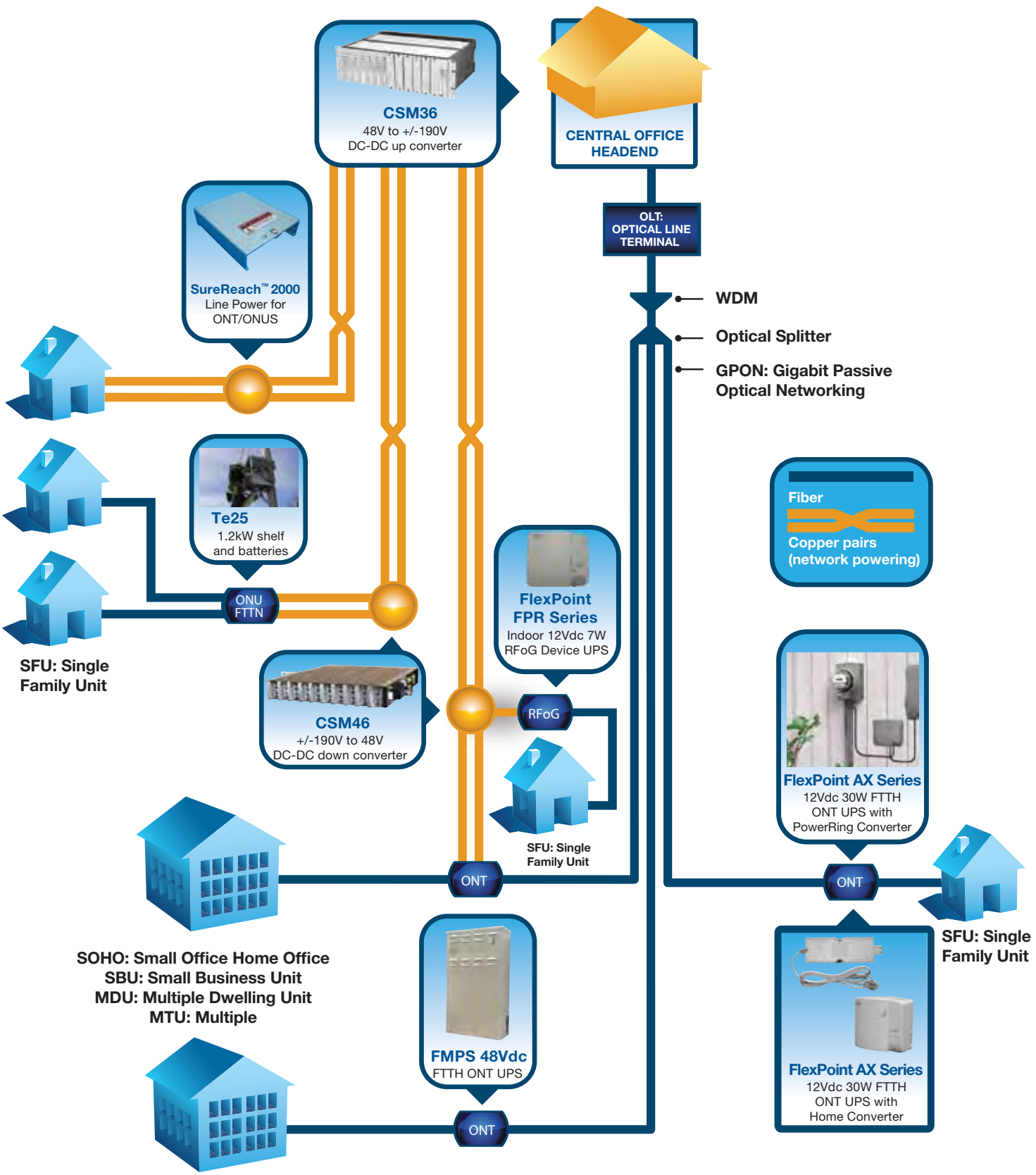
Non-locking plugs and receptacles	15 Ampere		20 Ampere		30 Ampere		50 Ampere	
	Receptacle	Plug	Receptacle	Plug	Receptacle	Plug	Receptacle	Plug
125V	 5-15R	 5-15P	 5-20R	 5-20P	 5-30R	 5-30P	 5-50R	 5-50P
For Canadian customers only	 5-20R	EEMAC Configuration						
250V	 6-15R	 6-15P	 6-20R	 6-20P	 6-30R	 6-30P	 6-50R	 6-50P
Alpha P/N	531-004-10	530-002-10	531-008-10	530-004-10	531-010-10	530-006-10	531-012-10	530-008-10
For Canadian customers only	 6-20R	EEMAC Configuration						

Locking plugs and receptacles	15 Ampere		20 Ampere		30 Ampere		50 Ampere	
	Receptacle	Plug	Receptacle	Plug	Receptacle	Plug	Receptacle	Plug
125V	 L5-15R	 L5-15P	 L5-20R	 L5-20P	 L5-30R	 L5-30P	  (Not NEMA config)	
250V	 L6-15R	 L6-15P	 L6-20R	 L6-20P	 L6-30R	 L6-30P	  (Not NEMA config)	
125V/250V	 L14-20R	 L14-20P						



Fiber Network Powering Solutions

Now available to over 20 million North American households, fiber is fast becoming the technology of choice for next-generation, high-speed access to Internet, video and emerging applications. Alpha offers a complete portfolio of fiber powering options with the FlexPoint™ line of 12Vdc single-family solutions (SFU) and the FlexNet line of 48Vdc multiple dwelling unit (MDU) and small office home office (SOHO) power supplies. All of Alpha'a powering solutions are engineered to perform reliably in the most demanding environmental conditions while optimizing battery life and performance.


CSM36
48V to +/-190V
DC-DC up converter
CENTRAL OFFICE
HEADEND
OLT:
OPTICAL LINE
TERMINAL
WDM
Optical Splitter
GPON: Gigabit Passive
Optical Networking
SureReach™ 2000
Line Power for
ONT/ONUS
Te25
1.2kW shelf
and batteries
ONU
FTTN
SFU: Single
Family Unit
CSM46
+/-190V to 48V
DC-DC down converter
FlexPoint
FPR Series
Indoor 12Vdc 7W
RFoG Device UPS
RFoG
Fiber
Copper pairs
(network powering)
FlexPoint AX Series
12Vdc 30W FTTH
ONT UPS with
PowerRing Converter
SFU: Single
Family Unit
ONT
ONT
SFU: Single
Family Unit
SOHO: Small Office Home Office
SBU: Small Business Unit
MDU: Multiple Dwelling Unit
MTU: Multiple
FMPS 48Vdc
FTTH ONT UPS
ONT
FlexPoint AX Series
12Vdc 30W FTTH
ONT UPS with
Home Converter

FlexNet™ MPS 48-7

MPS48-7F and MPS48-7T 50W 48Vdc Indoor/Outdoor UPS

NEW



FlexNet MPS 48-7

- Rugged 48Vdc 50W wall or pole mountable UPS
- LED local status indicators
- Local and remote status monitoring and reporting
- Temperature compensated battery charging for optimum battery life
- Optional battery heater provides extended runtimes in cold conditions
- MPS48-7F supports fiber-to-the-home applications including MDU, MTU and SBU ONT loads
- MPS48-7T supports critical network communication loads

FlexNet MPS48-7F P/N: 021-511-10-030
FlexNet MPS48-7T P/N: 021-511-10-040
Battery Heater Mat Kit for MPS48-7: 189-078-21

Electrical

AC input voltage: .....90 to 132, or 180 to 264Vac (switch selectable) or 250 to 305Vac with optional step-down transformer
AC input frequency: .....47 to 63Hz
Output power: .....50W continuous
Output voltage: .....42 to 56Vdc
Ripple: .....<250mVrms
Noise: ..... <2Vp-p

Performance / Features

Battery: .....Four x 7Ah Valve Regulated Lead Acid (VRLA (Batteries sold separately)

Mechanical

Dimensions:
mm:.....445H x 324Wx 133D
in:.....17.5H x 12.7W x 5.25D
Weight (without batteries): 4.9kg (11lbs)

Environmental

Operating Temperature:
with heater option: .....-40 to 55°C (-40 to 131 °F)
without heater option: ..... -20 to 55°C (-4 to 131 °F)
Storage Temperature: .....-50 to 70°C (-58 to 158 °F)
Humidity: .....0 to 95%
Altitude: .....Up to 10000ft (3048M) with ambient de-rating Above 6000ft (1828.8m), 2°C/1000ft (304.8m)

Agency Compliance

- FCC/GR1089 Class B, CSA-NRTL\C (CSA60950), CE, C-Tic,
- RoHS compliant per European Union's Directive
- 2002/95/EC, Restrictions of Hazardous Substances
- Seismic Zone 4 rated per GR-63
- Complies with IPx5 water intrusion criteria per IEC 60529 standard

FlexNet™ FMPS
Multipurpose Power Supply

- 150W Fibre-to-the-premise UPS for multiple dwelling, multiple tenant and small business unit applications
- Supports one or two MDU/SBU ONTs located up to 100ft from FMPS
- Battery management performs periodic battery capacity testing and status reporting to the ONT and customer
- Built-in battery heater provides extended runtime for applications in cold winter conditions
- Hybrid 16AWG and alarm cable minimizes installation labor
- Status indicators and audible alarm provide local status
- Option for dry contact and Packet Cable compliant telemetry connections to ONT and MTA



FlexNet FMPS

FlexNet FMPS, 120V Line cord, 150W, 48Vdc out, -40°C (-40°F) P/N: 010-592-20-050

FlexNet FMPS, FTTX Multipurpose PS, 120V line cord, -40°C (-40°F) P/N: 010-592-20-053

Dry contact alarm extension kit for 4 x MTA loads: 0370016-001

Alarm relay kit for ONT loads: 0370037-001

Electrical

AC input voltage: ..... 90 to 320Vac
AC input frequency: ..... 45 to 66Hz
Surge protection: ..... ANSI/IEEE Std. C62.41 to Category A, B, or C requirements, using a "Ring Wave" or "Combination" waveform, at a level of 6kV
Operational
Output power: ..... 150W continuous - 170W, 10 sec max.
Output voltage: ..... 48 to 58Vdc w/AC power
42 to 58Vdc with battery
Output current: ..... 3.1A typical (crowbar limited beyond 5A DC)
Output power loading: ..... Following GR-909 telephone lines in various states, e.g., ringing, off-hook, on-hook, data, and video operation requirements.
Ripple: ..... Less than 3mVrms
Noise: ..... Less than 100mVp-p
Output connection: ..... Two terminal blocks accepting 16AWG, parallel connections

Performance / Features

Battery: ..... Four or eight 7.2Ah or 8Ah valve regulated lead acid (VRLA) (batteries sold separately)

Mechanical

FMPS
Dimensions:
in: ..... 14W x 23.75H x 5.5D
cm: ..... 35.6W x 60.3H x 14D
Weight: 11.3kg (25lbs)

FMPS + shipping carton
Dimensions:
in: ..... 17W x 28.5H x 11.75D
cm: ..... 35.6W x 60.3H x 14D
Weight: 13.6kg (30lbs)

Environmental

Operating:
Temperature: ..... -40 to 46°C (-40 to 115°F) plus solar loading
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... 0 to 10000ft (0 to 3000m) elevation
Storage:
Temperature: ..... -15 to 85°C (-5 to 185°F) plus solar loading
Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... 0 to 50000ft (0 to 15000m)

User Interface

Local Alarms
System LED: ..... Green steady = system output normal, DC output
Off = no AC or battery power
Battery LED: ..... Yellow steady = system on battery
Off = normal mode
Replace battery: ..... Red steady = replace one or two battery strings
Off = batteries within parameters
Replace battery A&B (internal): ..... Red steady = replace one or both battery strings
Off = batteries within parameters

Remote Alarms
Connection: ..... Two five position IDC 24AWG, parallel connections
Pin 1 alarm return: ..... Open collector return reference
Pin 2 AC fail: ..... On battery
Pin 3 replace battery: ..... One or both battery strings failed periodic self test
Pin 4 missing battery: ..... Less than eight batteries
Pin 5 battery low: ..... Battery string voltage is less than 46.8Vdc

Local - Audible Indicator
Alarm on: ..... "Alarm Enable/Disable" toggle switch located on UPS
Batteries below voltage parameters

Agency Compliance

CSA/UL 60950, EN 60950, EN 55022 class B, FCC part 15 class B, GR-63 Sect 4.2 fire resistance, GR-1089 Sect 3 emissions, Sect 4 lightning and AC power fault, Sect 7 electrical safety, CE, C-Tick, RoHS 5 of 6

FlexNet™ ELPM-300

Element Powering - 48Vdc 300W UPS

NEW



FlexNet ELPM-300

- Rugged 48Vdc UPS for outdoor or indoor applications
- Power modules can be used in a variety of Alpha enclosures
- Temperature compensated battery charging for extended battery life
- Visual and electrical indicators for on-site and remote reporting
- Flexible cabinet mounting options – wall, pole or pedestal mount

ELPM 300-48 56V Maximum output
P/N : 010-322-22

Electrical

AC input voltage:.....85 to 170Vac or 132 to 264Vac selectable
AC input frequency:.....50 or 60Hz
Surge protection: .....IEEE Std C62.41-1991 level C
Output power (max.): 300W
Output voltage:.....48Vdc (42 to 54Vdc)
Ripple (DC): 500mVrms
Transfer Characteristics:...Uninterrupted output

Performance / Features

Battery:.....4 x 50AH (85GXL) VRLA Gel batteries
(sold separately)
Battery Charging:.....Temperature compensated
Backup Time Approx.:.....8hrs @ 270W load
Reverse Battery Polarity Protection

Mechanical

Dimensions:
mm:.....152H x 256.5Wx 82.6D
in:.....6H x 10.1W x 3.25D
Weight: 4.5kg (10lbs)
Mounting: .....Bracket mounted inside enclosure

Environmental

Operating Temperature: ...-40° to 65°C / -40° to 149°F
Storage Temperature:.....-50° to 70°C / -58° to 158°F
Humidity: .....0 to 95% non-condensing

User Interface

LED Indicators
Green: .....Output
Green blinking:.....Standby
Red blinking: .....Low/missing battery
Red:.....Replace battery
Alarm Indicators
AC FAIL (TELM 1)
Replace Battery (TELM 2)
Battery Missing (TELM 3)
Battery Low (TELM 4)

Note: Compliant with PacketCable™ UPS specifications
Embedded MTA Primary Line Support specifications

Agency Compliance

FCC part 15 Class B
CSA–NRTL\C (CSA950)

FlexNet™ ELPM-300 in Alpha Enclosures
LPE and PMR/GMR Series



FlexNet ELPM-300 in LPE Enclosure

- Rugged 48Vdc UPS for outdoor or indoor applications
- Power modules can be used in a variety of Alpha enclosures
- Temperature compensated battery charging for extended battery life
- Visual and electrical indicators for on-site and remote reporting
- Flexible cabinet mounting options – wall, pole or pedestal mount

Consult your Alpha representative for P/N configurations

LPE Enclosure Specifications

Enclosure Dimensions:
mm.....661H x 420W x 305D
in.....26H x 16.5W x 12D
Enclosure Weight: 11.3kgs (25lbs)
Material:.....Exterior Powdercoated aluminum
Number of Batteries: .....4 x 12Vdc 17Ah VRLA batteries
Door and Lid Seal: .....Poron gasketing
Approx. Backup Time:.....4 Hours at 250W load

PMR and GMR Enclosures Specifications

PMR-S1 Dimensions:
mm.....818H x 660W x 489D
in.....32.2H x 26W x 19.25D
Weight: 18kg (40lbs)

GMR-S1 Dimensions:
mm.....787Hx 699W x 508D
in.....31H x 27.5W x 20D
Weight: 22kg (49lbs)

PMR-S2 Dimensions:
mm .....940H x 762W x 489D
in.....37H x 30W x 19.25D
Weight: 21kg (47lbs)

GMR-S2 Dimensions:
mm .....965H x 787W x 508D
in.....38H x 31W x 20D
Weight: 29kg (63lbs)

Number of Batteries: .....4 x 12Vdc 50Ah (85GXL) batteries
Approx. Backup Time:.....8 Hours at 275W load
Enclosure Mounting
and Door - PMR Series:.....Galvanized steel brackets for wood, and concrete pole mount and wall mount
Enclosure Mounting
and Door - GMR Series: ....Precast polymer concrete pad or PS-6/PS-6XL pedestal systems
Fiber Strain Relief
Tie Bar Optional: .....19" mounting provides ability to strain relief fiber cable plugged into the front of communications equipment
Splice Tray:.....Splice Tray Kit (12 count), includes Splice tray with Elastomer Splice Block, Felt Tape, Tie Wraps, Cover and Recording Label
Fiber Management
Panel: .....Provides fiber slack storage and secures a splice tray using a Velcro strap. Tie wrap slots on sides permit securing fiber cables to panel

FlexPoint™ AX Series
FTTP ONT UPS System


FlexPoint AX series

- Scalable FTTP/FTTx power supply systems with or without standby
- Full or partial outdoor configurations
- Outdoor rated including battery for 24/7 availability
- Utility meter base provides most reliable source of AC power at home
- No homeowner appointments needed for access and maintenance
- Safe, low-voltage distribution
- 30W with battery module, 24W without battery module

Consult your Alpha representative for P/N configurations

Electrical

AC input voltage
AX30-12D-HC: .....85 to 132Vac (120Vac nominal)
AX-30-12D-PC:.....170 to 264Vac (230Vac nominal)
AC input frequency:.....50 to 60Hz
Note: International AC selections and line cords available.

DC output voltage
PC/HC + BBPS (UPS system): ....10.5 to 14.4Vdc
PC/HC (non UPS): 11.6Vdc

Continuous output power
PC/HC + BBPS (UPS system): ....30W at nominal battery float voltage
PC/HC (non UPS): 24W
Max output power:
UPS system: .....(<10s) 45W
Non UPS: .....2.4A current limit (HC/PC)
Short circuit protection: .....Electronic
DC ripple: 150mV

Performance / Features

Battery:.....Maintenance-free, leak-proof, sealed VRLA (valve regulated lead acid)
Recharge time:
AX-12D-BBPS-7.2: .....<16hrs with 24W
AX-12D-BBPS-17 load: .....<36hrs with 24W load

Environmental

Operating temperature range
AX-30-12D-PC + BBPS:.....-40 to 65°C (-40 to 149°F)
AX-30-12D-HC + BBPS:
HC: .....-40 to 45°C (-40 to 113°F)
BBPS:.....-40 to 65°C (-40 to 149°F)
AX-30-12D-HC: .....-40 to 45°C (-40 to 113°F)
Humidity: .....0 to 95% RH non-condensing
Battery storage: .....-15 to 65°C (5 to 149°F) 0 to 95% humidity
Elevation:
Operation max:.....10000ft (3000m)
Storage max: 50000ft (15000m)

User Interface

Status Alarms
Local (LED indicators):
Green steady:..... Output OK
Green blinking: ..... Standby operation
Red steady: ..... Replace battery
Red blinking: ..... Battery missing/battery low

Remote (Status Alarms – PacketCable Compliant):
AC fail: ..... Output power drawn from battery
Replace battery:..... Battery has failed periodic self-test
Battery missing:..... Battery is disconnected
Battery low:..... Battery has 20% remaining runtime

Agency Compliance

Home converter: ..... UL-listed system, FCC part 15, Class B, EN55022, class B
Power ring: ..... UL-recognized components
Power ring converter:..... UL-recognized components
BBPS modules: ..... CSA

FlexPoint UPS runtimes (mins) over temperature

7.2Ah			
Load/Temp	-40°C/-40°F	-20°C/-4°F	25°C/ 77°F
7W	360	560	800
10W	160	360	500
15W	110	195	320
18W	80	156	240
20W	60	130	210
25W	50	100	170
30W	30	80	130
17Ah			
Load/Temp.	-40°C/-40°F	20°C/-4°F	25°C/ 77°F
10W	750	1080	1240
15W	400	680	940
20W	60	440	680
25W	160	340	480
30W	140	232	400

Module Descriptions



Power-Ring

Compatible with ring and ringless style meter sockets and provides a receiving socket for the FlexPoint AC to DC Power-Ring converter module. Depending on the model, the Power-Ring can tap the AC power before or after the meter and comes supplied with a blanking plate.

200A continuous, 240A rated

- AX-POWER-RING-A (power tap after meter) — P/N: 021-053-021
- AX-POWER-RING-B (power tap before meter) — P/N: 021-053-020

320A Continuous, 400A Rated

- AX-400ARING-A (power tap after meter) — P/N: 021-053-030
- AX-400ARING-B (power tap before meter) — P/N: 021-053-031

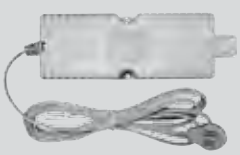
Dimensions:
mm: ..... 120H x 178Dia
in: ..... 4.75H x 7.0Dia
Weight: 0.68kg (1.5lbs)



Power-Ring Converter

Contains highly-reliable environmentally-hardened 240Vac to 12Vdc converter circuitry in a pluggable housing. Outputs 24W and 11.6Vdc as a stand-alone module, or supports 30W and 11.6 to 16Vdc battery backup power supply (BBPS) module output.

AX30-12D-PC — P/N: 010-318-034
Dimensions:
mm: ..... 209H x 51W x 51D
in: ..... 8.0H x 2.0W x 2.0D
Weight: 0.32kg (0.7lbs)

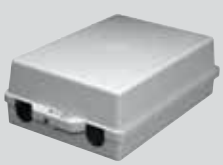


Home Converter

Contains highly-reliable environmentally-hardened 120Vac to 12Vdc converter circuitry in a wall mount housing. Comes with a two-conductor AC line cord and should be mounted in locations sheltered from rain or snow. Outputs 24W and 11.6Vdc as a stand-alone module or supports 30W and 11.6 to 16Vdc battery backup power supply (BBPS) module output.

AX30-12D-HC — P/N: 010-318-39
Dimensions:
mm: ..... 209H x 70W x 38D
in: ..... 8.25H x 2.75W x 1.5D
Weight: 0.32kg (0.7lbs)



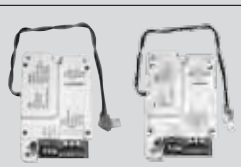


Battery Modules

The Battery Backup Power Supply (BBPS) module outputs 30W of continuous power and includes a microprocessor-based battery charge management system providing the correct charge voltage to the battery over a wide temperature range, while performing periodic battery capacity testing and status reporting to the ONT and customer. The onboard battery heater provides extended standby runtimes in cold conditions to -40˚C (-40˚F). The 7.2Ah battery model provides standard runtimes and the 17Ah model provides extended runtimes.

AX-12D-BBPS-7.2 — P/N: 031-264-021
Dimensions:
mm: ..... 203H x 230W x 102D
in: ..... 8.0H x 9.0W x 4.0D
Weight: ..... .68kg (1.5lbs)

AX-12D-BBPS-17 — P/N: 031-192-031
Dimensions:
mm: ..... 355H x 241W x 127D
in: ..... 14H x 9.5W x 5.0D
Weight: 2.04kg (4.5lbs)



The UPS Modules

Provides the network operator the capability to place the battery management element inside other enclosures located at the subscriber's home. UPS modules contain the same electronics used in the AX-12D-BBPS products without the battery heater and are to be used with FlexPoint Home converter and Power-Ring converter.

AX-12D-7.2Ah (for 7.2Ah battery) — P/N: 745-816-023
AX-12D-17Ah (for 17Ah battery) — P/N: 745-816-022



Batteries

The FlexPoint AX battery modules use valve regulated lead acid (VRLA) AGM batteries.

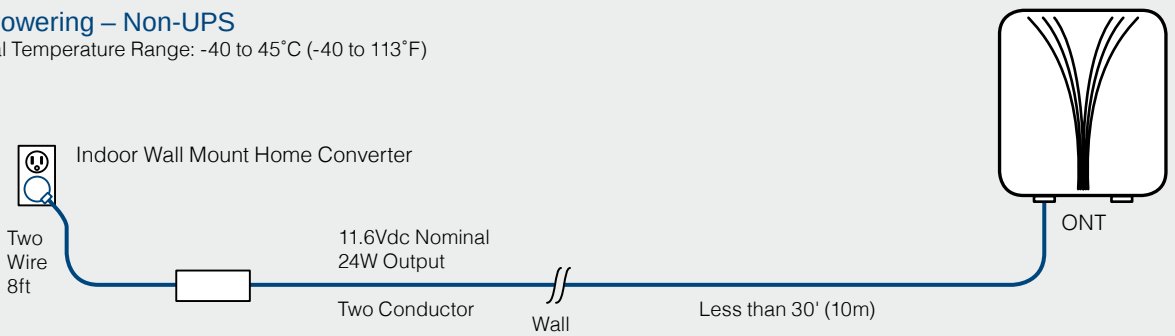
7Ah Standard-life battery, 1-year warranty P/N: 1810007
Weight: 2.4kg (5.29lbs)

7Ah Long-life battery with wide temperature range, 3-year warranty, P/N: 1810063
Weight: 5.5kg (12.130lbs)

Applications

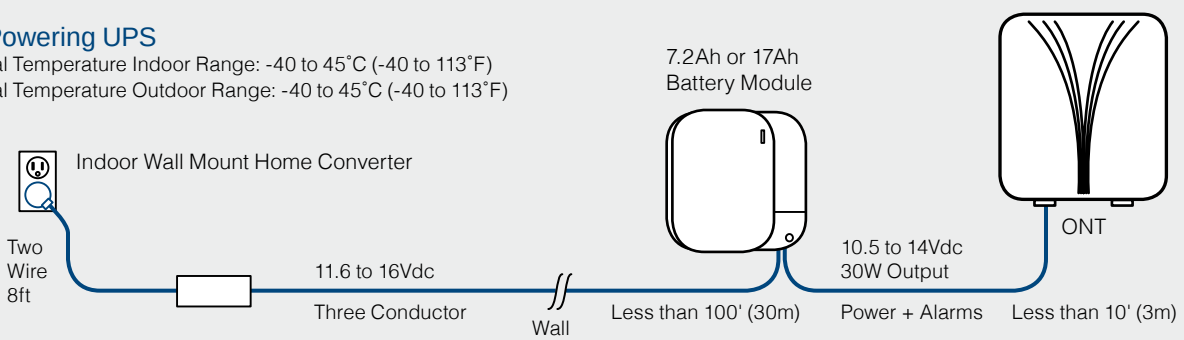
Indoor Powering – Non-UPS

Operational Temperature Range: -40 to 45˚C (-40 to 113˚F)



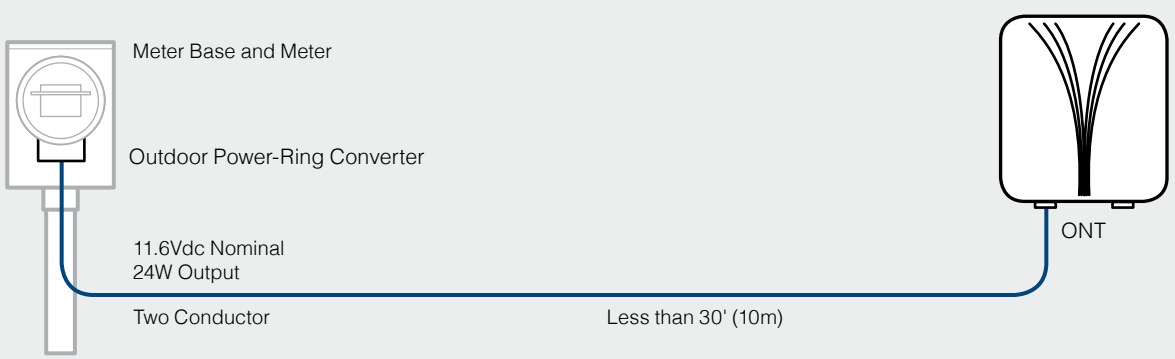
Indoor Powering UPS

Operational Temperature Indoor Range: -40 to 45˚C (-40 to 113˚F)
Operational Temperature Outdoor Range: -40 to 45˚C (-40 to 113˚F)



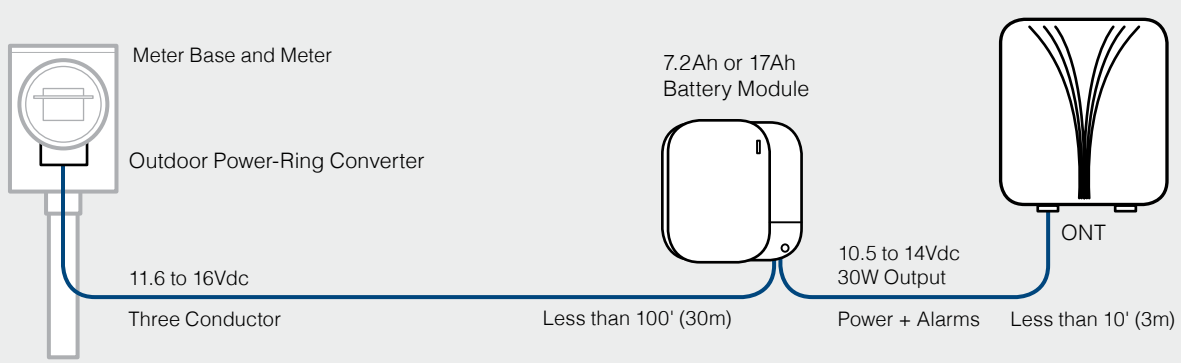
Outdoor Powering – Non-UPS

Operational Temperature Range: -40 to 45˚C (-40 to 113˚F)



Outdoor Powering UPS

Operational Temperature Range: -40 to 45˚C (-40 to 113˚F)




CXCM1
AIV
MODEM
RST
cordex
HIGH PERFORMANCE
CXRF 48-1 24V



Controllers and Communications

Whether it's a UPS being programmed for time of day operation at an intersection or a rectifier plant being monitored remotely via SNMP at a Network Operations Center, Alpha offers a wide array of feature-rich controllers and communications options. The industry-leading Cordex™ Controller logic is the intelligence behind our modular systems through the Cordex™ controllers and is integrated into our FXM family of Uninterruptable Power Supplies.

Alpha's controller software offers an outstanding combination of advanced features and reliability. Developed with the end-user in mind, our local and remote controller interfaces present critical information clearly and consistently; whether it's data logging, event monitoring or fault reporting.

Controllers

The Cordex™ CXC is Alpha's latest generation of advanced digital controllers for power system monitoring and control. Cordex™ supervisory controllers come in a wide array of modular designs for integration into compact Alpha power systems. Stand-alone rack mount versions are also available for DC systems and legacy controller upgrades.

A graphic LCD display with touch-screen interface allows simple and convenient set up, control and monitoring of Cordex™ rectifiers. Simple Network Management Protocol (SNMP) based Internet communication and built-in web servers allow complete configuration and monitoring from any location via the Internet using a standard web browser. Events and alarms can be sent to portable devices such as pagers and smart phones.

Cordex™ CXC controllers come standard with several advanced battery management features to allow for significant savings of energy and operational expenses.

Additional features include user definable alarms with custom algorithms, digital and/or analog input monitoring and data logging. Software upgrades are easily downloaded from Alpha's website for local or remote upload to the controller.

Alpha's CXC family of controllers communicate to other power devices in the system via the highly robust Controller Area Network (CAN) protocol, ensuring the reliable operation of all of your power solutions.

General

- **Web based GUI interface:** Web browser support for local or remote control and monitoring of power system
- **Single point setup and control**
- **Auto voltage adjustment and load sharing**
- **Analog and digital inputs**
- **Configurable form C relay outputs**
- **Multiple preset alarms:** Ability to configure up to 20 customized alarms
- **User programmable logic statements:** Create an event or alarm based on criteria you define
- **Legacy power system upgrade:** Controls legacy Pathfinder based systems and can be used as a site monitor for any Alpha or 3rd party DC power system
- **CAN communications:** Common platform for Alpha power electronics and peripherals, rugged and field proven protocol
- **Fail safe system operation:** In the event of CXC failure, rectifiers continue to run with default settings, fail alarm generated, and LVD's (if equipped) remain energized
- **Power save function:** Improves operational efficiency by running minimum number of rectifier modules required depending on system load
- **System start delay:** Allows delay for other AC powered equipment to start before rectifiers
- **Ramp test control:** Disables fail alarm on no-load conditions
- **SNMP support:** Network management service support for managing multiple systems in a single network
- **Email notifications:** Via TCP/IP
- **Cordex™ peripheral support:** Optional add-on's for individual cell and temperature monitoring and for expanding controller I/O
- **Multi language support:** Including Chinese characters

Battery Management

- **Temperature compensated float voltage:** Increases voltage with temperatures below 25°C (77°F) and decreases charge voltage above 25°C (77°F), maximizes life and capacity of battery and prevents thermal runway
- **Battery equalize:** Manual, automatic and periodic equalize charge modes, optional Battery Current Terminate function to prevent over charging of battery
- **Battery boost mode:** Offline high-voltage equalize charge with interlock safety feature
- **Dynamic charge current control:** Limits battery recharge current to a fixed value, helps to prevent thermal runway
- **Battery test:** Sets rectifier voltage low and performs safe discharge of batteries through the connected system loads
- **Battery capacity prediction:** Calculates current battery capacity after a discharge
- **Battery runtime estimate:** Based on current battery capacity and system load
- **Battery logging:** Retain up to 40 records of battery statistics and events

Maintenance

- **Data logger:** Record any system input(s), and set sample rate or record on deviation. Store up to 500 events via manual or auto start/stop
    - Typical data log applications: Detailed battery discharge info, AC voltage watch dog, outdoor cabinet thermal performance
- **Easy remote software upgrades:** Fail-safe protected upgrades for controllers, rectifiers and peripherals

Cordex™ CXCI
System Controller

- Integrated package with small footprint for various 2RU rectifier shelves
- Internet ready and remotely accessible for complete system monitoring and control
- Integrated SNMP functionality for cost effective multiple site monitoring
- Advanced battery monitoring and power save features for OPEX savings and reduced carbon footprint
- Highly configurable platform with user definable alarms and data logging



CXCI

P/N: Integrated option on 1.8kW, 650W, 400W, 250W shelves

Electrical

Input voltage:..... 17 to 65Vdc
Current:..... <100mA @ 48Vdc or < 200mA @ 24Vdc

Performance / Features

Display:.....4 segment LCD for V/I display
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

Communication ports:.....RJ45 ethernet port (front)
RS232 modem port (front)

System I/O:
Alarm relays:.....4 (3+1 internal on some models)
Voltage inputs:.....1 + 1 internal
Temperature inputs: 2
Current inputs:.....1 (0+1 internal on some models)
Digital inputs:.....2

Mechanical

Dimensions:
mm:.....88H x 26W x 280D
inch:.....3.5H x 1W x 11D
Mounting:..... Integrated on Cordex™ 2RU series 19" & 23" shelves

Environmental

Temperature:..... -40 to 65°C (-40 to 149°F)
Humidity:..... 0 to 95% RH non-condensing

Agency Compliance

Safety:.....CSA C22.2 No 60950-1-03
CE marked

Cordex™ CXCM
System Controller



CXCM

- Modular, hot swappable controller for use with 1kW rectifier platform
- Internet ready and remotely accessible for complete system monitoring and control
- Integrated SNMP functionality for cost effective multiple site monitoring
- Advanced battery monitoring and power save features for OPEX savings
- Highly configurable platform with user definable alarms and data logging

P/N: 018-557-20

Electrical

Input voltage: ..... 17 to 65Vdc
Current: ..... <100mA @ 48Vdc or < 200mA @ 24Vdc

Performance / Features

Display:..... LCD touchscreen display (160 x 160 pixels)
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

Communication ports:..... RJ45 ethernet port (front accessible rear port)
RS232 craft port (front)
RS232 modem port (optional)

Controller I/O:
- Voltage inputs:..... 1+1 internal
- Temperature inputs: 2
- Current inputs:..... 1
- Digital inputs:..... 3 (2+1 internal on some models)
- Relay alarm:..... 8
- Bi voltage inputs:..... 1

Mechanical

Mounting: ..... Modular controller for 1kW rectifier shelves

Dimensions:
- mm:..... 177H x 74W x 255D
- inches:..... 6.9H x 2.9W x 10D

Weight: 1.8kg (3.9lbs)

Environmental

Temperature:
- Extended: ..... -40 to 65°C (-40 to 149°F)
- Humidity: ..... 0 to 95% RH non-condensing

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1-03
CE marked

EMC: ..... ETSI 300 386

Emissions:..... CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)

Immunity:..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6

Cordex™ CXCM1
System Controller



CXCM1

- Modular, hot swappable controller for use with HP 1.2kW rectifier platform
- Internet ready and remotely accessible for complete system monitoring and control
- Integrated SNMP functionality for cost effective multiple site monitoring
- Advanced battery monitoring and power save features for Op-Ex savings
- Highly configurable platform with user definable alarms and data logging

P/N: 018-598-20

Electrical

Input voltage: .....17 to 65Vdc
Current: .....<100mA @ 48Vdc or < 200mA @ 24Vdc
Cordex™ CXCI
System Controller

Performance / Features

Display:.....4 segment LCD for V/I display
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

Communication ports:.....RJ45 ethernet port (front)
RS232 modem port (front)

System I/O:
Alarm relays:.....4 (3+1 internal on some models)
Voltage inputs:.....1+1 internal
Current inputs:.....1 (0+1 internal on some models)
Temperature inputs:.....2
Digital inputs:.....2

Mechanical

Mounting: .....Modular controller for 1.2kW shelves.
Horizontal and vertical mounting configurations available (consult factory)

Dimensions:
mm:.....44H x 88W x 318D
inches:.....1.73H x 3.5W x 12.5D
weight:.....1.8kg (3.9 lbs)

Environmental

Temperature:.....-40 to 65°C (-40 to 149°F)
Humidity: .....0 to 95% RH non-condensing

Agency Compliance

Safety:.....CSA C22.2 No 60950-1-03
CE marked

Cordex™ CXCM2
System Controller



CXCM2

- Modular, hot swappable site controller for use with 1.8kW and 2kW rectifier platforms
- Internet ready and remotely accessible for complete system monitoring and control
- Integrated SNMP functionality for cost effective multiple site monitoring
- Advanced battery monitoring and power save features for Op-Ex savings
- Highly configurable platform with user definable alarms and data logging

P/N: 018-573-20

Electrical

Input voltage: .....17 to 65Vdc
Current: .....<100mA @ 48Vdc or < 200mA @ 24Vdc

Performance / Features

Display:.....LCD touchscreen display (160x160 pixels)
"OK / Major / Minor" 3-color, LED display
Web based GUI via Ethernet

Communication ports:.....RJ45 ethernet port (front)

Controller I/O:
Voltage inputs:.....1+1 internal
Current inputs:.....2
Temperature inputs: 2
Digital inputs:.....6
Relay:.....6

Mechanical

Dimensions:
mm:.....96.4H x 128W x 247D
inches: .....3.4H x 5W x 9.7D
Mounting: .....Modular controller for 1.8kW shelves

Environmental

Temperature:.....-40 to 65°C (-40 to 149°F)
Humidity: .....0 to 95% RH non-condensing

Agency Compliance

Safety: .....CSA C22.2 No 60950-1-03
CE marked

EMC: .....ETSI 300 386

Emissions:.....CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)

Immunity:.....EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6

Cordex™ CXCM4
System Controller



CXCM4

- Modular, hot swappable controller for use with 3.1kW and 3.6kW rectifier platforms
- Internet ready and remotely accessible for complete system monitoring and control
- Integrated SNMP functionality for cost effective multiple site monitoring
- Advanced battery monitoring and power save features for OPEX savings
- Highly configurable platform with user definable alarms and data logging

P/N: 018-574-20

Electrical

Input voltage: ..... 17 to 65Vdc
Current: ..... <100mA @ 48Vdc or < 200mA @ 24Vdc

Performance / Features

Display:..... LCD touchscreen display (160 x 160 pixels)
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

Communication ports:..... RJ45 ethernet port
RS232 craft port (front)

Controller I/O:
- Voltage inputs:..... 1+1 internal
- Current inputs:..... 4
- Temperature inputs: 2
- Digital inputs:..... 4
- Bi voltage inputs:..... 2
- Relay outputs:..... 8

Mechanical

Dimensions:
- mm:..... 177H x 87W x 257D
- inches: ..... 7.0H x 3.4W x 10.1D

Weight: 1.8kg (3.9lbs)
Mounting: ..... Modular controller for 3.1kW and 3.6kW shelves

Environmental

Temperature:
- Extended: ..... -40 to 65°C (-40 to 149°F)
- Humidity: ..... 0 to 95% RH non-condensing

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1-03
CE marked

EMC: ..... ETSI 300 386

Emissions:..... CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)

Immunity:..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6

Cordex™ CXCR/CXCP
System Controller



CXCR Rack Mount Controller

- Flexible rack and panel mount controller for use with all Cordex™ rectifier platforms
- Internet ready and remotely accessible for complete system monitoring and control
- Integrated SNMP functionality for cost effective multiple site monitoring
- Advanced battery monitoring and power save features for OPEX savings
- Highly configurable platform with user definable alarms and data logging

P/N: 018-557-20

Electrical

Input voltage: ..... 17 to 65Vdc
Current: <100mA @ 48Vdc or < 200mA @ 24Vdc

Performance / Features

Display:..... LCD touchscreen display (160 x 160 pixels)
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

Communication ports:..... RJ45 ethernet port (front accessible rear port)
RS232 craft port (front)
RS232 modem port (optional)

Controller I/O:
- Voltage inputs:..... 2
- Current inputs:..... 4
- Temperature inputs: 2
- Digital inputs:..... 8
- Bi voltage inputs:..... 2
- Relay outputs:..... 8

Mechanical

Mounting: ..... CXCR with 19" or 23" rack mounting
CXCP panel mount

CXCP/R (excludes mounting brackets)
Dimensions:
- mm:..... 131H x 431W x 100D
- inches:..... 5.1H x 16.9W x 3.9D

Weight:..... 6.2kg (13.8lbs)

Environmental

Temperature:
- Extended:..... -40 to 65°C (-40 to 149°F)
- Humidity:..... 0 to 95% RH non-condensing

Agency Compliance

Safety:..... CSA C22.2 No 60950-1-03
CE marked

EMC: ..... ETSI 300 386

Emissions:..... CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)

Immunity:..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6

Cordex™ CXCR 125/220V
System Controller



CXCR 125/220V
Rack Mount Controller

- Flexible rack mount controller for use with 125/220Vdc Cordex™ rectifier platforms
- Internet ready and remotely accessible for complete system monitoring and control
- Integrated SNMP functionality for cost effective multiple site monitoring
- Advanced battery monitoring and power save features for OPEX savings
- Highly configurable platform with user definable alarms and data logging

P/N: 018-570-20

Electrical

Input voltage: ..... 17 to 65Vdc
Current: <100mA @ 48Vdc or < 200mA @ 24Vdc

Performance / Features

Display:..... LCD touchscreen display (160 x 160 pixels)
"OK / Major / Minor" 3-color, LED display
Web based GUI via ethernet

Communication ports:..... RJ45 ethernet port (front accessible rear port)
RS232 craft port (front)
RS232 modem port (optional)

Controller I/O:
Voltage inputs:..... 1
Current inputs:..... 1 shunt +1 hall effect
Temperature inputs: 2
Digital inputs:..... 4
Bi voltage inputs:..... 4
Relay outputs:..... 8

Mechanical

Mounting: ..... 19" or 23" rack mounting

CXCR 125/220V (excludes mounting brackets)
Dimensions:
mm:..... 131H x 431W x 100D
inches:..... 5.1H x 16.9W x 3.9D
Weight:..... 6.2kg (13.8lbs)

Environmental

Temperature:
Extended:..... -40 to 65°C (-40 to 149°F)
Humidity: ..... 0 to 95% RH non-condensing

Agency Compliance

Safety:..... CSA C22.2 No 60950-1-03
CE marked

EMC: ..... ETSI 300 386

Emissions:..... CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)

Immunity:..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6

Model	CXCM	CXCM1	CXCM2	CXCM4
Specifications				
Screen	Full graphic LCD 160 x 160 pixels	Basic current / Volts display only	Full graphic LCD 160 x 160 pixels	Full graphic LCD 160 x 160 pixels
Inputs				
Analog	2V, 2T, 1C, 1BIV	1V, 1C, 2T	1V, 2T, 2C, 4BIV	2V, 2T, 4C, 2BIV
Digital	3	2	6	4
Alarm relay outputs	8 Form C	4 Form C	6 Form C	8 Form C
Dimensions				
mm	177H x 74W x 255D	41.4H x 84.4W x 256.8D	86.4H x 128W x 247D	177H x 87W x 257D
inches	6.9H x 2.9W x 10D	1.63H x 334W x 10.11D	3.4H x 5W x 9.7D	7H x 3.4W x 10.1D

Model	CXCI	CXCR/CXCP	CXCR HV
Specifications			
Screen	Basic current / Volts display only	Full graphic LCD 160 x 160 pixels	Full graphic LCD 160 x 160 pixels
Inputs			
Analog	1V, 1C, 2T	2V, 2T, 4C, 2BIV	1V, 2T, 1C, 4BIV, 1GFI
Digital	2	8	4
Alarm relay outputs	4 Form C	8 Form C	8 Form C
Dimensions			
mm	88H x 26W x 280D	131H x 431W x 100D	131H x 431W x 100D
inches	3.5H x 1W x 11D	5.1H x 16.9W x 3.9D	5.1H x 16.9W x 3.9D

Rectifier shelf option availability							
Model	CXCM	CXCM1	CXCM2	CXCM4	CXCI	CXCR/CXCP	CXCR HV
250W (12Vdc)					Yes		
400W (24Vdc)					Yes		
650W (48Vdc)					Yes		
1kW (48Vdc)	Yes					Yes	
1.2kW (48Vdc)		Yes					
1.8kW/2.0kW (48Vdc)			Yes		Yes	Yes	
2.4kW (48Vdc)						Yes	
3.1kW (24Vdc)				Yes		Yes	
3.6kW/4.0kW (48Vdc)				Yes		Yes	
1.1kW (125/220Vdc)							Yes
4.4kW (125/220Vdc)							Yes

Cordex™ 4R/8D and 8R/8D ADIO
CXC Smart Peripheral



4R/8D ADIO
Shown

- Provides additional I/O expansion to existing CXC site controller
- Seamless expansion of four or eight relay outputs and eight digital inputs
- Flexible 1RU rack mounting system integration options
- Ideal for alternate device monitoring and control such as HVAC and generators

4R/8D P/N: 018-590-20

Electrical

Power supply:
- Voltage: .....9V to 60Vdc
- Current:.....500mA
- Power:.....5W

Digital inputs:
- Inactive voltage: .....-1.5 to 1.5V
- Active voltage:.....± (5 to 60V)

Relay outputs:
- Voltage: .....Up to 60V
- Current:.....500mA

User Interface

Status indication:
- LED's: .....Power on (green)
  Module acquired (green)

Connections:
- Power supply:.....Terminal block (#16 to 26AWG)
- Digital input: .....Terminal block (#16 to 26AWG)
- Relay output: .....Terminal block (#16 to 26AWG)
- CAN In/Out: .....RJ12 offset connector

Environmental

Operating:
- Temperature: .....-40 to 75°C (-40 to 167°F)
- Humidity: .....0 to 95% non-condensing

Related Components

Rack mount shelf: 030-734-20
Wall mount shelf:.....030-764-20

Agency Compliance

Unit is designed to meet the following standards

Safety:.....CSA C22.2 No 60950-1-03
CE marked

8R/8D P/N: 0180002-001, 0180002-002, 0180002-003

Electrical

Power supply:
- Voltage: .....9V to 60Vdc
- Current:.....500mA
- Power:.....5W

Digital inputs:
- Inactive voltage: .....-1.5 to 1.5V
- Active voltage:.....± (5 to 60V)

Relay outputs:
- Voltage: .....Up to 60V
- Current:.....1A

User Interface

Status indication:
- LED's: .....Power on (green)
  Module acquired (green)

Connections:
- Power supply:.....Terminal block (#14 to 22AWG)
- Digital input: .....Terminal block (#14 to 22AWG)
- Relay output: .....Terminal block (#14 to 22AWG)
- CAN In/Out: .....RJ12 offset connector

Environmental

Operating:
- Temperature: .....-40 to 75°C (-40 to 167°F)
- Humidity: .....0 to 95% non-condensing

Related Components

Rack mount shelf: 030-734-20

Agency Compliance

Unit is designed to meet the following standards

Safety:.....CSA C22.2 No 60950-1-03
CE marked

SD08
Battery Mid-Point Monitor



› Simple, easy to use battery monitoring solution for 48V applications

The SD08 Battery Fail Monitor module is designed to monitor the status of a single string, using mid-point monitoring. The SD08 splits the battery string voltage in half and the string voltage halves are compared. If the difference between the two exceeds the programmed value (set by front panel rotary switch) then an alarm is sent via a Form "C" relay and the red "BATT FAIL" LED is illuminated. The red LED is latching and requires manual intervention to reset (front panel push button).

A complete battery monitoring system consists of one or more SD08 modules installed in a 19" or 23"' panel or wall mount unit. Additional SD08 modules can be added at a later time.

P/N: 747-109-020-040

Electrical

Input voltage: .....±20 to 60Vdc

Performance / Features

LEDs:
Green:.....battery cond. OK
Red: .....battery cond. fail

Front panel reset
Rear output Form C relay: battery fail
Front panel switch:.....adjust volt deviation to max 1.6V in 0.1V increments

Mechanical

Dimensions:
mm:.....38.1H x 114.3W x 25.4D
inches: .....1.5H x 4.5W x 1D
Mounting: .....Wall or rack optional (19 or 23" rack)

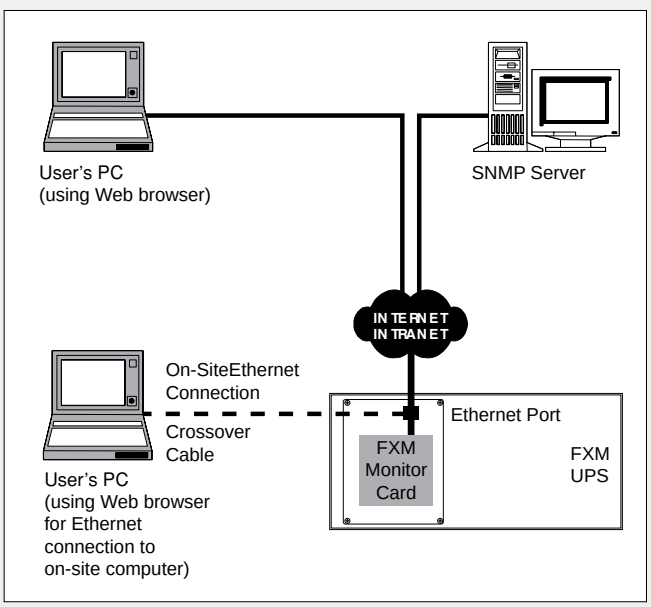
Environmental

Temperature:.....-40 to +50°C
Humidity: .....0 to 95% RH non-condensing

Ethernet/SNMP Card* - Alpha FXM, Alpha Micro, Alpha Micro Secure

For greater effectiveness, control and communication with your UPS system, choose the Ethernet/SNMP card option for our Alpha FXM, Alpha Micro and Alpha Micro Secure products.** The Ethernet/SNMP card allows for communication with the Alpha UPS remotely through a web based interface. The Ethernet/SNMP card is powered by the UPS batteries eliminating the need for an external power source. Using Alpha's renowned CXC software, the communication card is capable of providing notifications to four different email addresses and to devices such as your PC, a mobile phone or PDA. Outgoing notifications can be customized with selectable severity levels and triggered by events, faults and/or alarms. Firmware updates for the UPS or the card itself can be downloaded from our website and uploaded to the device remotely.





The Alpha user Software is a graphical user interface (GUI) designed to help Alpha UPS users monitor, control and set various parameters for their UPS systems through a computer using a standard RS-232 connection or through the internet when the UPS is equipped with an Ethernet/SNMP card. Users are able to read and display UPS events, warnings, date, time and relay configurations through this Windows-based environment. The software is an excellent maintenance and troubleshooting tool that automatically updates information every five seconds and records events and warnings with time/date stamps. The UPS event log can be downloaded to your PC via the user interface.



Alpha UPS Monitor

Get real-time notification of every alarm and fault that occurs so that you are immediately in a position to take action. Easy to customize to your exact needs, the Ethernet edition allows you to set your own notification preferences via PC and receive notifications to any PC, mobile phone, PDA, or any device that accepts email.

*Ethernet/SNMP option must be chosen at time of order
**Standard on Micro 350 / FXM 350


No Alarms Present
STATUS
OK
MIN
MAJ
RST
AC ON
DC ON
ALARM
Cordex™



Power Modules

Alpha power modules feature some of the most innovative technology on the market today. Many options are available for a variety of powering applications including inverters, rectifiers and DC-DC converter modules. Multiple power sizes and voltages are available to enable the most flexible, compact and cost-effective power system design.

Combining a unique blend of advanced features, high reliability and high efficiency, Alpha power modules offer users significant operational and capital savings. High temperature rated designs are ideal for harsh environments including outdoor enclosure solutions.

Rectifiers, DC-DC converters and AIM inverter modules are designed to operate seamlessly with the advanced Cordex™ CXC controllers, providing local and remote access to system control and monitoring.

Rectifiers

Cordex rectifiers are available in a wide array of power sizes from 250W to 12,000W per module, enabling the most compact and cost-effective power system design. Multiple DC output and AC input options are available to provide an ideal solution for most telecommunications and utility applications.

Combining a unique blend of advanced features, high reliability and greater efficiency, Cordex rectifiers offer significant operational and capital savings. High power diversity modules provide users with greater rack space for additional revenue generating equipment in space restricted environments. Fan cooled rectifier options are industry leading in terms of high temperature operation in harsh environments.

Cordex™ 650W
48Vdc Modular Switched Mode Rectifier

- Available in 13.5A @ 48Vdc
- Universal 120V/208 to 240V single phase AC input
- Power limiting and wide range AC input
- 91% efficiency and power factor correction
- Convection cooled
- Hot swappable, 2RU ultra compact design



Cordex™ 48-650W

120V model P/N: 010-571-20
Universal 120/240 model P/N: 010-570-20

Electrical

Input voltage (120Vac model):
- Operating: .....90 to 140Vac (output power 650W)
- Extended: .....90 to 70Vac (de-rated output power)
- Power output: .....650W at nominal 120Vac

Input voltage (universal 100 to 240Vac model):
- Operating: .....176 to 320Vac (output power 650W)
- Extended: .....176 to 90Vac (de-rated output power)
- Operating: .....100 to 140Vac (output power 500W)
- Power output: .....650W at nominal 208 to 240Vac & 500W at nominal 120Vac

Input frequency: .....45 to 70Hz
Power factor: .....>99%
THD: .....<5%
Efficiency: .....>91% (1% loss for 120Vac model)
Output voltage: .....42 to 58Vdc
Output current: .....12A @ 54Vdc (13.5A max)
Load regulation: .....Static <±0.5%
Dynamic <±2% for 50 to 100% load step
2ms recovery time
Line regulation: .....Static <±0.1%
Dynamic <±1% for any change within rated limits
Wide band noise: .....<30mVrms
<150mVp-p
Psophometric noise: .....<1mV

Performance / Features

Indicators: .....AC mains OK—green LED
Module alarm—red LED
Cooling: .....Natural convection
Adjustments: .....Float and equalize voltage
(via CXCI controller) Battery test voltage
High and low voltage alarms
High voltage shutdown
Current limit
Start delay time
Slope %
Protection: .....Current limit/short circuit
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown

Mechanical

Dimensions:
- mm: .....88.4H x 71.6W x 242D
- inches: .....3.4H x 2.8W x 9.5D

Weight: 1.4kg (3lbs)

Environmental

Temperature:
- Operation: .....-40 to 50°C (-40 to 122°F)
(power de-rated up to 70°C/158°F)
- Storage: .....-40 to 85°C (-40 to 185°F)

Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 3000m (-1640 to 9840ft)
Heat dissipation: .....<94 BTU per hour

Agency Compliance

Safety: .....CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: .....ETSI 300 386
- Emissions: .....CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3

- Immunity: .....EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ 1kW
48Vdc Modular Switched Mode Rectifier


Cordex™ 48-1kW

- Available in 20.8A @ 48Vdc
- Power limiting and wide range AC input
- 92% efficiency and power factor correction
- Convection cooled
- Hot swappable, 4RU ultra compact design

P/N: 010-566-20

Electrical

Input voltage:
- Nominal: ..... 208 to 277Vac
- Operating: ..... 150 to 320Vac
- Extended: ..... 150 to 90Vac (de-rated power)

Input frequency: ..... 45 to 66Hz
Power factor: ..... >0.99
Efficiency: ..... >92%
Power output: ..... 1000W continuous/module
Output voltage: ..... 42 to 60Vdc
Output current: ..... 18.5A @ 54Vdc (20.8A max)
Load regulation: ..... <±0.5% (static)
Line regulation: ..... <±0.1% (static)
Transient response: ..... ±1% for 50 to 100% load step, 2ms recovery time

Noise:
- Voice band: ..... <32dBrnC
- Wide band: ..... <5mVrms
  <100mVpk to pk

Psophometric: ..... <1mV

Performance / Features

Indicators: ..... AC mains OK—green LED
Module OK—green LED
Module alarm—red LED

Cooling: ..... Natural convection

Adjustments: ..... Float and equalize voltage
(via CXC Controller) Battery test voltage
High and low voltage alarms
High voltage shutdown
Current limit
Start delay timers
Slope %

Protection: ..... Current limit/short circuit
Start delay
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown

Mechanical

Dimensions:
- mm: ..... 177H x 71W x 250D
- inches: ..... 6.9H x 2.8W x 9.8D

Weight: 2.9kg (6.4lbs)

Environmental

Temperature:
- Operation: ..... -40 to 50°C (-40 to 122°F)
  (with short periods up to 70°C/158°F)
- Storage: ..... -40 to 85°C (-40 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 4000m (-1640 to 13120ft)
Heat dissipation: ..... <295 BTU per hour

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: ..... ETSI 300 386
- Emissions: ..... CFR47 (FCC) Part 15 Class B
  ICES-03 Class B
  EN55022 (CISPR 22) Class B
  C-Tick (Australia)
  EN 61000-3-2
  EN 61000-3-3
- Immunity: ..... EN 61000-4-2
  EN 61000-4-3
  EN 61000-4-4
  EN 61000-4-5
  EN 61000-4-6
  EN 61000-4-11
  ANSI/IEEE C62.41 Cat B3
  EN 61000-4-11
  ANSI/IEEE C62.41 Cat B3

Cordex™ HP 1.2kW
48Vdc Modular Switched Mode Rectifier

- >93% efficiency for reduced operating expenses and carbon footprint
- High temperature operation for installation in harsh outdoor environments
- 1RU x 2RU footprint for flexible and multiple mounting options
- High power density (21.8W/in^3) yields more space for revenue generating equipment
- Wide AC input range for a variety of global installation requirements



Cordex™ HP 48-1.2kW

P/N: 010-619-20

Electrical

Input voltage:
- Nominal: ..... 176 to 276Vac
- Extended (low): ..... 90 to 175Vac (de-rated output power)
- Extended (high): ..... 277 to 300Vac (de-rated power factor)

Input current:
- Nominal: ..... 7.4A max
- 90 to 132Vac: ..... 6A max

Input frequency: ..... 45 to 70Hz
Power factor: ..... >99%
THD: ..... <5% @ nominal input voltage
Efficiency: ..... >93% 40%-100% load (nominal AC input)
>90% 40%-100% load (120Vac input)
Output voltage: ..... 42 to 58Vdc
Output power:
- Nominal AC input: 1200W
- 110 to 132Vac: ..... 600W (de-rated linearly to 491W @ 90Vac)

Output current:
- Nominal AC input: ..... 22.2A @ 54V (25A max @ 48V)
- 110 to 132Vac: ..... 12.5A max (de-rated linearly to 10.2A @ 90Vac)

Load regulation:
- Static: ..... <±0.5%
- Dynamic: ..... <±1% for 40 to 90 to 40% load step, 2ms recovery time

Line regulation:
- Static: ..... <±0.1%
- Dynamic: ..... <±1% for any change within rated limits

Wide band noise: ..... <30mVrms
<150mVp-p
Psophometric noise: ..... <2mV

Performance / Features

Indicators: ..... AC mains OK — green LED
DC output OK – green LED
Module alarm — red LED
Cooling: ..... Fan cooled
Adjustments: ..... Float and equalize voltage
(via CXC controller) Battery test voltage
High and low voltage alarms high voltage shutdown
Current limit
Start delay time
Slope %
Protection: ..... Current limit/short circuit
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown

Mechanical

Dimensions:
- mm: ..... 41.4H x 84.8W x 256.8D
- inches: ..... 1.63H x 3.34W x 10.11D

Weight: 1.23kg (2.7lbs)

Environmental

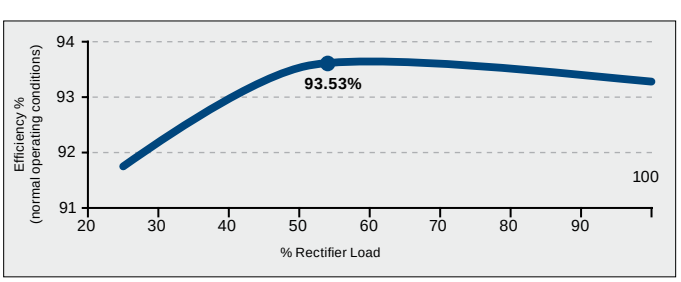
Temperature:
- Operation: ..... -40 to 65°C (-40 to 149°F)
(power derated up to 80°C/176°F)
- Storage: ..... -40 to 85°C (-40 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 3000m (-1640 to 9840ft)
Heat dissipation: ..... <308 BTU per hour

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1-03
CE marked
EMC: ..... ETSI 300 386
Emissions: ..... CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-tick (Australia)
EN 61000-3-2
EN 61000-3-3
Immunity: ..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6 EN 61000-4-11
ANSI/IEEE C62.41 Cat B3
NEBS / Telcordia: GR-1089-CORE
GR-63-CORE

Cordex™ CXRF-HP 1.2kW Efficiency



Cordex™ 1.8kW
48Vdc Modular Switched Mode Rectifier



Cordex™ 48-1.8kW

- Available in 37.5A @ 48Vdc
- High power density
- Universal, wide range AC input
- 91% efficiency and power factor correction
- Hot swappable, 2RU ultra compact design

P/N: 010-580-20

Electrical

Input voltage:
- Nominal: ..... 208 to 277Vac
- Operating: ..... 176 to 312Vac
- Extended: ..... 176 to 90Vac (de-rated power)

Input frequency: ..... 45 to 66Hz
Power factor: ..... >0.99 (50 to 100% load)
THD: ..... <5%
Efficiency: ..... >91%
Output voltage: ..... 42 to 60Vdc
Output current: ..... 37.5A @ 48Vdc (nominal I/p)
24A @ 48Vdc (115 to 135Vac)
(de-rated linearly to 18.75A @ 90Vac)
Output power: ..... 1800W continuous @ nominal I/p
1150W (115 to 135Vac)
(de-rated linearly to 900W @ 90Vac)
Load regulation: ..... <±0.5% (static)
Line regulation: ..... <±0.1% (static)
Transient response: ..... ±2% for 50 to 100% load step,
2ms recovery time

Noise:
- Voice band: ..... <32dBrnC
- Wide band: ..... <30mV RMS (10kHz to 10MHz)
<150mV pk to pk (10kHz to 100MHz)

Psophometric: ..... <1mV
Acoustic: ..... <60dBa @ 1m (3ft)

Performance / Features

Indicators: ..... AC mains OK—green LED
Module OK—green LED
Module fail—red LED
Controls: ..... CAN interface to CXC
Adjustments: ..... Float voltage
(via CXC controller) Equalize voltage
High voltage alarm
Low voltage alarm
High voltage shutdown
Current limit
Slope
Start delay timers
Protection: ..... Current limit/short circuit
Start delay
Input/output fuses
Output high voltage shutdown
Power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown

Mechanical

Dimensions:
- mm: ..... 84H x 100W x 235D
- inches: ..... 3.3H x 3.94W x 9.25D

Weight: 2.8kg (6.2lbs)

Environmental

Temperature:
- Standard: ..... -40 to 65°C (-40 to 149°F)
- Storage: ..... -40 to 85°C (-40 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 2800m (-1640 to 9186ft)
Heat dissipation: ..... <608 BTU per hour

Shelves

19/23" 4-module P/N: 030-749-20
23" 5-module P/N: 030-747-20

19/23" shelf
Dimensions:
- mm: ..... 89H x 438W x 310D
- inches: ..... 3.5H x 17.2W x 12.2D

Weight: 8.5kg (19lbs)
Mounting: ..... 19" flush or center mount
23" center mount only

23" shelf
Dimensions:
- mm: ..... 89H x 541W x 310D
- inches: ..... 3.5H x 21.3W x 12.2D

Weight: 10kg (22lbs)
Mounting: ..... 23" flush or center mount

Connections:
- Input: ..... Terminal blocks
Mini-fit connectors (23" only)
- Output: ..... Bus adapters with ⅜" on 1" center holes
- Chassis ground: ..... ¼" studs on ⅝" centers
- CAN communication: ..... RJ12 offset

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: ..... ETSI 300 386
- Emissions: ..... CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3
- Immunity: ..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ HP 2.0kW
48Vdc Modular Switched Mode Rectifier

cordex HP™ HIGH PERFORMANCE

NEW

- 94% efficiency for reduced operating expenses and carbon footprint
- Available in 41.7A @ 48Vdc
- Universal, wide range AC input
- Hot swappable, 2RU ultra compact design
- Backwards compatible with Cordex 1.8kW shelves and power solutions enabling cost effective system upgrade



Cordex™ HP 48-2.0kW

P/N: 010-622-20

Electrical

Input voltage:
- Nominal: ..... 187 to 277Vac
- Operating: ..... 187 to 312Vac
- Extended: ..... 176 to 90Vac (de-rated power)

Input frequency: ..... 45 to 66Hz
Power factor: ..... >0.99 (50 to 100% load)
THD: ..... <5% (@ 208Vac)
Efficiency: ..... >94.2%
Output voltage: ..... 42 to 58Vdc
Output current: ..... 41.7A @ 48Vdc (nominal I/p)
26A @ 48Vdc (@ 120Vac input)
Output power: ..... 2000W continuous @ nominal I/p
1248W (@ 120Vac)
Load regulation: ..... <±0.5% (static)
Line regulation: ..... <±0.5% (static)
Transient response: ..... ±2% for 40 to 90% load step

Noise:
- Voice band: ..... <38dBrnC
- Wide band: ..... <30mV RMS (10kHz to 10MHz)
<150mV pk to pk (10kHz to 100MHz)

Psophometric: ..... <2mV RMS
Acoustic: ..... <60dBa @ 1m (3ft), 30°C

Performance / Features

Indicators: ..... AC mains OK—green LED
Module OK—green LED
Module fail—red LED
Controls: ..... CAN interface to CXC
Adjustments: ..... Float voltage
(via CXC controller) Equalize voltage
High voltage alarm
Low voltage alarm
High voltage shutdown
Current limit
Slope
Start delay timers
Protection: ..... Current limit/short circuit
Start delay
Input/output fuses
Output high voltage shutdown
Power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown

Mechanical

Dimensions:
- mm: ..... 86H x 102W x 270D
- inches: ..... 3.4H x 4.0W x 10.6D

Weight: 2.3kg (5.1lbs)

Environmental

Temperature:
- Standard: ..... -40 to 55°C (-40 to 149°F)
- Extended: ..... -40 to 75°C (-40 to 167°F)
derated power (~1800W @ 65°C (149°F))
- Storage: ..... -40 to 85°C (-40 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -60 to 2000m (-198 to 6600ft)
Heat dissipation: ..... <549 BTU per hour

Shelves

19/23" 4-module P/N: 030-749-20
23" 5-module P/N: 030-747-20

19/23" shelf (4 modules)

Dimensions:
- mm: ..... 89H x 438W x 310D
- inches: ..... 3.5H x 17.2W x 12.2D

Weight: 8.5kg (19lbs)
Mounting: ..... 19" flush or center mount
23" center mount only

23" shelf (5 modules)

Dimensions:
- mm: ..... 89H x 541W x 310D
- inches: ..... 3.5H x 21.3W x 12.2D

Weight: 10kg (22lbs)
Mounting: ..... 23" flush or center mount

Connections:
- Input: ..... Terminal blocks
Mini-fit connectors (23" only)
- Output: ..... Bus adapters with ⅜" on 1" center holes
- Chassis ground: ..... ¼" studs on ⅝" centers
- CAN communication: ..... RJ12 offset

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: ..... ETSI 300 386
- Emissions: ..... CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3
- Immunity: ..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ 3.6kW
48Vdc Modular Switched Mode Rectifier

- Available in 75A @ 48Vdc
- High power density, over 21kW per 23" shelf
- Power limiting and wide range AC input
- High efficiency and power factor correction
- Hot swappable, 4RU ultra compact design



Cordex™ 48-3.6kW

P/N: 010-567-20

Electrical

3.6kW Rectifier Module(s)

Input voltage:
- Nominal: ..... 208 to 277Vac
- Operating: ..... 176 to 312Vac
- Extended: ..... 176 to 90Vac (de-rated power)

Input frequency: ..... 45 to 66Hz
Power factor: ..... >0.99 (50 to 100% load)
THD: ..... <5%
Efficiency: ..... >92%
Output voltage: ..... 42 to 60Vdc
Output power: ..... 3600W continuous/module
Float voltage: ..... 48 to 58Vdc
Output current: ..... 66A @ 54Vdc (75A max 48V)
Load regulation: ..... <±0.5% (static)
Line regulation: ..... <±0.1% (static)
Transient response: ..... ±2% for 50 to 100% load step, 2ms recovery time

Noise:
- Voice band: ..... <32dBrnC
- Wide band: ..... <30mV RMS (10kHz to 10MHz)
  <150mV pk to pk (10kHz to 100MHz)

Psophometric: ..... <1mV
Acoustic: ..... <60dBa @ 1m (3ft)

Performance / Features

Indicators: ..... AC mains OK — green LED
Module OK — green LED
Module fail — red LED
Controls: ..... CAN interface to CXC
Adjustments: ..... Float voltage
(via CXC controller) Equalize voltage
High/low voltage alarm
High voltage shutdown
Current limit
Slope
Start delay
Protection: ..... Current limit/short circuit
Start delay
Input/output fuses
Output high voltage shutdown
Power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback shutdown

Mechanical

Dimensions:
- mm: ..... 160H x 87W x 300D
- inches: ..... 6.3H x 3.4W x 11.8D

Weight: 4.6kg (10lbs)

Environmental

Temperature:
- Standard: ..... -40 to 65°C (-40 to 149°F)
- Storage: ..... -40 to 85°C (-40 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 4000m (-1640 to 13120ft)
Heat dissipation: ..... <1176 BTU per hour

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1
EMC: ..... ETSI 300 386
Emissions: ..... CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3
Immunity: ..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3
NEBS: ..... GR-1089 CORE
GR-63 CORE

Cordex HP™ 4.0kW
48Vdc Modular Switched Mode Rectifier

cordex HP™ HIGH PERFORMANCE

NEW

- Near 95% efficiency for reduced operating expenses and carbon footprint
- Available in 75A @ 48Vdc
- High power density, over 23kW per 23" shelf
- Power limiting and wide range AC input
- Hot swappable, 4RU ultra compact design
- Backwards compatability with Cordex 3.6kW rectifier shelves and power solutions providing cost effective upgrade path



Cordex HP™ 48-4kW

P/N: 010-623-20

Electrical

4.0kW Rectifier Module(s)

Input voltage:
- Nominal: ..... 208 to 277Vac
- Operating: ..... 187 to 312Vac
- Extended: ..... 187 to 90Vac (de-rated power)

Input frequency: ..... 45 to 66Hz
Power factor: ..... >0.99 (50 to 100% load)
THD: ..... <5% (@ 208Vac)
Efficiency: ..... >94.9% peak
Output voltage: ..... 42 to 60Vdc
Output power: ..... 4000W continuous/module
Float voltage: ..... 48 to 58Vdc
Output current: ..... 74A @ 54Vdc (83.3A max 48V)
Load regulation: ..... <±0.5% (static)
Line regulation: ..... <±0.1% (static)
Transient response: ..... ±3% for 40 to 90% load step,
Noise:
- Voice band: ..... <38dBrnC
- Wide band: ..... <30mV RMS (10kHz to 10MHz)
  <150mV pk to pk (10kHz to 100MHz)

Psophometric: ..... <2mV
Acoustic: ..... <60dBa @ 1m (3ft)

Performance / Features

Indicators: ..... AC mains OK—green LED
Module OK—green LED
Module fail—red LED
Controls: ..... CAN interface to CXC
Adjustments: ..... Float voltage
(via CXC controller) Equalize voltage
High/low voltage alarm
High voltage shutdown
Current limit
Slope
Start delay
Protection: ..... Current limit/short circuit
Start delay
Input/output fuses
Output high voltage shutdown
Power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback shutdown

Mechanical

Dimensions:
- mm: ..... 160H x 87W x 300D
- inches: ..... 6.3H x 3.4W x 11.8D

Weight: 4.6kg (9lbs)

Environmental

Temperature:
- Standard: ..... -40 to 55°C (-40 to 149°F)
- Extended: ..... -40 to 75°C (-40 to 167°F)
  derated power (~3600W @ 65°C (149°F))
- Storage: ..... -40 to 85°C (-40 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 4000m (-1640 to 13120ft)
Heat dissipation: ..... <1150 BTU per hour

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1
EMC: ..... ETSI 300 386
Emissions: ..... CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3
Immunity: ..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3
NEBS: ..... GR-1089 CORE
GR-63 CORE

Cordex HP™ 12kW
Modular Switched Mode Rectifier

cordex HP™ HIGH PERFORMANCE

NEW

- -48V high capacity rectifier for C.O., MSC, Data Center and Cable Headend facilities
- Legacy power system upgrade ready, with Cordex controller
- 95% efficiency for decreased OPEX and reduced carbon footprint
- Wide AC input operating range that satisfies a variety of global installation requirements



Cordex HP™ 12kW Rectifier

P/N: 0100002-002

Electrical

Input voltage:
- Nominal: ..... 208 to 240Vac (3PH-3W)
  360 to 480Vac (3PH-4W)

Input frequency: ..... 45 to 66Hz
Power: ..... 12,000W continuous/module
Power factor: ..... >0.99 (50 to 100% load)
THD: ..... <5% (@208 Vac)
Efficiency: ..... 95% peak @ 277Vac
Output voltage: ..... 44 to 60Vdc
Float Voltage: ..... 48 to 58Vdc
Output current: ..... 222A @ 54Vdc (249A max. @ 48V)
Load regulation: ..... <±0.5% (static)
Line regulation: ..... <±0.1% (static)
Transient response: ..... ±3% for 40 to 90% load step
Noise:
- Voice band: ..... <38dBrnC
- Wide band: ..... <20mV RMS (10kHz to 10MHz)
  <150mV pk to pk (10kHz to 100MHz)

Psophometric: ..... <2mV
Acoustic: ..... <60dBa @ 1m (3ft)

Performance / Features

Indicators: ..... AC mains OK—green LED
DC output OK—green LED
Module fail—red LED
Controls: ..... CAN interface to CXC Controller
Adjustments: ..... Float voltage
(via CXC Controller) ..... Equalize voltage
High voltage alarm
Low voltage alarm
High voltage shutdown
Current limit
Slope
Start delay timers
Protection: ..... Current limit/short circuit
Start delay
Input/output fuses
Output high voltage shutdown
Power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown

Mechanical

Dimensions:
- mm: ..... 160H x 261W x 300D
- inches: ..... 6.3H x 10.2W x 11.8D

Weight: 12kg (27lbs)

Environmental

Temperature:
- Standard: ..... -40 to 55°C (-40 to 131°F)
- Extended: ..... -40 to 75°C (-40 to 167°F) (derated power)
  ~ 10800W @ 65°C (149°F)
- Storage: ..... -40 to 85°C (-40 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 4000m (-1640 to 13120ft)
Heat dissipation: ..... <3450 BTU per hour

Shelves

23" shelf (2 modules)
Dimensions:
- mm: ..... 177H x 530W x 389D
- inches: ..... 6.9H x 20.8W x 15.3D

Weight: 14.5kg (32lbs)
Mounting: ..... Fits 23" racks only flush/center mount

Connections

Input: ..... Box type terminal block
6 to 16mm² (10 to 6AWG)
Output: ..... Bus adapters with ⅜" studs on 1" centers
Chassis ground: ..... Compression lug
6 to 16mm² (10 to 6AWG)
CAN communication: ..... RJ 12 offset

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1
UL 60950-1 1st Edition
CE marked
IEC/EN 60950-1
EMC: ..... ETSI 300 386
- Emissions: ..... CFR47 (FCC) Part 15 Class B
  ICES-03 Class B
  EN55022 (CISPR 22) Class B
  C-tick (Australia)
  EN 61000-3-12
  EN 61000-3-3
- Immunity: ..... EN 61000-4-2
  EN 61000-4-3
  EN 61000-4-4
  EN 61000-4-5
  EN 61000-4-6
  EN 61000-4-11
  ANSI/IEEE C62.41 Cat B3

Related Components

5900550-001 ..... 12kW Blank Panel
030-716-20 ..... Rectifier shelf, 2 module

Cordex™ 400W
24Vdc Modular Switched Mode Rectifier

- Available in 14A @ 24Vdc
- Universal 120/208 to 240Vac input
- High efficiency and power factor correction
- Convection cooled
- Hot swappable, 2RU ultra compact design



Cordex™ 12-250W

P/N 010-582-20

Electrical

Input voltage: .....90 to 320Vac
Input frequency: .....45 to 70Hz
Power factor: .....>99%
THD: .....<5%
Efficiency:.....>90%
Power output: .....400W (max)
Output voltage:.....20 to 29Vdc
Output current: .....14A (current limited)
Load regulation: .....Static <±0.5%
Dynamic <±2% for 50 to 100% load step
2ms recovery time
Line regulation: .....Static <±0.1%
Dynamic <±1% for any change within rated limits
Wide band noise: .....<30mVrms
<150mVp-p
Psophometric noise: .....<1mV

Performance / Features

Indicators: .....AC mains OK—green LED
Module alarm—red LED

Cooling: .....Natural convection

Adjustments: .....Float and equalize voltage
(via CXCI controller) Battery test voltage
High and low voltage alarms
High voltage shutdown
Current limit
Start delay time
Slope %

Protection: .....Current limit/short circuit
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown

Mechanical

Dimensions:
mm:.....88.4H x 71.6W x 242D
inches: .....3.4H x 2.8W x 9.5D
Weight: 1.4kg (3lbs)

Environmental

Temperature:
Operation:.....-40 to 50°C (-40 to 122°F)
(power de-rated up to 70°C/158°F)
Storage: .....-40 to 85°C (-40 to 185°F)
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 3000m (-1640 to 9840ft)
Heat dissipation: .....<94 BTU per hour

Agency Compliance

Safety: .....CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: .....ETSI 300 386
Emissions: .....CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3

Immunity:.....EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ 3.1kW
24Vdc Modular Switched Mode Rectifier

- Available in 130A @ 24Vdc
- High power density, over 21kW per 23" shelf
- Power limiting and wide range AC input
- High efficiency and power factor correction
- Hot swappable, 4RU ultra compact design



Cordex™ 24-3.1kW

P/N: 010-572-20

Electrical

3.1kW Rectifier Module(s)

Input voltage:
- Nominal: ..... 208 to 277Vac
- Operating: ..... 176 to 312Vac
- Extended: ..... 176 to 90Vac (de-rated power)

Input frequency: ..... 45 to 70Hz
Power factor: ..... >0.99 (50 to 100% load)
THD: ..... <5%
Efficiency: ..... >90%
Output voltage: ..... 21 to 29Vdc
Output power: ..... 3100W continuous/module
Output current: ..... 115A @ 27Vdc (130A max. 24V)
Load regulation: ..... <±0.5% (static)
Line regulation: ..... <±0.1% (static)
Transient response: ..... ±2% for 50 to 100% load step, 2ms recovery time

Noise:
- Voice band: ..... <32dBrnC
- Wide band: ..... <30mV RMS (10kHz to 10MHz)
  <150mV pk to pk (10kHz to 100MHz)

Psophometric: ..... <1.0mV
Acoustic: ..... <60dBa @ 1m (3ft)

Performance / Features

Indicators: ..... AC mains OK—green LED
Module OK—green LED
Module fail—red LED
Controls: ..... CAN interface to CXC
Adjustments: ..... Float voltage
(via CXC controller) Equalize voltage
High/low voltage alarm
High voltage shutdown
Current limit
Slope
Start delay
Protection: ..... Current limit/short circuit
Start delay
Input/output fuses
Output high voltage shutdown
Power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback shutdown

Mechanical

Dimensions:
- mm: ..... 160H x 87W x 300D
- inches: ..... 6.3H x 3.4W x 11.8D

Weight: 4.6kg (10lbs)

Environmental

Temperature:
- Standard: ..... -40 to 65°C (-40 to 149°F)
- Storage: ..... -40 to 85°C (-40 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 4000m (-1640 to 13120ft)
Heat dissipation: ..... <1176 per hour

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1
EMC: ..... ETSI 300 386
- Emissions: ..... CFR47 (FCC) Part 15 Class B
  ICES-03 Class B
  EN55022 (CISPR 22) Class B
  C-Tick (Australia)
  EN 61000-3-2
  EN 61000-3-3
- Immunity: ..... EN 61000-4-2
  EN 61000-4-3
  EN 61000-4-4
  EN 61000-4-5
  EN 61000-4-6
  EN 61000-4-11
  ANSI/IEEE C62.41 Cat B3

NEBS: ..... GR-1089 CORE
GR-63 CORE

Cordex™ 250W
12Vdc Modular Switched Mode Rectifier



- Available in 20.8A @ 12Vdc
- Universal 120/208 to 240Vac input
- Power factor correction
- Convection cooled
- Hot swappable, 2RU ultra compact design

P/N: 010-587-20

Electrical

Input voltage: .....90 to 320Vac
Input frequency: .....45 to 70Hz
Power factor: .....>99%
THD: .....<5%
Efficiency: .....>90%
Power output: 250W
Output voltage: .....10.5 to 14.5Vdc
Output current: .....18.5A @ 13.5Vdc (20A max)
Load regulation: .....<±0.5% (static)
Line regulation: .....<±0.1% (static)
Transient response: ..... ±2% for 50 to 100% load step
2ms recovery time
Wide band noise: .....<30mVrms
<150mVp-p
Psophometric noise: .....<1mV

Performance / Features

Indicators: .....AC mains OK—green LED
Module alarm—red LED

Cooling: .....Natural convection

Adjustments: .....Float and equalize voltage
(via CXCI controller) Battery test voltage
High and low voltage alarms
High voltage shutdown
Current limit
Start delay time
Slope %

Protection: .....Current limit/short circuit
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown

Mechanical

Dimensions:
mm: .....88.4H x 71.6W x 242D
inches: .....3.4H x 2.8W x 9.5D
Weight: 1.4kg (3lbs)

Environmental

Temperature:
Operation: .....-40 to 50°C (-40 to 122°F)
(power de-rated up to 70°C/158°F)
Storage: .....-40 to 85°C (-40 to 185°F)
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 3000m (-1640 to 9840ft)
Heat dissipation: .....<94 BTU per hour

Agency Compliance

Safety: .....CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: .....ETSI 300 386
Emissions: .....CFR47 (FCC) Part 15 Class B
ICES-03 Class B
EN55022 (CISPR 22) Class B
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3

Immunity: .....EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ 1.1kW
125Vdc Modular Switched Mode Rectifier



Cordex™ 125-1.1kW

- 8.8A output @ 125Vdc
- Power limiting and wide range AC input
- 93% efficiency with power factor correction
- Convection cooled
- Hot swappable, 4RU ultra compact design

P/N: 010-579-20

Electrical

Input voltage:
- Nominal: ..... 208 to 277Vac
- Operating: ..... 176 to 320Vac
- Extended: ..... 176 to 150Vac (de-rated to 75%)

Input frequency: ..... 45 to 66Hz
Power output: ..... 1100W continuous/module
Power factor: ..... >0.99 (input current)
THD: ..... <5%
Efficiency: ..... >93%
Output voltage: ..... 90 to 180Vdc
Output current: ..... 8.8A @ 125Vdc (11A max)
Load regulation: ..... Static <±0.5%
Line regulation: ..... Static <±0.1%
Transient response: ..... <±2% for 50 to 100% load step, 10ms recovery time
Wide band noise: ..... <30mVrms
<150mVp-p
Insulation: ..... 2.5kVac input-earth
3kVac input-output
2kVac output-earth
0.5kVac signals-earth

Performance / Features

Indicators: ..... AC mains OK—green LED
Module OK—green LED
Module alarm—red LED

Cooling: ..... Natural convection

Adjustments: ..... Float and equalize voltage
(via CXC controller) Battery test voltage
High and low voltage alarms
High voltage shutdown
Current limit
Start delay time
Slope %

Protection: ..... Current limit/short circuit
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown
Earth leakage alarm

Mechanical

Dimensions:
- mm: ..... 177H x 71W x 250D
- inches: ..... 6.9H x 2.8W x 9.8D

Weight: 2.9kg (6.4lbs)

Environmental

Temperature:
- Operation: ..... -40 to 50°C (-40 to 122°F)
(up to 70°C/158°F power de-rated)
- Storage: ..... -50 to 85°C (-58 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 4000m (-1640 to 13120ft)
Heat dissipation: ..... <282 BTU per hour (max)

Shelves

P/N: 030-740-20

19" shelf (6 module)

Dimensions:
- mm: ..... 177H x 444W x 303D
- inches: ..... 6.9H x 17.5W x 11.9D

Weight: 7.3kg (16lbs)
Mounting: ..... Fits 19" rack flush mount
Fits 19" or 23" center mount

Connections:
- Input: ..... Terminal blocks for 3 feeds
4–6mm² (12–10AWG)
- Output: ..... ¼" studs on ⅝" centers
- Chassis ground: ..... ¼" stud
- CAN communication: ..... RJ 12 offset

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: ..... ETSI 300 386
- Emissions: ..... CFR47 (FCC) Part 15 Class A
ICES-03 Class A
EN55022 (CISPR 22) Class A
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3
- Immunity: ..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ 1.1kW
220Vdc Modular Switched Mode Rectifier

- 5A output @ 220Vdc
- Power limiting and wide range AC input
- 93% efficiency with power factor correction
- Convection cooled
- Hot swappable, 4RU ultra compact design



Cordex™ 220-1.1kW

P/N: 010-569-20

Electrical

Input voltage:
- Nominal: ..... 208 to 277Vac
- Operating: ..... 176 to 320Vac
- Extended: ..... 176 to 150Vac (de-rated to 75%)

Input frequency: ..... 45 to 66Hz
Power output: ..... 1100W continuous/module
Power factor: ..... >0.99 (input current)
THD: ..... <5%
Efficiency: ..... >93%
Output voltage: ..... 180 to 320Vdc
Output current: ..... 5A @ 220Vdc (5.5A max)
Load regulation: ..... Static <±0.5%
Line regulation: ..... Static <±0.1%
Transient response: ..... <±2% for 50 to 100% load step, 10ms recovery time
Wide band noise: ..... <30mVrms
<150mVp-p
Insulation: ..... 2.5kVac input-earth
3kVac input-output
2kVac output-earth
0.5kVac signals-earth

Performance / Features

Indicators: ..... AC mains OK—green LED
Module OK—green LED
Module alarm—red LED

Cooling: ..... Natural convection

Adjustments: ..... Float and equalize voltage
(via CXC controller) Battery test voltage
High and low voltage alarms
High voltage shutdown
Current limit
Start delay time
Slope %

Protection: ..... Current limit/short circuit
Input/output fuses
Output high voltage shutdown
Output power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback/shutdown
AC high voltage shutdown
Earth leakage alarm

Mechanical

Dimensions:
- mm: ..... 177H x 71W x 250D
- inches: ..... 6.9H x 2.8W x 9.8D

Weight: 2.9kg (6.4lbs)

Environmental

Temperature:
- Operation: ..... -40 to 50°C (-40 to 122°F)
(up to 70°C/158°F power de-rated)
- Storage: ..... -50 to 85°C (-58 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 4000m (-1640 to 13120ft)
Heat dissipation: ..... <282 BTU per hour (max)

Shelves

P/N: 030-718-20

19" shelf (6 module)

Dimensions:
- mm: ..... 177H x 444W x 303D
- inches: ..... 6.9H x 17.5W x 11.9D

Weight: 7.3kg (16lbs)
Mounting: ..... Fits 19" rack flush mount
Fits 19" or 23" center mount

Connections:
- Input: ..... Terminal blocks for 3 feeds
4–6mm² (12–10AWG)
- Output: ..... ¼" studs on ⅝" centers
- Chassis ground: ..... ¼" stud
- CAN communication: ..... RJ 12 offset

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC: ..... ETSI 300 386
- Emissions: ..... CFR47 (FCC) Part 15 Class A
ICES-03 Class A
EN55022 (CISPR 22) Class A
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3
- Immunity: ..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3

Cordex™ 4.4kW
Modular Switched Mode Rectifier



Cordex™ 4.4kW

- Available in 35A @ 125Vdc or 20A @ 220Vdc
- High power density, over 22kW per 19" shelf
- Power limiting and wide range AC input
- 92% efficiency and power factor correction
- Hot swappable, 4RU ultra compact design

125V P/N: 010-589-20, 220V P/N: 010-588-20

Electrical

Input voltage:
- Nominal: ..... 208 to 240Vac
- Operating: ..... 187 to 312Vac
- Extended: ..... 187 to 90Vac (de-rated)

Input frequency: ..... 45 to 70Hz
Power: ..... 4400W continuous/module
Power factor: ..... >0.99 (50 to 100% load)
THD: ..... <5%
Efficiency: ..... >92%
Output voltage:
- 125V module: ..... 90 to 160Vdc
- 220V module: ..... 180 to 320Vdc

Output current:
- 125Vdc module: ..... 35A@ 125Vdc (40A @ 110Vdc max)
- 220Vdc module: ..... 20A @ 220Vdc

Load regulation: ..... Static <±0.5%
Line regulation: ..... Static <±0.1%
Transient response: ..... <±5% for 40 to 90% load step, 30ms recovery time
Wide band noise: ..... 220Vdc module: <30mVrms
<300mVp-p
125Vdc module: <90mVrms
<700mVp-p
Insulation: ..... 2.5kVac input-earth
3kVac input-output
2kVac output-earth
0.5kVac signals-earth
Acoustic: ..... <60dBa @ 1m (3ft)

Performance / Features

Indicators: ..... AC mains OK—green LED
Module OK—green LED
Module fail—red LED
Controls: ..... CAN interface to CXC
Adjustments: ..... Float voltage
(via CXC controller) Equalize voltage
High & low voltage alarms
High voltage shutdown
Current limit
Slope
Start delay
Protection: ..... Current limit/short circuit
Start delay
Input/output fuses
Output high voltage shutdown
Power limiting
Thermal foldback/shutdown
Input transient
AC low line foldback shutdown

Mechanical

Dimensions:
- mm: ..... 160H x 87W x 300D
- inches: ..... 6.3H x 3.4W x 11.8D

Weight: 4.65kg (10.57lbs)

Environmental

Temperature:
- Standard: ..... -40 to 50°C (-40 to 130°F)
- Extended: ..... -40 to 75°C (-40 to 167°F)
- Storage: ..... -40 to 85°C (-40 to 185°F)

Humidity: ..... 0 to 95% RH non-condensing
Elevation: ..... -500 to 2800m (-1640 to 9186ft)
Heat dissipation: ..... <1080 BTU per hour

Shelves

125V 19" 5-module P/N: 030-769-20
220V 19" 5-module P/N: 030-768-20

Dimensions:
- mm: ..... 177H x 442W x 389D
- inches: ..... 6.9H x 17.4W x 15.3D

Weight: 8.5kg (19lbs)
Mounting: ..... Fits 19" rack flush/center mount (5 modules)
Fits 23" rack center mount only

Connections:
- Input: ..... Box type terminal block
6 to 16mm² (10 to 6AWG)
- Output: ..... Bus adapters with ⅜" studs on 1" centers
- Chassis ground: ..... Compression lug
6 to 16mm² (10 to 6AWG)
- CAN communication: ..... RJ12 offset

Agency Compliance

Safety: ..... CSA C22.2 No 60950-1-03
UL 60950-1 1st edition
CE marked
IEC/EN 60950-1

EMC:
- Emissions: ..... CFR47 (FCC) Part 15 Class A
ICES-03 Class A
EN55022 (CISPR 22) Class A
C-Tick (Australia)
EN 61000-3-2
EN 61000-3-3
- Immunity: ..... EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-4-11
ANSI/IEEE C62.41 Cat B3



Converters

Alpha Cordex modular, hot swappable DC-DC converters are the ideal solution for providing dual voltage capability in new systems – or upgrades to existing DC plants for a variety of applications.

Modular 24V-48V and 48V-24V converters meet the needs of wireless carriers that are transitioning radio technologies. Alpha's DC power solutions include the ability to incorporate Cordex converters into the same system. For existing sites with established DC power plants, the Alpha converters can be configured into a stand-alone shelf for powering the electronic equipment.

Whether supporting legacy cellular equipment or enhancing a network with advanced radio overlays, Alpha Cordex converters provide flexibility that allow you to maintain a single voltage battery system.

CXDF 24-48/2kW
Cordex™ Series DC-DC Converters

- Support small to medium 48Vdc loads from legacy 24V power systems
- High power density modular design, up to 2kW output per module
- Advanced monitoring and control capability including remote accessibility
- Internal low voltage shutdown for cost effective integration into existing systems



CXDF 24-48/2kW Converter Module

P/N: 012-526-20

Electrical

Input voltage: .....21 to 30Vdc
Input current: .....Up to 94A @ 24V
Efficiency: .....>88%
Input noise:
  Voice band: .....<32dBrnC
  Wide band: .....<10mV RMS to 10MHz
  <150mVp-p to 100MHz
Output power: .....2000W max @ -54V
Output voltage: .....-54Vdc nominal
Output current: .....37A max
Regulation: .....-1% +/-0.1% load (static)
  +/- 0.1% line (static)
Output noise:
  Voice band: .....<38dBrnC
  Wide band: .....<10mV RMS to 10MHz
  <150mVp-p to 100MHz
Acoustic noise: .....<60dBa @ 1m (3ft)

Performance / Features

Indicators: .....Input ok LED (green)
  Output ok LED (green)
  Module fail LED (red)
Adjustments: .....Via CXC controller
Protection: .....Input fuse
  Input inrush current limit
  Output fuse
  Over temperature limiting
  Input high and low voltage shutdown
  Current limit/short circuit protection
Miscellaneous: .....Control and monitoring via CXC controller (requires v1.96 min)
  Low voltage cutoff (LVD)

Mechanical

Dimensions:
  mm: .....84H x 100W x 235D
  in: .....3.3H x 3.94W x 9.25D
Weight: 2.8kg (6.2lbs)

Environmental

Temperature: .....-40 to 55°C (de-rated power up to 75°C)
Humidity: .....0 to 95% NC

Shelves

24-48V 5-Mod 23" shelf (single input) P/N: 030-900-20
24-48V 4-Mod 19" shelf (single input) P/N: 030-839-20

Mechanical

24-48V 5-Mod 23" shelf dimensions:
  mm: .....89H x 584W x 304D
  in: .....3.5H x 23.0W x 12.0D
Weight: 10.4kg (23.0lbs)

24-48V 4-Mod 19" shelf dimensions:
  mm: .....89H x 438W x 310D
  in: .....3.5H x 17.2W x 12.2D
Weight: 85kg (19lbs)

Performance / Features

CAN bus communication
Optional integrated CXCI controller
+/- Input busbar integration with standard 3.1kW systems (S-mod shelf)

Related Components

External Options:
  567-808-19: .....Kydex cover, 23" CXDF shelf
  567-809-19: .....Kydex cover, 19" CXDF shelf

Agency Compliance

Safety: .....CSA/UL C22.2 60950 (NRTL)
  CE IEC/EN 60950
  CE marked
EMI: .....Class A radiated
  Class A conducted
  EN 6100-4-2, -3, -4, -6
  GR-1089 (where applicable)
  GR-63


CXDF 24-48/2kW 23", 5-module shelf

CXDF 48-24/2kW
Cordex™ Series DC-DC Converters

- Support small to medium 24Vdc legacy loads from 48Vdc power systems
- High power density modular design, up to 2kW output per module
- Advanced monitoring and control capability including remote accessibility
- Internal low voltage shutdown for cost effective integration into existing systems



CXDF 48-24/2kW Converter Module

P/N: 012-527-20

Electrical

Input voltage: .....-42 to -60Vdc
Input current:.....<48A @ 48V (55A max)
Efficiency:.....>88% (50 to 100% load)
Input noise:
  Voice band: .....<32dBrnC
  Wide band: .....<10mV RMS to 10MHz
  <150mVp-p to 100MHz
Output power:.....2000W max @ 27Vdc (1.8kW @ 24Vdc)
Output voltage:.....27Vdc nominal
Output current:.....74A max @ 27Vdc
Regulation:.....-1% +/-0.1% load (static)
  +/- 0.1% line (static)
Output noise:
  Voice band: .....<38dBrnC
  Wide band: .....<20mV RMS to 10MHz
  <150mVp-p to 100MHz
Acoustic noise:.....<60dBa @ 1m (3ft)

Performance / Features

Indicators: .....Input ok LED (green)
  Output ok LED (green)
  Module fail LED (red)
Adjustments: .....Via CXC controller
Protection:.....Input fuse
  Input inrush current limit
  Output fuse
  Over temperature limiting
  Input high and low voltage shutdown
  Current limit/short circuit protection
Miscellaneous:..... Control and monitoring via CXC controller
  (requires v1.96 min)
  Low voltage cutoff (LVD)

Mechanical

Dimensions:
  mm:.....84H x 100W x 235D
  in:.....3.3H x 3.94W x 9.25D
Weight:.....2.8kg (6.2lbs)

Environmental

Temperature:.....-40 to 55°C (de-rated power up to 75°C)
Humidity: .....0 to 95% NC

Shelves

48-24V 4-Mod 19/23" shelf P/N: 030-840-20

Mechanical
Dimensions:
  mm:.....88.4H x 438W x 332D
  in:.....3.48H x 17.2W x 13.1D
Weight: 8.6kg (18.9lbs)

Performance / Features
CAN bus communication to remote CXC controllers/peripherals
Optional integrated CXCI controller

Agency Compliance

Safety: .....CSA/UL C22.2 60950 (NRTL)
  CE IEC/EN 60950
  CE marked
EMI: .....Class A radiated
  Class A conducted
  EN 6100-4-2, -3, -4, -6
  GR-1089 (where applicable)
  GR-63



Inverters

Alpha's -48Vdc inverter modules and stand-alone inverters offer high reliability, high power efficiency and optimal power density. AIM2500, AIM1500 and INEX 1500 are hot swappable modules installed in AMPS80 HP, AMPS24 HP and INEX inverter systems, respectively, while INVERTER 2000 is a stand-alone inverter.

Alpha Inverter Module 2500
For installation in AMPS80 HP Systems



AIM 2500

- Revolutionary technology offers 94% efficiency and Telecom-grade reliability
- Hot swappable 2.5kVA/2kW AC power module allows optimal scalability and flexibility
- No single point of failure due to system static switch as each module has DSP controlled static switch functionality
- Up to 4 high power density modules per inverter shelf
- Up to 30 modules per 75kVA AMPS80 HP system

AIM 2500 P/N: 014-201-20

Electrical

AC Output:
- Power rating:.....2500VA/2000W
- Waveform: .....Pure sine wave
- Efficiency:.....94% AC-to-AC mode
- Power factor: 0.8
- Transfer time:.....Zero transfer time
- Nominal voltage: 120Vac
- Voltage accuracy: .....±2%
- Frequency: .....60Hz (same as input frequency)
- Frequency accuracy: 0.03%
- THD (resistive load):.....<1.5%
- Transient load recovery time:.....0.4 ms
- Soft start time: 20s
- Maximum crest factor at nominal power:.....3.5
- Short circuit overload capacity:.....10 x In for 20msec (AC-to-AC mode)
- Short term overload capacity:.....150% for 5 seconds
- Permanent overload capacity:.....110%
- MTBF.....>230,000hrs

AC Input:
- Nominal AC voltage:.....120Vac
- AC voltage range:.....90 – 140Vac
- Input power factor:.....>99%
- Synchronization range:.....57 – 63Hz

DC Input:
- Nominal DC voltage:.....48Vdc
- Maximum DC voltage range (max):.....40 – 60Vdc (user adjustable)
- Voltage ripple:.....<2mV/<38 dbrnc

Mechanical

Dimensions:
- mm:.....88.9H x 102W x435D
- inches:.....3.5H x 4W x 17.13D

Weight:.....5kg (11lbs)

Environmental

Temperature:
- Operating: .....-20 to 40°C (-4 to 104°F)
- Storage:.....-40 to 70°C (-40 to 158°F)

Relative humidity:.....Up to 95%, non-condensing

Operating altitude: .....Up to 1500m (4900ft) above sea level

Heat Dissipation: .....437BTU per hour in AC-to-AC mode;
.....758BTU per hour in DC-to-AC mode

Agency Compliance

Safety:.....UL 60950

Immunity:.....EN 61000-4

Emissions:.....EN 55022 (Class A)

RoHS:.....Compliant

Alpha Inverter Module 1500

For installation in AMPS24 HP Systems

NEW



AIM 1500

- Revolutionary technology offers 93% efficiency and Telecom-grade reliability
- Hot swappable 1.5kVA/1.2kW AC power module allows optimal scalability and flexibility
- No single point of failure due to system static switch as each module has DSP controlled static switch functionality
- Up to 4 high power density modules per inverter shelf
- Up to 16 modules per 24kVA AMPS24 HP system

AIM 2500 P/N: 0140004

Electrical

AC Output:
- Power rating:.....1500VA/1200W
- Waveform: .....Pure sine wave
- Efficiency:.....93% AC-to-AC mode
- Power factor: 0.8
- Transfer time:.....Zero transfer time
- Nominal voltage: 120Vac
- Voltage accuracy: .....±2%
- Frequency: .....60Hz (same as input frequency)
- Frequency accuracy: 0.03%
- THD (resistive load):.....<1.5%
- Transient load recovery time:.....0.4 ms
- Soft start time: 20s
- Maximum crest factor at nominal power:.....3.5
- Short circuit overload capacity:.....10 x In for 20msec (AC-to-AC mode)
- Short term overload capacity:.....150% for 5 seconds
- Permanent overload capacity:.....110%
- MTBF.....>230,000hrs

AC Input:

Nominal AC voltage:.....120Vac
- AC voltage range:.....90 – 140Vac
- Input power factor:.....>99%
- Synchronization range:.....57 – 63Hz

DC Input:
- Nominal DC voltage:.....48Vdc
- Maximum DC voltage range (max):.....40 – 60Vdc (user adjustable)
- Voltage ripple:.....<2mV/<38 dbrnc

Mechanical

Dimensions:
- mm:.....88.9H x 102W x300D
- inches:.....3.5H x 4W x 12.5D

Weight:.....2.4kg (5.3lbs)

Environmental

Temperature:
- Operating: .....-20 to 50°C (-4 to 122°F)
- Storage:.....-40 to 70°C (-40 to 158°F)

Relative humidity:.....Up to 95%, non-condensing

Operating altitude: .....Up to 1500m (4900ft) above sea level

Heat Dissipation:.....286BTU per hour in AC-to-AC mode; 410BTU per hour in DC-to-AC mode

Agency Compliance

Safety:.....UL 60950

Immunity:.....EN 61000-4

Emissions:.....EN 55022 (Class A)

RoHS:.....Compliant

INEX 1500

For installation in INEX Systems



INEX 1500

- Pure sine wave
- Hot swappable replacement in shelf
- High efficiency >88%
- DSP design for higher system reliability
- Smart fan speed control
- N+1 redundancy system, load sharing difference <5%
- High power density
- Wide operation temperature range, -20 to 70°C (-4 to 158°F)

120Vac, 1500VA P/N: 014-116-10
230Vac, 1500Va P/N: 014-117-10

Electrical

DC input:
- Nominal voltage: 48Vdc
- Operating range: .....40.5Vdc ~ 58Vdc
- Input protection: .....Reverse polarity protection
- Psophometric noise voltage: .....≤1.0mV ITU-T O.41 (16.66~6000Hz)

AC output:
- Power rating:.....1500VA/1200W
- Waveform: .....Pure sine wave
- Power factor: 0.8
- Nominal output voltage: .110/115/120Vac 208/220/230/240Vac
- Voltage variation:.....Max ±2%
- Output frequency: 50/60Hz
- Crest factor:.....3:1
- THD: .....<3%, linear load <5%, non-linear load
- Efficiency:.....Min 88%
- Isolation AC-enclosure:..Basic isolation (Pri-Gnd) 2121Vdc/1min
- Dynamic response: .....<±10%
- Over load protection:.....1.5*Inom >20s 1.25*Inom temperature controlled

Mechanical

Dimension:
- mm:.....270D x 215W x 43.8H
- inches:.....10.63D x 8.46W x 1.72H

Weight: 3.0kg (6.61lbs)

Environmental

Operating temperature: ....-20 to 70°C (-4 to 158°F) -5 to 58°C (23 to 122°F) with full performance
Storage temperature:.....-40 to 85°C (-40 to 185°F)
Humidity: .....90% RH non-condensing
Audible noise: 55dB

Agency Compliance

Safety: .....EN 60950-1, UL 60950-1, IEC 60950-1, CSA C22.2 No. 60950-1
EMC:.....EN 55022:1998
Certifications:.....UL, CE
RoHS:.....Compliant

INVERTER 2000
Stand-alone Telecom Inverter



Inverter 2000

- Powerful 2000VA/2000W stand-alone module
- High quality pure sine wave output
- Remarkable overload capability: 120% overload continuously, 200% overload for up to 5 seconds
- Stand out efficiency, up to 91%
- Built-in auto transfer switch (ATS) for increased reliability
- LCD display for real time status monitoring and setting module parameters

120Vac (NEMA outlets) P/N: 014-129-10
230Vac (IEC outlets) P/N: 014-130-10

Electrical

DC Input:
- Nominal voltage: 48Vdc
- Operating range: .....40 to 58Vdc
- Psophometric noise voltage: .....≤1.0mV ITU-T O.41 (16.66~6000Hz)

AC Input:
- Voltage range: .....110/115/120Vac: 89 to 138Vac; 208/220/230/240Vac: 176 to 276Vac
- Over voltage threshold: 138/276Vac
- Under voltage threshold: 89/176Vac
- Frequency range: .....50/60Hz, ±2.5%
- Transfer time: .....Inverter to bypass: 8ms

AC Output:
- Power capacity: 2000VA/2000W
- Waveform: .....Pure sine wave
- Power factor: 1.0
- Nominal output voltage: .....110/115/120Vac or 208/220/230/240Vac
- Voltage regulation: .....Max ±2%
- Output frequency: 50/60Hz
- Crest factor: 3:1
- THD: .....<3% for linear load, <5% for non-linear load
- Efficiency: .....>90.5% @ full load and nominal DC input; >91.5% max
- Overload protection: .....1.2 x Inom permanent overload capacity @ 30°C; 1.5 x Inom ≥10s; 2.0 x Inom ≥5s

Mechanical

Dimensions:
- mm: .....43.8H x 440W x 360D
- inches: .....1.72H x 17.3W x 14.2D

Weight: 7.1kg (15.7lbss)

Environmental

Temperature:
- Operation: ..... -20 to 50°C full performance, operating -20 to 60°C
- Storage: ..... -30 to 80°C

Humidity: ..... 95% relative humidity (non-condensing)
Altitude: 1500m (4920ft)
Heat dissipation: ..... Forced cooling with smart control
Audible noise: ..... 55dB ETS 300 753, class 3.1

Communication Interface

Signals/Controls:
- Control: ..... Keypad to setting all output values and parameters
- Display: ..... LCD and 3-LED's display alarms and system parameters
- General alarm signal: ..... Dry relay contact
- Remote On/Off: ..... Remote On/Off switch
- PC communications: ..... USB port

Agency Compliance

EMC: .....EN300 386:2001. Class B compliance
Safety compliance: .....Comply with EN 60950-1/UL 60950-1
Certification: .....CE/UL/C-Tick
RoHS: .....Compliant
MTBF: .....>200,000 hrs as per Telcordia SR-232


TECHNOLOGIES
FUSE



Distribution

Alpha offers a wide variety of breaker and fuse panels for distributing power to critical loads. Panels are available in various sizes, output voltages and use industry-standard breakers and fuses.

Multiple loose panel options are available for either expanding existing site distribution requirements, or for developing custom power systems for your specific requirements. Panels are available with several options including front access, ground bars, integrated shunts and LVD's.

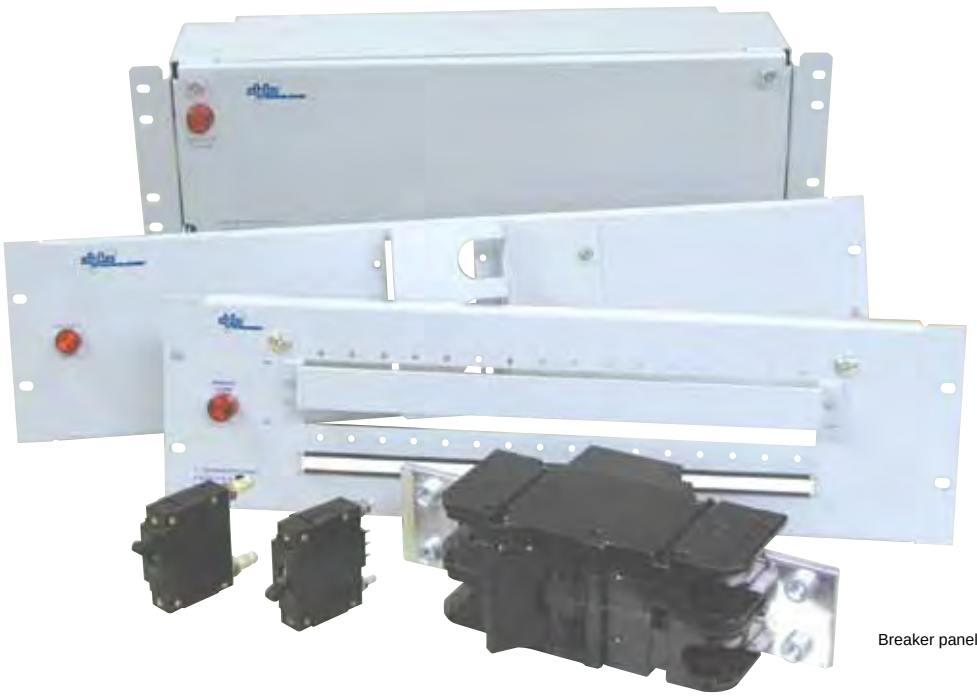
Alpha supplies a variety of universal distribution centers (UDC's) that accommodate system control, distribution and battery connections, all in a single rack mount unit. Further integration with a Cordex™ rectifier system creates a comprehensive power solution in a very compact package; easily configured to practically any power distribution requirement.

Distribution Panel Overview
DC Distribution Options

	P/N	Fuse position	Fuse type	Breaker position	Breaker type	Capacity	Mounting	Front access	RU	Additional options
Stand alone breaker / fuse panels	**020-107-20**	0		16/22	AM bolt-in	550A	19/23"	No	3	Gnd bar
	020-588-20	16*	TPS*	16	AM plug-in	400A	19/23"	Yes	5	Gnd bar, LVD
	020-589-20	20*	TPS*	20	AM plug-in	400A	23"	Yes	5	Gnd bar, LVD
	020-671-20	24*	TPS*	24	AM plug-in	600A	23"	No	3	
	020-675-20	18*	TPS*	18	AM plug-in	600A	19/23"	No	3	
	020-534-20	0		3	GJ bolt-in		19/23"	No	3	
	020-578-20	0		4	GJ bolt-in		23"	No	4	
	020-103-20	32	GMT	0		60A	19/23"	No	1	Gnd bar
	020-005-20	20	GMT	0		90A	19/23"	No	1	Gnd bar
	020-597-20	2	TPL	0		1200A	23"	No	4	Shunt
Universal Distribution Centers	**020-702-20**	18*	TPS*	18	AM plug-in	300A	19/23"	Yes	3	Controller I/O, LVD, Shunt, Batt breakers
	020-645-20	20-24*	TPS*	20-24	AM plug-in**	800A	23"	Yes	7	Controller, LVD, Shunt
		10	GMT							
	020-646-20	40-48*	TPS*	40-48	AM plug-in**	1000A	23"	Yes	9	Controller, LVD, Shunt
		10	GMT							
	020-635-20	80-96*	TPS*	80-96	AM plug-in**	2000A	23"	Yes	17	Controller, LVD, Shunt
		10	GMT							

Notes
*TPS fuses with AM plug-in breaker cartridges may be used as alternate to breakers
** Compatible with multiple pole AM plug-in breakers (110 to 250A)

Breaker Panels
Stand-Alone DC Distribution



Breaker panels

- AM bolt-in, AM plug-in and GJ breaker options
- 19" and 23" rack mount models
- 12, 24 or 48V configurations
- Rear access and front access options
- Designed for flexible and custom DC distribution

Breaker Panel Options

P/N	020-107-20	020-588-20	020-589-20	020-671-20	020-675-20	020-534-20	020-578-20
Breakers	AM bolt-in	AM plug-in	AM plug-in	AM plug-in	AM plug-in	GJ	GJ
Positions	16/22	16	20	24	18	3	4
Capacity	550A	400A	400A	600A	600A		
Mounting	19/23"	19"	23"	23"	19"	19/23"	23"
RU	3	5	5	3	3	3	4

Fuse Panels
Stand-Alone DC Distribution



Fuse Panels

- GMT and TPL fuse panel options
- TPS fuse options using fuse mount breaker cartridges
- 19" and 23" rack mount models
- 12, 24 or 48V configurations
- Designed for flexible and custom DC distribution

Fuse Panel Options

P/N	020-103-20	020-005-20	020-597-20	020-588-20	020-589-20	020-671-20	020-675-20
Breakers	GMT	GMT	TPL	TPS*	TPS*	TPS*	TPS*
Positions	32	20	2	16	20	24	18
Capacity	60A	90A	1200A	400A	400A	600A	600A
Mounting	19/23"	19/23"	23"	19"	23"	23"	19"
RU	1	1	5	5	5	3	3

*Requires AM plug-in breaker cartridge for TPS fuse mount (520-059-10)

Vista Distribution Centers
Universal Distribution Centers



Vista Two Tier UDC

- Various modular distribution configurations
- Complete front access
- Integrated Cordex™ system controller
- Integrated shunt and LVD options
- AM plug-in breaker, GJ breaker and GMT fuse options

Vista UDC Options

Model	Single tier	Two tier	Four tier
P/N	**020-645-20**	**020-646-20**	**020-635-20**
Breakers	AM plug-in	AM plug-in	AM plug-in
Positions	20-24	40-48	80-96
Capacity	600A	1200A	2000A
Mounting	23"	23"	23"
RU	7	9	17

Modular Distribution Tier Options

Single voltage	24 position AM plug-in 20 position AM plug-in w/ 600A LVD 3 position GJ 3 position GJ w/ 600A LVD
Dual voltage	12x primary & 10x secondary (AM plug-in) 16x primary & 6x secondary (AM plug-in) 8x primary (w/ LVD) & 10x secondary (AM plug-in) 12x primary (w/ LVD) & 6x secondary (AM plug-in)

Note: Consult factory for NEBS L3 certified system solutions using Vista UDC's

Related Components

Cordex™ controller CXCP: .See page 88
AM plug-in breakers:.....See page 125
GMT style fuses: .....See page 125

DCP03
Universal Distribution Center



DCP03 300A Distribution Center

- Up to 18 breaker positions
- Optional battery breaker disconnects
- Shunt and LVD options
- Universal 19/23" rack mount
- Compact 3RU high design
- Integrated controller I/O termination

P/N: 020-702-20

Electrical

Voltage: .....24Vdc or 48Vdc (list option configurable)
Current: .....300A DC max

Mechanical

Dimensions (excludes mounting brackets):
mm:.....133H x 432W x 318D
in:.....5.23H x 17.25W x 12.5D
Mounting: .....19/23", flush/center mount
Weight: 11.6kg (25.6lbs)

Connnections:
Load breaker: .....¼"-20 studs on ⅝" centers
*18x sets w/L87, 14x sets w/ L88
Battery breaker:.....¼"-20 studs on ⅝" centers
*4x sets w/L88 only
Ground bar: .....18x sets ¼" holes on ⅝" centers

Rectifier input:
Hot:.....2x sets ⅜" holes on 1" centers
Return:.....2x sets ⅜" holes on 1" centers
Alarm: .....1.31 to 0.128mm^2 (#16 to #26AWG)
Communications: .....Terminal blocks: Internal I/O
DB (serial) connection(s): CXCI and CXCM2 I/O
RJ-12 Offset: CAN for optional ADIO
Access:.....Front access after installation with 1RU required above panel for tooling

Environmental

Temperature:.....-40 to 65°C (-40 to 149°F)
-40 to 55°C (-40 to 131°F) de-rated when L71 (24V LVD) equipped
Humidity: .....0 to 95% RH non-condensing
Elevation: .....-500 to 4000m (-1640 to 13124ft)

Related Components

Distribution:
L87:.....18x load positions (AM plug-in breaker)
L88: .....14x load positions & 4x battery positions (AM plug-in breaker)

System options:
L71:.....24V LVD
L72:.....48V LVD
L84:.....400A shunt
L74: .....CXCI I/O extension
L75:.....CXCM2 I/O extension
L79:.....4R/8D ADIO
L93: .....Top cover

External options:
614-840-13:.....Bus bar for UDC & single 19/23" 2kW rectifier shelf (qty 2x req'd)
614-841-13: .....Bus bar for UDC & two 19" 2kW rectifier shelves (qty 2x req'd)
037-202-20:.....Kydex cover kit; for UDC & single 19/23" 2kW rectifier shelf
037-207-20: .....Kydex cover kit; for UDC & two 19" 2kW rectifier shelves
567-815-19: .....Kydex cover kit; for standalone UDC



DCP03 rear view

Breakers

AM Series, Bolt-In Style Breakers	
P/N	**Description**
747-011-20	5 Amp w/ Jumper Kit
747-012-20	10 Amp w/ Jumper Kit
747-013-20	15 Amp w/ Jumper Kit
747-014-20	20 Amp w/ Jumper Kit
747-015-20	25 Amp w/ Jumper Kit
747-016-20	30 Amp w/ Jumper Kit
747-017-20	40 Amp w/ Jumper Kit
747-018-20	50 Amp w/ Jumper Kit
747-019-20	60 Amp w/ Jumper Kit
747-020-20	70 Amp w/ Jumper Kit
747-021-20	80 Amp w/ Jumper Kit
747-022-20	90 Amp w/ Jumper Kit
747-023-20	100 Amp w/ Jumper Kit

1RU Load Breakers for CXPS-HD Systems	
P/N	**Description**
4700054	3A Circuit breaker, 1RU
4700055	5A Circuit breaker, 1RU
4700056	10A Circuit breaker, 1RU
4700057	20A Circuit breaker, 1RU
4700058	30A Circuit breaker, 1RU
4700059	40A Circuit breaker, 1RU
4700060	50A Circuit breaker, 1RU
4700061	60A Circuit breaker, 1RU

1RU Battery Breakers for CXPS-HD Systems	
P/N	**Description**
4700100	60A Circuit breaker, 1RU

GJ Series, Bolt-In Style Breakers	
P/N	**Description**
470-120-10	100 Amp
470-125-10	125 Amp
470-188-10	150 Amp
470-171-10	175 Amp
470-121-10	200 Amp
470-081-10	225 Amp
470-228-10	250 Amp
470-122-10	300 Amp (2-Pole)
470-126-10	400 Amp (2-Pole)
470-210-10	450 Amp (3-Pole)
470-123-10	500 Amp (3-Pole)
470-219-10	600 Amp (3-Pole)
470-208-10	700 Amp (3-Pole)

AM Series, Plug-In Style Breakers	
P/N	**Description**
470-300-10	1 Amp, Mid-Trip
470-301-10	3 Amp, Mid-Trip
470-302-10	5 Amp, Mid-Trip
470-303-10	10 Amp, Mid-Trip
470-304-10	15 Amp, Mid-Trip
470-305-10	20 Amp, Mid-Trip
470-306-10	25 Amp, Mid-Trip
470-307-10	30 Amp, Mid-Trip
470-308-10	35 Amp, Mid-Trip
470-309-10	40 Amp, Mid-Trip
470-310-10	45 Amp, Mid-Trip
470-311-10	50 Amp, Mid-Trip
470-312-10	60 Amp, Mid-Trip
470-346-10	60 Amp, Series-Trip
470-370-10	65 Amp, Series-Trip
470-313-10	70 Amp, Mid-Trip
470-314-10	80 Amp, Mid-Trip
470-315-10	90 Amp, Mid-Trip
470-316-10	100 Amp, Mid-Trip
470-347-10	100 Amp, Series-Trip
747-220-20	110 Amp, Mid-Trip (2-Pole)
747-147-20	125 Amp, Mid-Trip (2-Pole)
747-148-20	150 Amp, Mid-Trip (2-Pole)

Fuses

GMT Series Fuses	
P/N	**Description**
460-004-10	0.5 Amp
460-006-10	1 Amp
460-081-10	1.33 Amp
460-082-10	1.5 Amp
460-083-10	2 Amp
460-013-10	3 Amp
460-085-10	4 Amp
460-084-10	5 Amp
460-105-10	7.5 Amp
460-069-10	10 Amp
460-150-10	15 Amp
520-046-10	GMT Fuse Cover

TPL Series Fuses	
P/N	**Description**
460-140-10	100 Amp
460-141-10	150 Amp
460-142-10	200 Amp
460-143-10	225 Amp
460-139-10	250 Amp
460-144-10	300 Amp
460-145-10	400 Amp
460-146-10	500 Amp
460-147-10	600 Amp
460-148-10	800 Amp

TPS Series Fuses	
P/N	**Description**
460-215-10	1 Amp
460-216-10	3 Amp
460-217-10	5 Amp
460-218-10	6 Amp
460-219-10	10 Amp
460-220-10	15 Amp
460-221-10	20 Amp
460-222-10	25 Amp
460-223-10	30 Amp
460-224-10	40 Amp
460-225-10	50 Amp
460-226-10	60 Amp
460-227-10	70 Amp
460-228-10	80 Amp
460-229-10	90 Amp
460-230-10	100 Amp
520-059-10	TPS Fuse Holder (AM plug-in breaker)



Bypass and Transfer Switches

A transfer switch allows safe switching from utility power to emergency power while maintaining isolation of each source from the other. Alpha offers a range of transfer and bypass switches as part of our total power solutions package. These switches allow for power to be seamlessly migrated between utility/line to battery backup or generator.

Alone or combined with an optional rack mount kit, the Universal Automatic Transfer Switch (UATS) and Universal Generator Transfer Switch (UGTS) can also be configured with a variety of output options such as surge arrestors, EMI filters and custom plates – contact your Alpha representative for details. Optional wall mount kits also available.

The Alpha 255A External Maintenance Bypass Switch is a manually operated wrap-around mechanical switch for use with a UPS System such as AMPS80 HP. It provides a simple and effective means for bypassing the UPS while maintaining continuity of power to critical AC loads.

255A Bypass Switch

Indoor External Maintenance Bypass Switch

NEW



255A Bypass Switch

- Simple, safe and reliable means for bypassing UPS while maintaining continuity of power to critical AC loads
- Phase detector with lock out prevents unauthorized operation
- Safe-to-switch (IN PHASE) lamp
- Electromechanical manual override feature for emergency situations
- Auxiliary contacts for remote monitoring
- UL 508 listed

Electrical

Voltage Rating :.....120/ 208 and 120/240 Vac (nominal)
Current Rating:.....255 A
Short Circuit
Current Rating:.....5kA

Current vs. Temperature Rating

Current (A)	Ambient Temperature
255	40°C (104°F)
210	45°C (113°F)
170	50°C (1220°F)

Cooling.....Not applicable; no heat generating components inside

Mechanical

Dimensions:
mm:.....910H x 610W x 280D
inches:.....36H x 24W x 11D
Weight:.....79.5kg (175lbs)

Environmental

Temperature:
Operating: .....-20 to 40°C (-4 to 104°F)
Storage:.....-40 to 75°C (-40 to 167°F)
Operating altitude: .....Up to 3858m (12,000ft)
Storage altitude:.....Up to 4572m (15,000ft)

Agency Compliance

Safety:.....UL / cUL 508



Automatic Transfer Switch

UATS

- 120V/30A
- 230V/16A

Alpha's Universal Automatic Transfer Switch is designed as a three stage bypass switch that allows for the UPS to be bypassed and still maintain the ability to keep batteries fully charged.

It acts as a fail-safe device by switching the critical load to the utility line should a fault occur in the UPS. The UATS ensures that clean power is always provided to the critical load, ensuring that your mission-critical equipment always remains running in the event of an outage. This transfer switch also includes a standard manual bypass switch which eliminates costly equipment downtime while servicing the UPS or replacing the batteries.



Automatic Generator Transfer Switch

UGTS

- 120V/30A
- 230V/16A

Alpha's Universal Automatic Generator Transfer Switch automatically transfers the input to the UPS from the utility line to a portable AC generator.

The UGTS allows the generator to recharge the batteries and ensure your mission - critical equipment remains in operation during extended power outages. For manually connecting or disconnecting a generator, a standard switch is included.



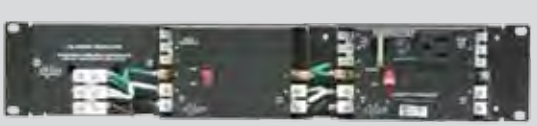
Alpha Maintenance Bypass Switch

Alpha Maintenance Bypass Switch

- 120V
- 230V Option not available

Alpha's Maintenance Bypass Switch allows the user to manually bypass the UPS system to safely perform service or routine maintenance.

When working in conjunction with the Alpha U-ATS, the manual-only maintenance bypass switch can be installed into the traffic controller cabinet, allowing for the complete UPS system to be bypassed for safe emergency replacement.



Rack Mount Options

Other Mounting Options

- Wall mount kit – P/N: 740-756-21
- Rack mount kit – P/N: 593-364-P4

Can be configured with U-ATS, U-GTS, surge option and/or receptacle plate for heating mats.



Enclosures

The Alpha enclosure product line provides a full range of rugged cabinet solutions for any application, including secure indoor.

Designed and tested to meet the highest industry operating standards, Alpha outdoor enclosures are equipped with control systems that maintain temperatures well within the specified operating ranges of internally mounted equipment. Each enclosure maintains a clean and dry environment that uses both open and closed loop thermal management designs.

Alpha enclosures provide application flexibility with a variety of adjustable components including moveable equipment mounting racks, different types of mounting hardware, swing racks, slide out equipment rails, different styles of cable entry ports and many other options and features.

When an Alpha outdoor enclosure and power products are combined as a system, the result is an optimally designed, highly-reliable and efficient outdoor power plant that provides easy installation and long term operation in a single outdoor cabinet design.

Enclosure Selection
Considerations

What are the requirements for the base enclosure?

Dimensions (in/mm):		Mounting:				Accessibility:		Cable entry/exit:				Security:	
Height	____	Pad	☐	Rack	☐	Front	☐	Rear	☐	Top	☐	Padlock-able	☐
Width	____	Pole	☐	Pedestal	☐	Rear	☐	Bottom	☐	Front	☐	Special “keyed”	☐
Depth	____	Wall	☐			Top	☐	Sides	☐			Other	____

What are the environmental conditions?

Temperature (°C/°F):		Wind Driven:				Seismic zone:			
Minimum	____	Rain	☐	Dust	☐	1	☐	3	☐
Maximum	____	Snow	☐	Other	____	2	☐	4	☐

What is the electrical service available at the location?

AC Voltage:						Main breaker rating:					
120Vac	☐	120/240Vac	☐	277/480Vac	____	15A	☐	30A	☐	100A	☐
120/208Vac	☐	347/600Vac	☐	Other	____	20A	☐	50A	☐	Other	____

What are the operating parameters of your equipment?

AC Voltage:		DC Voltage:		Total load current (A):	Mounting:	
24Vac	☐	12Vdc	☐	Minimum ____	19”rack	☐
120Vac	☐	24Vdc	☐	Maximum____	23”rack	☐
208Vac	☐	48Vdc	☐		Other	____
240Vac	☐	125Vdc	☐			
Other	____	Other	____			

Equipment space (RU):		Operating temperature range:				Equipment heat dissipation (Btu/hr or W):
Item 1	____	Min	____	Max	____	_____
Item 2	____	Min	____	Max	____	_____
Item 3	____	Min	____	Max	____	_____

Which climate control option is preferable with the enclosure?

Cooling:				Emergency Ventilation System (EVS)		Heating:	
Fan(s)	☐	Heat exchanger	☐	Recommended if A/C is selected	☐	PTC fan heater(s)	☐
Air conditioner	☐	Other	____			Other	____

What are the battery requirements?

Application:		Battery chemistry:				Discharge time:		Recharge time:	
Cycle	☐	Lead-acid	☐	Li-Ion	☐	Hour(s)	____	Hour(s)	____
Float	☐	Ni-Cad	☐	Other	____	Minute	____	Minute	____

How is the power distributed to the critical loads?

Fuse ☐ (Specify size and quantity if known) _____

Breaker ☐ (Specify size and quantity if known) _____

Have you considered these system options?

Load center	☐	Surge suppression	☐	Fiber winding box	☐
Generator inlet	☐	Meter base	☐	Convenience outlet(s)	☐
Transfer switch	☐	Battery heater mat	☐	Specify other options required	_____

Are there any requirements for agency compliance?

GR standard				NEBS		Safety compliance			
GR487	____	GR1089	____	Level 1	☐	CSA/UL 60950	☐	Other	____
GR13	____	Other	____	Level 2	☐	CE	☐		
GR63	____			Level 3	☐				

MMOE - Telecom
Outdoor Enclosure



MMOE - Telecom

- Multi-Mount Outdoor Enclosure - Telecom
- Compact enclosure design provides ideal fit for locations where aesthetics and footprint are important
- Light-weight powder coated aluminum construction offers superior corrosion resistant properties
- Large sun shield reduces solar heat load inside cabinet
- 180° stainless steel piano-hinged door (with two locking open positions) make installation and maintenance easy and convenient
- Thermostat controlled filtered fan cooling and louvered vents ensure reliable operation in high temperature environments
- Various mounting options (including pole mount) make this highly versatile in space constrained mobile broad-band applications

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm:.....687H x 559W x 457D
- inches:.....27H x 22W x 18D

Weight:.....27.2kg (60lbs)
Construction:.....High strength corrosion resistant aluminum
Finish:.....Power coated white color
Equipment space:.....5RU space with one battery shelf
Equipment rails:.....EIA standard 19"
Cable entrance:
- Bottom of enclosure:.....1 x 3" diameter knock-out (2½" trade size)
  4 x 1.125" diameter knock-out (¾" trade size)

Hardware

Hinge type:.....Stainless steel piano hinge
Door prop:.....Aluminum rod, 2 locking open positions
Door latch:.....Bellcore 216 compression lock with pad lock collar

HVAC

Cooling:.....Thermostat controlled 48Vdc fan, 100 cfm or better, ON at 49°C (120°F) Off at 32°C (89°F)
Ventilation:.....Door installed louvers

Environmental

Temperature:
- Operating:.....-40 to 46°C
- Storage:.....-40 to 85°C

Installation

Access:.....Front hinged door provides full front access

Maintenance

Door installed louvers:.....Equipped with splash baffle or washable filters

Enclosure Options

Mounting:.....Pole, host, wall, or pedestal (please specify if pole used is concrete at time of order)

System Specifications (as shown)

- Battery shelf with 4x AlphaCell™ 195GXL-FT batteries
- FXM1100 UPS
- Pedestal mount kit

System Options
- Alpha universal automatic transfer switch
- Alpha universal generator transfer switch
- AlphaGuard battery balancer
- Battery heater mats
- Transient voltage surge suppression device

Agency Compliance

CSA/UL:.....C22.2 No.60950
Telcordia:.....GR-13-CORE
NEMA rating:.....3R

MMOE - Traffic
Outdoor Enclosure

- Multi-Mount Outdoor Enclosure - Traffic
- Designed for outdoor or secure indoor applications
- Traffic grade aluminum enclosure protects battery backup power systems from outdoor elements
- Various mounting options (including pole-mount) provide a flexible solution for space constrained traffic applications
- Large sun shield reduces solar heat load inside cabinet
- Thermostat controlled fan and louvered vents ensure reliable operation in high temperatures
- 180° stainless steel piano hinged door with two locking open positions makes installation and maintenance easy and convenient
- Three-point latching mechanism with Corbin Type 2 lock for maximum security



MMOE - Traffic
Shown with Alpha FXM 2000, Alpha transfer switches and AlphaCell™ batteries

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm: 687H x 559W x 457D
- inches: 27H x 22W x 18D

Weight: 27.2kg (60lbs)
Construction: High strength corrosion resistant 0.125" thick aluminum
Finish: Natural aluminum or painted gray
Equipment space: 7RU space with one battery shelf
Equipment rails: EIA standard 19"
Cable entrance:
- Bottom of enclosure: 1 x 3" diameter knock-out (2½" trade size)
  4 x 1.125" diameter knock-out (¾" trade size)

Hardware

Hinge type: Stainless steel piano hinge
Door prop: Aluminum rod, 2 locking open positions
Door latch: 3 point latch with integrated Corbin Type 2 lock

HVAC

Cooling: Thermostat controlled 48Vdc fan, 100 cfm or better, ON at 49°C (120°F) Off at 32°C (89°F)
Ventilation: Door installed louvers

Environmental

Temperature:
- Operating: -40 to 46°C
- Storage: -40 to 85°C

Installation

Access: Front hinged door provides full front access

Maintenance

Door installed louver: Equipped with washable filter

Enclosure Options

Mounting: Pole, host, wall, or pedestal (please specify if pole used is concrete at time of order)

System Specifications (as shown)

- Battery shelf with 4x AlphaCell™ 85GXL batteries
- FXM2000 UPS
- Pedestal mount kit
- Universal automatic transfer switch

System Options
- Universal generator transfer switch
- AlphaGuard battery balancer
- Battery heater mats
- Transient voltage surge suppression device

Agency Compliance

NEMA rating: 3R

AOES6
Outdoor Enclosure

- Alpha Outdoor Enclosure Side Mount 6
- Designed for outdoor or secure indoor applications
- Traffic grade aluminum enclosure protects battery backup power systems from outdoor elements
- Various mounting options (including pole-mount) provide a flexible solution for traffic applications
- Large sun shield reduces solar heat load inside the cabinet
- Thermostat controlled fan and louvered vents ensure reliable operation in high temperatures
- 180° stainless steel piano hinged door with two locking open positions makes internal component installation and maintenance easy and convenient
- Three-point latching mechanism with Corbin Type 2 lock (or optional Best lock) for maximum security



AOES6 (shown with Alpha FXM 1100, transfer switches and AlphaCell batteries)

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm: 1220H x 419W x 419D
- inches: 48H x 16.5W x 16.5D

Weight: 34kg (75lbs)
Construction: High strength corrosion resistant aluminum
Finish: Natural aluminum
Equipment space: 8RU space (without generator inlet) with two (2) battery shelf
Equipment rails: EIA standard 19"
Cable entrance:
- Bottom of enclosure: 1 x 76mm (3") diameter knock-out

Hardware

Hinge type: Stainless steel piano hinge
Door prop: Aluminum rod, 2 locking open positions
Handle: Stainless steel handle with padlock fitting for extended life and improved look
Door latch: 3 point latch with integrated Corbin Type 2 lock (or optional Best lock) for maximum security

HVAC

Cooling: Thermostat controlled 48Vdc fan, 100 cfm or better, ON at 49°C (120°F) Off at 32°C (89°F)
Ventilation: Door installed louvers

Environmental

Temperature:
- Operating: -40 to 46°C
- Storage: -40 to 85°C

Installation

Access: Removable bottom shelf for easy wiring access

Maintenance

Door installed louver: Equipped with washable filter
Other: Bug screen protected top vent

Enclosure Options

Mounting: Side mount (standard) - designed to mount to the side of most traffic enclosure cabinets
Ground mount kit (optional)
Pole mount kit (optional)

System Specifications (as shown)

- 2 Battery shelf with 4x AlphaCell 220GXL batteries
- FXM1100 UPS
- Universal automatic transfer switch
- Universal generator transfer switch

System Options
- Generator support: locking generator access door and L5-30 F1 plug
- AlphaGuard™ battery balancer
- Battery heater mats
- "On Battery" indicator light
- Door activated interior light
- Tilt switch
- Tamper switch

Agency Compliance

CSA/UL, CE: UL50E/C22.2 No.94
NEMA rating: 3R

Te25
20" General Purpose Enclosure

- Multipurpose indoor/outdoor enclosure designed for small power (AC or DC) applications requiring batteries, power equipment or both
- Various mounting options provide a flexible solution for space constrained or remote applications
- Thermostat controlled filtered fan cooling and louvered vents ensure reliable operation in high temperature environments
- Durable aluminum construction provides excellent corrosion resistance
- AC and DC power connections (pre-wired at factory) reduce field installation time



Te25

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm: 516H x 544W x 518D
- inches: 20.3H x 21.4W x 20.4D

Weight: 29kg (65lbs)
Construction: High strength corrosion resistant aluminum
Finish: Powdercoat
Equipment space: 11RU (without batteries)
Cable entrance: Knockouts located on the bottom and rear of enclosure
Equipment rails: 19"

Hardware

Hinge type: 2 position lift off hinge
Door latch: Padlockable ¼ turn latch
Battery trays (qty.): 1

HVAC

Cooling: Thermostat controlled filtered fan cooling
Ventilation: Door installed louvers

Environmental

Temperature:
- Operating: -40°C to 46°C
- Storage: -40°C to 85°C

Installation

Access: Rear louver can be removed for equipment installation

Maintenance

Door installed louvers: Equipped with washable/replaceable filter

Enclosure Options

Mounting: Wall, pole, pedestal or rack

System Specifications (as shown)



- 48Vdc Cordex rectifier shelf comes with DC distribution
- 4 x 91Ahr batteries
- External 8 position AC load centre with surge arrestor
- Dual filtered fan cooling
- Alarm terminal block
- Ground bar

System Options
- AC load centre
- AC surge arrestor
- Combination meter base
- Main breaker disconnect box
- Battery heater mat

Agency Compliance

CSA/UL: C22.2 No. 60950
NEMA rating: Type 3R (CSAC22.2 No 94-M91)

AOES10
Outdoor Enclosure

- Alpha Outdoor Enclosure Side Mount 10
- Designed to Caltrans specification for systems requiring Caltrans approved product
- Additional shelf allows for customer furnished equipment inside the enclosure
- Large battery space allows for up to four BCI Group 31 batteries for the longest runtime in a Caltrans enclosure
- Large sun shield, thermostatically controlled fan and louvered vents ensure reliable operation in high temperatures
- 180° stainless steel piano hinged door with two open positions makes installation and maintenance easy and convenient
- Three-point latching mechanism with integrated Corbin Type 2 lock for maximum security
- Designed for outdoor or secure indoor applications



AOES10

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
mm:.....1422H x 724W x 334D
inches:.....56H x 28W x 13.2D
Weight:.....52.16kg (115lbs) no options
Construction:.....High strength corrosion resistant 0.125" thick aluminum
Finish:..... Natural aluminum
Equipment space:..... 6RU

Hardware

Hinge type:.....Stainless steel piano hinge
Door prop:.....Aluminum rod, 2 Lock-out positions
Handle:.....Stainless steel handle for extended life and improved look
Door latch:.....3 point latch with integrated Corbin Type 2 lock or optional best lock for maximum security
Equipment shelves:.....4 equipment shelves

HVAC

Cooling:.....Thermostat controlled 48Vdc fan, 100 cfm or greater, ON at 49°C (120°F) Off at 32°C (89°F)
Ventilation:.....Door installed louvers

Environmental

Temperature:
Operating:.....-40 to 46°C
Storage:.....-40 to 85°C

Installation

Access:.....Removable bottom shelf for easy wiring access

Maintenance

Door installed louver:.....Equipped with washable filter
Other:.....Bug screen protected top vent

Enclosure Options

Mounting:.....Side mount (standard) - designed to mount to the side of most traffic enclosure cabinets
Stand alone

System Specifications

- 4x Alphacell 220GXL batteries
- FXM2000 UPS
- Universal automatic transfer switch

System Options

- Generator support: locking generator access door and L5-30 F1 plug with manual switch
- Universal automatic transfer switch
- Universal generator transfer switch
- AlphaGuard™ battery balancer
- Battery heater mats
- Transient voltage surge suppression device
- “On Battery” indicator light
- Door activated interior light
- Tilt switch
- Tamper switch
- Ground mount kit
- Best lock
- Natural aluminum or powder coat finish

Agency Compliance

NEMA rating:.....3R

Z Series
Outdoor Enclosure



Z Series

- Extreme conditions enclosure
- Meets Telcordia Seismic Zone-4 standard
- NEMA 3R outdoor rated enclosure
- Simple, flexible options for pole, wall, ground or pedestal installations
- Designed for outdoor or secure indoor applications
- Wide temperature range -40 to 46˚C

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
mm:.....956H x 788W x 407D
inches:.....37H x 31W x 16D
Weight:.....368kg (812lbs)
Note: Weight depends on internal battery selection

Construction:.....High strength corrosion resistant aluminum
Finish:.....Powdercoat

Hardware

Handle:.....Lockable enclosure
Battery trays (qty.):.....2 (8 batteries)

Enclosure Options

Mounting: .....Multiple mounting configurations

System Specifications

System Options
- Input/output surge protection
- Intelligent back/boost operation for greater protection
- Hot swappable UPS and batteries
- Noise suppression, FCC Class B.

Agency Compliance

CSA/UL, CE: .....NRTL/CSA/CE
Telcordia:.....Telcordia zone 4 approved with battery retention bar
Telcordia salt fog tested, 14 day operational
Telcordia approved door restraint

P Series
Outdoor Enclosure

- Designed for outdoor or secure indoor applications
- Universal Mount enclosure
- Aluminum welded construction
- Pole mounting brackets included
- Removable, lockable doors and easy open lids
- Durable, powder coat finish
- Slide trays for batteries



P Series

Consult your Alpha representative for P/N configurations

Mechanical

P4
Dimensions:
mm:.....629H x 768W x 406D
inches:.....24.75H x 30.25W x 16.0D
Weight:.....26kg (57lbs)

P6
Dimensions:
mm:.....933H x 615W x 355D
inches:.....36.75H x 24.25W x 14.0D
Weight:.....31kg (68lbs)

P8
Dimensions:
mm:.....937H x 768W x 406D
inches:.....36.88H x 30.25W x 16.0D
Weight:.....55kg (121lbs)

Construction:.....High strength corrosion resistant aluminum
Finish:.....Powdercoat

Hardware

Battery trays (qty.):
P4:.....1 (4 batteries)
P6:.....2 (6 batteries)
P8:.....2 (8 batteries wider enclosure)
Door/lid:.....Completely removable
Micellaneous:.....Door prop rod
120V 20A or 240V 15A breaker
Duplex quad
Remove indicator light

Enclosure Options

Mounting:.....Universal mounting
Pole mount bracket included

System Specifications

General Specifications
Output Voltage Range:.....Duplex/quad output

System Options
- Battery heater mats
- Storm hood
- Enclosure cooling fan
- Internal service entrance
- Factory installed breaker box



P4



P6



P8

Te25xh
36" General Purpose Enclosure

- Multipurpose indoor/outdoor enclosure designed for medium power (AC or DC) applications requiring batteries, power equipment or both
- Various mounting options provide a flexible solution for space constrained or remote applications
- Thermostat controlled filtered fan cooling and louvered vents ensure reliable operation in high temperature environments
- Durable aluminum construction provides excellent corrosion resistance
- AC and DC power connections pre-wired at factory reduce field installation time



Te25xh

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm: 914H x 544W x 518D
- inches: 36H x 21.4W x 20.4D

Weight: 41kg (90lbs)
Construction: High strength corrosion resistant aluminum
Finish: Powdercoat
Equipment space: 19RU (without batteries)
Cable entrance: Knockouts located in bottom and back of enclosure
Rear side - 1@1" K.O.
1@¾" K.O.
1@½" K.O.
Equipment rails: 19"

Hardware

Hinge type: 3 position lift off hinge
Handle: Padlockable
Door latch: 3 point latch
Equipment shelves: Optional
Battery trays (qty.): 2 (Note: Equipment space reduced to 5RU with 8 x 91Ah batteries)

HVAC

Cooling: Air conditioner w/heater/heat exchanger/ thermostat controlled filtered fan cooling
Ventilation: Door installed louvers

Environmental

Temperature:
- Operating: -40°C to 46°C
- Storage: -40°C to 85°C

Installation

Access: Rear louver can be removed for equipment installation

Maintenance

Door installed louver: Equipped with washable/replacable filter

Enclosure Options

Mounting: Wall, pole, pedestal or rack

System Specifications (as shown)



Te17
(shown configured to customer specification)

- 48Vdc Cordex rectifier shelf c/w DC distribution
- External 8 position AC distribution with 30A generator connector
- 8 position GMT fuse panel
- Dual filtered fan cooling
- Alarm terminal block
- Ground bar

System options
- Combination meter base
- Main breaker disconnect
- Battery heater mat
- Heat exchanger 50W/°C
- Air Conditioner
- AC load centre
- AC surge protector

Agency Compliance

CSA/UL: C22.2 No. 60950
NEMA rating: Type 3R (CSAC22.2 No 94-M91)

FBE2322
Flexible Backhaul Enclosure

NEW

- Provides 15RU for 19” horizontal mounted equipment or 10RU for 23” vertical mounted equipment
- Front and side door access with removable lid
- Durable welded aluminum construction
- Wall, H-Frame, pole or ground mount options
- Multiple thermal management options



FBE2322

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm:.....752H x 686W x 610D
- inches:.....30H x 27W x 24D

Weight:.....29.5kg (65lbs)
Construction:.....High strength corrosion resistant aluminum
Finish:.....Powdercoat
Equipment space:.....15RU (19") horizontal or 10RU (23") vertical
Cable entrance:.....Knockouts located on the rear and bottom of enclosure
Equipment rails:.....19" for horizontal mount or 23" for vertical mount

Hardware

Hinge type:.....Reversible 2 position lift-off hinge
Handle:.....Padlockable
Door latch:.....½ turn padlock
Battery trays (qty):.....1

HVAC

Cooling:.....Air conditioner with heater/heat exchanger/ variable speed-controlled fan(s)
Ventilation:.....Door installed louvers

Environmental

Temperature
- Operating:.....-40 to 46°C
- Storage:.....-40 to 85°C

Installation

Access:.....Front hinged door, left and right lift off doors, removable lid

Maintenance

Door installed louvers:.....Equipped with washable/replaceable filter on systems with fan cool option

Enclosure Options

Mounting:.....Wall, H-frame, pole or ground

System Specifications (as shown)

- 48Vdc Cordex rectifier shelf c/w DC distribution
- External 8 position AC distribution with 30A generator connector
- Air conditioner
- Alarm terminal block
- Ground bar

System Options
- Heat exchanger
- Variable speed-controlled fan(s)
- Load center
- Surge protector
- Main breaker disconnect box
- Battery heater mat

Agency Compliance

CSA/UL:.....60950-22 ITE electrical enclosure
NEMA rating:.....Type 3R

Te17
44" General Purpose Enclosure

- Outdoor single compartment enclosure designed to hold batteries, power equipment or both
- 30” x 28” footprint allows for easy transport through doorways and stairwells
- Multiple access points from the outside provide greater flexibility to customer installed equipment
- Air conditioner unit with built-in heater ensures reliable operation of devices under cold and hot conditions
- Durable aluminum construction provides excellent corrosion resistance
- 14” riser with removable lift-off panels provide greater protection against water ingress and functions as a cable storage compartment



Te17

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions (including riser):
mm:.....1473H x 762W x 711D
inches:.....58H x 30W x 28D
Weight:.....204kg (450lbs)
Construction:.....High strength corrosion resistant aluminum
Finish:.....Powdercoat
Equipment space:.....23RU
Cable entrance:.....Knockouts located in side and bottom of enclosure
Equipment rails:.....23"

Hardware

Hinge type:.....Stainless steel piano hinge
Handle:.....Padlockable
Door latch:.....3-point latch
Equipment shelves:.....Optional
Battery trays (Qty):.....Optional

HVAC

Cooling:.....4000 BTU air conditioner

Environmental

Temperature:
Operating:.....-40 to 46°C
Storage:.....-40 to 85°C

Installation

Access:.....Removable rear panel and front hinged door provide full enclosure access

Maintenance

Front access after installation

Enclosure Options

Mounting:.....Pad or platform mount

System Specifications (as shown)

- 24Vdc Cordex rectifier shelf c/w DC distribution
- Internal 8 position AC panel
- Air conditioner and heater
- EVS (Emergency ventilation system)
- Customer specific equipment layout
- Alarm terminal block
- Ground bar

General Specifications
Input voltage range N/A:...120/240Vac
Voltage:.....24Vdc
Current:.....64A (n+1)

System options
Consult factory for custom system solutions

Agency Compliance

CSA/UL:.....C22.2 No. 60950
NEMA rating:.....Type 3R



Te45
72" Single Compartment Power Enclosure

- 39RU single compartment enclosure offering full height equipment installation flexibility
- Adjustable front to back rails provide for mid or flush mount equipment installation
- Multiple knockouts provide cable interface locations for installation flush or remote installation in enclosure lineups
- Pad-lockable door and durable powder coated aluminum construction allow for secure outdoor or indoor applications
- Heating cooling and ventilation options maintain equipment operating temperatures for various loads in all climate conditions


Te45

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm: 1829 x 762W x 762D
- inches: 72H x 30W x 30D

Weight: 250kg (550lbs)
Construction: High strength corrosion resistant aluminum
Finish: Powdercoat
Equipment space: 39RU
Cable entrance: Knockouts on sides and bottom
Equipment rails: 23"

Hardware

Hinge type: 4 position lift off hinges
Handle: Padlockable
Door latch: 3 point latch
Battery trays (qty.): Configuration dependent - 8RU per front terminal battery shelf

HVAC

Cooling: 4000 BTU air conditioner
Heating: 500W
EVS: DC fan powered EVS (Emergency Ventilation system) option
Audible noise: <65dbA

Environmental

Temperature:
- Operating: -40 to 46°C
- Storage: -40 to 85°C

Installation

Access: Removable rear panels and front hinged door provide full enclosure access

Maintenance

Front access after installation

Enclosure Options

Mounting: Pad or platform mount

System Specifications (as shown)

- 48Vdc Cordex 1.8kW rectifiers
- AC panel c/w generator panel and ATS (automatic transfer switch)
- Air conditioner w/heater
- EVS (Emergency ventilation system)
- Alarm terminal block
- Ground bar

General Specifications
Input voltage range N/A: ... 120/240Vac

System options
Consult factory for custom system solutions

Agency Compliance

CSA/UL: C22.2 No. 60951
Telcordia: GR-487 compliance - contact factory for specific compliances
NEMA rating: Type 3R (CSAC22.2 No 94-M91)



Te45 Battery
72" Front Terminal Battery Enclosure

- 4 battery trays designed for up to 8 strings of front terminal batteries @ 24Vdc and 4 strings @ -48Vdc. Up to 190Ahr size batteries
- Multiple knockouts provide cable interface locations for installation flush or remote installation in enclosure lineups
- Pad-lockable door and durable powder coated aluminum construction allow for secure outdoor or indoor applications
- The bolt together and sealed design provides structural integrity that will withstand seismic events and harsh weather conditions
- Built in cooling and heating system ensure longer battery life



Te45 Battery

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm: 1829H x 762W x 762D
- inches: 72H x 30W x 30D

Weight: 273kg (600lbs)
Construction: High strength corrosion resistant aluminum
Finish: Powdercoat
Equipment space: 39RU
Cable entrance: Knockouts on sides and bottom
Equipment rails: 23"

Hardware

Hinge type: 4 position lift off hinges
Handle: Padlockable
Door latch: 3 point latch
Battery trays (qty.): 4 Front terminal battery shelves

HVAC

Cooling: 4000 BTU air conditioner
Heating: 500W
EVS: DC fan powered EVS (Emergency Ventilation system) option
Audible noise: <65dbA

Environmental

Temperature:
- Operating: -40 to 46°C
- Storage: -40 to 85°C

Installation

Access: Removable rear panels and front hinged door provide full enclosure access

Maintenance

Front access after installation

Enclosure Options

Mounting: Pad or platform mount

System Specifications (as shown)

- 4 battery shelves for GNB 150Ahr or larger front terminal batteries
- Air conditioner w/heater
- EVS (Emergency ventilation system)
- Alarm terminal block
- Ground bar

General Specifications
Input voltage range N/A: 120/240Vac

System options
Consult factory for custom system solutions.

Agency Compliance

CSA/UL: C22.2 No. 60952
Telcordia: GR-487 compliance - contact factory for specific compliances
NEMA rating: Type 3R (CSAC22.2 No 94-M91)



Te45v2
Outdoor Enclosure

NEW

- Dual compartment system provides operational cost savings using a heat exchanger to cool equipment in the sealed upper compartment and ambient cooling for batteries in the vented lower compartment
- 13RU of rack space in the top compartment provides room for rectifiers, distribution, main radio units, surge protection and other 23” rack mount equipment
- 72” tall, 30” wide and 30” deep provides a small overall footprint that can easily be used in new site builds or existing equipment lineups
- Compliant with GR-487, the enclosure is designed for high reliability and long operating life in extreme environments
- 3 battery trays provide room for 6 strings of 24Vdc or 3 strings of -48Vdc batteries each rated at 150Ahrs or more



Te45v2

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm: 1829H x 762W x 762D
- inches: 72H x 30W x 30D

Weight
(no batteries): 236kg (520lbs)
Mounting: Pad or platform
Cooling: Heat exchanger for power compartment
Forced air ambient for battery compartment
Enclosure: Aluminum, 5052-H32
Equipment rack units: 23", 11RU (UC)

Electrical

Input voltage: 120/240Vac, 60Hz single phase
120Vac for auxiliary equipment
120/240Vac for rectifiers
Output voltage: 48Vdc or 24Vdc
Output power: 9.0kW (5x Cordex 48V rectifiers; Alpha #010-580-20) (as shown)

Recommended feeder breakers:
- Per rectifier shelf:
  - 2 AC feeds: 1 feed (3 rectifiers) 2-pole, 50A (120/240Vac single phase)
    1 feed (2 rectifiers) 2-pole, 30A (120/240Vac single phase)
  - GFCI outlets: 1 pole, 15A, 120V

Environmental

Operating temperature: -40 to +46°C (-40 to 115°F)
Storage temperature: -40 to +85°C (-40 to +185°F)
Humidity: 0 to 95% non-condensing
Elevation: 3600 m, see operating temperature (12,000 feet)
Weather tightness: NEMA Type 3R

Other Information

Alarm:
- Connection: Terminal block
- Description: High/low temperature
  Intrusion, fan fail, AC fail etc.

Chassis ground: Multiple connection
Buss bar located in cabinet
Security: Pad-lockable doors with socket pin-head key

Agency Compliance

CSA: C22.2 No 60950-01-03
UL: Std. No 60950-01
CABINET: NEMA Type 3R (CSA C22.2 No 94-M91)
SEISMIC: Compliant to Zone 4 requirements
GR487: Compliant to GR487



Te47
Outdoor Enclosure

NEW

- Multi-purpose outdoor enclosure designed for mobile broadband applications
- Thermostat controlled filtered fan cooling and louvered vents ensure reliable operation in high temperature environments
- Multiple access points from the outside provides greater flexibility to customer installed equipment
- Superior thermal insulation material (R6) improves energy efficiency of the inside walls of the enclosure
- External AC disconnect hatch allows the user to interrupt power without opening the front door
- Designed and tested to Zone 4 seismic requirements



Te47

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm: 1524H x 737W x 635D
- inches: 60H x 29W x 25D

Weight: 82kg (181lbs)
Construction: High strength corrosion resistant aluminum
Finish: Powdercoat
Equipment rails: 23"
Equipment space: 30RU
Cable entrance:
- Bottom of enclosure: 2 x 2.5" diameter knock-out (2" trade size)
- Rear of enclosure 2 x 2.5" diameter knock-out (2" trade size)

Hardware

Hinge type: 3 position lift-off hinge
Door prop: Wind-Stop with automatic lock
Door latch: 3 point latch with padlockable L-handle

HVAC

Cooling: Thermostat controlled filtered fan cooling
Ventilation: Door installed louvers

Environmental

Temperature:
- Operating: -40 to 46°C
- Storage: -40 to 85°C

Installation

Access: Full front access as well as side door access on both left and right side of enclosure. Each side access measures: 29.25"H x 9.75"W

Maintenance

Door installed louvers: Equipped with washable/replaceable filter on front & rear

Enclosure options

Mounting: Pole or ground

System Specifications

System options
- TVSS
- Load center
- AC disconnect hatch
- Heater

Agency compliance

NEMA rating: 3R
CSA: C22.2 No. 60950-01-03
Seismic: Designed & tested to seismic Zone 4 requirements

Te40 Battery
84" Front Terminal Battery Enclosure

- 5 battery trays designed for up to 10 strings of front terminal batteries @ 24Vdc or 5 strings @ -48Vdc. Up to 190Ahr size batteries
- Multiple knockouts provide cable interface locations for flush or remote installation in enclosure lineups
- Pad-lockable door and durable powder coated aluminum construction provide secure outdoor or indoor applications
- The bolt together and sealed design provides structural integrity that will withstand seismic events and harsh weather conditions
- Built in cooling and heating system ensure long battery life



Te40 Battery

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm:.....2134H x 762W x 762D
- inches:.....84H x 30W x 30D

Weight:.....Up to 300kg (660lbs)
Construction:.....High strength corrosion resistant aluminum
Finish:.....Powdercoat
Equipment space:.....44RU
Cable entrance:.....Knockouts on sides and bottom
Equipment rails:.....23"

Hardware

Hinge type:.....5 position lift off hinges
Handle:.....Padlockable
Door latch:.....3 point latch
Battery trays (qty.):.....5 Front terminal battery shelves

HVAC

Cooling:.....4000 BTU air conditioner
Heating:.....500W
Audible noise:.....<65dbA

Environmental

Temperature:
- Operating:.....-40 to 46°C
- Storage:.....-40 to 85°C

Installation

Access:.....Removable rear panels and front hinged door provide full enclosure access

Maintenance

Front access after installation

Enclosure Options

Mounting:.....Pad or platform mount

System Specifications (as shown)

- 5 battery shelves for GNB 150Ahr or larger front terminal batteries
- Air conditioner w/ heater
- Alarm terminal block
- Ground bar

General Specifications
Input voltage range N/A:...120/240Vac

System options
Consult factory for custom system solutions

Agency Compliance

CSA/UL:.....C22.2 No. 60954
Telcordia:.....GR-487 compliance - contact factory for specific compliances
NEMA rating:.....Type 3R (CSAC22.2 No 94-M91)



Te41 Power
84" Dual Compartment Power Enclosure

- Dual compartment system reduces the total cost of operation using ambient cooling for rectifiers. Air conditioning is only used for the battery compartment
- Bolt together and sealed construction provides a robust design that meets GR-487 requirements including seismic, wind driven rain and salt fog compliance
- A 30” x 30” (762mm x 72mm) footprint allows for easy new installations and replacement upgrades
- Internal power capacities of up to 39.6kW @-48Vdc and 34.1kW at 24Vdc provide sufficient power for high density and multiple platform enclosure line-ups
- The bolt together and sealed design provides structural integrity that will withstand seismic events and harsh weather conditions for a wide variety of equipment configurations



Te41 Power

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm:.....2134H x 762W x 762D
- inches:.....84H x 30W x 30D

Weight:.....Up to 340kg (750lbs) no batteries
Construction:.....High strength corrosion resistant aluminum
Finish:.....Powdercoat
Equipment space:.....Upper compartment 19RU
Lower compartment 26RU
Cable entrance:.....Knockouts on sides and bottom and rear of enclosure
Equipment rails:.....23"

Hardware

Hinge type:.....5 position lift off hinges
Handle:.....Padlockable
Door latch:.....2 point latch upper and lower compartments
Battery trays (qty.):.....Configuration dependent - 8RU per front terminal battery shelf

HVAC

Cooling:.....Upper compartment filtered fan cooled. 4000 BTU air conditioner lower compartment
Heating:.....500W
Audible noise:.....<65dbA

Environmental

Temperature:
- Operating:.....-40 to 46°C
- Storage:.....-40 to 85°C

Installation

Access:.....Removable rear panels and front hinged door provide full enclosure access

Maintenance

Front access after installation

Enclosure Options

Mounting:.....Pad or platform mount

System Specifications (as shown)

- 48Vdc Cordex 3.6kW rectifiers (3.1kW Cordex system optional)
- Qty 48 DC breaker positions
- LVD or BLVD options
- AC panel c/w generator panel and ATS (automatic transfer switch)
- Air conditioner w/ heater
- Fan/filter ambient cooled upper compartment
- Customer specific equipment layout
- Alarm terminal block
- Ground bar

General Specifications
Input voltage range N/A:...120/240Vac

System options
Consult factory for custom system solutions

Agency Compliance

CSA/UL:.....C22.2 No. 60953
Telcordia:.....GR-487 compliance - contact factory for specific compliances
NEMA rating:.....Type 3R (CSAC22.2 No 94-M91)

Te43
84" single Compartment Enclosure

NEW

- 45RU single compartment enclosure offering full rack height equipment installation flexibility
- Adjustable front to back rails provide for mid or flush mount equipment installation
- Multiple knockouts provide cable interface locations for flush or remote installation in enclosure lineups
- Pad-lockable door and durable powder coated aluminum construction allow for secure outdoor or indoor applications
- Heating cooling and ventilation options maintain equipment operating temperatures for various loads in all climate conditions



Te43

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
mm:.....2134H x 762W x 762D
inches:.....84H x 30W x 30D
Weight:.....300kg (660lbs)
Construction:.....High strength corrosion resistant aluminum
Finish:.....Powdercoat
Equipment space:.....44RU
Cable entrance:.....Knockouts on sides and bottom
Equipment rails:.....23"

Hardware

Hinge type:.....5 position lift off hinges
Handle:.....Padlockable
Door latch:.....3 point latch
Battery trays (qty.):.....5 Front terminal battery shelves

HVAC

Cooling:.....4000 BTU air conditioner
Heating:.....500W
Audible noise:.....<65dbA

Environmental

Temperature:
Operating:.....-40 to 46°C
Storage:.....-40 to 85°C

Installation

Access:.....Removable rear panels and front hinged door provide full enclosure access

Maintenance

Front access after installation

Enclosure Options

Mounting:.....Pad or platform mount

System Specifications (as shown)

- Air conditioner w/ heater
- Alarm terminal block
- Ground bar

General Specifications
Input voltage range N/A:...120/240Vac

System options
Consult factory for custom system solutions

Agency Compliance

CSA/UL:.....C22.2 No. 60954
Telcordia:.....GR-487 compliance - contact factory for specific compliances
NEMA rating:.....Type 3R (CSAC22.2 No 94-M91)

CXPS-48-500-IWM
Power System

NEW



CXPS-48-500-IWM

- Wall-mountable indoor enclosure provides a flexible solution for space constrained applications
- Light weight powder coated aluminum enclosure is easy to install and offers superior corrosion properties
- Cordex-based DC power system offer modularity and scalability in power up to 500W
- Battery shelf can accommodate up to two 48Vdc strings of batteries
- Low maintenance and high efficiency reduces overall cost of ownership for the user

Consult your Alpha representative for P/N configurations

Mechanical

Dimensions:
- mm:.....356H x 615W x 381D
- inches:.....14H x 24.2W x 15D

Weight:.....18.2kg (40lbs)
Construction:.....High strength corrosion resistant aluminum
Finish:.....Powdercoat
Equipment rails:.....19"
Equipment space:.....2RU for Cordex 650W shelf
Cable entrance:
- Top of enclosure:.....1 x 3" diameter knock-out; 4 x ¾" knock-out
- Bottom of enclosure.....1 x 3" diameter knock-out; 4 x ¾" knock-out
- Sides of enclosure.....2 x 3" diameter knock-out; 4 x ¾" knock-out

Hardware

Door latch:.....Removable front door
Door lock:.....Panel fastener

HVAC

Cooling:.....Passive
Ventilation:.....Louvers installed on side of enclosure

Environmental

Temperature:
- Operating:.....0 to 40°C

Installation

Access:.....Full front access

Maintenance

No filters used
Bug screen protected on vent openings

Enclosure Options

Mounting:.....Wall mount only

System Specifications

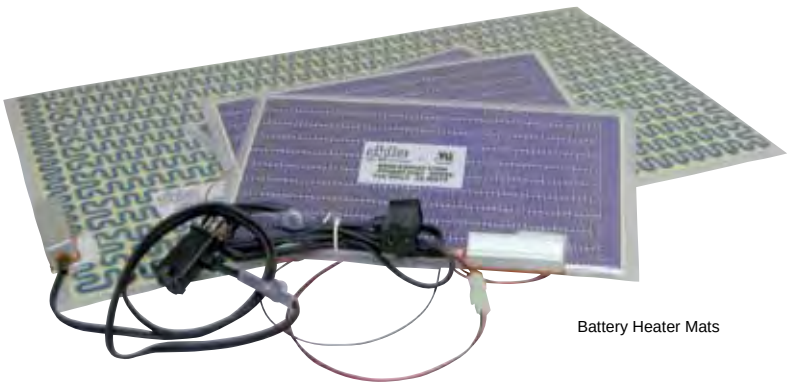
- 48Vdc Cordex rectifier shelf with DC distribution
- Maximum available power is 500W
- Customer interface to all alarms available on the front

Agency compliance

NEMA rating:.....3R
CSA:.....C22.2 No. 60950-01-03

Battery Heater Mats

Extend Battery Runtime in Cold Weather

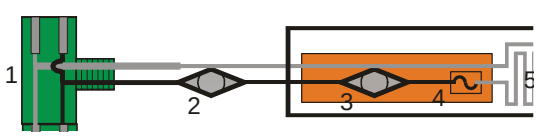


Battery Heater Mats

- Durable polyester construction
- Sealed on-mat electronics for maximum protection
- On-mat thermal switch and thermal fuse for redundant safety
- Insulated design directs heat to the batteries not the enclosure for a 30% reduction in power consumption
- Piggyback plug standard on 120V models

All Mats

Line Cord Thermostat	
Turn on Temp:	5 deg C
Turn off Temp:	15 deg C
Mat Mounted Thermostat	
Over Temp Off:	50 deg C
Turn Back on:	40 deg C
Thermal Fuse Rating:	85 deg C
Optional Line Cord Thermostat	
Turn on Temp:	0 deg C
Turn off Temp:	10 deg C



The main power connector (1) on the heater mat is plugged into an AC source. In low temperature conditions the main control thermistor (2) will allow power to flow to the heater mat coil (5). The thermistor is mounted on the power cord so that it reacts to the enclosure temperatures and not the mat surface temperature. A secondary thermistor (3) is mounted on the mat with significantly higher temperature settings than the main thermistor (2). This thermistor keeps the mat from overheating during extended run periods. A thermal fuse (4) is a final fail safe device. The power connector (1) has an AC receptacle so that additional mats can be plugged in. Its parallel wiring keeps the failure of the first mat from affecting the operation of others in the string.

Battery heater mats are an integral component in outdoor power solutions and need to be carefully integrated with the other system elements to ensure effective operations.

Please contact your Alpha representative to determine the proper bettery heater mat required for your outdoor power system.


ALPHACell
PREMIUM GEL 220 GOLD-HP
Date:
VOC:
Mhos:
DO NOT USE EXISTING HARDWARE.
Proper Hardware Provided.
Hardware size: ½"-20 UNC x ¾" max length
NO SE USE CON EL HERRAJE EXISTENTE.
El herraje apropiado se provee con la batería.
Tamaño del herraje: ½"-20 UNC, x ¾" Máximo de largo
WARNING
Ventilate well when in an enclosed space and when charging
ALPHA
DANGER/POISON
SHIELD EYES EXPLOSIVE GASES CAN CAUSE BLINDNESS OR INJURY
NO SPARKS, FLAMES, OR SMOKING
SULFURIC ACID CAN CAUSE BLINDNESS OR SEVERE BURNS
FLUSH EYES IMMEDIATELY WITH WATER GET MEDICAL HELP FAST. KEEP OUT OF REACH OF CHILDREN
CALIF. PROPOSITION 65 WARNING
Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of Calif. to cause cancer and reproductive harm. Wash hands after handling.
0909
ALPHACell
PREMIUM GEL 195 GXL
Mhos:
ATTENTION
12 Volt - Saturation 195 minutes @ 25C



Batteries

Alpha offers a comprehensive line of AlphaCell™ batteries in a number of formats specifically designed for demanding indoor and outdoor Telecom, Cable, Traffic, Security and Renewable Energy applications. In addition to the AlphaCell™ Gel battery line are AGM and specialty batteries that support multiple applications while offering extended runtime and warranty options. In particular, excellent heat displacement characteristics have shown Alpha's Gel cell batteries to exhibit superior working life and reliability to competing technologies. AlphaCell™ GXL batteries come with a full replacement non-prorated warranty and provide years of expected life and trouble free performance.

Choosing Alpha battery technology means 100% out-of-box capacity and reliable performance in harsh operating conditions, longer service life and reduced maintenance. In addition to our battery offerings, Alpha has a full range of accessories to complement your battery installation or testing needs.

Battery Selection Considerations

Alpha offers batteries for virtually every backup power application. However, not all batteries are listed in the catalog. To help us propose the optimal battery solution for your specific application, please review the following questions prior to contacting your Alpha representative.

What is the nature of the application?

Cycle – batteries will be drained and recharged frequently.
Float – batteries will only be drained and recharged when the primary power source fails.
What is the battery backup time requirement?

What are the environmental conditions?

Will the batteries be installed in a controlled, non-controlled, or partially controlled environment?
Minimum/maximum ambient temperatures surrounding the batteries?
Humidity/Precipitation: Will the batteries be exposed to snow, rain, etc?
Is there adequate ventilation?

Where will the batteries be installed (i.e. what country, city/town)?

Our battery warranties vary by country of installation; contact Alpha for details.
What is the expected frequency of utility power failures, e.g. once a year, once a month, etc.?
How long does the average utility power failure last?
Is there any government legislation stipulating backup power requirements?

What is the DC voltage requirement?

12, 24, 36, or 48Vdc? Other?

Are there any space restrictions?

Depending on type of battery, how many, and where the batteries & backup equipment will be installed.
How convenient is battery replacement? Consider total cost of ownership.

Is there an existing battery string?

When replacing batteries on the same string, ensure date codes, voltage and conductance are matched.
AlphaGuard™ is highly recommended to spread the charge voltage equally across all batteries in the string, which optimizes battery life and runtime.

Are any accessories required?

E.g. AlphaGuard™ Battery Charge Management System, Battery Heater Mats, Battery Testing Equipment, Battery Spacers, etc. Note: Battery heater mats are specific to the enclosure and application.

What warranty/service needs are required?

Is extended warranty required? Special servicing needs?

Note: Replaced batteries require environmentally safe disposal.

AlphaCell™ 195 GXL-FT
Gel Front Terminal Batteries

- True gel technology and high performance separator for extended battery cycle life
- Front access design with protective covers for ease of installation and maintenance
- Ideal for demanding outdoor telecom, Wi-Fi and broadband applications



AlphaCell™ 195 GXL-FT

Nominal Specifications

Model		**195 GXL-FT P/N: 1810029**
Service life		Extended
Sealed VRLA		Valve regulated lead acid
Heat resistant		Extreme
Hydrogen emission		Low
Terminals		16mm insert M6 thread
Typical runtime		195 mins
Cells per unit		6
Voltage per unit		12.8V
Conductance value		1200
Max. discharge current		400A
Short circuit current		3000A
10 Second volts @ 100A		10.8
Impedance @ 60Hz (Ohms)		0.0041
Capacity at 20hrs (to 1.75VPC)		110Ah
Mechanical		
Dimensions w/ terminals*	mm	285H x 110W x 395D
	inches	11.22H x 4.33W x 15.55D
Weight		34.52kg (76.29lbs)
Environmental		
Discharge		-40 to 71°C (-40 to 160°F)
Charge (with temp compensation)		-20 to 50°C (-4 to 122°F)
Float charging voltage (Vdc)		Float 2.27 to 2.30VPC @ 25°C cycling 2.35VPC @ 25°C
AC ripple charger		0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4% P-P

*Dimensions at top of battery. For information on the warranties please contact your sales rep.

Current Discharge Ratings Table in Amps (End Voltage 1.75VPC)

Hours	1	2	3	4	6	8	10	12	20	24	48	72	100
195 GXL-FT	71.1	38.0	26.8	21.1	15.2	12.0	9.92	8.48	5.50	4.60	2.31	1.56	1.13

AlphaCell™ 3.5 and 4.0HP
Pure Lead Top Terminal Batteries

HP™ NEW



AlphaCell™ 4.0 HP

- Pure lead technology provides up to 20% increased life expectancy
- 3 to 5 times longer shelf life versus standard VRLA batteries
- Up to 50% increased runtime in cold climates
- Non-spillable UN2800 rating for ease of transportation
- Higher runtime allows string count reduction
- 5-year full, hassle-free warranty

Nominal Specifications

Model	**3.5HP**	**4.0HP**
P/N	**1810077**	**1810078**
Warranty*	5-year full replacement	
Service life	Extended	
Battery type	Pure lead AGM	
Heat resistant	Extreme	
Hydrogen emission	Low	
Capacity at 20hrs (to 1.75VPC)	104Ah	114Ah
Typical runtime (minutes)**	210	240
BCI group size	31	
Terminals	Threaded insert 1/4 - 20 UNC"	
Cells per unit	6	
Voltage per unit	12.8	
Conductance value	1700	2100
Max. discharge current (A)	800	900
Short circuit current (A)	2800	3200
10 second volts @ 100A	11.7	11.8
Impedance @ 60Hz (Ohms)	2.7	2.2

Mechanical			
Height w/terminals	mm	223.5H x 337.8W x 172.7D	223.5H x 337.8W x 172.7D
	inches	8.5H x 13.4W x 6.8D	8.5H x 13.4W x 6.8D
Weight		30.8kg (68lbs)	35.6kg (74lbs)
Environmental			
Discharge		-40 to 60°C	-40 to 60°C
		-40 to 140°F	-40 to 140°F
Charge (with temperature compensation)		-40 to 60°C	-40 to 60°C
		-9.4 to 140°F	-9.4 to 140°F
Float charging voltage		13.5 to 13.8Vdc	13.5 to 13.8Vdc
AC ripple charger		0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4%V pk to pk	

AlphaCell HP current discharge ratings in Amps (end voltage 1.75VPC @ 25°C/77°F)

Hours		1	2	3	4	8	10	20
3.5HP	End voltage 1.75VPC:	70.2	40.3	28.6	22.3	12.1	9.9	5.2
	End voltage 1.70VPC:	72.0	41.1	29.2	22.7	12.3	10.0	5.3
4.0HP	End voltage 1.75VPC:	81.9	45.8	32.2	25.0	13.1	10.6	5.7
	End voltage 1.70VPC:	83.7	46.7	32.8	25.4	13.3	10.7	5.8

AlphaCell HP Amp hour ratings in Amps (end voltage 1.75VPC @ 25°C/77°F)

Hours		1	2	3	4	8	10	20
3.5HP	End voltage 1.75VPC:	70.2	80.6	85.8	89.2	96.8	99	104
	End voltage 1.70VPC:	72.0	82.2	87.6	90.8	98.4	100	106
4.0HP	End voltage 1.75VPC:	81.9	91.6	96.6	100	104.8	106	114
	End voltage 1.70VPC:	83.7	93.3	98.3	101.5	106.3	107	115.8

* Warranty varies by country and region. Warranty valid only when used with Alpha approved power supplies, chargers and enclosures. Consult your salesperson for details.

** Runtimes calculated using a 25A DC constant current load to 1.75Vdc @ 25 °C

AlphaCell™ GXL
Gel Top Terminal Batteries



AlphaCell™ 195 GXL

- High-performance silver alloy for maximum life expectancy
- Longer runtime for demanding outdoor environments
- 100% runtime capacity out-of-box – No cycling required
- Maintenance-free threaded inserts – No periodic retorquing
- Available with 4 and 5 year full warranties
- Wide operating temperature range

Nominal Specifications for Gold-HP

Model	**220 GXL**	**195GXL**	**165GXL**	**85GXL-HP**
P/N	**181-231-10**	**181-230-10**	**1810015**	**181-213-10**
Warranty*	4 to 5 years full replacement			
Service life	Extended			
Battery type	True gel cell and silver alloy grid battery technologies			
Heat resistant	Extreme			
Hydrogen emission	Low			
Capacity at 20hrs (to 1.75VPC)	109Ah	100Ah	86Ah	50Ah
Typical runtime (minutes)**	221	196	165	85
BCI group size	31	31	27	22
Terminals	Threaded insert 1/4 to 20 UNC"			
Cells per unit	6	6	6	6
Voltage per unit	12.8V	12.8V	12.8V	12.8V
Conductance value	1175	1100	1000	600
Max. discharge current	900A	900A	800A	600A
Short circuit current	2800A	2600A	2500A	2200A
10 second volts @ 100A	11.4	11.3	11.2	10.8
Impedance @ 60Hz (Ohms)	0.005	0.005	0.0055	0.0065

Mechanical					
Dimensions (Height includes terminals)	mm	215.4H x 340.09W x 172.7D	223.5H x 337.8W x 172.7D	223.5H x 337.8W x 172.7D	
	inches	8.48H x 13.42W x 6.80D	8.5H x 13.4W x 6.8D	8.5H x 13.4W x 6.8D	
Weight		33.2kg (73lbs)	30.5kg (67lbs)	30.5kg (67lbs)	

Environmental (All Models)	
Discharge	-40 to 71°C
	-40 to 160°F
Charge (with temperature compensation)	-23 to 60°C
	-9.4 to 140°F
Float charging voltage	13.5 to 13.8Vdc
AC ripple charger	0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4%V pk to pk

AlphaCell HP current discharge ratings in Amps (end voltage 1.75VPC @ 25°C/77°F)

Hours	1	2	3	4	8	10	20
220GXL	66.1	39.6	28.5	22.4	12.3	10.0	5.4
195GXL	61.2	35.2	25.2	19.7	10.8	8.9	5
165GXL	55.9	32.8	23.5	18.4	10.0	8.2	4.3
85GXL	33.2	18.8	13.3	10.4	5.7	4.6	2.5

AlphaCell HP Amp hour ratings in Amps (end voltage 1.75VPC @ 25°C/77°F)

Hours	1	2	3	4	8	10	20
220GXL	66.2	79.2	85.5	89.6	98.4	100	109
195GXL	61.2	70.4	75.6	78.8	86.4	89	100
165GXL	55.9	65.6	70.5	73.6	80.0	82	86
85GXL	33.2	37.6	39.9	41.6	45.6	46	50

* Warranty varies by country and region. Warranty valid only when used with Alpha approved power supplies, chargers and enclosures. Consult your salesperson for details.

AlphaCell™ AGM
Top and Front Terminal Batteries

- Designed for indoor and outdoor standby applications
- 100% out-of-box runtime capacity
- Maintenance-free threaded inserts
- 100% replacement warranty
- Convenient carrying handle standard on all models



AlphaCell™ AGM

Nominal Specifications for 160 AGM (Top Terminal)

P/N: 1810017		
Sealed VRLA		Valve Regulated Lead Acid
Typical runtime (minutes)[1]		160
Cells per unit		6
Voltage per unit		12.8V
Conductance value		1300
Max. discharge current		800A
Short circuit current		3300A
10 Second volts @ 100A		11.6
Ohms impedance 60Hz		0.004
Capacity at 20hrs (to 1.75VPC)		77Ah
BCI group size		27
Mechanical		
Dimensions w/terminals	mm	229.8H x 317.8W x 173.4D
	inches	9.05H x 12.57W x 6.83D
Weight		28kg (62lbs)
Environmental		
Discharge		-40 to 71˚C (-40 to 160˚F)
Charge (with temp compensation)		-23 to 60˚C (-9.4 to 140˚F)
Float charging voltage		13.5 to 13.8Vdc
AC ripple charger		0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4% P-P

1.Runtimes calculated using a 25A DC constant current load with voltage discharge to 1.75V/cell @ 25˚C.

Nominal Specifications for AlphaCell™ 225 AGM-FT

P/N: 1810031		
Service life		Extended
Sealed VRLA		Valve Regulated Lead acid
Heat resistant		High
Hydrogen emission		Low
Terminals		16mm Insert M6 thread
Typical runtime		225 mins
Cells per unit		6
Voltage per unit		12.8V
Conductance value		1400
Max. discharge current		400A
Short circuit current		3100A
10 Second volts @ 100A		11.2
Impedance @ 60Hz (Ohms)		0.0045
Capacity at 20hrs (to 1.75VPC)		114Ah
Mechanical		
Dimensions w/terminals*	mm	285H x 110W x 395D
	inches	11.22H x 4.33W x 15.55D
Weight		34kg (75.14lbs)
Environmental		
Discharge		-40 to 71°C (-40 to 160°F)
Charge (with temp compensation)		-20 to 50°C (-4 to 122°F)
Float charging voltage (Vdc)		Float 2.27 to 2.30VPC @ 25°C cycling 2.35VPC @ 25°C
AC ripple charger		0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4% P-P

*Dimensions at top of battery. For information on the warranties please contact your sales rep.

Current Discharge Ratings Table in Amps (end Voltage 1.75VPC)

Hours	1	2	3	4	6	8	10	12	20	24	48	72	100
160AGM	61.20	33.90	23.10	17.60	11.98	9.20	7.38	3.84	3.84	3.20	1.60	1.07	0.77
225AGM-FT	81.00	43.10	30.30	23.70	16.70	12.90	10.40	8.90	5.70	4.80	2.43	1.62	1.18

AlphaCell™ Telecom and UPS
Front Terminal Batteries

- AlphaCell™ 160 BT and 180 BT for a wide range of telecom and broadband applications
- AlphaCell™ 700HR for high rate UPS applications
- Front access threaded copper alloy inserts for reduced maintenance and increased safety
- Front terminal design maximizes energy density in cabinet or rack applications
- Thermally welded case-to-cover bond to ensure a leak-proof seal
- Removable handles for ease of installation



AlphaCell™ Telecom and UPS

Nominal Specifications

Model		**160BT**	**180BT**	**700HR**
P/N		**1810118**	**1810119**	**1810120**
Warranty		4 years full, 6 years pro-rated		3 years full
Battery type		Long duration Telecom AGM		High rate UPS AGM
Capacity in Ah @ 25ºC (77ºF)		157.3Ah @ 8hr rate (to 1.75VPC)	181.2Ah @ 8hr rate (to 1.75VPC)	206Ah @ 20hr rate (to 1.67VPC)
Terminals		Threaded copper alloy insert terminal to accept 1/4-20 UNC bolt		
Terminal hardware initial torque		110 in-lbs (12.4 N-m)		
Maximum discharge current (A)		800		
Short circuit current (A)		4700	4500	4500
Impedance @ 60Hz (Ohms)		0.0031 Ohms	0.0037 Ohms	1836 Mhos (Midtronics)
Dimensions	mm	559D x 126W x 283H	463D x 176W x 257H	559D x 124W x 318H
	inches	22.01D x 4.95W x 11.14H	18.2D x 6.94W x 10.1H	22D x 4.9W x 12.5H
Weight		53kg (115lb)	55kg (121lb)	60.3kg (133lb)

Mechanical				
Dimensions (Height includes terminals)	mm	283.96H x 125.73W x 559.05D	320.04H x 125.73W x 559.05D	320.04H x 125.73W x 559.05D
	inches	11.14H x 22.01W x 4.95D	12.6H x 22.01W x 4.95D	12.6H x 22.01W x 4.95D
Weight		52.2kg (115lbs)	59.4kg (131lbs)	60kg (131lbs)
Environmental (All Models)				
Operating Temperature Range with temperature compensation		-40 to 71°C Discharge: -40°C (-40°F) to + 71°C (160°F) Charge: -23°C (-10°F) to 60°C (+140°F)		
Nominal Operating Temperature Range		23°C (+74°F) to 27°C (+80°F)		
Recommended Maximum Charging Current Limit		C/5 amperes @ 20 Hr rate		
Float charging voltage		13.5 to 13.8 Vdc average per 12V unit @ 25°C (77°F)		
Maximum AC Ripple (Charger):		0.5% RMS or 1.5% P-P of float charge voltage recommended for best results. Max voltage allowed = 1.4% RMS (4% P-P) Max current allowed = C/20		
Self Discharge		Battery can be stored up to 6 months at 25°C (77°F) before a freshening charge is required. Batteries stored at temperatures greater than 25°C (77°F) will require recharge sooner than batteries stored at lower temperatures.		

Equalize charge and cycle service voltage	14.40 to 14.80 Vdc average per 12V unit @ 25°C (77°F)

UPS Batteries
7 to 34AH



UPS batteries

- High rate and general purpose VRLA Batteries
- 12V batteries with capacities from 7Ah to 34Ah at 20 hrs
- Optimized grid for high power density
- Upright, side or end mounting
- Thermally welded case to cover bond eliminates leakage
- Optional flame retardant ABS casing to UL94-VO
- 100% replacement warranty

Consult your Alpha representative for P/N configurations

Electrical

Type:..... Valve regulated lead acid
Range of capacity: ..... 7 to 34Ah
Recommended float voltage:.....13.5VPC @ 20°C (68°F)
Terminal type:.....Threaded copper insert
Optional:.....UL 94 VO flame retardants casing

Enviromental

Operating temperature nominal:.....25°C (77°F) note: can operate at higher temperature up to 74°C (165°F) but degrades life of battery

Operating temperature range (Extended temperature batteries)
Discharge: .....-20°C to 50°C (-4°F to 122°F)
Charge:.....-20°C to 50°C (-4°F to 122°F)
Storage: .....-20°C to 50°C (-4°F to 122°F)

For information on warranties please contact your sales rep.

Advanced Battery Technologies



Alpha is continuously exploring new, innovative specialty energy storage technologies that help our customers lower their Total Cost of Ownership (TCO).

Our range of Nickel Cadmium (NiCad) and Lithium Ion (Li-ion) batteries are designed for safety, high reliability, high power density and long design life. NiCad batteries offer a versatile and reliable power source in the most extreme conditions.

Li-ion solutions offer optimum power density and low self-discharge rates and are available in a wide range of electrochemical technologies.

Comparison of Li-ion Battery Chemistries

Li-ion Battery Chemistry	**Lithium Cobalt Dioxide ($LiCoO_2$ or LCO)**	**Lithium Nickel Cobalt Aluminum Oxide ($LiNiCoAlO_2$)**	**Lithium Nickel Manganese Cobalt Oxide ($LiNiMnCoO_2$ or NMC)**	**Lithium Manganese Oxide ($LiMn_2O_4$ or LMO)**	**Lithium Iron Phosphate ($LiFePO_4$ or LFP)**
Energy Wh/kg or L	Good	Good	Good	Average	Average
Power	Good	Excellent	Good	Good	Good
Low Temperature	Good	Good	Good	Excellent	Average
Calendar life	Average	Excellent	Good	Poor	Poor > 45°C
Cycle life	Average	Excellent	Good	Excellent	Excellent
Safety (cathode only)	Poor	Poor	Poor	Average	Excellent
Safety (cathode & anode)	Poorer	Poorer	Poorer	Average	Good
Cost/ kWh	Higher	High	High	Lowest	High

PowerAgent
Remote Battery Monitoring

NEW



PowerAgent

- Intelligent site controller monitors up to 6 strings of 40 batteries (240 total batteries)
- Low power consumption minimizes runtime impact
- Monitors 2V or 12 V cells (with appropriate sensor)
- Monitors string and cell voltage, admittance, individual cell temperature, ripple current and float current for a comprehensive, real-time picture of the state of health of your battery bank

Electrical

Site Controller Unit:
- Sensors: 20-60Vdc
- Power consumption:.....5W @ 20-60Vdc plus 5W (if 12V source used at max load)

Sensors:
- Power requirements: .....2 volt: 1.65-3.0Vdc
  12 volt: 8.0-16Vdc
- Power consumption:.....2 volt: <15ma nominal, 2/5A during admittance test
  12 volt: <15ma nominal, 5/7A during admittance test

Rim Modules:
- AC line measurement: ....90 to 140Vac, RMS, Sine, 50/60Hz

Mechanical

Sensors (2Volt)
- Battery Interface
- Battery positive: Ring terminal with 12" wire
- Battery negative: Bracket or ring terminal with 12" wire

Rim Modules:

Dimensions:
- mm:.....68.6W x 81.3H x 25D
- inches:.....2.7W x 3.2W x 1D

Weight: 0.11kg (0.25lbs)

Environmental

Site Controller Unit:
- Operation:.....-45 to +65°C

Sensors:
- Operating range: .....2 volt: -40 to +80°C
  12 volt: -40 to +80°C

Heat dissipation: .....<94 BTU per hour

Communications

Site Controller Unit:.....SNMP via TCP/IP
USB (X4)

Sensors:
- Communications Interface .....2 volt: Optically isolated RJ-45 (1200 volts)
  12 volt: Optically isolated RJ-45 (1200 volts)



What Pieces Make Up The System?

The PowerAgent BMS has three components:

Sensors: A sensor is attached to the terminal posts of each monitored battery. The sensors measure the battery's admittance (internal resistance), voltage, and post temperature

A Site Controller: The site controller communicates with each of the sensors and collects the most recent measurement data. It checks each measurement against locally stored alarm thresholds and alerts the user's monitoring software if an abnormality occurs. The site controller is fully Ethernet TCP/IP compatible, and has a built-in web server and SNMP interface.

Monitoring Software: The PowerAgent BMS system, with its native standards-based SNMP interface, is the only battery monitoring system that gives the user 'freedom of choice' to select the optimum software for the application.

Software options include:

- No software – The site controller's internal web interface provides information for all components connected to the Site Controller.
- Lookout™ Software provides a global view of multiple installations with the ability to "drill in" to details. Lookout™ is provided at no charge.
- Continuity SBL enterprise-class battery system monitoring and analysis package provides predictive trending information and can manage thousands of battery sites.
- Any software that supports an SNMP interface.

Battery Accessories



AlphaGuard™ Battery Charge Management System



AlphaGuard™ Potted Version

AlphaGuard™ Battery Charge Management System

- AG-CMT-3 AlphaGuard™ Charge Management SC, 36V String – including Battery interface cable
- AG-CMT-4 AlphaGuard™ Charge Management SC, 48V String – including Battery interface cable

The AlphaGuard is a battery charge management system that monitors and protects your batteries for runtime optimization and longer battery life. CSA and UL approved, AlphaGuard allows you to replace single batteries rather than the whole string. It spreads charge voltage equally across batteries to maximize battery life and compensates for battery differences as they age.

Also available: AlphaGuard Potted Version for Below Grade Applications.

The potted version is ideal for applications where batteries are installed underground or subject to damp conditions or possible immersion.

Note: For some applications, Alpha offers an extended battery warranty when AlphaGuard is used.

Contact your Alpha representative for complete details.



Celltron Essential Battery Testing Equipment

Battery Testing Equipment

Alpha's battery testing equipment provides accurate information about the status of installed standby batteries allowing you to budget for early detection of failed or degraded batteries and for replacements with confidence.

A fast, reliable and affordable testing process.

Conductance testing, coupled with a simple utility load test, arms the operator with the quality of data necessary to know the status of installed standby batteries, allowing for detection and replacement before failure occurs and puts backup during an outage at risk.



Battery Spacer Clip

Battery Spacer Clip

- Designed for use with most group 27 (165GXL) or 31 (3.5HP, 4.0HP, 195GXL, 220GXL) VRLA batteries
- Easy to install - clips to the top of the battery
- Increases battery life expectancy by providing critical battery spacing required for proper ventilation
- Accurately positions and secures the Remote Temperature Sensor (RTS)
- Strongly recommended for hot climates
- Designed to last over 30 years or lifetime of the equipment



Generators

Alpha's line of DC generators are designed to allow for minimal battery backup installation while still providing extended runtime to critical loads. Every generator system incorporates efficient, effective and reliable power technology, including: natural gas or propane powered engine generators, exclusive audible noise baffling, remote status monitoring features and multiple built-in safeguards to protect the system, operators and the public.

The AlphaGen™ curbside DC generator system is specifically designed for outside plant communication networks requiring -48Vdc power. It offers quiet operation, small size and low profile for easy installation in populated areas and is one example of several capable generator models in the AlphaGen™ family.

AlphaGen™ Portable

3.0kW Portable 36/48Vdc Generator System



AlphaGen™ Portable

- DC technology requires no UATS (Universal Automatic Transfer Switch)
- No need to disconnect or reconnect power supply to utility power
- Selectable output for 36 or 48Vdc operation up to 3000W
- Quiet operation only 58dBA @ 7m (22ft)
- Completely enclosed, water resistant for safe operation in the field
- Oversized metal gas tank with level gauge for extended runtimes of up to 20hrs

P/N: 013-018-10-010

Performance / Features

Engine: ..... Honda GX 200 6.5hp, air-cooled, OHV, single cylinder, manual recoil starting, manual choke
Rated power: ..... 2800W continuous, 3000W max
Alternator: ..... Permanent magnet, brushless, bearingless

Dual range selector:
36V: ..... 39.5Vdc nominal at generator output connector
48V: ..... 52.5Vdc nominal at generator output connector

Output regulation: 1Vdc
Control features: ..... Automatic voltage regulation
Electronic governor
Over current protection
Analog voltmeter with back light
Cable interface: ..... Anderson type SBE-80 connector
Fuel tank: ..... 3.4 gallon metal tank with level gauge

Runtime:
@ 25% load: 20hrs
@ 80% load: 10hrs
@ 100% load: 7.2hrs

Audible noise: ..... Approx. 58dBA @ 7m under full load
Frame: ..... Fully enclosed

Mechanical

Dimensions:
mm: ..... 569H x 480W x 655D
inches: ..... 22.4H x 18.9W x 25.8D
Dry weight: ..... Less than 53.5kg (118lbs)

Agency Compliance

CSA C22.2 No. 100-95, 107.1-01,107.2-M89, 0.4 FCC part 15B Class A

Required Accessories

Output interface cable: .....Available in 10', 30' or 50' lengths
Battery interface cable:.....Choose ring lung, heavy-duty alligator clamp, or Y-adapter*

*Connects the power supply's battery input directly to the generator



30' Output interface
10' P/N 877-567-10-022
50' P/N 877-567-10-021



Ring lug battery interface



Alligator clamp battery interface
P/N 874-946-20



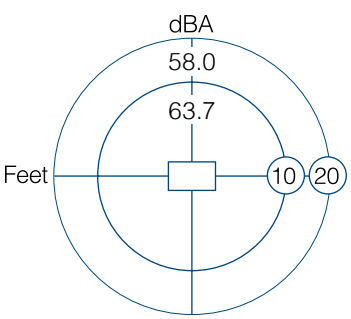
Y-Adaptor battery
P/N 874-946-22

Optional accessories:

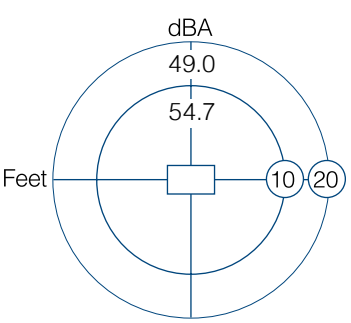
DCX-PG-WK:.....Portable generator wheel kit
AG-PG-TOOL:.....Punch tool kit for enclosures
AG-PG-UK: .....Enclosure upgrade kit
DCX-PG-HANDLE: .....Locking handle
AG-CAB-KIT .....Cable bag with cable and key lanyard

3.0kW Portable Generator Sound Levels

Ambient background noise level at 45dBA
All readings are 8 point averages



Generator at 100% rated load



Generator at 100% rated load (typical)



AlphaGen front view



AlphaGen portable trailer



AlphaGen with wheel kit

AlphaGen™
DC Generator System



AlphaGen™

- 3.5, 5.0 and 7.5kW options in either 36Vdc or 48Vdc configurations
- Cost effective extended runtime solution for Telecom powering applications
- Quiet operation, small size and low profile allow for easier installation in populated areas
- Eliminates large quantities of batteries otherwise required for extended runtime
- Designed for stand-alone or collocated powernode applications
- Built-in safeguards to protect the system, operators and the public
- Safe unattended operation designed to UL2200, NFPA 37, 54, 58 and 70 standards

Consult your Alpha representative for P/N configurations

Performance / Features

Gas inlet pressure: .....0.5 to 2 PSI inlet pressure (see note 1)
Ign charger voltage: 13.5Vdc
Ign charger current:.....6A max
Remote interface length:.....75ft max
Distance depends upon proper installation, de-rating and wire gauge (see note 2)

Fuel system, controls & monitoring:.....The controls and fuel system meet applicable sections of NFPA 37, 54 and 58 for automatic unattended operation of remotely located generators. Full system control and status monitoring included.

Sensors:.....Gas hazard
Pad shear
Water intrusion
Tamper

Safety shutdowns

All models:.....Low oil pressure
Over temp
Low fuel pressure shutdown (propane only)
Water intrusion
Pad shear
Gas hazard (propane or natural gas)
Over speed
Over crank

Optional feature: .....Cold start kit: Provides additional starting capability at temperatures below 17.7˚C (0˚F).

Agency Compliance

UL1778
UL2200
NFPA 37/54/58/70
CSA C22.2 No.107.1
EMC/FCC Part 15 Class A

Note: Contact Alpha Technologies for the following:
1. Low pressure
2. Remote interface length distance

Nominal Specifications

Model:		3.5kW			5.0kW			7.5kW	
DC output voltage		39.0V ±0.5V @ no load 36V configuration			39.0V ±0.5V @ no load 36V configuration			52.0V ±0.5V @ no load 48V configuration	
		52.0V ±0.5V @ no load 48V configuration			52.0V ±0.5V @ no load 48V configuration			104.0V ±0.5V @ no load 96V configuration	
DC output load regulation		0.5V			0.5V			0.5V	
Output current		39.0V @ 90A max			39.0V @ 128A max			52.0V @ 144A max	
		52.0V @ 67A max			52.0V @ 96A max			104V @ 72A max	
Engine		398CC, Air cooled, Single OHV			398CC, Air cooled, Single OHV			624CC, Air cooled, Twin OHV	
		10.5hp (using natural gas fuel)			10.5hp (using natural gas fuel)			15hp (using natural gas fuel)	
RPM: (variable speed)		2800 to 3600RPM			2800 to 3600RPM			2800 to 3600RPM	
Acoustical noise									
dBA 10' @ 100% rated load		68.7Ave			68.5Ave			70.3Ave	
dBA 20' @ 100% rated load		63.0Ave			62.5Ave			64.3Ave	
dBA 10' @ 70% rated load		68.3Ave			66.9Ave			66.4Ave	
dBA 20' @ 70% rated load		62.6Ave			60.9Ave			60.4Ave	
Dimensions		CE-3x	CE-9x	PN-4xL	CE-3x	CE-9x	PN-4xL	PN-6x	with optional pedestal
Height	cm	111.2	132.1	81.3	111.2	132.1	81.3	99	144
	in	44	52	32	44	52	32	39	57
Width	cm	66	132.1	81.3	66	132.1	81.3	100	
	in	26	52	32	26	52	32	39.25	
Depth	cm	61	61	76.2	61	61	76	61	
	in	24	24	30	24	24	30	24	
Weight	kg	174	187	177	174	187	177	174	168
	lbs	383	413	390	383	413	390	338	370
APU fuel consumption									
Natural gas: 1000 BTU/Ft.^{3}		60ft^3/hr			80ft^3/hr			156ft^3/hr	
Propane gas: 2520 BTU/Ft.^{3}		0.82gal/hr			1.10gal/hr			1.48gal/hr	
		30ft^3/hr			40ft^3/hr			54ft^3/hr	
		3.46lbs/hr			4.62lbs/hr			6.24lbs/hr	
Exterior surface temperature		65˚C max (149˚F) (meets requirements of UL/CSA)			65˚C max (149˚F) (meets requirements of UL/CSA)			65˚C max (149˚F) (meets requirements of UL/CSA)	



CE-3x2
3.5 or 5kW



CE-9x2
3.5 or 5kW



CE-3/9G propane storage for generator (For 3.5 and 5.0kW)



PN-4xL
3.5 or 5kW



PN-6x
7.5kW
(PN-6x is not compatible with CE-3/9G)

Alpha Energy

Alpha Energy is an engineering and project development group that provides innovative power conversion solutions integrating solar, wind and alternative resources to provide reliable electric power for the most demanding applications.

Outback Power

OutBack Power is the leading designer and manufacturer of advanced power electronics for renewable energy, back-up power and mobile applications, with an emphasis on product performance. OutBack has established itself as the supplier of choice in harsh environmental conditions, and applications where product reliability is paramount.

Sinewave/Inverter Chargers



Radian Series

Radian Series Inverter/Charger

> 8000 Watts of continuous power
> UPS mode capabilities
> Unsurpassed surge capability
> 120/240Vac split-phase voltage
> Simplified parallel design allows easy installation of systems from 8 to 80kW
> Quick and easy installation

The Radian Series GS8048 provides a comprehensive answer for grid-interactive and stand-alone power systems.



FX Sealed

FX Inverter/Charger

> Sinewave output
> High 93% operating efficiency
> Intelligent battery charging
> Modular system architecture
> Field serviceable

The FX Series offers an industry leading sealed inverter that has been proven to serve in the most extreme environments, while the VFX is suitable for more protected installations. And unlike typical grid-tied inverters, the GFX continues to function during a grid outage.



FLEXmax 80



FLEXmax 60

FLEXmax Charge Controllers

> Increased PV array output by up to 30%
> Advanced continuous maximum power point tracking
> Full power output in ambient temperature up to 40°C / 104°F
> Battery voltages from 12 to 60Vdc
> Built-in 128 days of data logging

OutBack charge controllers allow you to maximize your systems potential and can increase your renewable energy yield by up to 30%.

Systems



FLEXpower ONE



FLEXpower TWO

FLEXpower Inverter Systems

> Fully integrated, true sinewave, reliable power system
> Includes Inverter/Charger (1 or 2), AC and DC wiring boxes, a MATE3 and HUB
> Compact design
> Easy-to-install mounting bracket
> Fully pre-wired and factory-tested system



FLEXware 250



FLEXware 1000

FLEXware Integration Hardware

> Balance-of-system enclosure for OutBack inverters
> Reduced time of installation
> Compact design with powdercoat finish
> Protects system AC and DC breakers, Input-Output Bypass and wire connections
> System sold as components (standard) or pre-wired (optional)



PV Upgradable UPS

Photovoltaic Upgradable UPS

> Fully-integrated turn-key system including the FLEXpower ONE and EnergyCell RE front terminal batteries
> Modular, expandable design
> Fully enclosed for ease of maintenance and protection
> Small footprint
> Flexible 200Ah to 1000Ah power range
> Custom configured application specific



PVPS

Photovoltaic Power System

> Hybrid DC powering system
> Solar harvested system efficiency of 97%
> Integrated PV and advanced charge control technology
> Scalable from 4.23kW to 25.38kW


Hz



Services and Support

Effective power systems require first class support. Alpha provides a full range of service and support solutions designed to keep power infrastructure running.

At Alpha, we understand that our products are often just one or more parts of a complete power solution. That's why Alpha service goes beyond just Alpha equipment to providing support solutions that meet the ultimate need of our customers: continuous, reliable power.

Whether it's an item sent in for repair, a technical support phone call or an on site preventative maintenance visit; Alpha technicians stand behind every Alpha product. Have your equipment repaired right at the factory, or in one of our many service centers. Take advantage of our service plans that provide a complete on site maintenance solution for one low annual fee. Or call us to have new batteries installed, the old ones recycled and perform a complete preventative maintenance routine for your power system.

Alpha has standard service and support solutions designed to meet the needs of our clients. At Alpha, we understand that many power systems are unique situations that have unique needs. Our services can be tailored to provide the service that's right for you.
If you want to know more just call us, 24/7, at:

USA and Canada: 1-888-462-7487
International: 1-604-436-5547

Services and Support

Alpha Service Plans				
	Factory Warranty	Warranty plus Extended Warranty	Basic On Site	Reliability On Site
Comprehensive coverage of equipment and batteries	✓	✓	✓	✓
Telephone technical support	✓	✓	✓	✓
Advance replacement	O	✓	✓	✓
Freight to customer	✓	✓	✓	✓
On-site start up business day		O	✓	✓
On-site corrective maintenance business day		O	✓	✓
Next business day response			✓	✓
Equipment preventative maintenance				✓
Battery preventative maintenance				✓

Legend: ✓ = Included O = Optional

Alpha Services on Demand	
Service	Description
Repair/exchange	Repair or exchange of delivered unit for a flat fee
Advance replacement	Immediate shipment of replacement unit with credit issued for return unit when received
Replacement battery bundle	Set of replacement batteries including delivery
On site replace and PM	On site replacement of all batteries including delivery, recycling, installation and preventative maintenance on equipment and battery cabinet

Service Depot Locations

Western Canada
7700 Riverfront Gate
Burnaby, BC, V5J 5M4

Eastern Canada
Suite 4 – 6740 Davand Drive
Mississauga, ON, L5T 2K9

Northeast United States
5055 Central Highway
Pennsauken, NJ 08109

Southeast United States
1075 Satellite Blvd. NW, Suite 400
Suwanee, GA 30024

Midwest United States
10393 Brockwood Road
Dallas, TX 75238

Southwest United States
1725 West Williams Drive
Building D, Suite 37
Phoenix, AZ 85027

Northwest United States
3116 Mercer Ave
Bellingham, WA 98226

To arrange service call 1-888-462-7487 • Email: support@alpha.ca



Technical Support

Alpha provides Technical Support services 24 hours per day, 7 days per week. If you reach voice mail, relax. Someone will get back to you within 30 minutes. That's our commitment to quality service. So go ahead, call us at the number below. Don't worry. You do not have to have your credit card ready.

Free 24-hour telephone technical support

- Alpha's technical support center provides expert technical support 24 hours-a-day, 7 days-a-week.
- All calls receive a response within 30 minutes.
- Toll-free in the USA and Canada: 1-888-462-7487
- International: +1-604-436-5547
- E-mail: support@alpha.ca

Installation and Commissioning

Get off to the right start. Many problems can be avoided if a system is correctly installed and fully tested at the beginning. Commissioning costs are waived when the customer upgrades their warranty to an on site Basic or Reliability service plan. We want our systems to perform their best right out of the gate. Let Alpha take the responsibility. We're used to it.

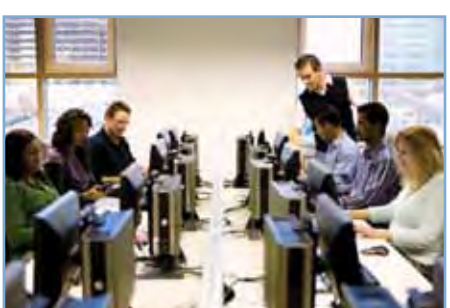
Maintenance and repair

Things go wrong. Batteries wear out. Components fail. Environmental damage occurs. While Alpha products adhere to the highest quality standards in the industry, maintenance and repair of power equipment that is in regular use is an unavoidable fact. Do it yourself, send it to us, or call us out to help. Alpha is available to provide service the way you need it. Alpha service plans and Extended Warranties help organizations plan for and minimize costs, but it is always best to avoid failures before they happen. Our Reliability Plan does just that with regularly scheduled Preventative Maintenance visits to stop troubles before they happen. That is the goal after all: continuous reliable power.

Training

Alpha provides a range of training solutions to meet client needs. Our course on Telecom DC Power is an industry standard. A wide range of courses are available covering various aspects of power systems installation, maintenance and management. Training courses are available at our Vancouver, Canada facility where students can enjoy the features of a wonderful location when they are not in the classroom.

Alpha also provides training programs on-site. Like all Alpha services, these programs can be customized to meet your needs. Please enquire.



To see a list of currently scheduled courses please visit us online at **www.alpha.ca/training**

Software, manuals, product registration and specifications

A wide range of documentation is available on our website to help you get the most from Alpha products. Visit us online at www.alpha.ca. While you are there don't forget to register your product with us. That way we will be able to provide you with relevant information concerning your product, even a reminder when you should change your batteries. Don't worry. We won't bombard you with email.

Training Courses

Course 1

Telecom DC Power and Cordex Advanced Power System Training

This course is recommended for anyone who is designing, engineering, installing or maintaining DC power plants for the telecommunications industry. The course is applicable to all telecom DC power plants but provides specific training on the Alpha Cordex DC power systems.

What is covered:		Duration: 2-3 days
DC Power system theory	Safety	Remote access, Ethernet, POTS and SNMP
DC System sizing	Controller programming	Maintenance and troubleshooting techniques
Site engineering	Installation and commissioning	30% Hands on training
Checking alarm set-points	SNMP and MODBUSS	

Course 2

Power Systems for Cable Applications

This course is recommended for anyone who is designing, engineering, installing and maintaining power systems used in Cable TV headend or outside plant applications. DC power plant, AC UPS and Network powering topologies will be reviewed

What is covered:		Duration: 1 day
AC/DC Power system theory	AC/DC System sizing	Outside plant network powering topologies
Site engineering	Installation and commissioning	Maintenance and troubleshooting techniques
Safety	Checking alarm set-points	

Course 3

Cordex Power Systems - Advanced

This course is recommended for anyone who is designing, engineering, installing or maintaining Alpha Cordex DC power systems. The course is focused on Cordex Power Systems and controller programming.

What is covered:		Duration: 1 day
Installation and commissioning	Detailed controller programming	Remote access, Ethernet, POTS and SNMP
Safety	Checking alarm set-points	Maintenance and troubleshooting techniques

Course 4

Cordex Power Systems - Basic

This course is recommended for anyone who is installing or maintaining Alpha Cordex DC power systems. The course is focused on the Cordex controller programming.

What is covered:		Duration: 1/2 day
Installation and commissioning	Basic controller programming	Maintenance and troubleshooting techniques
Safety	Checking alarm set-points	

Course 5

Telecom DC Power

This course is recommended for anyone who is designing, engineering, installing or maintaining DC power plants for the telecommunications industry. The course is applicable in all telecom DC power plants.

What is covered:		Duration: 1 day
DC Power system theory	Installation and commissioning	Maintenance and troubleshooting techniques
DC System sizing	Site engineering	Checking alarm set-points
Safety		

For further details, visit **www.alpha.ca/training** or contact us at **1-888-462-7487** or **training@alpha.ca**


cordex
CXRF 48-1.8kW
AC
DC
ALM

Your Power Solutions Partner

VISIT US AT WWW.ALPHA.CA

Alpha Technologies Ltd.
7700 Riverfront Gate
Burnaby, BC V5J 5M4
Canada
Tel: +1 604 436 5900
Fax:+1 604 436 1233
Toll Free: +1 800 667 8743
www.alpha.ca

Alpha Technologies Inc.
3767 Alpha Way
Bellingham, WA 98226
United States
Tel: +1 360 647 2360
Fax:+1 360 671 4936
www.alpha.com

Alpha Industrial Power Inc.
1075 Satellite Blvd NW,
Suite 400
Suwanee, GA 30024
United States
Tel: +1 678 475 3995
Fax:+1 678 584 9259
www.alpha.com

Alpha Energy
3767 Alpha Way
Bellingham, WA 98226
United States
Tel: +1 360 647 2360
Fax: +1 360 671 4936
www.alpha.com

Alpha Technologies GmbH
Hansastrasse 8
D-91126
Schwabach, Germany
Tel: +49 9122 79889 0
Fax:+49 9122 79889 21
www.alphatechnologies.com

Technologies Argus First de Mexico
Anatole France Num. 17
Colonia Polanco
11560, México D.F.
Tel: +52 55 5280 6990
www.argusmexico.com.mx

Alpha Technologies Europe Ltd.
Twyford House Thorley
Bishop's Stortford
Hertfordshire, CM22 7PA
United Kingdom
Tel: +44 1279 501110
Fax:+44 1279 659870
www.alphatechnologies.com

Alphatec Ltd.
339 St. Andrews St.
Suite 101 Andrea Chambers
P.O. Box 56468
3307 Limassol, Cyprus
Tel: +357 25 375 675
Fax:+357 25 359 595
www.alpha.com

Alpha TEK ooo
Khokhlovskiy Pereulok 16
Stroenie 1, Office 403
Moscow, 109028
Russia
Tel: +7 495 916 1854
Fax:+7 495 916 1349
www.alpha-group.ru

Alpha Technologies
Unit 504, 5/F,
Fourseas Building
No 208-212 Nathan Road
Kowloon, Hong Kong
Tel: +852 2736 8663
Fax:+852 2199 7988
www.alpha.com

Alpha Innovations Brasil
Rua Manuel Augusto
de Alvarenga, 155
CEP 04402-050
São Paulo SP, Brazil
Tel: +55 11 2476 0150
Fax: +55 11 2476 0150
www.alpha.com

Alphatec Baltic
S. Konarskio Street 49-201
Vilnius, LT-03123
Lithuania
Tel: +370 5 210 5291
Fax:+370 5 210 5292
www.alpha.com

Mitra Innovations
131 Boulevard de l'Europe
1301 Wavre
Belgium
Tel: +32 10 438 211
Fax:+32 10 438 212
www.mitra-innovations.com

Outback Power
6115 192nd St NE
Arlington, WA 98223
United States
Tel: +1 360 435 6030
Fax:+1 360 435 6019
www.outbackpower.com

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MIX
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24ACB7
Performance™ 17 2–Stage Air Conditioner with Puron® Refrigerant
2 to 5 Tons

Carrier
turn to the experts

Product Data



Puron
the environmentally sound refrigerant

Performance SERIES

Carrier Air Conditioners with Puron® refrigerant provide a collection of features unmatched by any other family of equipment. The 24ACB has been designed utilizing Carrier's Puron refrigerant. The environmentally sound refrigerant allows you to make a responsible decision in the protection of the earth's ozone layer.

This product has been designed and manufactured to meet Energy Star® criteria for energy efficiency when matched with appropriate coil components. Refer to the combination ratings in the Product Data for system combinations that meet Energy Star® guidelines.

NOTE: **Ratings contained in this document are subject to change at any time. Always refer to the AHRI directory (www.ahridirectory.org) for the most up-to-date ratings information.**

INDUSTRY LEADING FEATURES / BENEFITS

Efficiency

- 14.0 – 17.7 SEER / 11.3 – 13.7 EER
- Microtube Technology™ refrigeration system
- Indoor air quality accessories available

Sound

- Sound level as low as 72 dBA

Comfort

- System supports Thermidistat™ or standard 2-stage thermostat controls

Reliability

- Puron® refrigerant – environmentally sound, won't deplete the ozone layer and low lifetime service cost.
- Front-seating service valves
- 2-stage scroll compressor
- Internal pressure relief valve
- Internal thermal overload
- Low pressure switch
- High pressure switch
- Filter drier
- Balanced refrigeration system for maximum reliability

Durability

WeatherArmor Ultra™ protection package:

- Solid, Durable sheet metal construction
- Steel louver coil guard
- Baked-on, complete outer coverage, powder paint

Applications

- Long-line – up to 250 feet (76.2 m) total equivalent length, up to 200 feet (60.96 m) condenser above evaporator, or up to 80 ft. (24.38 m) evaporator above condenser (See Longline Guide for more information.)
- Low ambient cooling (down to 0°F / -17.8°C) with approved low ambient accessory kits.

MODEL NUMBER NOMENCLATURE

1	2	3	4	5	6	7	8	9	10	11	12	13
N	N	A	A	A/N	N	N	N	A/N	A/N	A/N	N	N
2	4	A	C	B	7	3	6	A	0	0	3	0
Product Series		Product Family	Tier	Major Series	SEER	Cooling Capacity		Variations	Open	Open	Voltage	Minor Series
24=AC		A=RES AC	C=Performance	B=Puron	7=17 SEER			A=Standard	0=Not Defined	0=Not Defined	3=208–230–1	0, 1, 2...

Puron™
the environmentally sound refrigerant

AHRI CERTIFIED™ www.ahridirectory.org

Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program For verification of certification for individual products, go to www.ahridirectory.org.

Certified System™

ISO 9001
QMI-SAI Global

c UL us

ENERGY STAR

This product has been designed and manufactured to meet Energy Star® criteria for energy efficiency when matched with appropriate coil components. However, proper refrigerant charge and proper air flow are critical to achieve rated capacity and efficiency. Installation of this product should follow all manufacturing refrigerant charging and air flow instructions. **Failure to confirm proper charge and air flow may reduce energy efficiency and shorten equipment life.**

STANDARD FEATURES

FEATURES	Unit Size – Series			
	24–31	36–31	48–31	60–30
Puron Refrigerant	X	X	X	X
Maximum SEER Rating*	17.0	17.7	17.0	17.0
2–Stage Scroll Compressor	X	X	X	X
Low Ambient Cooling Capability with Approved Kits	X	X	X	X
Crankcase Heater w/Temperature Switch	O	O	X	X
Louvered Coil Guard	X	X	X	X
Field Installed Filter Drier	X	X	X	X
Front Seating Service Valves	X	X	X	X
Internal Pressure Relief Valve	X	X	X	X
Internal Thermal Overload	X	X	X	X
Long Line capability	X	X	X	X
Low Pressure Switch	X	X	X	X
High Pressure Switch	X	X	X	X

X = Standard O = Accessory
* With approved combinations

REFRIGERANT PIPING LENGTH LIMITATIONS

Liquid Line Sizing and Maximum Total Equivalent Lengths† for Cooling Only Systems with Puron® Refrigerant:

The maximum allowable length of a residential split system depends on the liquid line diameter and vertical separation between indoor and outdoor units.

See Table below for liquid line sizing and maximum lengths :

Maximum Total Equivalent Length
Outdoor Unit BELOW Indoor Unit

Size	Liquid Line Connection	Liquid Line Diam. w/TXV	AC with Puron Refrigerant Maximum Total Equivalent Length†: Outdoor unit BELOW Indoor Vertical Separation ft (m)								
			0–5 (0–1.5)	6–10 (1.8–3.0)	11–20 (3.4–6.1)	21–30 (6.4–9.1)	31–40 (9.4–12.2)	41–50 (12.5–15.2)	51–60 (15.5–18.3)	61–70 (18.6–21.3)	71–80 (21.6–24.4)
024 AC with Puron	3/8	1/4	75	75	75	50	50	– –	– –	– –	– –
		5/16	250*	250*	250*	250*	250*	225*	175	125	100
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
036 AC with Puron	3/8	5/16	175	150	150	100	100	100	75	– –	– –
		3//8	250*	250*	250*	250*	250*	250*	250*	250*	250*
048 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	230	160	– –
060 AC with Puron	3/8	3/8	250*	250*	250*	225*	190	150	110	– –	– –

*** Maximum actual length not to exceed 200 ft (61 m)**

† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.

– – = outside acceptable range

Maximum Total Equivalent Length
Outdoor Unit ABOVE Indoor Unit

Size	Liquid Line Connection	Liquid Line Diam. w/TXV	AC with Puron Refrigerant Maximum Total Equivalent Length†: Outdoor unit ABOVE Indoor Vertical Separation ft (m)							
			25 (7.6)	26–50 (7.9–15.2)	51–75 (15.5–22.9)	76–100 (23.2–30.5)	101–125 (30.8–38.1)	126–150 (38.4–45.7)	151–175 (46.0–53.3)	176–200 (53.6–61.0)
024 AC with Puron	3/8	1/4	100	125	175	200	225*	250*	250*	250*
		5/16	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
036 AC with Puron	3/8	5/16	225*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
048 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	250*	250*
060 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	250*	250*

*** Maximum actual length not to exceed 200 ft (61 m)**

† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.

REFRIGERANT CHARGE ADJUSTMENTS

Liquid Line Size	Puron Charge oz/ft (g/m)
3/8	0.60 (17.74) (Factory charge for lineset = 9 oz / 266.16 g)
5/16	0.40 (11.83)
1/4	0.27 (7.98)

Units are factory charged for 15 ft (4.6 m) of 3/8" liquid line. The factory charge for 3/8" lineset 9 oz.(266.16 g). When using other length or diameter liquid lines, charge adjustments are required per the chart above.

Charging Formula:

[(Lineset oz/ft x total length) – (factory charge for lineset)] = charge adjustment

Example 1: System has 15 ft of line set using existing 1/4" liquid line. What charge adjustment is required?

Formula: (.27 oz/ft x 15ft) – (9 oz) = (-4.95) oz.

Net result is to remove 4.95 oz of refrigerant from the system

Example 2: System has 45 ft of existing 5/16" liquid line. What is the charge adjustment?

Formula: (.40 oz/ft. x 45ft) – (9 oz.) = 9 oz.

Net result is to add 9 oz of refrigerant to the system

LONG LINE APPLICATIONS

An application is considered Long Line, when the refrigerant level in the system requires the use of accessories to maintain acceptable refrigerant management for systems reliability. See Accessory Usage Guideline table for required accessories. Defining a system as long line depends on the liquid line diameter, actual length of the tubing, and vertical separation between the indoor and outdoor units.

For Air Conditioner systems, the chart below shows when an application is considered Long Line.

AC WITH PURON® REFRIGERANT LONG LINE DESCRIPTION ft (m)
Beyond these lengths, long line accessories are required

Liquid Line Size	Units On Same Level	Outdoor Below Indoor	Outdoor Above Indoor
1/4	No accessories needed within allowed lengths	No accessories needed within allowed lengths	175 (53.3)
5/16	120 (36.6)	50 (15.2) vertical or 120 (36.6) total	120 (36.6)
3/8	80 (24.4)	35 (10.7) vertical or 80 24.4) total	80 (24.4)

Note: See Long Line Guideline for details

VAPOR LINE SIZING AND COOLING CAPACITY LOSS

Acceptable vapor line diameters provide adequate oil return to the compressor while avoiding excessive capacity loss. The suction line diameters shown in the chart below are acceptable for AC systems with Puron refrigerant:

Vapor Line Sizing and Cooling Capacity Losses — Puron® Refrigerant 2-Stage Air Conditioner Applications

Unit Nominal Size (Btuh)	Maximum Liquid Line Diameters (In. OD)	Vapor Line Diameters (In.) OD	Cooling Capacity Loss (%) Total Equivalent Line Length ft. (m)								
			26–50 (7.9–15.2)	51–80 (15.5–24.4)	81–100 (24.7–30.5)	101–125 (30.8–38.1)	126–150 (38.4–45.7)	151–175 (46.0–50.3)	176–200 (53.6–60.0)	201–225 (61.3–68.6)	226–250 (68.9–76.2)
024 2–Stage Puron AC	3/8	5/8	0	1	1	2	3	3	4	4	5
		3/4	0	0	0	0	1	1	1	1	1
036 2–Stage Puron AC	3/8	5/8	1	2	4	5	6	7	9	10	11
		3/4	0	0	1	1	2	2	3	3	4
		7/8	0	0	0	0	1	1	1	1	2
048 2–Stage Puron AC	3/8	3/4	1	2	2	3	4	5	6	7	7
		7/8	0	1	1	2	2	2	3	3	3
		1–1/8	0	0	—	—	—	—	—	—	—
060 2–Stage Puron AC	3/8	3/4	1	2	4	5	6	7	9	10	11
		7/8	0	1	2	2	3	4	4	5	5
		1–1/8	0	0	0	1	1	1	1	1	1

Applications in this area may be long line and may have height restrictions. See the *Residential Piping and Long Line Guideline*.
— Applications in this area are not recommended due to insufficient oil return

PHYSICAL DATA

UNIT SIZE SERIES	24–31	36–31	48–31	60–30
Operating Weight lb (kg)	183 (83.0)	216 (98.0)	277 (125.6)	316 (143)
Shipping Weight lb (kg)	222 (100.7)	255 (115.7)	318 (144.2)	373 (169)
Compressor Type	Ultratech 2–Stage Scroll			
REFRIGERANT	Puron® (R–410A)			
Control	TXV (Puron Hard Shutoff)			
Charge lb (kg)	6.64 (3.01)	9.26 (4.20)	12.94 (5.87)	15.13 (6.86)
COND FAN	Propeller Type, Direct Drive			
Air Discharge	Vertical			
Air Qty (CFM)	2481	3068	4700	4450
Motor HP	1/12	1/10	1/4	1/4
Motor RPM	800	825	825	800
COND COIL				
Face Area (Sq ft)	19.38	19.38	25.12	30.18
Fins per In.	25	20	20	20
Rows	1	2	2	2
Circuits	5	7	7	8
VALVE CONNECT. (In. ID)				
Vapor	3/4	7/8	7/8	7/8
Liquid	3/8			
REFRIGERANT TUBES (In. OD)				
Rated Vapor*	3/4	7/8	1–1/8	1–1/8
Liquid	3/8			

*Units are rated with 25 ft (7.6 m) of lineset length. See *Vapor Line Sizing and Cooling Capacity Loss* table when using other sizes and lengths of lineset.

ELECTRICAL DATA

UNIT SIZE – SERIES	V/PH	OPER VOLTS*		COMPR		FAN	MCA	MIN WIRE SIZE†	MIN WIRE SIZE†	MAX LENGTH ft. (m)‡	MAX LENGTH ft. (m)‡	MAX FUSE** or CKT BRK AMPS
		MAX	MIN	LRA	RLA	FLA		60° C	75° C	60° C	75° C	
24–31	208–230/1	253	197	58.3	11.1	0.6	14.5	14	14	54 (16.6)	52 (15.7)	20
36–31				83.0	15.3	0.7	19.8	12	12	63 (19.2)	60 (18.3)	35
48–31				104.0	21.2	1.3	27.8	10	10	72 (21.9)	68 (20.8)	40
60–30				118.0	23.0	1.3	30.1	8	10	93 (28.3)	57 (17.4)	50

* Permissible limits of the voltage range at which the unit will operate satisfactorily

† If wire is applied at ambient greater than 30°C, consult table 310–16 of the NEC (NFPA 70). The ampacity of non–metallic–sheathed cable (NM), trade name ROMEX, shall be that of 60°C conditions, per the NEC (NFPA 70) Article 336–26. If other than uncoated (no–plated), 60 or 75°C insulation, copper wire (solid wire for 10 AWG or smaller, stranded wire for larger than 10 AWG) is used, consult applicable tables of the NEC (NFPA 70).

‡ Length shown is as measured one way along wire path between unit and service panel for voltage drop not to exceed 2%.

** Time–Delay fuse.

FLA – Full Load Amps

LRA – Locked Rotor Amps

MCA – Minimum Circuit Amps

RLA – Rated Load Amps

NOTE: Control circuit is 24–V on all units and requires external power source. Copper wire must be used from service disconnect to unit. All motors/compressors contain internal overload protection.

Complies with 2010 requirements of ASHRAE Standards 90.1

A–WEIGHTED SOUND POWER LEVEL

UNIT SIZE–VOLTAGE,SERIES	STANDARD RATING (dBA)	TYPICAL OCTAVE BAND SPECTRUM (dBA, without tone adjustment)					
		125	250	500	1000	4000	8000
24–31	73 – High Stage	49.0	58.0	66.5	69.5	61.0	57.5
	74 – Low Stage	52.0	59.5	67.0	69.5	61.0	55.0
36–31	74 – High Stage	53.5	61.5	68.0	71.0	62.5	57.5
	73 – Low Stage	54.0	61.5	67.5	68.0	63.0	56.0
48–31	74 – High Stage	54.5	59.5	67.0	68.0	60.0	53.5
	72 – Low Stage	55.5	61.5	67.0	66.0	60.5	55.0
60–30	74 – low stage	51.4	58.4	63.3	62.5	57.0	50.9
	74 – high stage	52.4	62.4	62.3	65.5	58.0	51.9

NOTE: Tested in accordance with AHRI Standard 270–08. (Not listed with AHRI).

CHARGING SUBCOOLING (TXV–TYPE EXPANSION DEVICE)

UNIT SIZE–VOLTAGE, SERIES	REQUIRED SUBCOOLING °F (°C)
24–31	10 (5.6)
36–31	14 (7.8)
48–31	13 (7.2)
60–30	10 (5.6)

THERMOSTATS

PART NUMBER	PROGRAM	GAS	ELECTRIC	HEAT	COOL
Performance					
TP–PAC01	7–Day	√	√	1	1
TP–NAC01	NP	√	√	1	1

THERMOSTAT ACCESSORIES		
PART NUMBER	**BRIEF DESCRIPTION**	**THERMOSTATS USED WITH**
SYSTXCCRRS01	Indoor Remote Room Temperature Sensor	All TP– thermostats
TP–EXP01–A	ExP® Computer Programming Accessory	TP–P thermostats
TSTATXXCNV10‡	Thermostat Conversion Kit (4 to 5 wire) – 10 pack	All Carrier® branded thermostats
TX–LBP01	Large Decorative Backplate	TP–Pxx, TP–Nxx, TC–Pxx
TSTATXXSEN01–B*	Outdoor Air Temperature Sensor	All TP– thermostats

ACCESSORIES

ORDER NUMBER	DESCRIPTION	24–31	36–31	48–31	60–30
KAACH1701AAA	CRANKCASE HTR	X	X	S	S
KSAHS2501*	HARD START KIT	X	X		
KSAHS2801*	HARD START KIT			X	
KSAHS2601	HARD START KIT				X
KSALA0301410	LOW AMBIENT PRESSURE SWTICH	X	X	X	X
KAAFT0101AAA	FREEZE THERMOSTAT	X	X	X	X
KAAWS0101AAA	WINTER START CONTROL	X	X	X	X
KSASH2301COP	SOUND BLANKET	X	X		
KSASH2401COP	SOUND BLANKET			X	X
KAALS0201LLS	SOLENOID VALVE KIT	X	X	X	X
KSASF0101AAA	SUPPORT FEET	X	X	X	X

X = Accessory S= Standard

* Not backward compatible to previous series.

ACCESSORY USAGE GUIDELINE

Accessory	Required for Low Ambient Cooling Applications (Below 55° F / 12.8° C)	Required for Long Line Applications*	Required for Sea Coast Applications (within 2 miles/3.2 km)
Compressor Start Assist Capacitor and Relay	Yes	Yes	No
Crankcase Heater	Yes (standard on some units)	Yes (standard on some units)	No
Evaporator Freeze Thermostat	Yes	No	No
Hard Shutoff TXV	Yes (standard w/factory approved indoor unit)	Yes (standard w/factory approved indoor unit)	Yes (standard w/factory approved indoor unit)
Liquid Line Solenoid Valve	No	See Residential Piping and Long Line Guideline	No
Low–Ambient Pressure Switch	Yes	No	No
Support Feet	Recommended	No	Recommended
Winter Start Control	Yes	No	No

* For tubing line sets between 80 and 200 ft. (24.38 and 60.96 m) and/or 35 ft. (10.7 m) vertical differential, refer to Residential Piping and Longline Guideline.

Accessory Description and Usage (Listed Alphabetically)

1. Compressor Start Assist - Capacitor and Relay

Start capacitor and relay gives a ”hard” boost to compressor motor at each start up.

Usage Guideline:

Required for 2-stage non-communicating units in the following applications:

- Long line
- Low ambient cooling

Suggested for all compressors in areas with a history of low voltage problems.

2. Crankcase Heater

An electric resistance heater which mounts to the base of the compressor to keep the lubricant warm during off cycles. Improves compressor lubrication on restart and minimizes the chance of liquid slugging.

Usage Guideline:

Required in low ambient cooling applications.

Required in long line applications.

Suggested in all commercial applications.

3. Evaporator Freeze Thermostat

An SPST temperature-actuated switch that stops unit operation when evaporator reaches freeze-up conditions.

Usage Guideline:

Required when low ambient kit has been added.

4. Low-Ambient Pressure Switch

A long life pressure switch which is mounted to outdoor unit service valve. It is designed to cycle the outdoor fan motor in order to maintain head pressure within normal operating limits. The control will maintain working head pressure at low-ambient temperatures down to 0°F (-17.8°C) when properly installed.

Usage Guideline:

A Low-Ambient Pressure Switch must be used when cooling operation is used at outdoor temperatures below 55°F (12.8°C).

5. Support Feet

Four stick-on plastic feet that raise the unit 4 in. (101.6 mm) above the mounting pad. This allows sand, dirt, and other debris to be flushed from the unit base, minimizing corrosion.

Usage Guideline:

Suggested in the following applications:

Coastal installations.

Windy areas or where debris is normally circulating.

Rooftop installations.

For improved sound ratings.

6. Thermostatic Expansion Valve (TXV)

A modulating flow-control valve which meters refrigerant liquid flow rate into the evaporator in response to the superheat of the refrigerant gas leaving the evaporator.

Kit includes valve, adapter tubes, and external equalizer tube. Hard shut off types are available.

NOTE: When using a hard shut off TXV with single phase reciprocating compressors, a Compressor Start Assist Capacitor and Relay is required.

Usage Guideline:

Required to achieve AHRI ratings in certain equipment combinations. Refer to combination ratings.

Hard shut off TXV or LLS required in air conditioner long line applications.

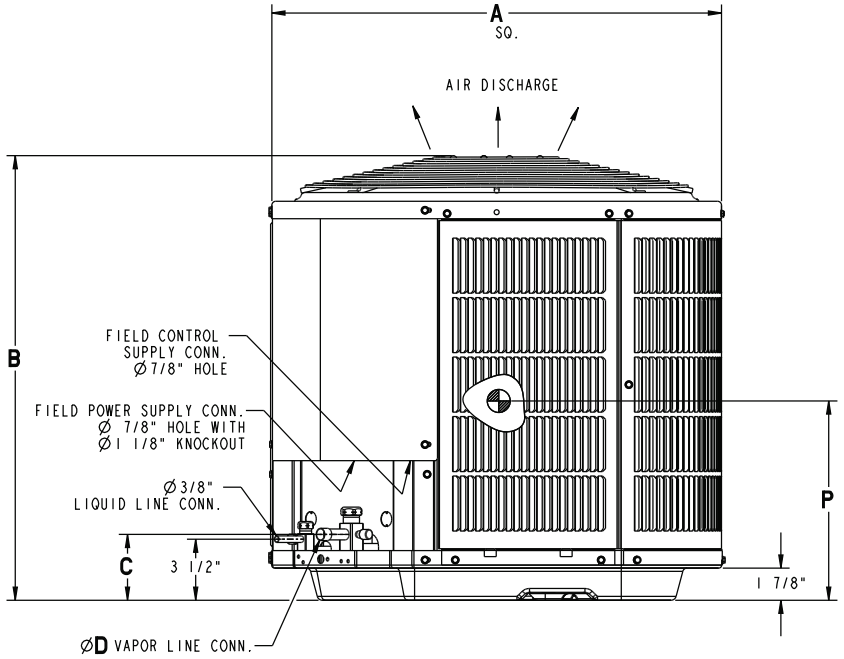
7. Winter Start Control

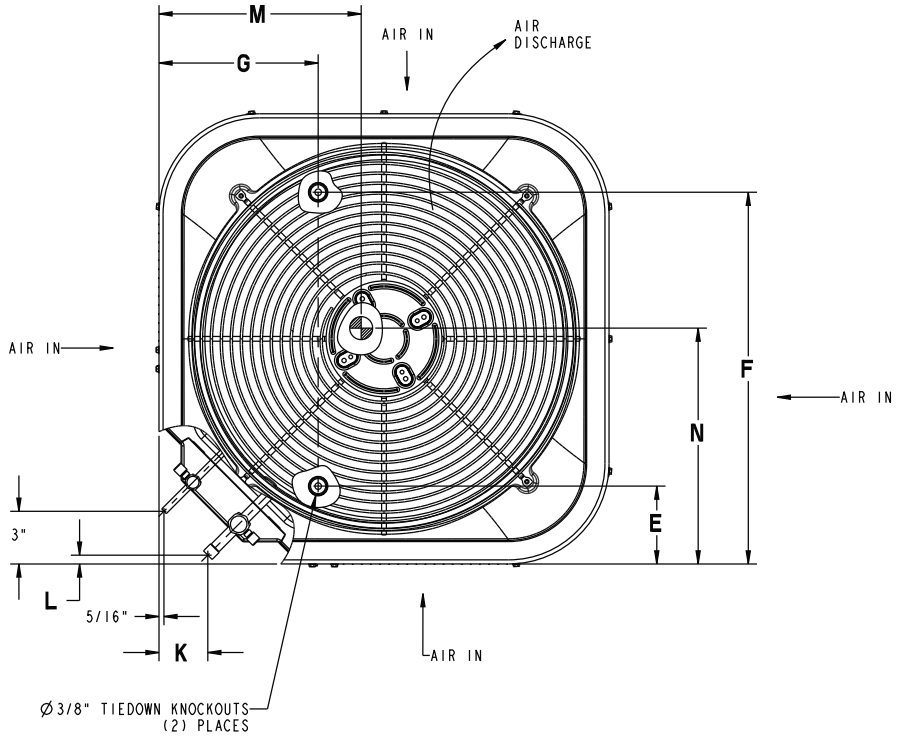
This control is designed to alleviate nuisance opening of the low-pressure switch by bypassing it for the first 3 minutes of operation.

DIMENSIONS – ENGLISH

UNIT	SERIES	ELECTRICAL CHARACTERISTICS				A	B	C	D	E	F	G	K	L	M	N	P	OPERATING WEIGHT (lbs)	SHIPPING WEIGHT (lbs)	SHIPPING DIMENSIONS (L x W x H)
24ACB724	1	X	O	O	O	31 3/16"	35 3/4"	3 7/8"	3/4"	6 9/16"	24 11/16"	9 1/8"	2 15/16"	5/8"	16"	15 1/2"	16 1/8"	183	222	33 5/16" X 33 5/16" X 39 3/8"
24ACB736	1	X	O	O	O	31 3/16"	35 3/4"	3 7/8"	7/8"	6 9/16"	24 11/16"	9 1/8"	2 15/16"	5/8"	15 3/4"	15 1/2"	15"	216	255	33 5/16" X 33 5/16" X 39 3/8"
24ACB748	1	X	O	O	O	35"	39 1/8"	3 7/8"	7/8"	6 9/16"	28 7/16"	9 1/8"	2 15/16"	5/8"	18 1/2"	16 1/2"	17"	277	318	37 1/8" X 37 1/8" X 42 3/4"
24ACB760	0	X	O	O	O	35"	45 7/8"	3 7/8"	7/8"	6 9/16"	28 7/16"	9 1/8"	2 15/16"	5/8"	17 7/8"	18 5/8"	20 1/4"	316	373	37 1/8" X 37 1/8" X 46 3/16"
		208-230-1-60	230-1-60	208/230-3-60	460-3-60															

X = YES
O = NO



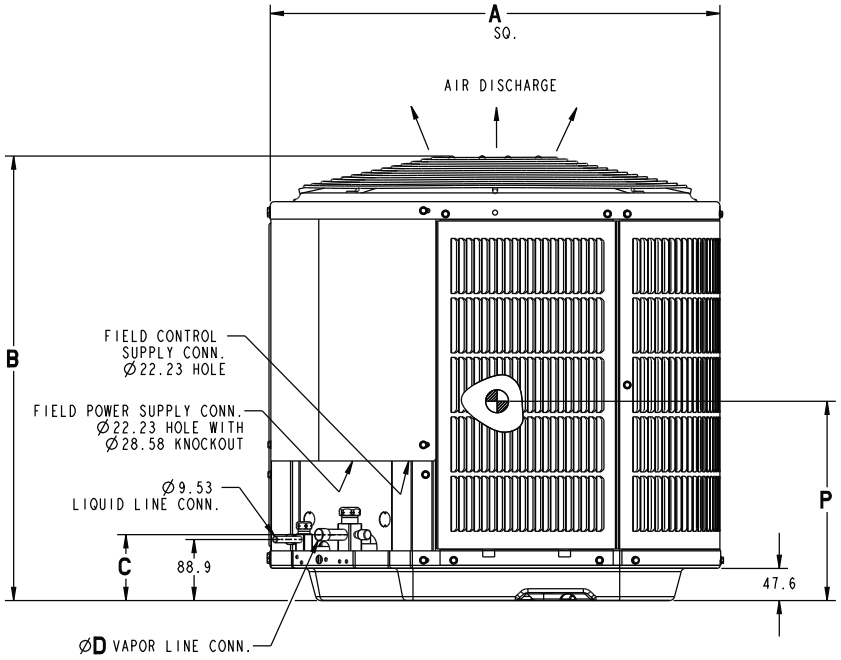


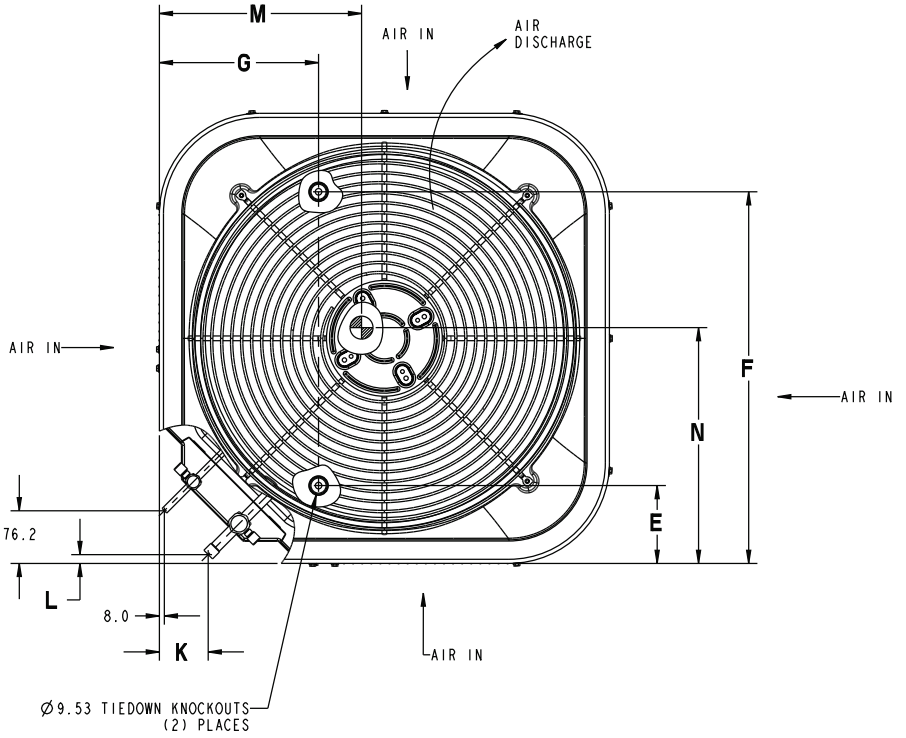
UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
24, 36	31 1/2" X 31 1/2"
48, 60	35" X 35"

DIMENSIONS – SI

UNIT	SERIES	ELECTRICAL CHARACTERISTICS				A	B	C	D	E	F	G	K	L	M	N	P	OPERATING WEIGHT (Kgs)	SHIPPING WEIGHT (Kgs)	SHIPPING DIMENSIONS (L x W x H)
24ACB724	1	X	O	O	O	792.2	908.0	98.4	19.1	166.7	627.1	231.8	74.6	15.9	406.4	393.7	409.6	83.0	100.7	846.4 X 846.4 X 1000.1
24ACB736	1	X	O	O	O	792.2	908.0	98.4	22.2	166.7	627.1	231.8	74.6	15.9	400.1	393.7	381.0	98.0	115.7	846.4 X 846.4 X 1000.1
24ACB748	1	X	O	O	O	889.0	993.8	98.4	22.2	166.7	722.3	231.8	74.6	15.9	469.9	419.1	431.8	125.6	144.2	942.9 X 942.9 X 1085.9
24ACB760	0	X	O	O	O	889.0	1165.2	98.4	22.2	166.7	722.3	231.8	74.6	15.9	454.0	473.1	514.4	143	169	942.9 X 942.9 X 1173.2
		208-230-1-60	230-1-60	208/230-3-60	460-3-60															

X = YES
O = NO

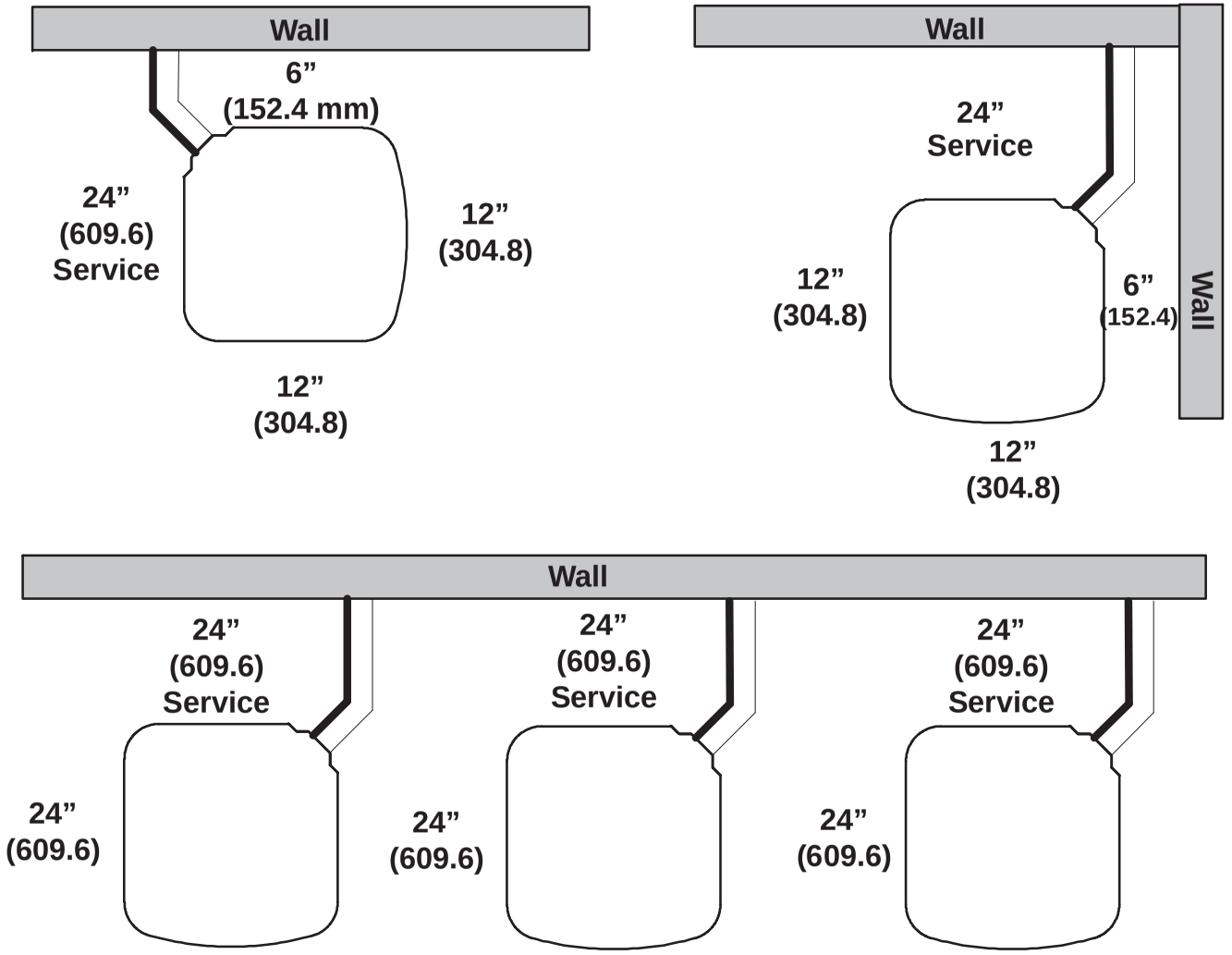




UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
24,36	800.1 X 800.1
48,60	889.0 X 889.0

CLEARANCES

Clearances (various examples)



Note: Numbers in ( ) = mm

IMPORTANT: When installing multiple units in an alcove, roof well, or partially enclosed area, ensure there is adequate ventilation to prevent re-circulation of discharge air.

A07833

TESTED AHRI COMBINATION RATINGS

NOTE: Ratings contained in this document are subject to change at any time.

For AHRI ratings certificates, please refer to the AHRI directory www.ahridirectory.org

Additional ratings and system combinations can be accessed via the Carrier database at: www.MyCarrierRatings.com

For performance data at specific application &/or design conditions with various indoor unit combinations, the equipment performance calculator can be accessed at : http://rpmob.wrightsoft.com/

UNIT SIZE – SERIES, VOLTAGE	INDOOR MODEL	ARI STANDARD RATINGS						FURNACE MODEL
		COOLING						
		CAPACITY		SEER	EER	ID CFM		
		HIGH	LOW			HIGH	LOW	
24ACB724A**31	CNPV*3117A**	24,000	21,600	17.0	13.0	835	670	58CV(A,X)090–16
24ACB736A**31	CNPV*4821A**	36,000	29,400	17.0	13.0	1005	835	58CV(A,X)090–16
24ACB748A**31	CNPV*6124A**	48,000	40,000	17.0	13.0	1355	1010	58CV(A,X)135–22
24ACB760A**30	CNPH*6124A**	59,000	48,000	16.5	13.0	1675	1245	58PH*110–20

AHRI — Air Conditioning, Heating & Refrigeration Institute
EER — Energy Efficiency Ratio – 80°F (26.6°C) indoor db/67°F (19.4°C) indoor wb & 95°F (35°C) outdoor wb.
SEER — Seasonal Energy Efficiency Ratio
TDR — Time–Delay Relay. In most cases, only 1 method should be used to achieve TDR function. Using more than 1 method in a system may cause degradation in performance. Use either the accessory Time–Delay Relay KAATD0101TDR or a furnace equipped with TDR. Most Carrier furnaces are equipped with TDR.

NOTES:
1. Ratings are net values reflecting the effects of circulating fan motor heat. Supplemental electric heat is not included.
2. Tested outdoor/indoor combinations have been tested in accordance with DOE test procedures for central air conditioners. Ratings for other combinations are determined under DOE computer simulation procedures.
3. Determine actual CFM values obtainable for your system by referring to fan performance data in fan coil or furnace coil literature.
4. Do not apply with capillary tube coils as performance and reliability are affected.

DETAILED COOLING CAPACITIES#

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh		Total System KW**	Capacity MBtuh		Total System KW**	Capacity MBtuh		Total System KW**	Capacity MBtuh		Total System KW**	Capacity MBtuh		Total System KW**	Capacity MBtuh		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
24ACB724A**31 Outdoor Section With CNPV*3117A**+58CV(A,X)090–16 Indoor Section – High																			
600	57 (13.9)	24.35	24.35	1.59	21.95	21.95	1.68	19.59	19.59	1.78	17.29	17.29	1.90	15.06	15.06	2.03	12.92	12.92	2.18
	62 (16.7)	25.97	21.39	1.60	23.22	19.39	1.69	20.53	17.42	1.79	17.94	15.51	1.90	15.45	13.65	2.03	13.09	11.86	2.18
	63 (17.2)††	26.50	17.74	1.60	23.69	16.00	1.69	20.94	14.30	1.79	18.29	12.65	1.91	15.74	11.06	2.03	13.32	9.54	2.18
	67 (19.4)	28.68	18.42	1.61	25.64	16.63	1.71	22.68	14.88	1.80	19.82	13.18	1.92	17.07	11.54	2.04	14.47	9.98	2.19
	72 (22.2)	31.66	15.36	1.63	28.31	13.79	1.72	25.04	12.27	1.82	21.89	10.80	1.93	18.87	9.39	2.06	16.01	8.05	2.21
650	57 (13.9)	25.14	25.14	1.60	22.64	22.64	1.69	20.19	20.19	1.80	17.81	17.81	1.91	15.50	15.50	2.04	13.29	13.29	2.18
	62 (16.7)	26.46	22.38	1.61	23.65	20.29	1.70	20.90	18.25	1.80	18.25	16.26	1.91	15.71	14.32	2.04	13.33	13.26	2.19
	63 (17.2)††	26.98	18.42	1.61	24.11	16.62	1.70	21.29	14.87	1.80	18.57	13.16	1.92	15.98	11.52	2.04	13.51	9.95	2.19
	67 (19.4)	29.19	19.14	1.63	26.08	17.29	1.72	23.05	15.48	1.81	20.12	13.72	1.93	17.32	12.03	2.05	14.66	10.41	2.20
	72 (22.2)	32.19	15.83	1.64	28.75	14.22	1.73	25.41	12.65	1.83	22.20	11.14	1.94	19.12	9.70	2.07	16.20	8.32	2.21
700	57 (13.9)	25.85	25.85	1.61	23.27	23.27	1.71	20.74	20.74	1.81	18.28	18.28	1.92	15.90	15.90	2.05	13.62	13.62	2.19
	62 (16.7)	26.90	23.34	1.62	24.03	21.18	1.71	21.23	19.06	1.81	18.53	16.98	1.92	15.97	15.81	2.05	13.65	13.65	2.20
	63 (17.2)††	27.40	19.08	1.62	24.46	17.23	1.71	21.59	15.42	1.81	18.83	13.66	1.92	16.18	11.97	2.05	13.67	10.34	2.20
	67 (19.4)	29.63	19.84	1.64	26.45	17.93	1.73	23.35	16.07	1.82	20.38	14.26	1.93	17.52	12.51	2.06	14.82	10.84	2.21
	72 (22.2)	32.64	16.28	1.65	29.13	14.63	1.74	25.73	13.02	1.84	22.46	11.48	1.95	19.33	10.00	2.08	16.37	8.58	2.22
750	57 (13.9)	26.50	26.50	1.63	23.85	23.85	1.72	21.24	21.24	1.82	18.71	18.71	1.93	16.26	16.26	2.06	13.93	13.93	2.20
	62 (16.7)	27.30	24.28	1.63	24.37	22.04	1.72	21.53	19.84	1.82	18.80	17.68	1.93	16.29	16.29	2.06	13.95	13.95	2.20
	63 (17.2)††	27.76	19.72	1.63	24.77	17.82	1.72	21.86	15.96	1.82	19.04	14.15	1.93	16.35	12.41	2.06	13.82	10.73	2.20
	67 (19.4)	30.00	20.53	1.65	26.77	18.56	1.73	23.63	16.64	1.83	20.59	14.78	1.94	17.70	12.98	2.07	14.96	11.25	2.21
	72 (22.2)	33.03	16.71	1.66	29.46	15.02	1.75	26.01	13.38	1.85	22.68	11.80	1.96	19.51	10.29	2.08	16.51	8.84	2.23
800	57 (13.9)	27.10	27.10	1.64	24.38	24.38	1.73	21.70	21.70	1.83	19.10	19.10	1.94	16.60	16.60	2.07	14.20	14.20	2.21
	62 (16.7)	27.65	25.20	1.64	24.69	22.88	1.73	21.82	20.59	1.83	19.13	19.13	1.94	16.62	16.62	2.07	14.22	14.22	2.21
	63 (17.2)††	28.08	20.35	1.64	25.05	18.40	1.73	22.09	16.49	1.83	19.23	14.63	1.94	16.51	12.83	2.07	13.94	11.11	2.21
	67 (19.4)	30.34	21.20	1.66	27.05	19.18	1.74	23.86	17.21	1.84	20.78	15.29	1.95	17.85	13.44	2.08	15.08	11.66	2.22
	72 (22.2)	33.37	17.13	1.67	29.75	15.40	1.76	26.25	13.73	1.85	22.88	12.12	1.96	19.67	10.57	2.09	16.63	9.09	2.24
835	57 (13.9)	27.50	27.50	1.65	24.72	24.72	1.74	22.00	22.00	1.83	19.36	19.36	1.95	16.81	16.81	2.07	14.38	14.38	2.22
	62 (16.7)	27.89	25.83	1.65	24.90	23.45	1.74	22.03	22.03	1.83	19.39	19.39	1.95	16.84	16.84	2.07	14.40	14.40	2.22
	63 (17.2)††	28.29	20.79	1.65	25.22	18.80	1.74	22.23	16.85	1.84	19.35	14.96	1.95	16.61	13.13	2.07	14.02	11.38	2.22
	67 (19.4)	30.54	21.66	1.66	27.22	19.61	1.75	24.00	17.60	1.85	20.90	15.65	1.96	17.95	13.76	2.08	15.16	11.94	2.23
	72 (22.2)	33.58	17.41	1.68	29.93	15.67	1.76	26.39	13.97	1.86	23.00	12.33	1.97	19.77	10.77	2.10	16.70	9.27	2.24
900	57 (13.9)	28.17	28.17	1.66	25.31	25.31	1.75	22.51	22.51	1.85	19.79	19.79	1.96	17.18	17.18	2.08	14.67	14.67	2.23
	62 (16.7)	28.32	26.95	1.66	25.34	25.34	1.75	22.55	22.55	1.85	19.82	19.82	1.96	17.20	17.20	2.08	14.70	14.70	2.23
	63 (17.2)††	28.63	21.58	1.66	25.50	19.52	1.75	22.47	17.51	1.85	19.55	15.56	1.96	16.77	13.67	2.08	14.15	11.85	2.23
	67 (19.4)	30.88	22.51	1.68	27.51	20.38	1.76	24.24	18.31	1.86	21.10	16.29	1.97	18.11	14.34	2.09	15.28	12.46	2.24
	72 (22.2)	33.93	17.93	1.69	30.22	16.14	1.78	26.64	14.41	1.87	23.20	12.73	1.98	19.92	11.12	2.11	16.82	9.58	2.25

See notes on page 15

DETAILED COOLING CAPACITIES# (CONTINUED)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
24ACB724A**31 Outdoor Section With CNPV*3117A** +58CV(A,X)090–16 Indoor Section – Low																			
450	57 (13.9)	17.62	17.62	1.05	16.16	16.16	1.25	14.68	14.68	1.48	13.20	13.20	1.76	11.79	11.79	2.07	10.43	10.43	2.44
	62 (16.7)	18.73	15.76	1.04	17.00	14.15	1.24	15.27	12.56	1.48	13.57	11.03	1.75	11.95	9.57	2.07	10.46	10.45	2.44
	63 (17.2)††	19.10	13.04	1.04	17.34	11.64	1.24	15.56	10.27	1.47	13.83	8.95	1.75	12.16	7.70	2.07	10.58	6.53	2.44
	67 (19.4)	20.70	13.55	1.02	18.79	12.11	1.22	16.89	10.70	1.46	15.02	9.35	1.73	13.24	8.06	2.06	11.55	6.85	2.43
	72 (22.2)	22.95	11.31	1.00	20.84	10.04	1.20	18.74	8.82	1.44	16.71	7.65	1.71	14.76	6.54	2.04	12.91	5.51	2.42
500	57 (13.9)	18.38	18.38	1.05	16.84	16.84	1.25	15.28	15.28	1.48	13.74	13.74	1.75	12.25	12.25	2.07	10.84	10.84	2.44
	62 (16.7)	19.20	16.75	1.04	17.41	15.05	1.24	15.63	13.38	1.48	13.90	11.76	1.75	12.28	12.28	2.07	10.85	10.85	2.44
	63 (17.2)††	19.56	13.72	1.04	17.73	12.26	1.24	15.90	10.83	1.48	14.11	9.45	1.75	12.40	8.15	2.07	10.78	6.92	2.44
	67 (19.4)	21.19	14.29	1.02	19.21	12.78	1.22	17.25	11.30	1.46	15.33	9.89	1.74	13.49	8.54	2.06	11.76	7.27	2.44
	72 (22.2)	23.47	11.79	1.00	21.29	10.47	1.20	19.13	9.20	1.44	17.03	7.99	1.72	15.02	6.85	2.05	13.12	5.78	2.43
550	57 (13.9)	19.06	19.06	1.05	17.44	17.44	1.25	15.81	15.81	1.48	14.21	14.21	1.75	12.66	12.66	2.07	11.19	11.19	2.44
	62 (16.7)	19.60	17.71	1.04	17.77	15.93	1.24	15.96	14.17	1.48	14.23	14.23	1.75	12.68	12.68	2.07	11.21	11.21	2.45
	63 (17.2)††	19.94	14.38	1.04	18.06	12.86	1.24	16.18	11.37	1.48	14.34	9.94	1.75	12.59	8.58	2.08	10.94	7.29	2.45
	67 (19.4)	21.60	15.00	1.02	19.57	13.42	1.22	17.55	11.89	1.46	15.58	10.42	1.74	13.70	9.01	2.06	11.93	7.68	2.44
	72 (22.2)	23.90	12.24	1.00	21.66	10.89	1.20	19.44	9.57	1.44	17.29	8.32	1.72	15.24	7.14	2.05	13.30	6.04	2.43
600	57 (13.9)	19.66	19.66	1.05	17.98	17.98	1.25	16.28	16.28	1.48	14.62	14.62	1.75	13.02	13.02	2.08	11.50	11.50	2.45
	62 (16.7)	19.96	18.65	1.04	18.11	16.78	1.24	16.31	16.31	1.48	14.65	14.65	1.75	13.04	13.04	2.08	11.52	11.52	2.45
	63 (17.2)††	20.26	15.03	1.04	18.33	13.45	1.24	16.41	11.90	1.48	14.54	10.42	1.76	12.76	9.00	2.08	11.08	7.67	2.45
	67 (19.4)	21.94	15.69	1.03	19.86	14.06	1.23	17.80	12.47	1.46	15.79	10.93	1.74	13.88	9.47	2.07	12.08	8.09	2.45
	72 (22.2)	24.26	12.68	1.00	21.96	11.29	1.20	19.70	9.94	1.44	17.50	8.65	1.72	15.41	7.44	2.06	13.44	6.30	2.44
650	57 (13.9)	20.20	20.20	1.05	18.46	18.46	1.25	16.71	16.71	1.48	15.00	15.00	1.76	13.35	13.35	2.08	11.78	11.78	2.45
	62 (16.7)	20.31	19.56	1.05	18.49	18.49	1.25	16.74	16.74	1.48	15.02	15.02	1.76	13.37	13.37	2.08	11.80	11.80	2.45
	63 (17.2)††	20.54	15.66	1.05	18.58	14.03	1.25	16.62	12.42	1.48	14.72	10.89	1.76	12.90	9.42	2.09	11.21	8.03	2.46
	67 (19.4)	22.24	16.37	1.03	20.11	14.68	1.23	18.01	13.03	1.47	15.97	11.44	1.75	14.03	9.92	2.07	12.21	8.48	2.45
	72 (22.2)	24.57	13.12	1.00	22.22	11.68	1.20	19.91	10.29	1.44	17.68	8.97	1.73	15.56	7.72	2.06	13.56	6.54	2.45
670	57 (13.9)	20.41	20.41	1.05	18.64	18.64	1.25	16.87	16.87	1.48	15.14	15.14	1.76	13.47	13.47	2.08	11.88	11.88	2.46
	62 (16.7)	20.46	20.36	1.05	18.67	18.67	1.25	16.90	16.90	1.48	15.16	15.16	1.76	13.49	13.49	2.08	11.90	11.90	2.46
	63 (17.2)††	20.64	15.91	1.05	18.66	14.25	1.25	16.69	12.63	1.48	14.78	11.07	1.76	12.96	9.58	2.09	11.26	8.17	2.46
	67 (19.4)	22.34	16.64	1.03	20.20	14.92	1.23	18.09	13.25	1.47	16.04	11.64	1.75	14.09	10.10	2.08	12.26	8.64	2.45
	72 (22.2)	24.67	13.29	1.01	22.31	11.84	1.21	19.99	10.43	1.45	17.75	9.09	1.73	15.61	7.83	2.06	13.60	6.64	2.45
700	57 (13.9)	20.70	20.70	1.05	18.90	18.90	1.25	17.10	17.10	1.48	15.34	15.34	1.76	13.64	13.64	2.08	12.03	12.03	2.46
	62 (16.7)	20.73	20.73	1.05	18.93	18.93	1.25	17.13	17.13	1.48	15.36	15.36	1.76	13.66	13.66	2.08	12.05	12.05	2.46
	63 (17.2)††	20.79	16.28	1.05	18.79	14.59	1.25	16.80	12.94	1.49	14.87	11.35	1.77	13.04	9.83	2.09	11.33	8.38	2.47
	67 (19.4)	22.49	17.03	1.03	20.33	15.28	1.23	18.20	13.58	1.47	16.13	11.93	1.75	14.16	10.36	2.08	12.33	8.87	2.46
	72 (22.2)	24.82	13.53	1.01	22.44	12.06	1.21	20.10	10.64	1.45	17.84	9.28	1.73	15.69	7.99	2.07	13.66	6.78	2.45

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DETAILED COOLING CAPACITIES# (CONTINUED)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
24ACB736A**31 Outdoor Section With CNPV*4821A**+58CV(A,X)090–16 Indoor Section – High																			
900	57 (13.9)	35.84	35.84	2.28	33.31	33.31	2.47	30.78	30.78	2.70	28.23	28.23	2.96	25.63	25.63	3.26	22.99	22.99	3.58
	62 (16.7)	38.02	31.58	2.30	35.06	29.75	2.49	32.11	27.93	2.72	29.14	26.10	2.97	26.15	24.26	3.26	23.16	22.40	3.58
	63 (17.2)††	38.77	26.12	2.30	35.74	24.49	2.50	32.71	22.86	2.72	29.66	21.22	2.98	26.58	19.58	3.27	23.48	17.94	3.58
	67 (19.4)	41.84	27.07	2.33	38.59	25.41	2.52	35.31	23.74	2.74	32.02	22.07	3.00	28.69	20.39	3.29	25.34	18.71	3.60
	72 (22.2)	46.07	22.49	2.37	42.48	20.99	2.56	38.88	19.49	2.77	35.25	17.98	3.03	31.59	16.46	3.31	27.88	14.95	3.63
975	57 (13.9)	36.91	36.91	2.30	34.29	34.29	2.50	31.67	31.67	2.73	29.01	29.01	2.99	26.31	26.31	3.28	23.57	23.57	3.60
	62 (16.7)	38.68	32.98	2.32	35.66	31.09	2.51	32.63	29.20	2.74	29.60	27.31	2.99	26.56	25.39	3.28	23.61	23.61	3.60
	63 (17.2)††	39.40	27.07	2.32	36.30	25.40	2.52	33.20	23.73	2.74	30.07	22.04	3.00	26.93	20.36	3.28	23.76	18.68	3.60
	67 (19.4)	42.51	28.10	2.35	39.17	26.38	2.54	35.82	24.67	2.76	32.44	22.95	3.02	29.04	21.23	3.30	25.62	19.50	3.62
	72 (22.2)	46.76	23.13	2.40	43.10	21.60	2.58	39.41	20.07	2.79	35.69	18.53	3.04	31.95	16.98	3.33	28.17	15.43	3.64
1005	57 (13.9)	37.31	37.31	2.31	34.65	34.65	2.51	31.99	31.99	2.74	29.30	29.30	2.99	26.56	26.56	3.28	23.78	23.78	3.60
	62 (16.7)	38.93	33.53	2.33	35.87	31.61	2.52	32.83	29.70	2.74	29.77	27.78	3.00	26.72	25.82	3.29	23.82	23.82	3.60
	63 (17.2)††	39.63	27.45	2.33	36.51	25.76	2.52	33.38	24.06	2.75	30.22	22.37	3.00	27.05	20.67	3.29	23.85	18.96	3.60
	67 (19.4)	42.75	28.49	2.36	39.37	26.76	2.55	36.00	25.03	2.77	32.59	23.29	3.02	29.17	21.56	3.31	25.71	19.81	3.62
	72 (22.2)	47.01	23.39	2.40	43.32	21.84	2.58	39.60	20.29	2.80	35.85	18.74	3.05	32.08	17.18	3.34	28.27	15.62	3.65
1200	57 (13.9)	39.58	39.58	2.37	36.72	36.72	2.56	33.84	33.84	2.79	30.92	30.92	3.04	27.97	27.97	3.33	24.98	24.98	3.65
	62 (16.7)	40.28	36.94	2.38	37.11	34.86	2.57	33.98	32.74	2.79	30.97	30.97	3.04	28.01	28.01	3.33	25.01	25.01	3.65
	63 (17.2)††	40.84	29.78	2.38	37.56	27.98	2.57	34.29	26.19	2.79	31.00	24.39	3.04	27.69	22.59	3.33	24.38	20.78	3.64
	67 (19.4)	44.00	30.99	2.41	40.46	29.14	2.59	36.93	27.31	2.81	33.39	25.47	3.07	29.82	23.62	3.35	26.24	21.77	3.66
	72 (22.2)	48.33	24.94	2.45	44.46	23.32	2.63	40.57	21.70	2.84	36.66	20.07	3.09	32.73	18.44	3.38	28.78	16.81	3.69
1350	57 (13.9)	41.01	41.01	2.41	38.01	38.01	2.60	34.98	34.98	2.82	31.93	31.93	3.08	28.84	28.84	3.37	25.70	25.70	3.68
	62 (16.7)	41.19	39.34	2.41	38.05	38.05	2.60	35.03	35.03	2.82	31.97	31.97	3.08	28.88	28.88	3.37	25.73	25.73	3.68
	63 (17.2)††	41.54	31.48	2.42	38.18	29.61	2.60	34.82	27.74	2.82	31.44	25.87	3.07	28.06	23.99	3.36	24.68	22.09	3.67
	67 (19.4)	44.70	32.80	2.45	41.09	30.89	2.63	37.47	28.98	2.85	33.83	27.06	3.10	30.19	25.13	3.38	26.53	23.19	3.69
	72 (22.2)	49.07	26.06	2.49	45.10	24.39	2.67	41.11	22.71	2.88	37.11	21.04	3.12	33.08	19.36	3.41	29.04	17.68	3.72
24ACB736A**31 Outdoor Section With CNPV*4821A**+58CV(A,X)090–16 Indoor Section – Low																			
720	57 (13.9)	26.16	26.16	1.51	24.56	24.56	1.75	22.93	22.93	2.02	21.26	21.26	2.34	19.53	19.53	2.71	17.74	17.74	3.15
	62 (16.7)	27.22	23.86	1.51	25.33	21.80	1.74	23.44	19.77	2.02	21.51	17.78	2.34	19.57	19.55	2.71	17.77	17.77	3.15
	63 (17.2)††	27.75	19.50	1.50	25.81	17.73	1.74	23.86	15.99	2.01	21.86	14.30	2.34	19.80	12.63	2.71	17.68	11.01	3.15
	67 (19.4)	30.15	20.35	1.48	28.03	18.51	1.72	25.90	16.71	2.00	23.75	14.95	2.32	21.53	13.24	2.70	19.24	11.56	3.13
	72 (22.2)	33.42	16.77	1.46	31.06	15.17	1.70	28.71	13.59	1.98	26.32	12.07	2.30	23.88	10.60	2.67	21.37	9.16	3.10
780	57 (13.9)	26.97	26.97	1.52	25.30	25.30	1.75	23.60	23.60	2.02	21.87	21.87	2.34	20.07	20.07	2.72	18.21	18.21	3.15
	62 (16.7)	27.71	25.00	1.51	25.78	22.85	1.75	23.85	20.74	2.02	21.92	21.84	2.34	20.11	20.11	2.72	18.24	18.24	3.15
	63 (17.2)††	28.20	20.29	1.51	26.21	18.45	1.74	24.21	16.66	2.02	22.17	14.90	2.34	20.07	13.18	2.72	17.90	11.50	3.16
	67 (19.4)	30.62	21.18	1.49	28.44	19.28	1.73	26.27	17.42	2.00	24.06	15.60	2.33	21.79	13.82	2.70	19.46	12.09	3.13
	72 (22.2)	33.92	17.30	1.46	31.51	15.64	1.70	29.09	14.04	1.98	26.65	12.48	2.31	24.16	10.96	2.68	21.60	9.49	3.11
835	57 (13.9)	27.64	27.64	1.52	25.91	25.91	1.75	24.16	24.16	2.03	22.37	22.37	2.35	20.52	20.52	2.72	18.59	18.59	3.15
	62 (16.7)	28.12	26.02	1.51	26.16	23.78	1.75	24.23	24.10	2.03	22.41	22.41	2.35	20.55	20.55	2.72	18.62	18.62	3.15
	63 (17.2)††	28.57	20.99	1.51	26.54	19.10	1.75	24.49	17.26	2.02	22.41	15.45	2.35	20.28	13.68	2.72	18.08	11.95	3.16
	67 (19.4)	30.99	21.93	1.49	28.78	19.97	1.73	26.56	18.06	2.01	24.30	16.19	2.33	22.00	14.36	2.71	19.64	12.57	3.14
	72 (22.2)	34.32	17.77	1.47	31.86	16.08	1.71	29.39	14.44	1.99	26.91	12.85	2.31	24.38	11.29	2.68	21.77	9.79	3.11
960	57 (13.9)	28.98	28.98	1.52	27.13	27.13	1.76	25.27	25.27	2.03	23.35	23.35	2.35	21.38	21.38	2.73	19.34	19.34	3.16
	62 (16.7)	29.01	29.01	1.52	27.17	27.17	1.76	25.30	25.30	2.03	23.39	23.39	2.35	21.41	21.41	2.73	19.37	19.37	3.16
	63 (17.2)††	29.25	22.53	1.52	27.14	20.52	1.76	25.03	18.57	2.04	22.87	16.64	2.36	20.67	14.76	2.74	18.42	12.92	3.17
	67 (19.4)	31.69	23.58	1.50	29.39	21.49	1.74	27.09	19.46	2.02	24.76	17.47	2.34	22.39	15.52	2.72	19.97	13.62	3.15
	72 (22.2)	35.05	18.80	1.48	32.49	17.03	1.72	29.94	15.32	2.00	27.37	13.65	2.32	24.76	12.02	2.70	22.08	10.44	3.13
1080	57 (13.9)	30.06	30.06	1.53	28.11	28.11	1.77	26.14	26.14	2.04	24.13	24.13	2.36	22.07	22.07	2.74	19.93	19.93	3.17
	62 (16.7)	30.11	30.11	1.53	28.15	28.15	1.77	26.18	26.18	2.04	24.16	24.16	2.36	22.10	22.10	2.74	19.96	19.96	3.17
	63 (17.2)††	29.77	23.95	1.53	27.60	21.84	1.77	25.42	19.77	2.05	23.22	17.74	2.37	20.98	15.75	2.75	18.70	13.78	3.19
	67 (19.4)	32.21	25.10	1.51	29.85	22.90	1.75	27.49	20.76	2.03	25.11	18.66	2.36	22.70	16.60	2.73	20.24	14.57	3.17
	72 (22.2)	35.58	19.75	1.49	32.95	17.90	1.73	30.34	16.12	2.01	27.70	14.38	2.34	25.03	12.68	2.71	22.29	11.04	3.14

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DETAILED COOLING CAPACITIES# (CONTINUED)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
24ACB748A**31 Outdoor Section With CNPV*6124A**+58CV(A,X)135–22 Indoor Section – High																			
1200	57 (13.9)	47.30	47.30	2.91	44.22	44.22	3.23	41.02	41.02	3.61	37.80	37.80	4.04	34.62	34.62	4.56	31.52	31.52	5.16
	62 (16.7)	50.25	41.83	2.93	46.59	39.45	3.25	42.79	37.01	3.62	39.01	34.60	4.05	35.32	32.24	4.56	31.77	29.95	5.17
	63 (17.2)††	51.23	34.57	2.93	47.48	32.43	3.25	43.59	30.24	3.63	39.71	28.08	4.06	35.92	25.98	4.57	32.25	23.96	5.17
	67 (19.4)	55.28	35.82	2.95	51.21	33.62	3.27	47.04	31.41	3.65	42.87	29.21	4.09	38.78	27.06	4.60	34.83	25.00	5.21
	72 (22.2)	60.74	29.68	2.97	56.26	27.68	3.30	51.68	25.68	3.68	47.07	23.68	4.12	42.67	21.79	4.65	37.97	19.81	5.24
1300	57 (13.9)	48.75	48.75	2.94	45.52	45.52	3.26	42.20	42.20	3.64	38.85	38.85	4.08	35.56	35.56	4.59	32.33	32.33	5.20
	62 (16.7)	51.12	43.71	2.95	47.36	41.24	3.27	43.48	38.72	3.65	39.61	36.23	4.08	35.87	33.78	4.59	32.38	32.38	5.20
	63 (17.2)††	52.07	35.84	2.96	48.22	33.65	3.28	44.23	31.40	3.65	40.26	29.19	4.09	36.38	27.03	4.60	32.63	24.95	5.20
	67 (19.4)	56.14	37.18	2.98	51.97	34.92	3.30	47.69	32.64	3.68	43.42	30.38	4.12	39.25	28.19	4.63	35.21	26.06	5.24
	72 (22.2)	61.64	30.52	3.00	57.05	28.49	3.33	52.36	26.44	3.71	47.70	24.43	4.15	43.13	22.47	4.67	38.69	20.58	5.29
1355	57 (13.9)	49.48	49.48	2.96	46.20	46.20	3.28	42.80	42.80	3.66	39.39	39.39	4.09	36.03	36.03	4.61	32.74	32.74	5.22
	62 (16.7)	51.56	44.72	2.97	47.74	42.20	3.29	43.82	39.65	3.66	39.92	37.10	4.10	36.17	34.58	4.61	32.79	32.79	5.22
	63 (17.2)††	52.48	36.53	2.97	48.57	34.30	3.30	44.54	32.02	3.67	40.53	29.78	4.10	36.60	27.60	4.62	32.81	25.49	5.22
	67 (19.4)	56.56	37.91	2.99	52.33	35.62	3.32	48.00	33.31	3.69	43.69	31.01	4.13	39.47	28.79	4.65	35.39	26.63	5.26
	72 (22.2)	62.08	30.97	3.01	57.42	28.92	3.34	52.68	26.85	3.72	47.97	24.82	4.17	43.35	22.84	4.69	38.88	20.92	5.31
1500	57 (13.9)	51.23	51.23	3.00	47.78	47.78	3.33	44.22	44.22	3.70	40.65	40.65	4.14	37.14	37.14	4.66	33.69	33.69	5.27
	62 (16.7)	52.58	47.33	3.01	48.66	44.69	3.33	44.65	42.00	3.70	40.72	40.58	4.14	37.19	37.19	4.66	33.74	33.74	5.27
	63 (17.2)††	53.41	38.29	3.01	49.38	35.97	3.34	45.25	33.63	3.71	41.12	31.31	4.14	37.11	29.05	4.66	33.23	26.87	5.26
	67 (19.4)	57.51	39.78	3.03	53.15	37.41	3.35	48.71	35.02	3.73	44.29	32.66	4.17	39.97	30.35	4.69	35.81	28.12	5.30
	72 (22.2)	63.05	32.12	3.05	58.27	30.02	3.38	53.40	27.90	3.76	48.57	25.81	4.21	43.85	23.78	4.73	39.27	21.82	5.35
1600	57 (13.9)	52.31	52.31	3.03	48.75	48.75	3.35	45.10	45.10	3.73	41.42	41.42	4.17	37.81	37.81	4.69	34.28	34.28	5.30
	62 (16.7)	53.20	49.06	3.03	49.23	46.33	3.36	45.22	44.88	3.73	41.48	41.48	4.17	37.86	37.86	4.69	34.32	34.32	5.30
	63 (17.2)††	53.95	39.47	3.04	49.85	37.11	3.36	45.65	34.71	3.73	41.47	32.34	4.17	37.40	30.03	4.68	33.47	27.80	5.29
	67 (19.4)	58.05	41.04	3.05	53.63	38.62	3.38	49.12	36.18	3.76	44.64	33.76	4.20	40.26	31.41	4.72	36.04	29.12	5.33
	72 (22.2)	63.61	32.89	3.07	58.75	30.75	3.40	53.81	28.60	3.79	48.91	26.48	4.23	44.12	24.41	4.76	39.49	22.42	5.38
1700	57 (13.9)	53.29	53.29	3.06	49.64	49.64	3.38	45.88	45.88	3.76	42.12	42.12	4.20	38.42	38.42	4.72	34.80	34.80	5.33
	62 (16.7)	53.79	50.73	3.06	49.81	47.89	3.38	45.95	45.95	3.76	42.18	42.18	4.20	38.47	38.47	4.72	34.84	34.84	5.33
	63 (17.2)††	54.43	40.62	3.06	50.27	38.21	3.39	46.01	35.77	3.76	41.77	33.35	4.20	37.65	30.99	4.71	33.68	28.70	5.32
	67 (19.4)	58.53	42.28	3.08	54.05	39.81	3.41	49.47	37.32	3.78	44.94	34.84	4.22	40.51	32.44	4.74	36.24	30.10	5.35
	72 (22.2)	64.10	33.64	3.10	59.16	31.47	3.43	54.15	29.28	3.81	49.20	27.12	4.26	44.36	25.03	4.79	39.67	23.01	5.40
24ACB748A**31 Outdoor Section With CNPV*6124A**+58CV(A,X)135–22 Indoor Section – Low																			
960	57 (13.9)	34.79	34.79	1.95	32.17	32.17	2.27	29.47	29.47	2.63	26.72	26.72	3.04	23.95	23.95	3.52	21.20	21.20	4.07
	62 (16.7)	36.22	32.17	1.94	33.19	29.54	2.26	30.08	26.91	2.62	26.94	24.30	3.04	24.00	24.00	3.52	21.24	21.24	4.07
	63 (17.2)††	36.92	26.30	1.93	33.83	24.03	2.25	30.63	21.75	2.62	27.37	19.49	3.04	24.11	17.30	3.52	20.88	15.17	4.07
	67 (19.4)	40.15	27.45	1.91	36.84	25.12	2.23	33.42	22.79	2.59	29.95	20.49	3.01	26.47	18.23	3.49	23.02	16.05	4.04
	72 (22.2)	44.69	22.68	1.87	41.06	20.65	2.19	37.33	18.62	2.56	33.54	16.62	2.98	29.75	14.67	3.46	25.97	12.78	4.01
1010	57 (13.9)	35.48	35.48	1.95	32.81	32.81	2.27	30.04	30.04	2.63	27.23	27.23	3.05	24.40	24.40	3.52	21.59	21.59	4.07
	62 (16.7)	36.64	33.15	1.94	33.58	30.45	2.26	30.44	27.75	2.63	27.30	27.20	3.04	24.45	24.45	3.52	21.63	21.63	4.07
	63 (17.2)††	37.32	26.98	1.94	34.18	24.66	2.26	30.94	22.33	2.62	27.63	20.03	3.04	24.33	17.79	3.52	21.07	15.62	4.08
	67 (19.4)	40.58	28.18	1.91	37.22	25.80	2.23	33.76	23.42	2.60	30.24	21.06	3.02	26.71	18.76	3.50	23.22	16.53	4.05
	72 (22.2)	45.14	23.15	1.87	41.47	21.09	2.20	37.68	19.02	2.57	33.84	16.99	2.99	29.99	15.01	3.47	26.17	13.10	4.02
1120	57 (13.9)	36.87	36.87	1.95	34.08	34.08	2.27	31.19	31.19	2.63	28.25	28.25	3.05	25.31	25.31	3.53	22.38	22.38	4.07
	62 (16.7)	37.49	35.25	1.95	34.37	32.41	2.27	31.24	31.24	2.63	28.30	28.30	3.05	25.36	25.36	3.53	22.42	22.42	4.07
	63 (17.2)††	38.08	28.43	1.94	34.86	26.01	2.26	31.53	23.59	2.63	28.15	21.19	3.05	24.76	18.85	3.53	21.43	16.59	4.09
	67 (19.4)	41.40	29.73	1.91	37.95	27.25	2.24	34.39	24.77	2.61	30.78	22.31	3.03	27.17	19.91	3.51	23.60	17.58	4.06
	72 (22.2)	46.01	24.15	1.88	42.22	22.02	2.20	38.32	19.89	2.57	34.40	17.78	3.00	30.46	15.73	3.48	26.55	13.75	4.03
1280	57 (13.9)	38.62	38.62	1.96	35.67	35.67	2.28	32.63	32.63	2.64	29.54	29.54	3.06	26.44	26.44	3.53	23.35	23.35	4.08
	62 (16.7)	38.70	38.62	1.95	35.73	35.73	2.27	32.68	32.68	2.64	29.59	29.59	3.06	26.48	26.48	3.53	23.39	23.39	4.08
	63 (17.2)††	38.98	30.46	1.95	35.66	27.91	2.28	32.23	25.35	2.64	28.75	22.82	3.07	25.29	20.35	3.55	21.88	17.94	4.10
	67 (19.4)	42.34	31.94	1.93	38.79	29.29	2.25	35.13	26.67	2.62	31.42	24.07	3.04	27.71	21.52	3.52	24.06	19.04	4.07
	72 (22.2)	47.00	25.53	1.89	43.09	23.30	2.22	39.09	21.07	2.59	35.04	18.88	3.01	30.99	16.73	3.49	26.97	14.66	4.04
1440	57 (13.9)	40.11	40.11	1.96	37.03	37.03	2.28	33.85	33.85	2.65	30.63	30.63	3.07	27.39	27.39	3.54	24.17	24.17	4.09
	62 (16.7)	40.18	40.18	1.96	37.09	37.09	2.28	33.91	33.91	2.65	30.68	30.68	3.07	27.43	27.43	3.54	24.20	24.20	4.09
	63 (17.2)††	39.70	32.42	1.97	36.29	29.74	2.29	32.80	27.05	2.66	29.25	24.39	3.08	25.73	21.77	3.56	22.32	22.12	4.12
	67 (19.4)	43.09	34.04	1.94	39.46	31.27	2.26	35.72	28.51	2.63	31.92	25.76	3.06	28.16	23.08	3.54	24.46	20.44	4.09
	72 (22.2)	47.76	26.84	1.90	43.76	24.52	2.23	39.67	22.21	2.60	35.52	19.93	3.03	31.38	17.70	3.51	27.28	15.54	4.06

See notes on page 15

DETAILED COOLING CAPACITIES# (CONTINUED)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**	Capacity MBtuh		Total Sys. KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
24ACB760A30 HIGH Outdoor Section With CNPHP6124 Indoor Section**																			
1500	57 (13.9)	54.27	54.27	3.61	52.74	52.74	3.98	50.95	50.95	4.38	49.05	49.05	4.82	46.81	46.81	5.30	44.25	44.25	5.83
	62 (16.7)	57.18	48.11	3.64	55.08	47.35	4.01	52.75	46.48	4.40	50.22	45.51	4.83	47.39	44.39	5.31	44.31	44.31	5.84
	63 (17.2)††	58.34	39.49	3.65	56.17	38.66	4.02	53.77	37.73	4.41	50.96	36.64	4.84	48.16	35.56	5.32	44.84	34.30	5.84
	67 (19.4)	63.05	41.02	3.70	60.68	40.18	4.07	58.06	39.24	4.47	55.17	38.22	4.90	51.93	37.06	5.38	48.34	35.79	5.90
	72 (22.2)	69.52	33.78	3.78	66.88	32.88	4.15	63.98	31.88	4.55	60.75	30.78	4.98	57.17	29.57	5.46	53.18	28.23	5.99
1710	57 (13.9)	56.76	56.76	3.70	55.08	55.08	4.07	53.17	53.17	4.47	51.02	51.02	4.91	48.63	48.63	5.40	45.87	45.87	5.93
	62 (16.7)	58.63	51.57	3.72	56.42	50.77	4.09	54.01	49.87	4.48	51.39	48.81	4.92	48.70	48.70	5.40	45.93	45.93	5.93
	63 (17.2)††	59.71	41.82	3.73	57.41	40.98	4.10	54.85	40.03	4.49	52.06	38.99	4.93	48.95	37.84	5.40	45.51	36.55	5.92
	67 (19.4)	64.47	43.51	3.79	61.97	42.66	4.16	59.19	41.71	4.55	56.13	40.67	4.98	52.75	39.51	5.46	48.99	38.22	5.98
	72 (22.2)	71.04	35.32	3.87	68.25	34.40	4.23	65.17	33.38	4.63	61.79	32.27	5.07	58.01	31.02	5.54	53.89	29.69	6.07
1835	57 (13.9)	58.06	58.06	3.76	56.29	56.29	4.13	54.30	54.30	4.53	52.08	52.08	4.97	49.55	49.55	5.45	46.68	46.68	5.98
	62 (16.7)	59.38	53.53	3.77	57.14	52.72	4.14	54.70	51.76	4.53	52.14	52.14	4.97	49.58	49.58	5.45	46.74	46.74	5.98
	63 (17.2)††	60.37	43.15	3.78	58.00	42.29	4.15	55.37	41.34	4.54	52.51	40.30	4.97	49.24	39.10	5.44	45.83	37.85	5.96
	67 (19.4)	65.16	44.93	3.84	62.57	44.07	4.20	59.71	43.12	4.60	56.59	42.08	5.03	53.13	40.91	5.50	49.31	39.62	6.03
	72 (22.2)	71.76	36.19	3.92	68.89	35.26	4.28	65.74	34.24	4.68	62.28	33.12	5.11	58.42	31.86	5.59	54.21	30.52	6.11
2000	57 (13.9)	59.59	59.59	3.83	57.72	57.72	4.20	55.62	55.62	4.60	53.28	53.28	5.04	50.62	50.62	5.52	47.63	47.63	6.05
	62 (16.7)	60.30	55.99	3.83	58.01	55.08	4.20	55.69	55.69	4.60	53.35	53.35	5.04	50.69	50.69	5.52	47.68	47.68	6.05
	63 (17.2)††	61.09	44.84	3.84	58.64	43.97	4.21	55.94	43.02	4.60	53.00	41.98	5.03	49.50	40.70	5.50	46.17	39.50	6.02
	67 (19.4)	65.91	46.75	3.90	63.22	45.88	4.26	60.31	44.93	4.66	57.09	43.89	5.09	53.55	42.72	5.56	49.66	41.41	6.09
	72 (22.2)	72.57	37.29	3.98	69.61	36.36	4.34	66.35	35.32	4.74	62.79	34.19	5.17	58.84	32.94	5.65	54.49	31.56	6.17
24ACB760A30 LOW Outdoor Section With CNPHP6124 Indoor Section**																			
1100	57 (13.9)	49.86	23.91	2.40	47.66	23.10	2.70	45.29	22.25	3.03	42.73	21.34	3.41	39.96	20.38	3.85	36.97	19.36	4.36
	62 (16.7)	44.89	28.95	2.41	42.92	28.16	2.72	40.78	27.32	3.06	38.45	26.41	3.45	35.95	25.45	3.90	33.27	24.43	4.42
	63 (17.2)††	41.27	27.74	2.43	39.43	26.95	2.74	37.48	26.12	3.09	35.35	25.23	3.48	33.05	24.28	3.94	30.59	23.28	4.47
	67 (19.4)	40.39	33.88	2.43	38.64	33.10	2.74	36.73	32.25	3.09	34.69	31.33	3.49	32.55	32.36	3.95	30.57	30.57	4.47
	72 (22.2)	38.60	38.60	2.44	37.27	37.27	2.75	35.79	35.79	3.10	34.18	34.18	3.49	32.43	32.43	3.95	30.51	30.51	4.47
1250	57 (13.9)	51.05	25.10	2.43	48.73	24.28	2.72	46.25	23.41	3.05	43.54	22.47	3.43	40.66	21.49	3.87	37.55	20.44	4.38
	62 (16.7)	46.00	30.83	2.44	43.91	30.02	2.74	41.67	29.15	3.08	39.23	28.22	3.47	36.62	27.24	3.91	33.83	26.20	4.44
	63 (17.2)††	42.33	29.50	2.45	40.40	28.69	2.76	38.35	27.84	3.11	36.05	26.90	3.50	33.72	25.95	3.96	31.15	24.92	4.49
	67 (19.4)	41.54	36.44	2.45	39.68	35.60	2.76	37.75	34.70	3.11	35.78	35.78	3.50	33.89	33.89	3.95	31.81	31.81	4.47
	72 (22.2)	40.50	40.50	2.46	39.05	39.05	2.77	37.46	37.46	3.11	35.73	35.73	3.50	33.84	33.84	3.95	31.76	31.76	4.47
1400	57 (13.9)	51.99	26.23	2.45	49.57	25.39	2.75	46.98	24.50	3.08	44.19	23.56	3.45	41.20	22.55	3.89	37.99	21.49	4.40
	62 (16.7)	46.87	32.63	2.46	44.69	31.80	2.76	42.36	30.92	3.10	39.84	29.97	3.49	37.15	28.97	3.93	34.27	27.90	4.45
	63 (17.2)††	43.18	31.19	2.47	41.18	30.37	2.78	39.04	29.50	3.13	36.72	28.56	3.52	34.24	27.56	3.98	31.59	26.49	4.51
	67 (19.4)	42.54	38.84	2.48	40.71	40.48	2.78	38.96	38.96	3.13	37.09	37.09	3.51	35.06	35.06	3.96	32.84	32.84	4.48
	72 (22.2)	42.13	42.13	2.48	40.58	40.58	2.78	38.89	38.89	3.13	37.02	37.02	3.51	35.01	35.01	3.96	32.80	32.80	4.48
1500	57 (13.9)	52.50	26.95	2.47	50.03	26.11	2.76	47.39	25.21	3.09	44.54	24.25	3.47	41.49	23.24	3.90	38.22	22.17	4.41
	62 (16.7)	47.35	33.80	2.48	45.12	32.96	2.78	42.74	32.06	3.12	40.18	31.10	3.50	37.44	30.08	3.95	34.52	28.99	4.47
	63 (17.2)††	43.66	32.29	2.49	41.61	31.45	2.80	39.42	30.56	3.14	37.05	29.60	3.53	34.53	28.59	3.99	31.85	27.50	4.52
	67 (19.4)	43.23	43.01	2.49	41.55	41.55	2.80	39.79	39.79	3.14	37.85	37.85	3.52	35.74	35.74	3.97	33.45	33.45	4.48
	72 (22.2)	43.11	43.11	2.49	41.49	41.49	2.80	39.73	39.73	3.14	37.79	37.79	3.52	35.69	35.69	3.97	33.40	33.40	4.48

† Total and sensible capacities are net capacities. Blower motor heat has been subtracted.

‡ Sensible capacities shown are based on 80°F (27°C) entering air at the indoor coil. For sensible capacities at other than 80°F (27°C), deduct 835 Btuh (245 kW) per 1000 CFM (480 L/S) of indoor coil air for each degree below 80°F (27°C), or add 835 Btuh (245 kW) per 1000 CFM (480 L/S) of indoor coil air per degree above 80°F (27°C).

Detailed cooling capacities are based on indoor and outdoor unit at the same elevation per AHRI standard 210/240–2008. If additional tubing length and/or indoor unit is located above outdoor unit, a slight variation in capacity may occur.

** System kw is total of indoor and outdoor unit kilowatts.

EWB — Entering Wet Bulb

NOTE: When the required data fall between the published data, interpolation may be performed. Extrapolation is not an acceptable practice.

CONDENSER ONLY RATINGS*

SST °F (°C)		CONDENSER ENTERING AIR TEMPERATURES °F (°C)							
		55 (12.78)	65 (18.33)	75 (23.89)	85 (29.44)	95 (35.0)	105 (40.56)	115 (46.11)	125 (51.67)
24ACB724A31**									
30 (–1.11)	TCG	28.00	25.00	21.90	18.90	16.00	13.30	10.70	8.50
	SDT	71.60	81.50	91.40	101.20	111.00	120.80	130.80	140.90
	KW	1.20	1.30	1.40	1.51	1.63	1.76	1.92	2.11
35 (1.67)	TCG	31.20	27.70	24.30	21.00	17.80	14.80	12.10	9.60
	SDT	73.20	83.00	92.80	102.60	112.40	122.20	132.10	142.10
	KW	1.23	1.33	1.43	1.53	1.65	1.79	1.95	2.14
40 (4.44)	TCG	34.60	30.70	26.90	23.20	19.80	16.50	13.50	10.70
	SDT	74.80	84.60	94.40	104.10	113.90	123.50	133.40	143.30
	KW	1.25	1.35	1.45	1.56	1.68	1.82	1.98	2.17
45 (7.22)	TCG	38.20	33.90	29.70	25.70	21.90	18.30	15.00	12.00
	SDT	76.60	86.30	96.00	105.70	115.20	124.90	134.70	144.60
	KW	1.28	1.38	1.48	1.58	1.70	1.84	2.01	2.20
50 (10.0)	TCG	42.00	37.30	32.60	28.30	24.10	20.20	16.60	13.40
	SDT	78.40	88.00	97.60	107.10	116.70	126.30	136.00	145.90
	KW	1.31	1.40	1.50	1.60	1.72	1.87	2.03	2.23
55 (12.78)	TCG	46.10	40.90	35.80	31.00	26.50	22.30	18.40	14.80
	SDT	80.20	89.70	99.20	108.60	118.10	127.70	137.40	147.10
	KW	1.34	1.43	1.52	1.63	1.75	1.89	2.06	2.26
60 (15.56)	TCG	50.50	44.70	39.20	33.90	29.00	24.40	20.20	16.30
	SDT	82.00	91.40	100.80	110.20	119.70	129.20	138.80	148.40
	KW	1.37	1.45	1.54	1.65	1.77	1.92	2.09	2.28
24ACB724A31**									
30 (–1.11)	TCG	13.50	13.60	13.30	12.80	12.20	11.30	10.40	9.40
	SDT	66.80	76.80	86.70	96.50	106.30	116.00	125.70	135.70
	KW	0.77	0.89	1.03	1.18	1.35	1.53	1.74	1.96
35 (1.67)	TCG	15.20	15.20	14.90	14.40	13.70	12.90	11.90	10.90
	SDT	68.00	78.00	87.90	97.70	107.40	117.10	126.90	136.90
	KW	0.77	0.89	1.02	1.17	1.34	1.53	1.74	1.98
40 (4.44)	TCG	16.90	16.90	16.60	16.00	15.30	14.50	13.50	12.50
	SDT	69.30	79.30	89.00	98.80	108.50	118.20	128.10	138.10
	KW	0.76	0.88	1.01	1.17	1.34	1.53	1.75	1.99
45 (7.22)	TCG	18.80	18.70	18.30	17.80	17.00	16.20	15.20	14.10
	SDT	70.60	80.50	90.30	100.00	109.70	119.40	129.20	139.20
	KW	0.75	0.87	1.00	1.16	1.33	1.53	1.76	2.01
50 (10.0)	TCG	20.80	20.60	20.20	19.60	18.90	18.00	17.00	15.90
	SDT	72.00	81.80	91.50	101.20	110.80	120.50	130.40	140.30
	KW	0.74	0.86	0.99	1.15	1.33	1.53	1.76	2.02
55 (12.78)	TCG	22.90	22.70	22.20	21.60	20.80	19.90	18.80	17.80
	SDT	73.40	83.20	92.80	102.40	112.10	121.70	131.50	141.40
	KW	0.73	0.84	0.98	1.14	1.32	1.53	1.77	2.03
60 (15.56)	TCG	25.10	24.80	24.30	23.70	22.80	21.90	20.80	19.70
	SDT	74.90	84.60	94.10	103.70	113.30	122.90	132.60	142.40
	KW	0.72	0.83	0.97	1.13	1.32	1.53	1.77	2.04
24ACB736A31 – High**									
30 (–1.11)	TCG	34.80	32.30	29.80	27.40	25.00	22.60	20.10	17.60
	SDT	71.10	80.60	90.10	99.60	109.10	118.50	127.80	137.20
	KW	1.72	1.87	2.04	2.25	2.47	2.72	3.00	3.29
35 (1.67)	TCG	38.50	35.70	33.10	30.40	27.80	25.10	22.40	19.60
	SDT	72.60	82.00	91.50	100.90	110.30	119.70	128.90	138.20
	KW	1.76	1.91	2.08	2.28	2.50	2.76	3.03	3.33
40 (4.44)	TCG	42.40	39.40	36.50	33.60	30.70	27.80	24.80	21.80
	SDT	74.20	83.60	93.00	102.40	111.70	120.90	130.10	139.20
	KW	1.81	1.95	2.11	2.31	2.53	2.79	3.06	3.37
45 (7.22)	TCG	46.50	43.30	40.20	37.00	33.90	30.70	27.50	24.20
	SDT	75.90	85.20	94.50	103.80	113.00	122.20	131.30	140.30
	KW	1.87	1.99	2.15	2.34	2.57	2.82	3.10	3.40
50 (10.0)	TCG	50.90	47.50	44.00	40.60	37.20	33.80	30.30	26.70
	SDT	77.60	86.80	96.10	105.30	114.40	123.50	132.50	141.40
	KW	1.92	2.04	2.19	2.38	2.60	2.85	3.13	3.44
55 (12.78)	TCG	55.50	51.80	48.10	44.50	40.80	37.00	33.20	29.40
	SDT	79.40	88.50	97.70	106.80	115.90	124.90	133.80	142.60
	KW	1.99	2.09	2.24	2.42	2.64	2.89	3.17	3.47
60 (15.56)	TCG	60.40	56.40	52.50	48.50	44.50	40.40	36.40	32.30
	SDT	81.20	90.20	99.30	108.40	117.40	126.30	135.00	143.80
	KW	2.05	2.15	2.29	2.47	2.68	2.93	3.20	3.51

See notes on page 19

CONDENSER ONLY RATINGS* CONTINUED

SST °F (°C)		CONDENSER ENTERING AIR TEMPERATURES °F (°C)							
		55 (12.78)	65 (18.33)	75 (23.89)	85 (29.44)	95 (35.0)	105 (40.56)	115 (46.11)	125 (51.67)
24ACB736A31 – Low**									
30 (–1.11)	TCG	20.70	20.10	19.50	18.80	18.00	16.90	15.60	14.10
	SDT	65.70	75.40	85.10	94.80	104.50	114.10	123.60	133.10
	KW	1.18	1.31	1.47	1.66	1.88	2.13	2.43	2.78
35 (1.67)	TCG	23.10	22.40	21.80	21.00	20.10	19.00	17.60	16.00
	SDT	66.80	76.50	86.10	95.80	105.40	115.00	124.50	134.00
	KW	1.16	1.30	1.46	1.65	1.87	2.12	2.42	2.76
40 (4.44)	TCG	25.60	25.00	24.20	23.40	22.40	21.20	19.80	18.10
	SDT	68.00	77.60	87.30	96.90	106.50	116.00	125.40	134.90
	KW	1.13	1.28	1.45	1.64	1.86	2.11	2.41	2.75
45 (7.22)	TCG	28.40	27.70	26.90	26.00	24.90	23.70	22.10	20.30
	SDT	69.30	78.80	88.40	98.00	107.50	117.00	126.40	135.80
	KW	1.11	1.26	1.43	1.63	1.85	2.10	2.40	2.73
50 (10.0)	TCG	31.40	30.60	29.70	28.70	27.60	26.20	24.60	22.70
	SDT	70.60	80.10	89.60	99.20	108.60	118.00	127.40	136.70
	KW	1.08	1.24	1.42	1.61	1.84	2.09	2.39	2.72
55 (12.78)	TCG	34.60	33.70	32.70	31.70	30.40	29.00	27.30	25.30
	SDT	72.00	81.50	90.90	100.40	109.80	119.10	128.40	137.60
	KW	1.06	1.22	1.40	1.60	1.83	2.08	2.38	2.71
60 (15.56)	TCG	38.10	37.00	36.00	34.80	33.50	31.90	30.10	28.00
	SDT	73.50	82.90	92.30	101.60	111.00	120.20	129.40	138.60
	KW	1.03	1.20	1.38	1.59	1.82	2.07	2.36	2.69
24ACB748A31 – High**									
30 (–1.11)	TCG	44.30	42.30	39.70	36.70	33.50	30.30	27.10	24.20
	SDT	69.60	79.40	88.90	98.30	107.70	117.10	126.50	136.00
	KW	2.00	2.27	2.56	2.88	3.24	3.67	4.16	4.76
35 (1.67)	TCG	49.40	47.10	44.10	40.80	37.30	33.80	30.40	27.20
	SDT	71.20	80.80	90.30	99.60	108.90	118.20	127.60	137.00
	KW	2.04	2.31	2.60	2.91	3.28	3.70	4.21	4.80
40 (4.44)	TCG	54.80	52.00	48.70	45.10	41.30	37.50	33.90	30.40
	SDT	72.80	82.30	91.60	100.90	110.20	119.40	128.70	138.00
	KW	2.08	2.35	2.63	2.95	3.32	3.75	4.25	4.86
45 (7.22)	TCG	60.40	57.20	53.50	49.60	45.50	41.40	37.50	33.80
	SDT	74.40	83.80	93.00	102.20	111.40	120.60	129.80	139.10
	KW	2.12	2.38	2.67	2.99	3.36	3.79	4.31	4.91
50 (10.0)	TCG	66.10	62.60	58.60	54.30	49.90	45.50	41.40	37.40
	SDT	76.00	85.30	94.50	103.60	112.70	121.80	131.00	140.20
	KW	2.15	2.41	2.70	3.02	3.40	3.84	4.36	4.98
55 (12.78)	TCG	72.10	68.10	63.80	59.10	54.40	49.80	45.30	41.10
	SDT	77.60	86.80	95.90	105.00	114.00	123.10	132.10	141.30
	KW	2.18	2.44	2.73	3.06	3.44	3.89	4.42	5.04
60 (15.56)	TCG	78.20	73.80	69.10	64.10	59.10	54.20	49.50	44.90
	SDT	79.30	88.40	97.40	106.40	115.40	124.30	133.30	142.30
	KW	2.20	2.46	2.76	3.09	3.48	3.94	4.48	5.11
24ACB748A31 – Low**									
30 (–1.11)	TCG	27.10	26.70	25.90	24.60	23.00	21.00	18.70	16.20
	SDT	65.00	74.70	84.40	93.90	103.40	112.80	122.20	131.50
	KW	1.44	1.66	1.90	2.18	2.49	2.84	3.25	3.71
35 (1.67)	TCG	30.20	29.70	28.80	27.50	25.90	23.80	21.50	18.80
	SDT	66.00	75.70	85.30	94.80	104.30	113.70	123.10	132.40
	KW	1.41	1.64	1.88	2.16	2.47	2.83	3.23	3.69
40 (4.44)	TCG	33.50	33.00	32.10	30.70	29.00	26.90	24.40	21.70
	SDT	67.10	76.80	86.30	95.80	105.30	114.60	124.00	133.30
	KW	1.38	1.61	1.86	2.14	2.45	2.81	3.22	3.68
45 (7.22)	TCG	37.00	36.50	35.60	34.20	32.40	30.20	27.70	24.80
	SDT	68.30	77.90	87.40	96.90	106.30	115.60	124.90	134.10
	KW	1.35	1.58	1.84	2.12	2.44	2.79	3.20	3.66
50 (10.0)	TCG	40.90	40.30	39.40	37.90	36.10	33.80	31.20	28.20
	SDT	69.50	79.10	88.60	98.00	107.40	116.60	125.80	135.00
	KW	1.32	1.56	1.81	2.10	2.42	2.78	3.18	3.64
55 (12.78)	TCG	45.00	44.50	43.50	42.00	40.10	37.80	35.00	31.90
	SDT	70.90	80.40	89.80	99.20	108.50	117.70	126.90	136.00
	KW	1.29	1.53	1.79	2.08	2.40	2.76	3.16	3.62
60 (15.56)	TCG	49.60	49.00	47.90	46.40	44.40	42.00	39.20	35.90
	SDT	72.30	81.80	91.10	100.40	109.70	118.80	127.90	137.00
	KW	1.26	1.50	1.77	2.06	2.38	2.74	3.15	3.60

See notes on page 19

CONDENSER ONLY RATINGS* CONTINUED

SST °F (°C)		CONDENSER ENTERING AIR TEMPERATURES °F (°C)							
		55 (12.78)	65 (18.33)	75 (23.89)	85 (29.44)	95 (35.0)	105 (40.56)	115 (46.11)	125 (51.67)
24ACB760A30 HIGH**									
30 (–1.11)	TCG	52.30	49.80	47.20	44.50	41.60	38.60	35.40	32.00
	SDT	70.40	79.70	89.00	98.30	107.60	116.80	126.00	135.20
	KW	2.27	2.61	2.97	3.34	3.74	4.18	4.67	5.21
35 (1.67)	TCG	58.00	55.20	52.40	49.40	46.20	42.90	39.50	35.80
	SDT	72.00	81.20	90.40	99.60	108.80	117.90	127.00	136.10
	KW	2.33	2.67	3.02	3.40	3.80	4.24	4.73	5.27
40 (4.44)	TCG	64.10	61.10	57.90	54.70	51.20	47.70	43.90	39.90
	SDT	73.70	82.70	91.80	101.00	110.10	119.10	128.20	137.20
	KW	2.40	2.73	3.09	3.46	3.87	4.31	4.81	5.35
45 (7.22)	TCG	70.60	67.40	63.90	60.30	56.60	52.70	48.60	44.20
	SDT	75.40	84.20	93.30	102.20	111.50	120.50	129.40	138.20
	KW	2.47	2.80	3.15	3.52	3.94	4.39	4.88	5.42
50 (10.0)	TCG	77.70	74.10	70.30	66.40	62.30	58.10	53.60	48.80
	SDT	77.30	85.90	94.90	103.90	112.90	121.90	130.70	139.40
	KW	2.55	2.87	3.22	3.60	4.01	4.47	4.96	5.51
55 (12.78)	TCG	85.30	81.30	77.20	72.90	68.40	63.70	58.90	53.70
	SDT	79.30	88.10	96.90	105.70	114.50	123.20	132.00	140.70
	KW	2.64	2.96	3.31	3.69	4.10	4.55	5.05	5.60
60 (15.56)	TCG	93.30	89.00	84.40	79.70	74.90	69.70	64.40	58.70
	SDT	81.40	90.10	98.80	107.40	116.10	124.80	133.40	141.90
	KW	2.74	3.06	3.40	3.78	4.19	4.64	5.14	5.70
24ACB760A30 LOW**									
30 (–1.11)	TCG	34.80	33.30	31.50	29.60	27.50	25.30	23.00	20.60
	SDT	64.40	74.00	83.60	93.10	102.70	112.20	121.60	131.10
	KW	1.65	1.96	2.27	2.60	2.98	3.41	3.90	4.49
35 (1.67)	TCG	39.00	37.30	35.30	33.20	30.90	28.50	25.90	23.30
	SDT	65.50	75.00	84.50	94.00	103.50	112.90	122.40	131.80
	KW	1.64	1.94	2.25	2.57	2.94	3.36	3.85	4.42
40 (4.44)	TCG	43.60	41.60	39.40	37.10	34.60	31.90	29.20	26.30
	SDT	66.70	76.10	85.60	95.00	104.40	113.80	123.20	132.50
	KW	1.64	1.93	2.23	2.55	2.90	3.31	3.79	4.35
45 (7.22)	TCG	48.50	46.30	43.90	41.30	38.50	35.60	32.60	29.40
	SDT	68.00	77.30	86.70	96.10	105.40	114.70	124.00	133.20
	KW	1.64	1.92	2.21	2.52	2.87	3.27	3.74	4.28
50 (10.0)	TCG	53.80	51.30	48.70	45.80	42.80	39.60	36.30	32.80
	SDT	69.30	78.60	87.90	97.20	106.40	115.60	124.80	134.00
	KW	1.64	1.91	2.20	2.50	2.84	3.23	3.68	4.22
55 (12.78)	TCG	59.50	56.70	53.80	50.70	47.40	43.90	40.20	36.30
	SDT	70.80	80.00	89.20	98.30	107.50	116.60	125.80	134.80
	KW	1.65	1.91	2.19	2.48	2.81	3.19	3.64	4.16
60 (15.56)	TCG	65.60	62.50	59.30	55.90	52.20	48.40	44.30	40.00
	SDT	72.30	81.40	90.50	99.60	108.60	117.70	126.70	135.70
	KW	1.66	1.92	2.18	2.47	2.79	3.16	3.59	4.10

* AHRI listing applies only to systems shown in Combination Ratings table.

KW – Outdoor Unit Kilowatts Only.

SDT – Saturated Temperature Leaving Compressor (°F)

SST – Saturated Temperature Entering Compressor (°F/°C)

TCG – Gross Cooling Capacity (1000 Btuh)

GUIDE SPECIFICATIONS
GENERAL

System Description

Outdoor-mounted, air-cooled, split-system air conditioner unit suitable for ground or rooftop installation. Unit consists of a hermetic compressor, an air-cooled coil, propeller-type condenser fan, and a control box. Unit will discharge supply air upward as shown on contract drawings. Unit will be used in a refrigeration circuit to match up to a packaged fan coil or coil unit.

Quality Assurance

- — Unit will be rated in accordance with the latest edition of AHRI Standard 210.
- — Unit will be certified for capacity and efficiency, and listed in the latest AHRI directory.
- — Unit construction will comply with latest edition of ANSI/ ASHRAE and with NEC.
- — Unit will be constructed in accordance with UL standards and will carry the UL label of approval. Unit will have c-UL approval.
- — Unit cabinet will be capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 500-hr salt spray test.
- — Air-cooled condenser coils will be leak tested and pressure tested.
- — Unit constructed in ISO9001 approved facility.

Delivery, Storage, and Handling

- — Unit will be shipped as single package only and is stored and handled per unit manufacturer's recommendations.

Warranty (for inclusion by specifying engineer)

- — U.S. and Canada only.

PRODUCTS

Equipment

- — Factory assembled, single piece, air-cooled air conditioner unit. Contained within the unit enclosure is all factory wiring, piping, controls, compressor, refrigerant charge Puron® (R-410A), and special features required prior to field start-up.

Unit Cabinet

- — Unit cabinet, including louvered coil guard, will be constructed of galvanized steel, bonderized, and coated with a powder coat paint.

Fans

- — Condenser fan will be direct-drive propeller type, discharging air upward.
- — Condenser fan motors will be totally enclosed, 1-phase type with class B insulation and permanently lubricated bearings. Shafts will be corrosion resistant.
- — Fan blades will be statically and dynamically balanced.
- — Condenser fan openings will be equipped with coated steel wire safety guards.

Compressor

- — Compressor will be hermetically sealed.
- — Compressor will be mounted on rubber vibration isolators.

Condenser Coil

- — Condenser coil will be air cooled.
- — Coil will be constructed of aluminum fins mechanically bonded to copper tubes which are then cleaned, dehydrated, and sealed.

Refrigeration Components

- — Refrigeration circuit components will include liquid-line shutoff valve with sweat connections, vapor-line shutoff valve with sweat connections, system charge of Puron® (R-410A) refrigerant, and compressor oil.
- — Unit will be equipped with high-pressure switch, low pressure switch and filter drier for Puron refrigerant.

Operating Characteristics

- — The capacity of the unit will meet or exceed _____ Btuh at a suction temperature of _____ °F/°C. The power consumption at full load will not exceed _____ kW.
- — Combination of the unit and the evaporator or fan coil unit will have a total net cooling capacity of _____ Btuh or greater at conditions of _____ CFM entering air temperature at the evaporator at _____ °F/°C wet bulb and _____ °F/°C dry bulb, and air entering the unit at _____ °F/°C.
- — The system will have a SEER of _____ Btuh/watt or greater at DOE conditions.

Electrical Requirements

- — Nominal unit electrical characteristics will be _____ v, single phase, 60 hz. The unit will be capable of satisfactory operation within voltage limits of _____ v to _____ v.
- — Unit electrical power will be single point connection.
- — Control circuit will be 24v.

Special Features

- — Refer to section of this literature identifying accessories and descriptions for specific features and available enhancements.

SYSTEM DESIGN SUMMARY

1. Intended for outdoor installation with free air inlet and outlet. Outdoor fan external static pressure available is less than 0.01-in. wc.
2. Minimum outdoor operating air temperature without low-ambient operation accessory is 55°F (12.8°C).
3. The maximum outdoor operating ambient in cooling mode is 125°F (51.67°C) when operating voltage is 230v. For 208v applications, the maximum outdoor ambient is 120°F (48.9°C).
4. Minimum outdoor operating air temperature for heating mode is –20°F (–28.9°C).
5. Maximum outdoor operating air temperature for heating mode is 66°F (18.9°C).
6. For reliable operation, unit should be level in all horizontal planes.
7. For interconnecting refrigerant tube lengths greater than 80 ft (23.4 m) and/or elevation differences between indoor and outdoor units greater than 20 ft (6.1 m), consult Residential Piping and Longline Guideline and Service Manual available from equipment distributor.
8. If any refrigerant tubing is buried, provide a 6 in. (152.4 mm) vertical rise to the valve connections at the unit. Refrigerant tubing lengths up to 36 in. (914.4 mm) may be buried without further consideration. Do not bury refrigerant lines longer than 36 in. (914.4 mm).
9. Use only copper wire for electric connection at unit. Aluminum and clad aluminum are not acceptable for the type of connector provided.
10. Do not apply capillary tube indoor coils to these units.
11. Factory-supplied filter drier must be installed.

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Catalog No. 24ACB7–6PD

Replaces: 24ACB7–5PD

Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.

FB4C
Base Series Fan Coil
Sizes 018 thru 060

Carrier
turn to the experts

Product Data



A10082

AIR HANDLER TECHNOLOGY AT ITS FINEST

The FB4C fan coil combines the proven technology of Carrier fan coil units with Puron®, the environmentally sound refrigerant, and are loaded with popular features. The design features contoured condensate pans with rugged drain connections, ensuring that little water is left in the unit at the end of the cooling duty cycle. The lack of standing condensate and corrosion free pans improves IAQ and product life, features homeowners appreciate.

Standard features include grooved copper tubing and louvered aluminum fins. Coil circuiting has also been updated to make the most of all Carrier heat pumps and air conditioners. Units come with solid state fan controls, 1-inch (25mm) thick insulation with R-value of 4.2, multi-speed motors, and fully-wettable coils. Units can accommodate factory- and/or field-installed heaters from 3 to 30 kW.

It also should be noted that the unique cabinet design of these fan coils meet new stringent regulations for cabinet air leakage - a requirement of 2% cabinet leakage rate when tested at 1.0 inches of static pressure.

The FB4C fan coil design is loaded with popular features. These fan coils utilize the latest in electronic commutation motor (ECM) technology through the use of high efficiency, X-13, blower motors, allowing reliable air delivery with increased static pressure. It comes in a pre-painted (taupe metallic) galvanized steel casing and a factory-supplied power plug for ease of installation. ArmorCoat™ provides a tin plating of the indoor coil's copper hairpins. This creates a barrier between the corrosion-causing elements and the coil. All FB4C units are equipped with a piston meter device.

STANDARD FEATURES

- High efficiency ECM (electronic commutating motor) X-13 motors - all sizes
- Integrated motor controls have replaced integrated circuit board
- Five available speed tags to meet a wide range of applications
- Large, grooved tube, louvered fin coils
- Efficient, quiet, time-tested blower housings and diffusers
- Sturdy, drainable condensate pans
- Cabinet construction features innovations designed to prevent cabinet sweating
- Tested for condensate disposal in much tougher conditions than Air Conditioning and Refrigeration Institute requirements
- Super-thick R-4.2 insulation with vapor barrier
- Pre-painted galvanized steel cabinet (taupe metallic)
- Cabinet design meets stringent regulations for 2% cabinet leakage rate when tested at 1.0 inches static pressure
- Installation-flexible, multipoise units
- Horizontal hanging provisions on cabinet
- No tools required to access filter
- Newly improved filter rack area filter door insulation added for improved air seal
- Factory-installed heater packages available (5- through 15-kW)
- 3- through 30-kW accessory heaters - field installed
- Factory-supplied power plug
- Easy plug-in provisions for heater installation
- Entry options for high and low voltage wiring hook-up
- Easy coil inspection (removable, snap-in plug on A-coil models)
- Leak-preventing sweat connections
- Dedicated refrigeration design specific to piston metering device
- Designed for manufactured housing applications.

ADDITIONAL FEATURES

- Factory-installed heater packages available
- ArmorCoat™ coil protection available

MODEL NUMBER NOMENCLATURE

1	2	3	4	5	6	7	8	9	10	11	12
F	B	4	C	N	F	0	1	8	0	0	0

Product
Fan Coil

Type
E = Infinity, Variable speed, Puron
V = Performance, Variable speed, Puron
B = Comfort, Puron – Piston
X – Comfort, Puron
Y = Comfort– Puron – Piston
F = Through–the–wall
H = Electric Furnace

Position
1 = Upflow
4 = Multipoise
5 = Upflow/downflow

Series
A, B, C, D, E

Electrical
N – 208/230v, 1 ph, 60 Hz
S = 230v, 1 ph, 50 Hz

Cabinet Style
B – Modular Cabinet (2 piece)
F – Single Piece

Capacity
018/019 = 18,000
024/025 = 24,000
030/031 = 30,000
036/037 = 36,000
042/043 = 42,000
048/049 = 48,000
060/061 = 60,000
001 = 18,000 – 36,000
002 = 18,000 – 36,000
003 = 24,000 – 42,000
004 = 24,000 – 42,000
005 = 30,000 – 48,000
006 = 36,000 – 60,000

Coil Coating
0 = Standard
T = ArmorCoat™

Heating Size
00 = No Heat
05 = 5 kW
75 = 7.5 kW
08 = 8 kW
10 = 10 kW
11 = 11 kW
15 = 15 kW

FB4C

Puron™ the environmentally sound refrigerant

AHRI CERTIFIED™ www.ahridirectory.org

Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program For verification of certification for individual products, go to www.ahridirectory.org.

c UL us

ISO 9001:2000 QMI REGISTERED

ArmorCoat™

DIMENSIONS

UNIT	A	B	C	D	E	F	G	H	J	COIL CONFIGURATION		SHIPPING WT (LBS) NON TIN-COATED	SHIPPING WT (LBS) TIN-COATED
										SLOPE	"A"		
FB4CNF018	42 11/16"	14 5/16"	12 7/16"	12 5/16"	10 7/16"	18 1/8"	18 5/8"	-	12"	X	-	112	112
FB4CNF024	42 11/16"	14 5/16"	12 7/16"	12 5/16"	10 7/16"	18 1/8"	18 5/8"	-	12"	X	-	112	112
FB4CNF030	49 5/8"	17 5/8"	15 3/4"	15 5/8"	15 3/8"	23 1/8"	23 5/8"	-	17"	X	-	122	122
FB4CNF036	49 5/8"	17 5/8"	15 3/4"	15 5/8"	15 3/8"	23 1/8"	23 5/8"	-	17"	X	-	122	122
FB4CNF042	49 5/8"	21 1/8"	19 1/4"	19 1/8"	15 11/16"	23 7/16"	23 1/8"	-	-	-	X	157	157
FB4CNF048	49 5/8"	21 1/8"	19 1/4"	19 1/8"	15 11/16"	23 7/16"	23 1/8"	-	-	-	X	157	157
FB4CNF060	53 7/16"	21 1/8"	19 1/4"	19 1/8"	19 1/2"	27 1/4"	26 15/16"	-	-	-	X	175	175

NOTE:

1. SERIES DESIGNATION IS THE 14TH POSITION OF UNIT PRODUCT NUMBER
2. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.

NOTE: ALLOW 21" FROM FRONT FOR SERVICE

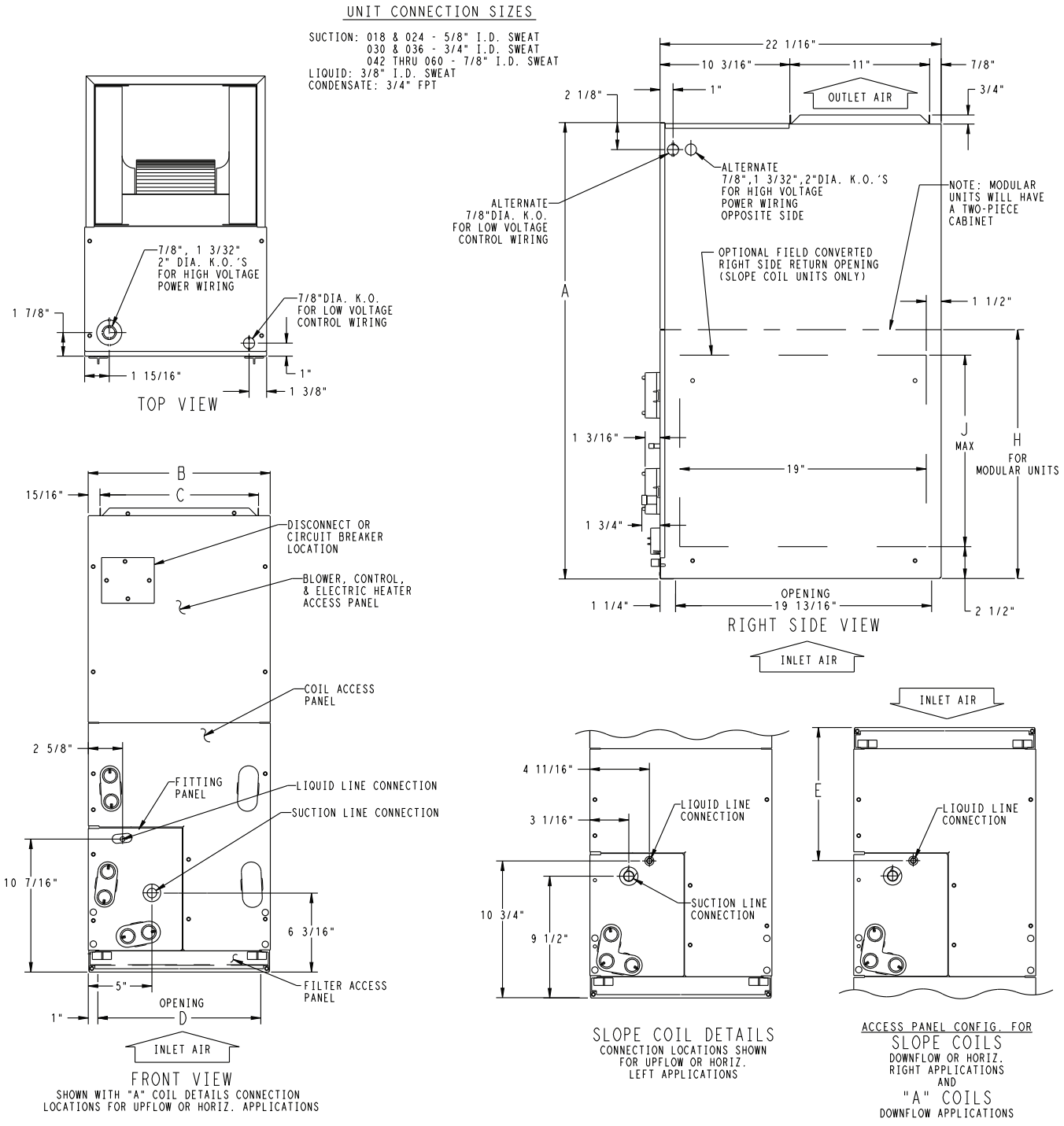
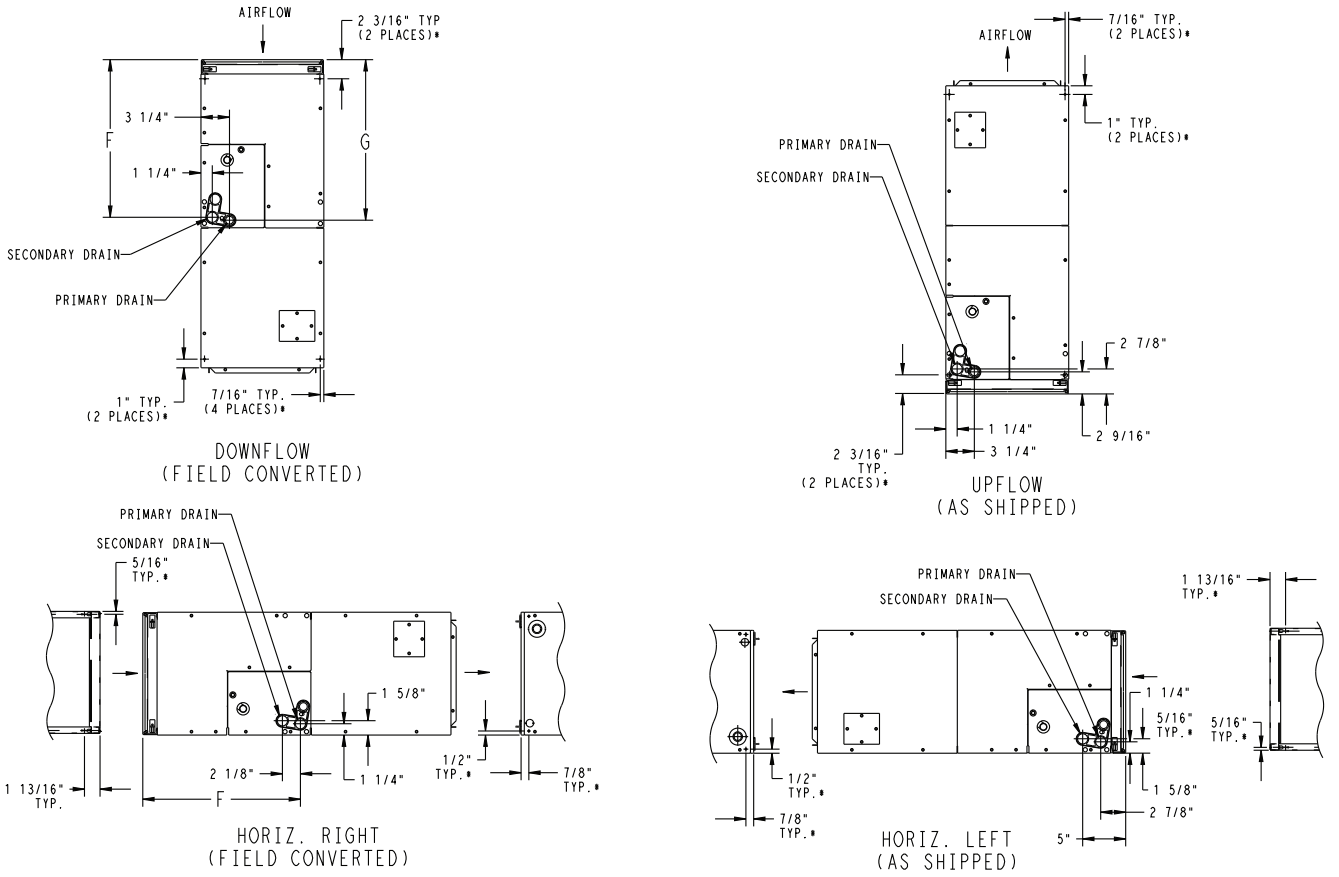


Fig. 1 – FB4CNF – English

DIMENSIONS (cont.)

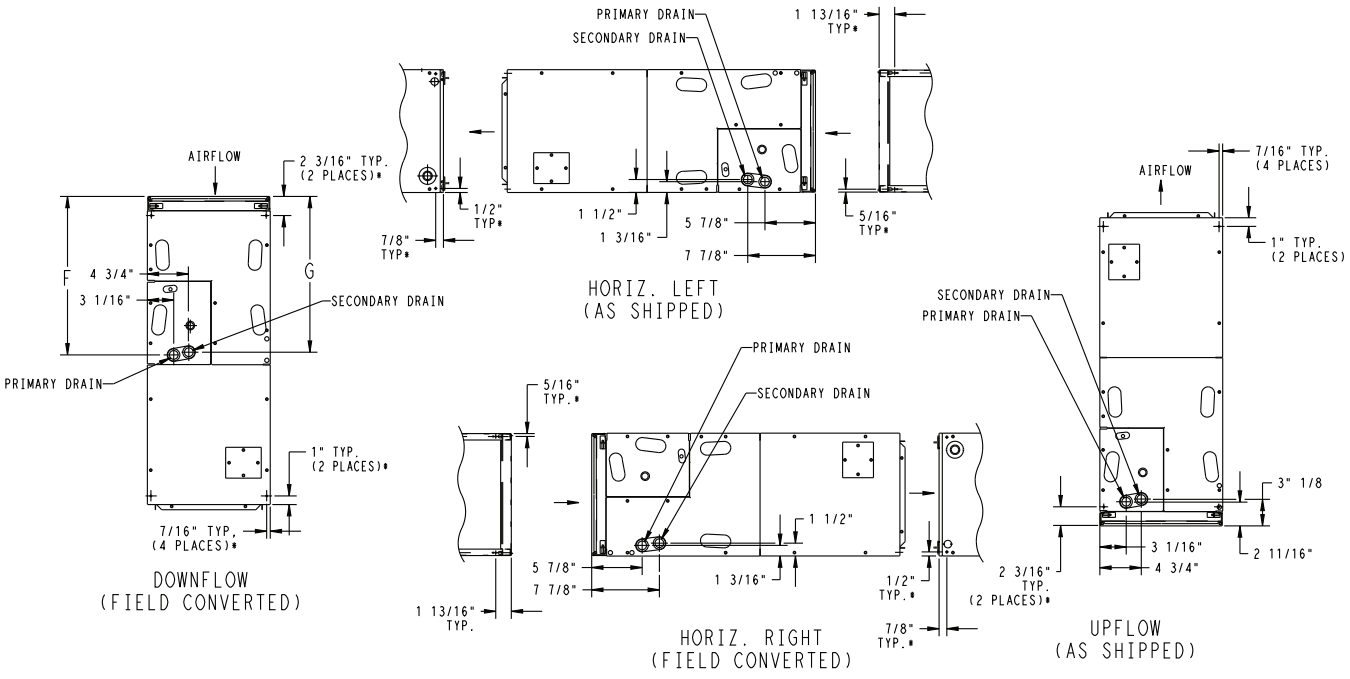
NOTES:
1. CONDENSATE PAN DRAIN CAPS NOT SHOWN FOR CLARITY.
2. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.

SLOPE COIL



* HORIZONTAL MOUNT LOCATIONS - DIMPLES PROVIDED IN TOP PANEL, AND BACK OF CABINET. IN CABINET BOTTOM. HOLES PROVIDED .136" DIA. HORIZONTAL HANGING HARDWARE TO BE FIELD SUPPLIED.

A-COIL



A10006

Fig. 2 – FB4CNF – English

DIMENSIONS (cont.)

UNIT	A	B	C	D	E	F	G	H	J	COIL CONFIGURATION		SHIPPING WT (Kgs) NON TIN-COATED	SHIPPING WT (Kgs) TIN-COATED
										SLOPE	"A"		
FB4CNF018	1084.3	363.6	315.9	312.8	265.1	460.4	473.1	-	304.8	X	-	50.8	50.8
FB4CNF024	1084.3	363.6	315.9	312.8	265.1	460.4	473.1	-	304.8	X	-	50.8	50.8
FB4CNF030	1260.5	447.7	400.0	396.9	390.5	587.4	600.1	-	431.8	X	-	55.3	55.3
FB4CNF036	1260.5	447.7	400.0	396.9	390.5	587.4	600.1	-	431.8	X	-	55.3	55.3
FB4CNF042	1260.5	536.6	489.0	485.8	398.5	595.3	587.4	-	-	-	X	71.2	71.2
FB4CNF048	1260.5	536.6	489.0	485.8	398.5	595.3	587.4	-	-	-	X	71.2	71.2
FB4CNF060	1357.3	536.6	489.0	485.8	495.3	692.2	684.2	-	-	-	X	79.4	79.4

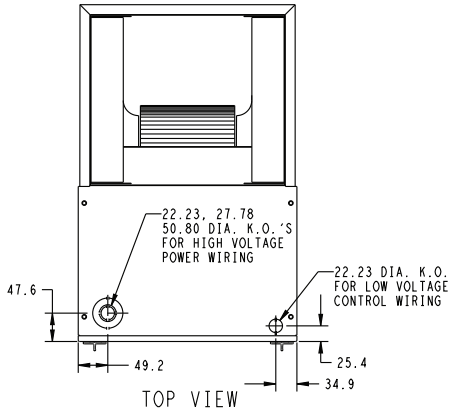
NOTE:

1. SERIES DESIGNATION IS THE 14TH POSITION OF UNIT PRODUCT NUMBER
2. ALL DIMENSIONS ARE IN "MM" UNLESS NOTED.

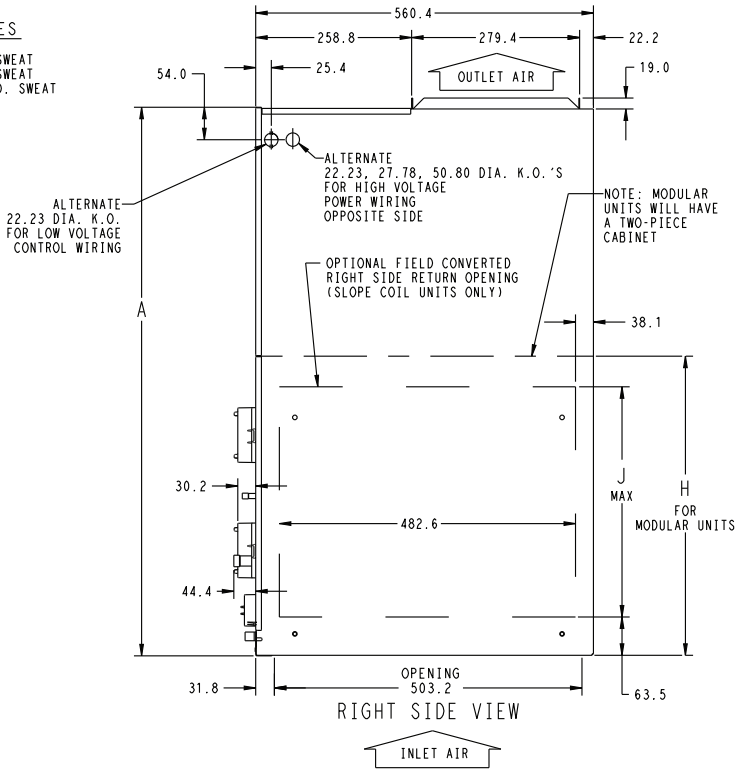
NOTE: ALLOW 533.4 FROM FRONT FOR SERVICE

UNIT CONNECTION SIZES

SUCTION: 018 & 024 - 15.88 I.D. SWEAT
030 & 036 - 19.05 I.D. SWEAT
042 THRU 060 - 22.23 I.D. SWEAT
LIQUID: 9.53 I.D. SWEAT
CONDENSATE: 19.0 FPT

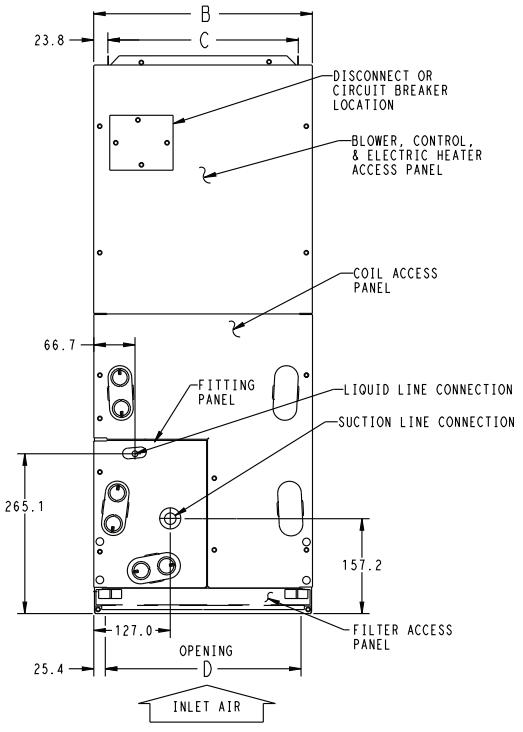


TOP VIEW



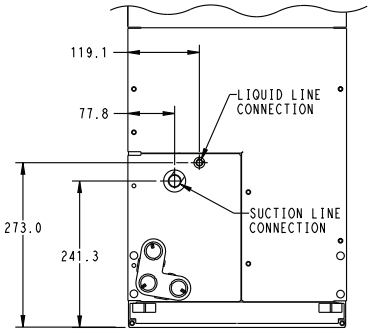
RIGHT SIDE VIEW

INLET AIR



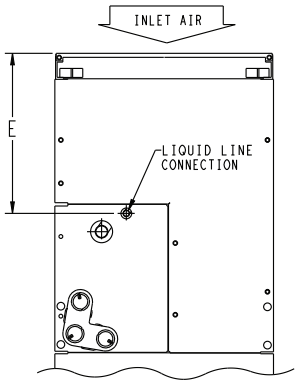
FRONT VIEW

SHOWN WITH "A" COIL DETAILS CONNECTION LOCATIONS FOR UPFLOW OR HORIZ. APPLICATIONS



SLOPE COIL DETAILS

CONNECTION LOCATIONS SHOWN FOR UPFLOW OR HORIZ. LEFT APPLICATIONS



ACCESS PANEL CONFIG. FOR SLOPE COILS

DOWNFLOW OR HORIZ. RIGHT APPLICATIONS AND "A" COILS DOWNFLOW APPLICATIONS

A10007

Fig. 3 – FB4CNF – Metric

DIMENSIONS (cont.)

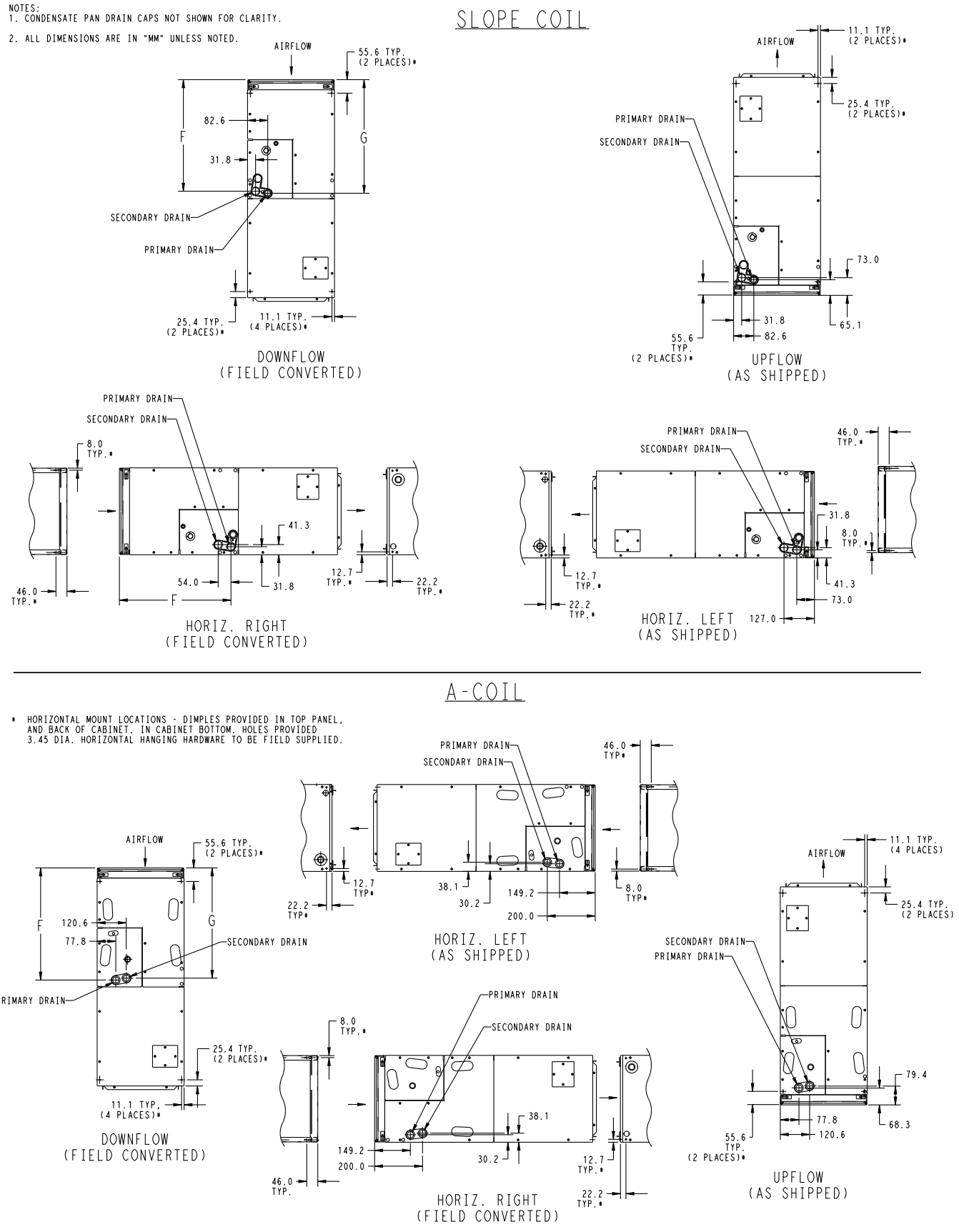


Fig. 4 – FB4CNF – Metric

PHYSICAL DATA

ORDERING NO.	FACTORY INSTALLED HEAT (kW)	NOMINAL COOLING CAPACITY (Btuh)	DIMENSIONS			SHIPPING WEIGHT
			Height	Width	Depth	
FB4CNF018(0,T)00	–	18,000	42–11/16 in. 1084mm	14–5/16 in. 363mm	22–1/16 in. 560mm	112 lb 51 kg
FB4CNF018(0,T)05	5					
FB4CNF018(0,T)08	8					
FB4CNF024(0,T)00	–	24,000	42–11/16 in. 1084mm	14–5/16 in. 363mm	22–1/16 in. 560mm	112 lb 51 kg
FB4CNF024(0,T)05	5					
FB4CNF024(0,T)10	10					
FB4CNF030(0,T)00	–	30,000	49–5/8 in. 1260mm	17–5/8 in. 447mm	22–1/16 in. 560mm	122 lb 55 kg
FB4CNF030(0,T)08	8					
FB4CNF030(0,T)10	10					
FB4CNF036(0,T)00	–	36,000	49–5/8 in. 1260mm	17–5/8 in. 447mm	22–1/16 in. 560mm	122 lb 55 kg
FB4CNF036(0,T)10	10					
FB4CNF036(0,T)15	15					
FB4CNF042(0,T)00	–	42,000	49–5/8 in. 1260mm	21–1/8 in. 536mm	22–1/16 in. 560mm	157 lb 71 kg
FB4CNF042(0,T)10	10					
FB4CNF042(0,T)15	15					
FB4CNF048(0,T)00	–	48,000	49–5/8 in. 1260mm	21–1/8 in. 536mm	22–1/16 in. 560mm	157 lb 71 kg
FB4CNF048(0,T)10	10					
FB4CNF048(0,T)15	15					
FB4CNF060(0,T)00	–	60,000	53–7/16 in. 1357mm	21–1/8 in. 536mm	22–1/16 in. 560mm	175 lb 79 kg
FB4CNF060(0,T)15	15					

FB4C

SPECIFICATIONS

FB4C	18	24	30	36	42	48	60
EVAPORATOR COIL							
Face Area (sq. ft)	2.23		2.97		4.45		5.93
Configuration	Slope				A		
Metering Device (Teflon–ring piston) Puron Refrigerant	EA52PT052	EA52PT057	EA52PT067	EA52PT070	EA52PT076	EA52PT080	EA52PT090
FILTER*							
21–1/2–in (546 mm) X	13–in (330 mm)		16–3/8–in (417 mm)		19–7/8–in (505 mm)		
BLOWER ASSEMBLY							
Blower Motor (X–13)	HD42AR225	HD44AR240	HD42AR226	HD44AR241	HD44AR242	HD46AR250	HD46AR251
HP	1/3	1/2	1/3	1/2	1/2	3/4	3/4
CFM	600	800	1000	1200	1400	1600	1750

*Filter must be field–supplied for FB4C units.

PERFORMANCE DATA

FB4C AIRFLOW PERFORMANCE (CFM)

MODEL & SIZE	BLOWER SPEED	0.10	0.20	0.30	0.40	0.50	0.60
FB4C 018	Tap 5	767	739	702	669	620	565
	Tap 4	614	569	534	486	436	398
	Tap 3	701	660	616	581	537	499
	Tap 2	614	569	534	486	436	398
	Tap 1	614	569	534	486	436	398
FB4C 024	Tap 5	969	936	892	835	763	676
	Tap 4	826	795	766	743	706	660
	Tap 3	826	795	766	743	706	660
	Tap 2	701	660	616	581	537	499
	Tap 1	617	592	552	507	472	420
FB4C 030	Tap 5	1108	1090	1065	1034	1009	974
	Tap 4	1026	1000	969	938	899	865
	Tap 3	1026	1000	969	938	899	865
	Tap 2	909	873	842	799	762	724
	Tap 1	825	795	757	722	674	634
FB4C 036	Tap 5	1301	1276	1245	1218	1176	1121
	Tap 4	1227	1191	1169	1143	1105	1074
	Tap 3	1227	1191	1169	1143	1105	1074
	Tap 2	1087	1062	1030	1001	966	930
	Tap 1	1026	1000	969	938	899	865
FB4C 042	Tap 5	1560	1544	1507	1464	1424	1358
	Tap 4	1419	1397	1358	1320	1279	1239
	Tap 3	1419	1397	1358	1320	1279	1239
	Tap 2	1249	1220	1184	1142	1093	1052
	Tap 1	1242	1205	1158	1110	1069	1026
FB4C 048	Tap 5	1743	1712	1679	1642	1610	1574
	Tap 4	1669	1634	1599	1564	1531	1499
	Tap 3	1669	1634	1599	1564	1531	1499
	Tap 2	1452	1413	1377	1339	1308	1271
	Tap 1	1300	1256	1221	1182	1142	1101
FB4C 060	Tap 5	1897	1867	1836	1808	1774	1736
	Tap 4	1817	1785	1757	1724	1693	1655
	Tap 3	1817	1785	1757	1724	1693	1655
	Tap 2	1657	1621	1589	1557	1518	1474
	Tap 1	1443	1412	1377	1332	1286	1243

– Airflow outside 450 cfm/ton.

NOTES:

1. Airflow based upon dry coil at 230v with factory–approved filter and electric heater (2 element heater sizes 018 through 036, 3 element heater sizes 042 through 060). For FB4C models, airflow at 208 volts is approximately the same as 230 volts because the X–13 motor is a constant torque motor. The torque doesn't drop off at the speeds the motor operates.
2. To avoid potential for condensate blowing out of drain pan prior to making drain trap:
   Return static pressure must be less than 0.40 in. wc.
   Horizontal applications of 042 – 060 sizes must have supply static greater than 0.20 in. wc.
3. Airflow above 400 cfm/ton on 048–060 size could result in condensate blowing off coil or splashing out of drain pan.

PERFORMANCE DATA (cont.)

GROSS COOLING CAPACITIES (MBH) – PURON® REFRIGERANT

UNIT SIZE	INDOOR COIL AIR		SATURATED TEMPERATURE LEAVING EVAPORATOR (°F / °C)														
			35 / 2			40 / 4			45 / 7			50 / 10			55 / 13		
	CFM	EWB	TC	SHC	BF	TC	SHC	BF	TC	SHC	BF	TC	SHC	BF	TC	SHC	BF
FB4C 018	525	72 / 22	41	20	0.00	37	17	0.00	32	15	0.00	27	13	0.02	21	11	0.03
		67 / 19	33	20	0.03	29	18	0.03	24	16	0.03	19	13	0.03	13	11	0.04
		62 / 17	26	20	0.03	22	18	0.03	18	16	0.04	14	14	0.10	11	11	0.26
	600	72 / 22	45	22	0.00	40	19	0.00	35	17	0.01	30	15	0.03	23	12	0.04
		67 / 19	37	22	0.04	32	20	0.04	27	17	0.04	21	15	0.04	15	12	0.05
		62 / 17	29	22	0.04	24	20	0.04	19	18	0.05	15	15	0.12	13	13	0.28
	675	72 / 22	49	24	0.00	44	21	0.00	38	19	0.03	32	16	0.04	25	13	0.05
		67 / 19	40	24	0.05	35	22	0.05	29	19	0.05	23	16	0.05	16	14	0.06
		62 / 17	32	25	0.05	27	22	0.05	21	19	0.06	17	17	0.14	14	14	0.29
FB4C 024	700	72 / 22	43	22	0.00	38	20	0.00	33	17	0.03	28	15	0.04	22	12	0.05
		67 / 19	35	23	0.05	30	20	0.05	25	18	0.05	20	15	0.05	14	13	0.06
		62 / 17	28	23	0.06	23	21	0.06	18	18	0.06	15	15	0.14	12	12	0.29
	800	72 / 22	47	24	0.00	42	22	0.01	36	19	0.04	31	17	0.06	24	14	0.06
		67 / 19	38	25	0.06	33	22	0.06	28	20	0.07	22	17	0.07	15	14	0.08
		62 / 17	30	26	0.07	25	23	0.07	20	20	0.08	16	16	0.17	13	13	0.31
	900	72 / 22	51	26	0.00	45	24	0.03	40	21	0.06	33	18	0.07	26	15	0.07
		67 / 19	41	27	0.07	36	25	0.08	30	22	0.08	24	19	0.08	17	16	0.09
		62 / 17	33	28	0.08	28	25	0.08	22	22	0.09	18	18	0.19	15	15	0.33
FB4C 030	875	72 / 22	62	31	0.00	56	28	0.00	49	24	0.02	41	21	0.04	32	17	0.04
		67 / 19	51	32	0.04	44	28	0.05	37	25	0.05	29	21	0.05	21	18	0.05
		62 / 17	40	32	0.05	34	29	0.05	27	25	0.06	21	21	0.13	18	18	0.28
	1000	72 / 22	68	34	0.00	61	31	0.00	53	27	0.04	45	23	0.05	35	19	0.06
		67 / 19	56	35	0.06	49	31	0.06	41	28	0.06	32	24	0.06	22	20	0.07
		62 / 17	44	36	0.06	37	32	0.06	29	28	0.07	24	24	0.16	20	20	0.30
	1125	72 / 22	74	37	0.00	66	33	0.02	58	29	0.05	48	25	0.06	38	21	0.07
		67 / 19	60	38	0.07	53	34	0.07	44	30	0.07	35	26	0.07	24	22	0.08
		62 / 17	48	39	0.07	40	35	0.07	32	31	0.09	26	26	0.18	21	21	0.32
FB4C 036	1050	72 / 22	68	34	0.00	61	31	0.00	53	27	0.04	45	23	0.05	35	20	0.06
		67 / 19	56	36	0.06	49	32	0.06	41	28	0.06	32	24	0.07	22	20	0.07
		62 / 17	44	36	0.07	37	33	0.07	30	29	0.08	24	24	0.17	20	20	0.31
	1200	72 / 22	75	38	0.00	67	34	0.03	58	30	0.06	49	26	0.07	38	22	0.07
		67 / 19	61	39	0.07	53	35	0.08	45	31	0.08	35	27	0.08	25	22	0.09
		62 / 17	49	40	0.08	41	36	0.08	32	32	0.09	26	26	0.19	22	22	0.33
	1350	72 / 22	81	41	0.00	72	37	0.05	63	32	0.07	53	28	0.08	41	23	0.09
		67 / 19	66	43	0.08	58	38	0.09	48	34	0.09	38	29	0.09	27	25	0.10
		62 / 17	53	44	0.09	44	40	0.09	35	35	0.11	29	29	0.22	24	24	0.35
FB4C 042	1225	72 / 22	89	44	0.00	80	40	0.00	70	35	0.02	58	30	0.03	46	25	0.04
		67 / 19	73	45	0.04	63	41	0.04	53	36	0.04	42	31	0.04	29	25	0.05
		62 / 17	58	46	0.04	48	41	0.04	38	36	0.05	30	30	0.12	25	25	0.28
	1400	72 / 22	98	49	0.00	88	44	0.00	77	39	0.03	64	33	0.04	50	28	0.05
		67 / 19	80	50	0.05	70	45	0.05	58	39	0.05	46	34	0.05	32	28	0.06
		62 / 17	64	51	0.06	53	46	0.06	42	40	0.06	34	34	0.14	28	28	0.29
	1575	72 / 22	106	53	0.00	95	48	0.00	83	42	0.04	69	36	0.05	54	30	0.06
		67 / 19	87	55	0.06	76	49	0.06	63	43	0.06	50	37	0.07	35	31	0.07
		62 / 17	69	56	0.07	58	50	0.07	46	44	0.08	37	37	0.17	31	31	0.31
FB4C 048	1400	72 / 22	88	46	0.00	79	42	0.00	69	37	0.03	58	31	0.04	45	26	0.05
		67 / 19	72	48	0.05	63	43	0.05	52	37	0.05	41	32	0.05	29	27	0.06
		62 / 17	57	49	0.06	48	43	0.06	38	38	0.06	30	30	0.14	25	25	0.29
	1600	72 / 22	97	51	0.00	87	46	0.01	75	40	0.04	63	35	0.06	49	29	0.06
		67 / 19	79	52	0.06	69	47	0.06	57	41	0.07	45	36	0.07	32	30	0.08
		62 / 17	63	54	0.07	53	48	0.07	42	42	0.08	34	34	0.17	28	28	0.31
	1800	72 / 22	105	55	0.00	94	50	0.03	82	44	0.06	68	38	0.07	54	31	0.07
		67 / 19	86	57	0.07	75	51	0.08	62	45	0.08	49	39	0.08	34	33	0.09
		62 / 17	68	59	0.08	57	53	0.08	45	47	0.09	37	37	0.19	30	30	0.33
FB4C 060	1600	72 / 22	106	54	0.00	95	49	0.00	82	43	0.01	69	37	0.03	54	31	0.04
		67 / 19	86	56	0.04	75	50	0.04	63	44	0.04	49	37	0.04	35	31	0.05
		62 / 17	68	56	0.04	57	50	0.04	45	44	0.05	36	36	0.12	29	29	0.28
	1750	72 / 22	113	58	0.00	101	52	0.00	88	46	0.02	74	39	0.04	58	33	0.04
		67 / 19	92	59	0.04	80	53	0.05	67	47	0.05	53	40	0.05	37	33	0.05
		62 / 17	73	61	0.05	61	54	0.05	49	48	0.06	39	39	0.13	32	32	0.28
	2000	72 / 22	124	64	0.00	111	57	0.00	97	50	0.04	81	43	0.05	63	36	0.06
		67 / 19	101	66	0.06	88	59	0.06	74	52	0.06	58	44	0.06	41	37	0.07
		62 / 17	80	67	0.06	67	60	0.06	53	53	0.07	43	43	0.16	35	35	0.30

See Notes following table.

PERFORMANCE DATA (cont.)

CFM – Cubic Ft per Minute
EWB – Entering Wet Bulb °F (°C)
LWB – Leaving Wet Bulb °F (°C)
TC – Gross Cooling Capacity 1000 Btuh
SHC – Gross Sensible Capacity 1000 Btuh
BF – Bypass Factor
MBH – 1000 Btuh

NOTES:

1. Contact manufacturer for cooling capacities at conditions other than shown in table.
2. Formulas:
   Leaving db = entering db $-\frac{\text{sensible heat cap.}}{1.09 \times \text{CFM}}$
   Leaving wb = wb corresponding to enthalpy of air leaving coil (h_{lwb})
   $h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{CFM}}$
   where h_{ewb} = enthalpy of air entering coil. Direct interpolation is permissible. Do not extrapolate.
3. SHC is based on 80°F (27°C) db temperature of air entering coil. Below 80°F (27°C) db, subtract (Correction Factor x CFM) from SHC. Above 80°F (27°C) db, add (Correction Factor x CFM) to SHC.
4. Bypass Factor = 0 indicates no psychometric solution. Use bypass factor of next lower EWB for approximation.

SHC CORRECTION FACTOR

BYPASS FACTOR	ENTERING AIR DRY–BULB TEMPERATURE (°F)					
	79	78	77	76	75	Under 75
	81	82	83	84	85	Over 85
	ENTERING AIR DRY–BULB TEMPERATURE (°C)					
	26	25	25	24	24	Under 75
	27	28	28	29	29	Over 85
	Correction Factor					
0.10	.098	1.96	2.94	3.92	4.91	Use formula shown below
0.20	0.87	1.74	2.62	3.49	4.36	
0.30	0.76	1.53	2.29	3.05	3.82	

Interpolation is permissible.
Correction Factor = 1.09 x (1 – BF) x (db – 80)

FB4C

FB4C AIR DELIVERY PERFORMANCE CORRECTION COMPONENT PRESSURE DROP (in wc) AT INDICATED AIRFLOW (DRY TO WET COIL)

UNIT SIZE	CFM															
	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
018	0.034	0.049	0.063	– –	– –	– –	– –	– –	– –	– –	– –	– –	– –	– –	– –	– –
024	0.034	0.049	0.063	0.076	0.089	– –	– –	– –	– –	– –	– –	– –	– –	– –	– –	– –
030	– –	– –	– –	0.049	0.059	0.070	0.080	– –	– –	– –	– –	– –	– –	– –	– –	– –
036	– –	– –	– –	– –	– –	0.070	0.080	0.090	0.099	– –	– –	– –	– –	– –	– –	– –
042	– –	– –	– –	– –	– –	– –	– –	0.049	0.056	0.063	0.070	– –	– –	– –	– –	– –
048	– –	– –	– –	– –	– –	– –	– –	– –	– –	0.063	0.070	0.076	0.083	0.090	– –	– –
060	– –	– –	– –	– –	– –	– –	– –	– –	– –	– –	– –	0.049	0.054	0.059	0.065	0.070

ELECTRIC HEATER STATIC PRESSURE DROP (in wc)

FB4C 018 – 036			FB4C 042 – 060		
HEATER ELEMENTS	kW	EXTERNAL STATIC PRESSURE CORRECTION	HEATER ELEMENTS	kW	EXTERNAL STATIC PRESSURE CORRECTION
0	0	+.02	0	0	+.04
1	3, 5	+.01	2	8, 10	+.02
2	8, 10	0	3	9, 15	0
3	9, 15	–.02	4	20	–.02
4	20	–.04	6	18, 24, 30	–.10

The airflow performance data was developed using fan coils with 10–kW electric heaters (2 elements) in the 018 through 036 size units and 15–kW heaters (3 elements) in the 042 through 060 size units. For fan coils with heaters of a different number of elements, the external available static at a given CFM from the curve may be corrected by adding or subtracting available external static pressure as indicated above.

MINIMUM CFM AND MOTOR SPEED SELECTION

FB4C	HEATER kW									
	3	5	8	9	10	15	18	20	24	30
018	525	525	525	—	600	—	—	—	—	—
024	700	700	700	—	700	775	—	—	—	—
030	—	875	875	—	875	875	—	1060	—	—
036	—	1050	970	970	970	920	—	1040	—	—
042	—	—	1225	1225	1225	1225	1225	1225	—	—
048	—	—	1400	1400	1400	1400	1400	1400	1400	1400
060	—	—	1750	1750	1750	1750	1750	1750	1750	1750

Speed Tap 4 (white wire) is used for electric heat only. White wire must remain on tap 4.

FIELD–INSTALLED FILTER STATIC PRESSURE DROP (in wc)

FB4C	CFM								
	400	600	800	1000	1200	1400	1600	1800	2000
018	0.02	0.044	0.075	—	—	—	—	—	—
024, 030	—	0.022	0.048	0.072	0.100	—	—	—	—
036, 042, 048	—	—	—	0.051	0.070	0.092	0.120	0.152	—
060	—	—	—	—	—	—	0.086	0.105	0.130

ACCESSORY ELECTRIC HEATERS

HEATER PART NO.	kW @ 240V	VOLTS/ PH	STAGES (kW OPERATING)	INTERNAL CIRCUIT PROTECTION	FAN COIL SIZE USED WITH	HEATING CAP.** @ 230V
KFCEH0401N03	3	230/1	3	None	018–024	9,400
KFCEH0501N05	5	230/1	5	None	018–060	15,700
KFCEH0801N08	8	230/1	8	None	018–060	25,100
KFCEH0901N10	10	230/1	10	None	018–060	31,400
KFCEH3201F20	20	230/1	5, 20	Fuse‡	030–060	62,800
KFCEH1601315	15	230/3	5, 15	None	036–060	47,100
KFCEH2001318	18	230/3	6, 12, 18	None	042–060	56,500
KFCEH3401F24	24	230/3*	8, 16, 24	Fuse	048, 060	78,300
KFCEH3501F30	30	230/3*	10, 20, 30	Fuse	048, 060	94,100
KFCEH2401C05	5	230/1	5	Circuit Breaker	018–060	15,700
KFCEH2501C08	8	230/1	8	Circuit Breaker	018–060	25,100
KFCEH2601C10	10	230/1	10	Circuit Breaker	018–060	31,400
KFCEH3301C20	20	230/1	5, 20	Circuit Breaker	030–060	62,800
KFCEH2901N09	9	230/1†	3, 9	None	036–060	28,200
KFCEH3001F15	15	230/1	5, 15	Fuse‡	024–060	47,100
KFCEH3101C15	15	230/1	5, 15	Circuit Breaker	024–060	47,100

* Field convertible to 1 phase.
† Field convertible to 3 phase.
‡ Single point wiring kit required for these heaters in Canada.
** Blower Motor heat not included.

ESTIMATED SOUND POWER LEVEL (dBA)

FB4C	CONDITIONS		OCTAVE BAND CENTER FREQUENCY*						
	CFM	Ext Static Pressure	63	125	250	500	1000	2000	4000
018	600	0.25	64.7	60.7	56.7	53.7	51.7	49.7	45.7
024	800	0.25	66.0	62.0	58.0	55.0	53.0	51.0	47.0
030	1000	0.25	67.0	63.0	59.0	56.0	54.0	52.0	48.0
036	1200	0.25	67.8	63.8	59.8	56.8	54.8	52.8	48.8
042	1400	0.25	68.4	64.4	60.4	57.4	55.4	53.4	49.4
048	1600	0.25	69.0	65.0	61.0	58.0	56.0	54.0	50.0
060	2000	0.25	70.0	66.0	62.0	59.0	57.0	55.0	51.0

* Estimated sound power levels have been derived using the method described in the 1987 ASHRAE HVAC Systems & Applications Handbook, Chapter 52, p. 52.7.

ELECTRICAL DATA FOR UNITS WITH FACTORY–INSTALLED HEAT

FB4CNF	MTR HP	MTR FLA	VOLTS / PH/ HZ	HEAT PACK INSTALLED	SINGLE CIRCUIT			DUAL CIRCUIT					
					HEATER AMPS	MCA	MOCP	HTR. AMPS	MCA	MOCP	HTR. AMPS	MCA	MOCP
								L1/L2	L1/L2	L1/L2	L3/L4	L3/L4	L3/L4
018(0,T)05	1/3	2.8	208/230/1/60	MKFCEH0501N05	18.1/20.0	26.1/28.5	30/30	N/A	N/A	N/A	N/A	N/A	N/A
018(0,T)08	1/3	2.8	208/230/1/60	MKFCEH0801N08	28.9/32.0	39.6/43.5	40/45	N/A	N/A	N/A	N/A	N/A	N/A
024(0,T)05	1/2	4.1	208/230/1/60	MKFCEH0501N05	18.1/20.0	27.8/30.0	30/30	N/A	N/A	N/A	N/A	N/A	N/A
024(0,T)10	1/2	4.1	208/230/1/60	MKFCEH0901N10	36.2/40.0	50.4/55.1	60/60	N/A	N/A	N/A	N/A	N/A	N/A
030(0,T)08	1/3	2.8	208/230/1/60	MKFCEH0801N08	28.9/32.0	39.6/43.5	40/45	N/A	N/A	N/A	N/A	N/A	N/A
030(0,T)10	1/3	2.8	208/230/1/60	MKFCEH0901N10	36.2/40.0	48.8/53.5	50/60	N/A	N/A	N/A	N/A	N/A	N/A
036(0,T)10	1/2	4.1	208/230/1/60	MKFCEH0901N10	36.2/40.0	50.4/55.1	60/60	N/A	N/A	N/A	N/A	N/A	N/A
036(0,T)15	1/2	4.1	208/230/1/60	MKFCEH1501F15	54.2/59.9	72.9/80.0	80/80	36.2/40.0	50.4/55.2	50/60	18.1/20.0	22.6/25.0	25/25
042(0,T)10	1/2	4.1	208/230/1/60	MKFCEH0901N10	36.2/40.0	50.4/55.1	60/60	N/A	N/A	N/A	N/A	N/A	N/A
042(0,T)15	1/2	4.1	208/230/1/60	MKFCEH1501F15	54.2/59.9	72.9/80.0	80/80	36.2/40.0	50.4/55.2	50/60	18.1/20.0	22.6/25.0	25/25
048(0,T)10	3/4	6.0	208/230/1/60	MKFCEH0901N10	36.2/40.0	52.8/57.5	60/60	N/A	N/A	N/A	N/A	N/A	N/A
048(0,T)15	3/4	6.0	208/230/1/60	MKFCEH1501F15	54.2/59.9	75.3/82.4	80/90	36.2/40.0	52.8/57.5	60/60	18.1/20.0	22.6/25.0	25/25
060(0,T)15	3/4	6.0	208/230/1/60	MKFCEH1501F15	54.2/59.9	75.3/82.4	80/90	36.2/40.0	52.8/57.5	60/60	18.1/20.0	22.6/25.0	25/25

ELECTRICAL DATA FOR UNITS WITHOUT ELECTRICAL HEAT

MODEL NO.	MTR HP	MTR FLA	VOLTS/PH/HZ	SINGLE CIRCUIT		BRANCH CIRCUIT MIN WIRE SIZE* AWG
				MCA	MAXIMUM OVERCURRENT PROTECTION	
FB4CNF018(0,T)00	1/3	2.8	208/230/1/60	3.5	15	14
FB4CNF024(0,T)00	1/2	4.1	208/230/1/60	5.1	15	14
FB4CNF030(0,T)00	1/3	2.8	208/230/1/60	3.5	15	14
FB4CNF036(0,T)00	1/2	4.1	208/230/1/60	5.1	15	14
FB4CNF042(0,T)00	1/2	4.1	208/230/1/60	5.1	15	14
FB4CNF048(0,T)00	3/4	6.0	208/230/1/60	7.5	15	14
FB4CNF060(0,T)00	3/4	6.0	208/230/1/60	7.5	15	14

* Use copper wire only. Use 75°C only in this application. When using non–metallic (NM) sheathed cable, wire size required should be based on that of 60°C conductors, instead of wire sizes shown in table above per NEC Article 336–26.

NOTE: If branch circuit wire length exceeds 100 ft (30 m), consult NEC 215–2 to determine maximum wire length. Use 2% voltage drop.

FLA – Full Load Amps

ACCESSORY ELECTRIC HEATER ELECTRICAL DATA

HEATER PART NO.	kW		PHASE	INTERNAL CIRCUIT PROTECTION	HEATER AMPS 208/230V			BRANCH CIRCUIT												
								Min Ampacity 208/230V*			Min Wire Size (AWG) 208/230V†			Min Gnd Wire Size 208/230V			Max Fuse/Ckt Bkr Amps 208/230V			Max Wire Length 208/230V (Ft)‡		
					Single Circuit	Dual Circuit		Single Circuit	Dual Circuit		Single Circuit	Dual Circuit		Single Circuit	Dual Circuit		Single Circuit	Dual Circuit		Single Circuit	Dual Circuit	
	240v	208v				L1,l2	L3,L4		L1,L2	L3,L4		L1, L2	L3, L4		L1, L2	L3,L4		L1,L2	L3,L4		L1,L2	L3,L4
KFCEH0401N03	3	2.3	1	None	10.9/12.0	—	—	15.9/17.3	—	—	12/12	—	—	12/12	—	—	20/20	—	—	67/68	—	—
KFCEH0501N05[1]	5	3.8	1	None	18.1/20.0	—	—	26.0/28.4	—	—	10/10	—	—	10/10	—	—	30/30	—	—	66/66	—	—
KFCEH0501N05[2]	5	3.8	1	None	18.1/20.0	—	—	31.2/33.5	—	—	8/8	—	—	10/10	—	—	35/35	—	—	85/88	—	—
KFCEH2401C05[1]	5	3.8	1	Ckt Bkr	18.1/20.0	—	—	26.0/28.4	—	—	10/10	—	—	10/10	—	—	30/30	—	—	66/66	—	—
KFCEH2401C05[2]	5	3.8	1	Ckt Bkr	18.1/20.0	—	—	31.2/33.5	—	—	8/8	—	—	10/10	—	—	35/35	—	—	85/88	—	—
KFCEH0801N08	8	6.0	1	None	28.9/32.0	—	—	44.7/48.5	—	—	8/8	—	—	10/10	—	—	45/50	—	—	59/60	—	—
KFCEH2501C08	8	6.0	1	Ckt Bkr	28.9/32.0	—	—	44.7/48.5	—	—	8/8	—	—	10/10	—	—	45/50	—	—	59/60	—	—
KFCEH2901N09	9	6.8	1	None	32.8/36.0	—	—	49.5/53.5	—	—	8/6	—	—	10/10	—	—	50/60	—	—	54/87	—	—
KFCEH2901N09**	9	6.8	3	None	18.8/20.8	—	—	32.0/34.5	—	—	8/8	—	—	10/10	—	—	35/35	—	—	83/85	—	—
KFCEH0901N10	10	7.5	1	None	36.2/40.0	—	—	53.8/58.5	—	—	6/6	—	—	10/10	—	—	60/60	—	—	78/80	—	—
KFCEH2601C10	10	7.5	1	Ckt Bkr	36.2/40.0	—	—	53.8/58.5	—	—	6/6	—	—	10/10	—	—	60/60	—	—	78/80	—	—
KFCEH3001F15	15	11.3	1	Fuse	54.2/59.9	36.2/40.0	18.1/20.0	76.3/83.4	53.8/58.5	22.7/25.0	4/4	6/6	10/10	8/8	10/10	10/10	80/90	60/60	25/25	88/89	78/80	75/76
KFCEH3101C15	15	11.3	1	Ckt Bkr	—	36.2/40.0	18.1/20.0	—	53.8/58.5	22.7/25.0	—	6/6	10/10	—	10/10	10/10	—	60/60	25/25	—	78/80	75/76
KFCEH1601315	15	11.3	3	None	31.3/34.6	—	—	47.7/51.8	—	—	8/6	—	—	10/10	—	—	50/60	—	—	56/90	—	—
KFCEH2001318	18	13.5	3	None	37.6/41.5	—	—	55.5/60.4	—	—	6/6	—	—	10/8	—	—	60/70	—	—	76/77	—	—
KFCEH3201F20	20	15.0	1	Fuse	72.3/79.9	36.2/40.0	36.2/40.0	98.9/108.4	53.8/58.5	45.3/50.0	3/2	6/6	8/8	8/6	10/10	10/10	100/110	60/60	50/50	85/109	78/80	59/59
KFCEH3301C20	20	15.0	1	Ckt Bkr	—	36.2/40.0	36.2/40.0	—	53.8/58.5	45.3/50.0	—	6/6	8/8	—	10/10	10/10	—	60/60	50/50	—	78/80	59/59
KFCEH3401F24††	24	18.0	3	Fuse	50.1/55.4	—	—	71.2/77.8	—	—	4/4	—	—	8/8	—	—	80/80	—	—	94/95	—	—
	24	18.0	1	Fuse	86.7/95.5	—	—	116.9/127.9	—	—	1/1	—	—	6/6	—	—	125/150	—	—	115/116	—	—
KFCEH3501F30††	30	22.5	3	Fuse	62.6/69.2	—	—	86.8/95.0	—	—	3/3	—	—	8/8	—	—	90/100	—	—	97/98	—	—
	30	22.5	1	Fuse	109.0/120.0	—	—	144.8/158.5	—	—	0/00	—	—	6/6	—	—	150/175	—	—	117/150	—	—

FIELD MULTIPOINT WIRING OF 24–AND 30–kW SINGLE PHASE

HEATER PART NO.	kW		PHASE	HEATER AMPS 208/230V			MIN AMPACITY 208/230V*			MIN WIRE SIZE (AWG) 208/230V†			MIN GND WIRE SIZE 208/230V	MAX FUSE/CKT BKR AMPS 208/230V			MAX WIRE LENGTH 208/230V (FT)‡		
	240V	208V		L1,L2	L3,L4	L5,L6	L1,L2	L3,L4	L5,L6	L1,L2	L3,L4	L5,L6		L1,L2	L3,L4	L5,L6	L1,L2	L3,L4	L5,L6
KFCEH3401F24††	24	18.0	1	28.9/32.0	28.9/32.0	28.9/32.0	44.7/48.5	36.2/40.0	36.2/40.0	8/8	8/8	8/8	10/10	45/50	40/40	40/40	59/60	73/73	73/73
KFCEH3501F30††	30	22.5	1	36.2/40.0	36.2/40.0	36.2/40.0	53.8/58.5	45.3/50.0	45.3/50.0	6/6	8/8	8/8	10/10	60/60	50/50	50/50	78/80	59/59	59/59

* Includes blower motor amps of largest fan coil used with heater.

† Copper wire must be used. If other than uncoated (non–plated), 75°C ambient, copper wire (solid wire for 10 AWG and smaller, stranded wire for larger than 10 AWG) is used, consult applicable tables of the National Electric Code (ANSI/NFPA 70).

‡ Length shown is as measured 1 way along wire path between unit and service panel for a voltage drop not to exceed 2%.

** Field convertible to 3 phase.

†† Field convertible to 1 phase, single or multiple supply circuit.

NOTES:

1. For fan coil sizes 018–036.
2. For fan coil sizes 042–060.
3. Single circuit application of F15 and F20 heaters requires single–point wiring kit accessory.

HEATER ELECTRICAL DATA

FACTORY-INSTALLED HEATER OPTIONS*

MODEL	018	024	030	036	042	048	060
FB4CNF	5 / 8	5 / 10	8 / 10	10 / 15	10 / 15	10 / 15	15

* For field−installed heater/fan coil combinations, see Accessory Electric Heaters Table.

ELECTRIC HEATER INTERNAL PROTECTION

HEATER kW	PHASE	FUSE QTY/SIZE	CKT BKR* QTY/SIZE
5	1	—	1/60
8	1	—	1/60
9	1/3	—	—
10	1	—	1/60
15	1	2/30–2/60	2/60
15	3	—	—
18	3	—	—
20	1	4/60	2/60
24	1/3	6/60	—
30	1/3	6/60	—

* All circuit breakers are 2 pole.

When using units with 20-, 24-, and 30-kW electric heaters, maintain a 1-in. (25mm) clearance from combustible materials to discharge plenum and ductwork and maintain a distance of 36-in. (914mm) from the unit. Use an accessory downflow base to maintain proper clearance on downflow installations. Use flexible connectors between ductwork and unit to prevent transmission of vibration. When electric heater is installed, use heat resistant material for flexible connector between ductwork and unit at discharge connection. Ductwork passing through unconditioned space must be insulated and covered with vapor barrier

ACCESSORIES

ITEM		ACCESSORY PART NO.*	FAN COIL SIZE USED WITH
1.	Disconnect Kit	KFADK0201DSC	Cooling controls and heaters 3− through 10−kW
2.	Downflow Base Kit	KFACB0101CFB	018, 024
		KFACB0201CFB	030, 036
		KFACB0301CFB	042, 048, 060
3.	Downflow Conversion Kit †	KFADC0201SLP	Slope Coil Units—018, 024, 030, 036
		KFADC0401ACL	A−Coil Units—042, 048, 060
4.	Downflow/Horizontal Conversion Gasket Kit	KFAHD0101SLP	All
5.	Horizontal Water Management Kit (25 pack) ‡	KFAHC0125AAA	All
6.	Single−Point Wiring Kit	KFASP0101SPK	Only with 15− and 20−kW Fused Heaters
7.	Filter Kit (12 Pack)	KFAFK0112SML	018, 024
		KFAFK0212MED	030, 036
		KFAFK0312LRG	042, 048, 060
8.	Fan Coil Filter Cabinet (Fan Coil Filter Media)	FNCCABCC0014 (FILXXFNC0014)	018, 024
		FNCCABCC0017 (FILXXFNC0017)	030, 036
		FNCCABCC0021 (FILXXFNC0021)	042, 048, 060
9.	PVC Condensate Trap Kit (50 pack)	KFAET0150ETK	All
10.	Air Cleaner 240−volt Conversion Kit	KEAVC0201240	All
11.	TXV Kit Puron R−410A	KSATX0201PUR	018, 024, 030
		KSATX0301PUR	036, 042
		KSATX0401PUR	048, 060
12.	TXV Kit R−22	KSATX0601HSO	018, 024, 030, 036, 042
		KSATX0701HSO	048
		KSATX1001HSO	060

* Factory authorized and listed, field−installed.
† KFAHD0101SLP must also be purchased for downflow applications.
‡ KFAHD0101SLP must also be purchased for downflow or horizontal applications.

ACCESSORIES (cont.)

Accessory Kits Description Suggested and Required Use

1. **Disconnect Kit**
   The kit is used to disconnect electrical power to the fan coil so service or maintenance may be performed safely.
   SUGGESTED USE: Units for 3- through 10-kW electric resistance heaters and cooling controls.
2. **Downflow Base Kit**
   This kit is designed to provide a 1-in. (25mm) minimum clearance between unit discharge plenum, ductwork, and combustible materials. It also provides a gap-free seal with the floor.
   REQUIRED USE: This kit must be used whenever fan coils are used in downflow applications.
3. **Downflow Conversion Kit**
   Fan coils are shipped from the factory for upflow or horizontal-left applications. Downflow conversion kits provide proper condensate water drainage and support for the coil when used in downflow applications. Separate kits are available for slope coils and A-coils.
   REQUIRED USE: This kit must be used whenever fan coils are used in downflow applications.
4. **Downflow/Horizontal Conversion Gasket Kit**
   This kit provides the proper gasketing of units when applied in either a downflow or horizontal application.
   REQUIRED USE: Fan coils in either downflow or horizontal applications.
5. **Horizontal Applications - Water Management Kit**
   This kit provides proper installation of fan coils under conditions of high static pressure and high relative humidity.
   SUGGESTED USE: All fan coils.
6. **Single Point Wiring Kit**
   The single point wiring kit acts as a jumper between L1 and L3 lugs, and between the L2 and L4 lugs. This allows the installer to run two heavy-gauge, high-voltage wires into the fan coil rather than 4 light-gauge, high-voltage wires.
   SUGGESTED USE: Fan coils with 15- and 20-kW fused heaters only.
7. **Filter Kit (12 pack)**
   The kit consists of 12 fan coil framed filters. These filters collect large dust particles from the return air entering the fan coil and prevents them from collecting on the coil. This process helps to keep the coil clean, which increases heat transfer and, in turn, the efficiency of the system.
   SUGGESTED USE: To replace filters in fan coils.
   REQUIRED USE: All units unless a filter grille is used.
8. **Fan Coil Filter Cabinet**
   This cabinet is mounted to the fan coil on the return air end and designed to slip over the outer fan coil casing. The cabinets are insulated using the same insulation as production fan coils. They are designed for the removal of particulates from indoor air using FILXXFNC00(14, 17, 21, 24) media filter cartridges. These fan coil media filter cartridge kits are designed for the removal of particles from indoor air. The cartridge is installed in the return air duct next to the air handler or further upstream.
   SUGGESTED USE: All fan coils.
9. **Condensate Drain Trap Kit**
   This kit consists of 50 PVC condensate traps. Each trap is pre-formed and ready for field installation. This deep trap helps the system make and hold proper condensate flow even during blower initiation.
   SUGGESTED USE: All fan coils.
10. **Air Cleaner 240-volt Conversion Kit**
    The AIRA electronic air cleaner comes ready for 115-v operation.
    REQUIRED USE: This kit is required when running 240-volt circuit to air cleaner.

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Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations. Replaces: FB4CNF–02PD

APPENDIX B

CADNA® ENVIRONMENTAL NOISE MODEL RESULTS

APPENDIX C

SOUND MONITORING DATA & NOTES

EBI CONSULTING - NOISE MONITORING FIELD NOTES

EBI Project #: 62145924 **Client Site #:** NL0226

Performed By: Jonathan Bieder

MEASUREMENT	
Location #:	1
Location:	Noth property line Golden Valley Rd
Date:	Wednesday, November 12, 2014
Start Time/End Time:	1:24 pm/1:44 pm
Run #:	#003

MEASUREMENT LOCATION (SKETCH)



WEATHER CONDITIONS: (per http://www.erh.noaa.gov/)		
	Start	**End**
Temperature:	66	66
Wind Speed:	0	0
Wind Direction:	0	0
Humidity:	49%	49%
Sky:	clear	clear

SOUND SOURCES (order by most prominent)

1)	traffic, aircraft and breeze	5)	
2)		6)	
3)		7)	
4)		8)	

MONITORING NOTES (describe & note time of intrusions, changes in condition, etc.)

2nd 5 minutes 2:53 into run fire truck

Casella CEL Ltd.

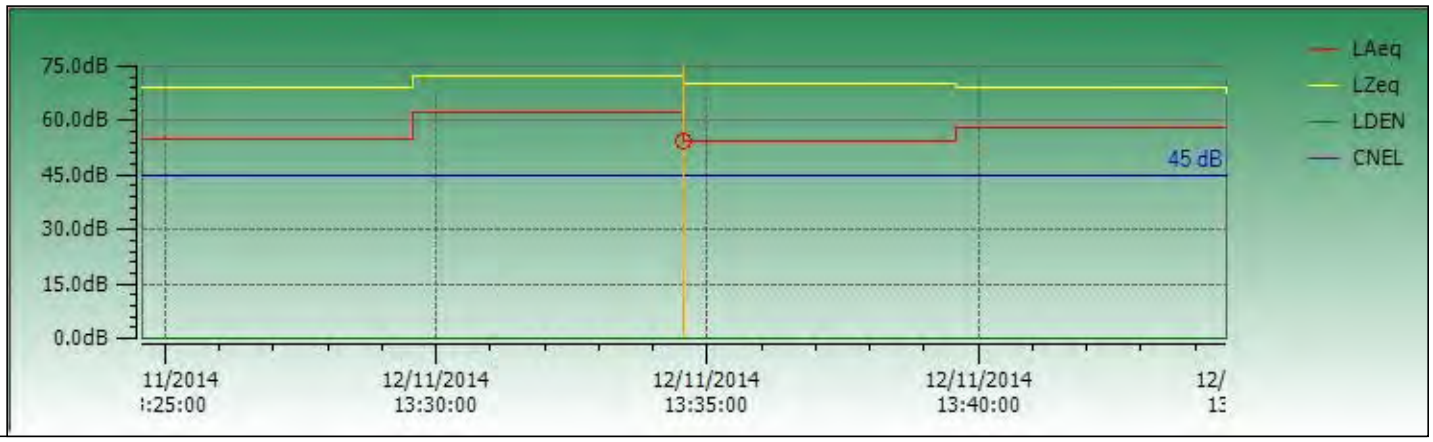
Report On Location 1 Day

Report Sorted/Grouped By: Site(Ascending)

Unallocated

Instrument Model	**CEL-633B**

Duration	00:20:10 HH:MM:SS	Calibration (Before) Offset	-2.65
End Date & Time	11/12/2014 1:44:45 PM	Calibration (Before) SPL	114 dB
Run Number	3	Calibration Drift	-0.050000000 dB
Start Date & Time	11/12/2014 1:24:35 PM	LAeq	58.537 dB
Location	Location 1 Day	LZeq	70.47 dB
Result	Period	LDEN	0
Calibration (After) Date	11/12/2014 2:44:06 PM	CNEL	0
Calibration (Before) Date	11/12/2014 1:23:49 PM		



EBI CONSULTING - NOISE MONITORING FIELD NOTES

EBI Project #: 62145924 **Client Site #:** NL0226

Performed By: Jonthan Biederer

MEASUREMENT	
Location #:	1
Location:	Noth property line Golden Valley Rd
Date:	Wednesday, November 12, 2014
Start Time / End Time:	10:46 pm/ 11:06 pm
Run #:	#007

MEASUREMENT LOCATION (SKETCH)



WEATHER CONDITIONS: (per http://www.erh.noaa.gov/)		
	Start	**End**
Temperature:	61	61
Wind Speed:	0	0
Wind Direction:	0	0
Humidity:	63%	63%
Sky:	clear	clear

SOUND SOURCES (order by most prominent)

1)	traffic light	5)	
2)		6)	
3)		7)	
4)		8)	

MONITORING NOTES (describe & note time of intrusions, changes in condition, etc.)

1st 5 min; cars are only hit on noise al noise from local bar traffic.

2nd 5 min; airplane 4:22 into run

Casella CEL Ltd.

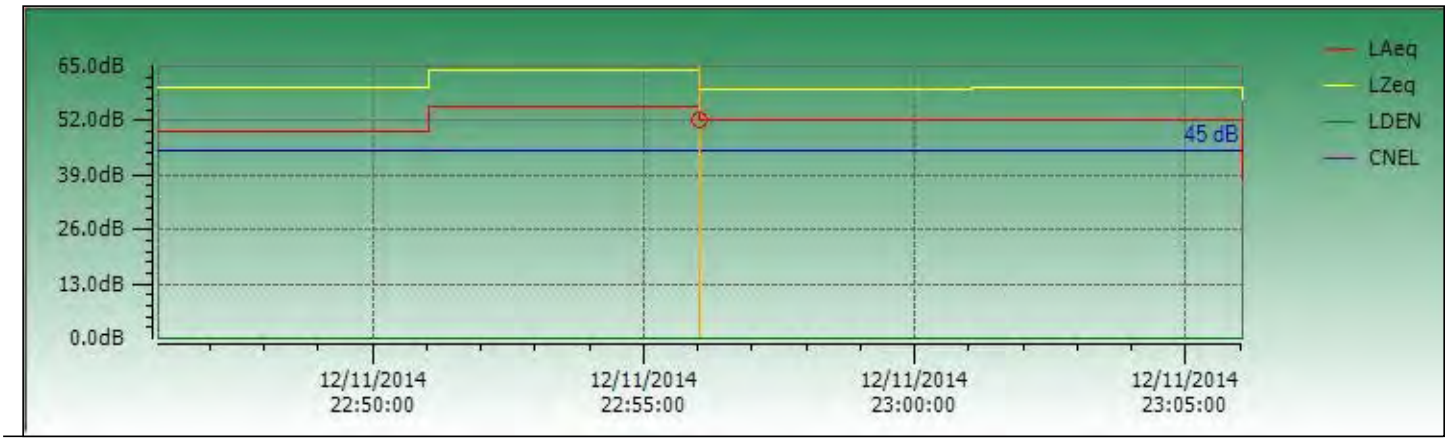
Report On Location 1 Night

Report Sorted/Grouped By: Site(Ascending)

Unallocated

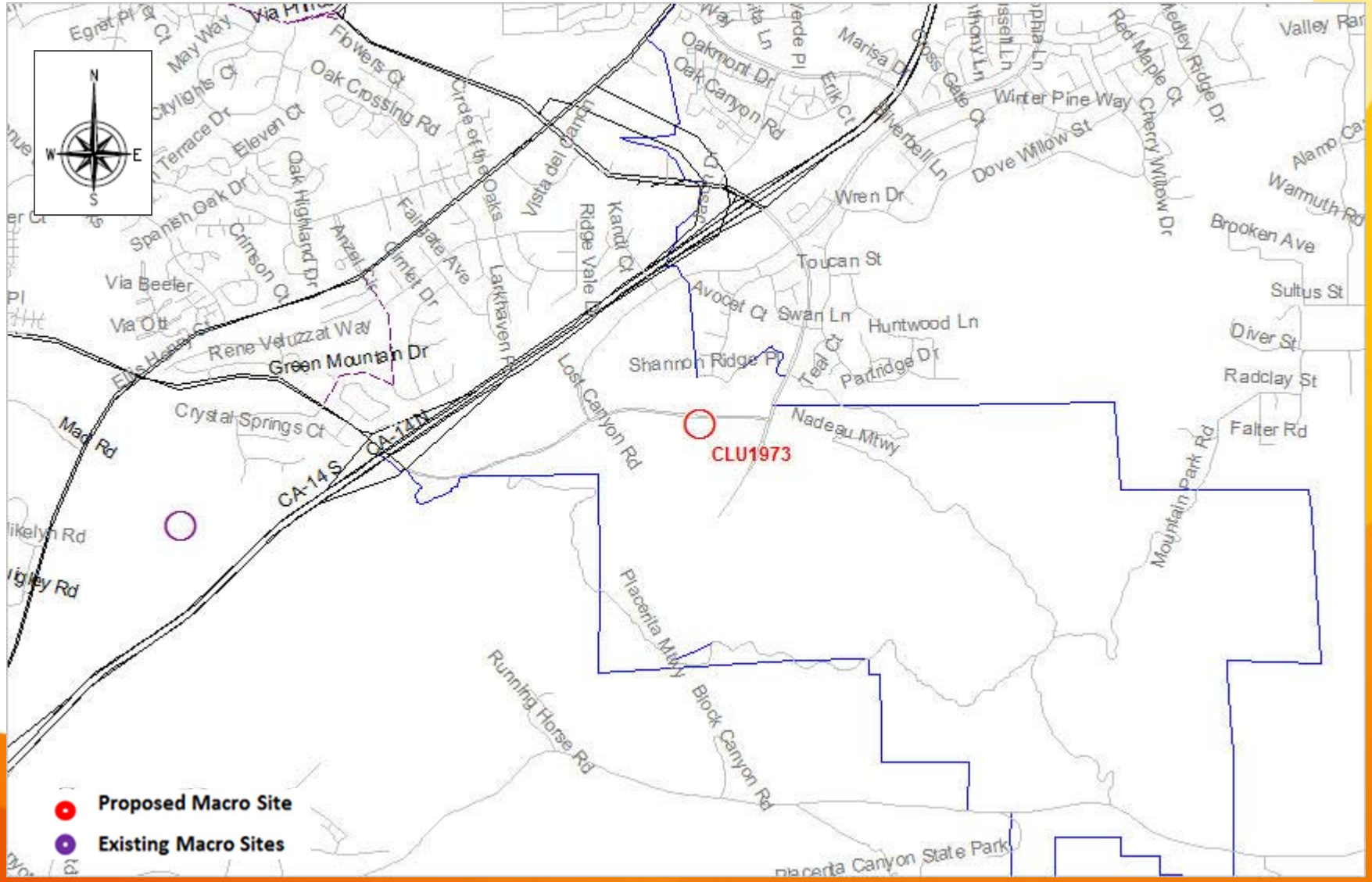
Instrument Model	**CEL-633B**

Duration	00:20:05 HH:MM:SS	Calibration (Before) Offset	-2.65
End Date & Time	11/12/2014 11:06:08 PM	Calibration (Before) SPL	114 dB
Run Number	7	Calibration Drift	0.100000000 dB
Start Date & Time	11/12/2014 10:46:03 PM	LAeq	52.8133 dB
Location	Location 1 Night	LZeq	61.2066 dB
Result	Period	LDEN	0
Calibration (After) Date	11/12/2014 11:19:48 PM	CNEL	0
Calibration (Before) Date	11/12/2014 10:45:03 PM		



Coverage Site: CLU4250

25201 Via Princessa, Santa Clarita, CA 91387

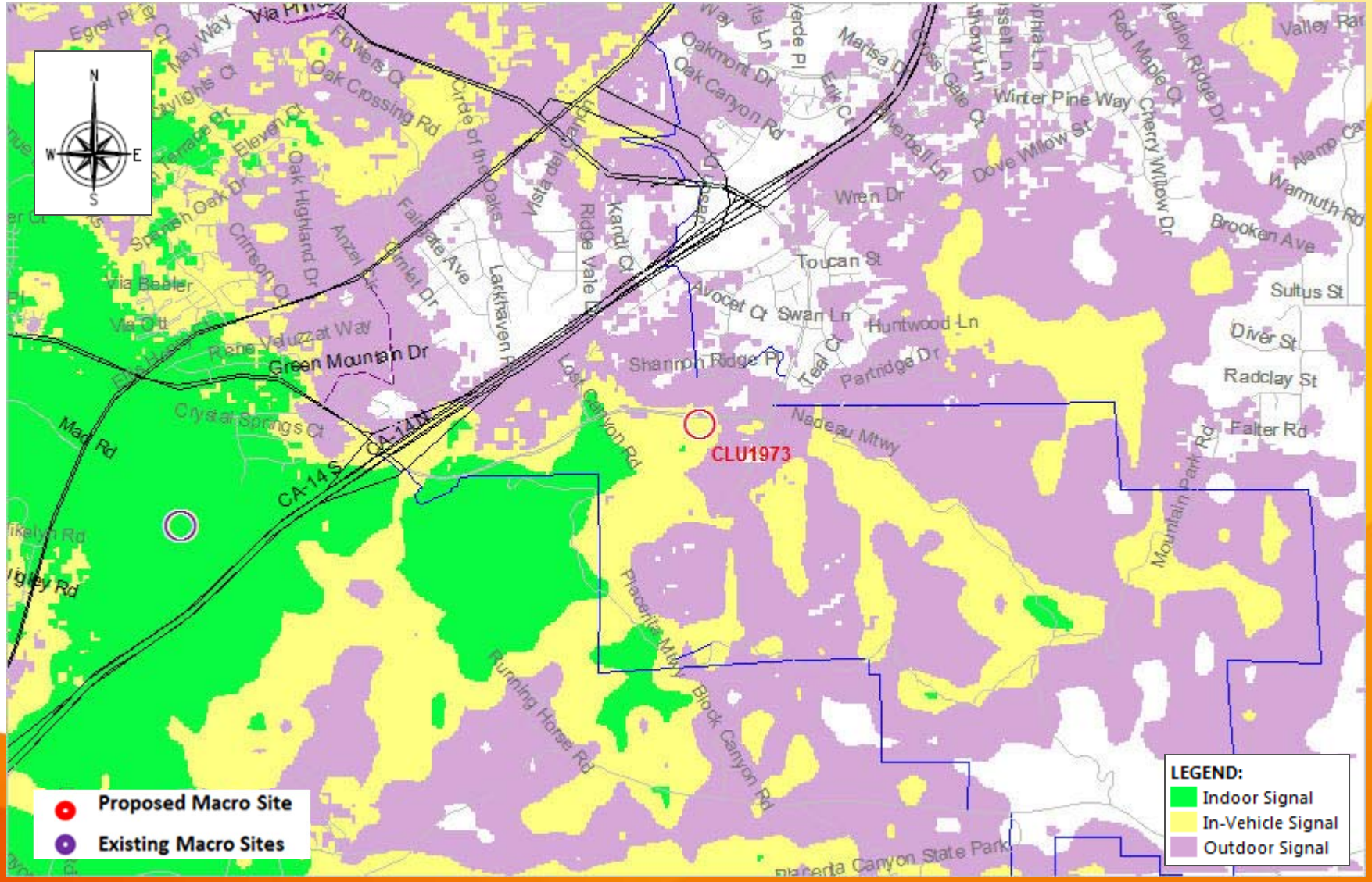


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November 2, 2014

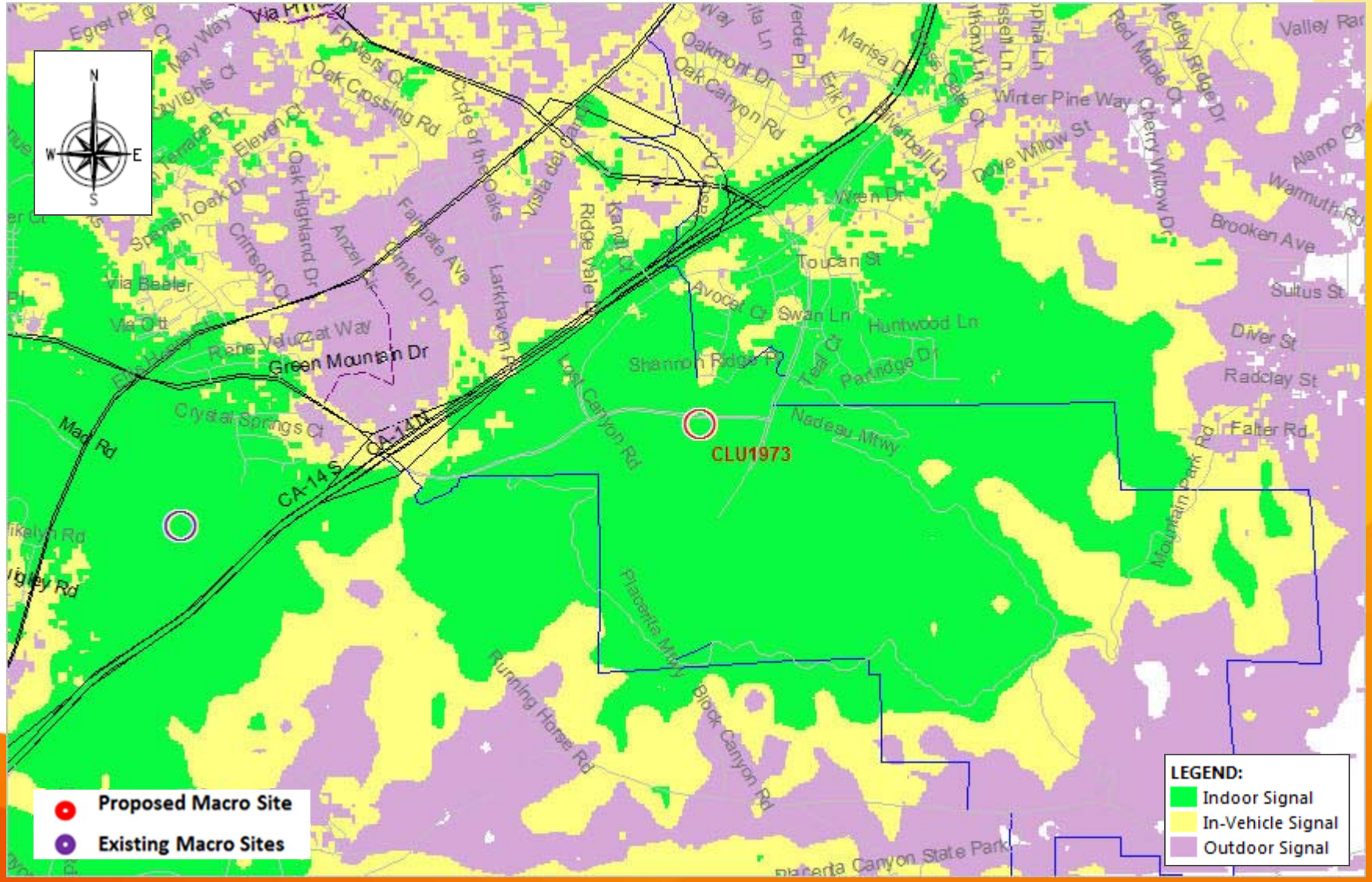
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UMTS Coverage -- Prior to NSB Site CLU4250



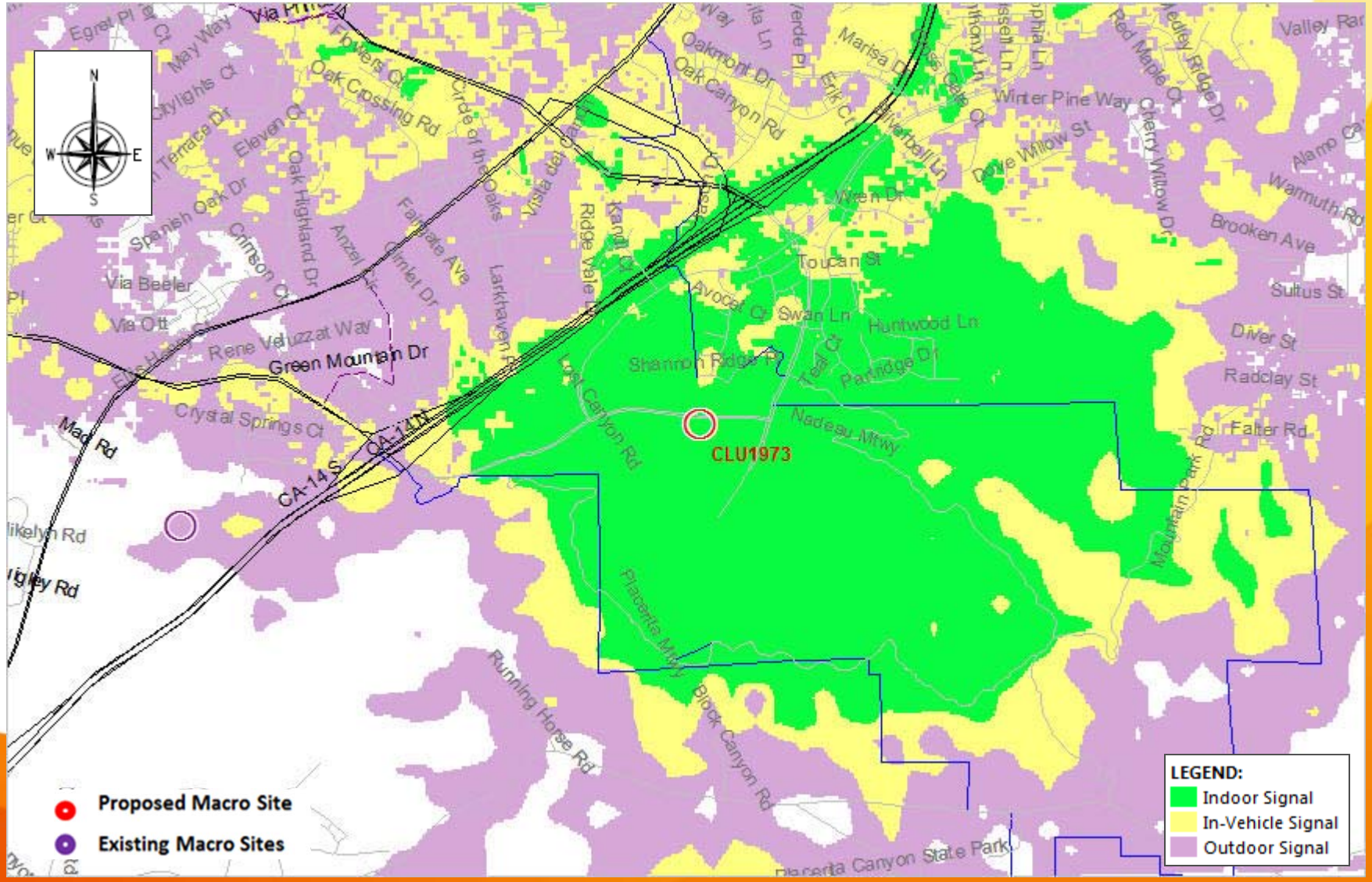
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UMTS Coverage -- with CLU4250 Proposed and Neighboring Sites



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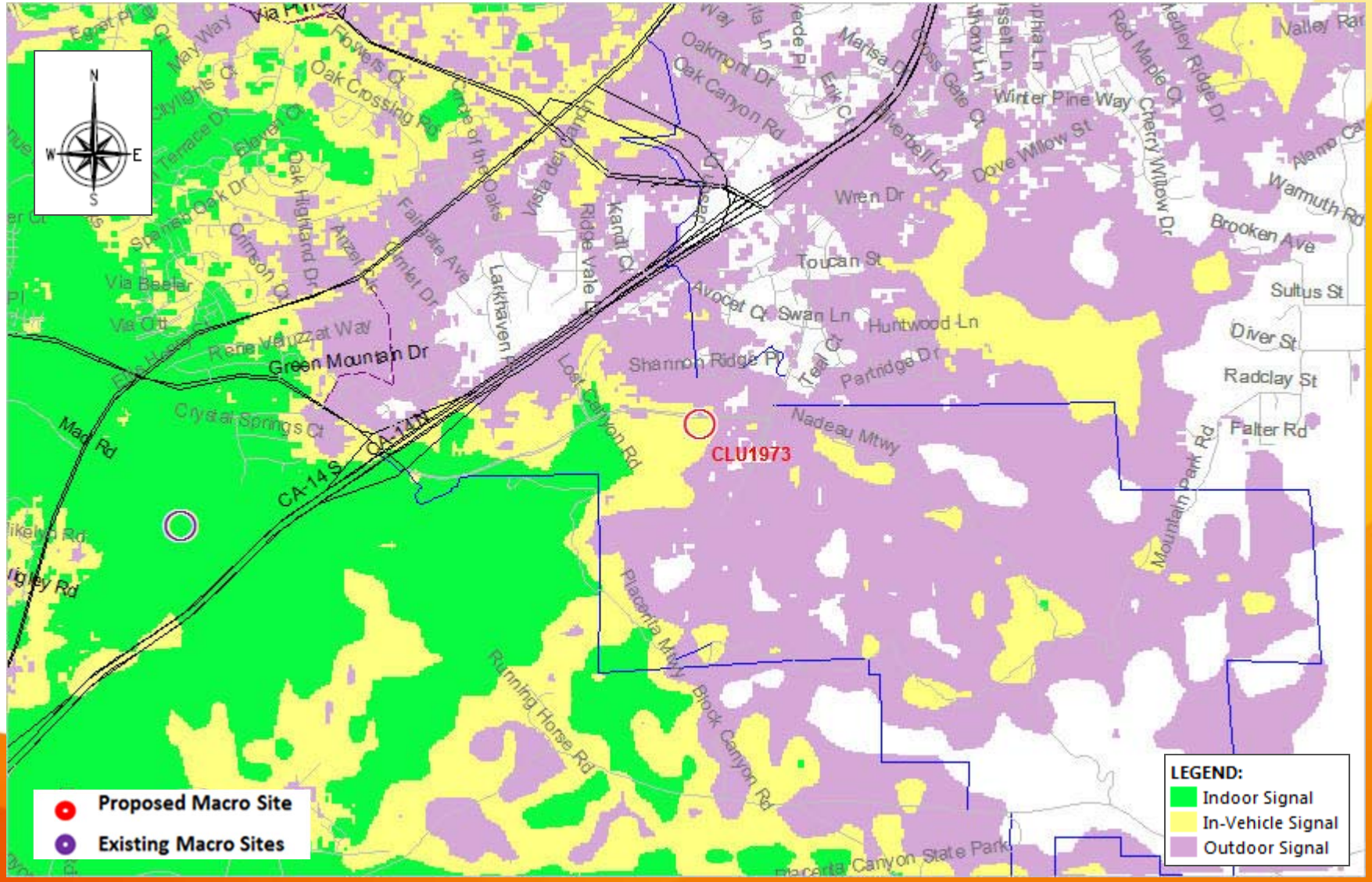
UMTS Coverage – with Site CLU4250 Proposed STANDALONE



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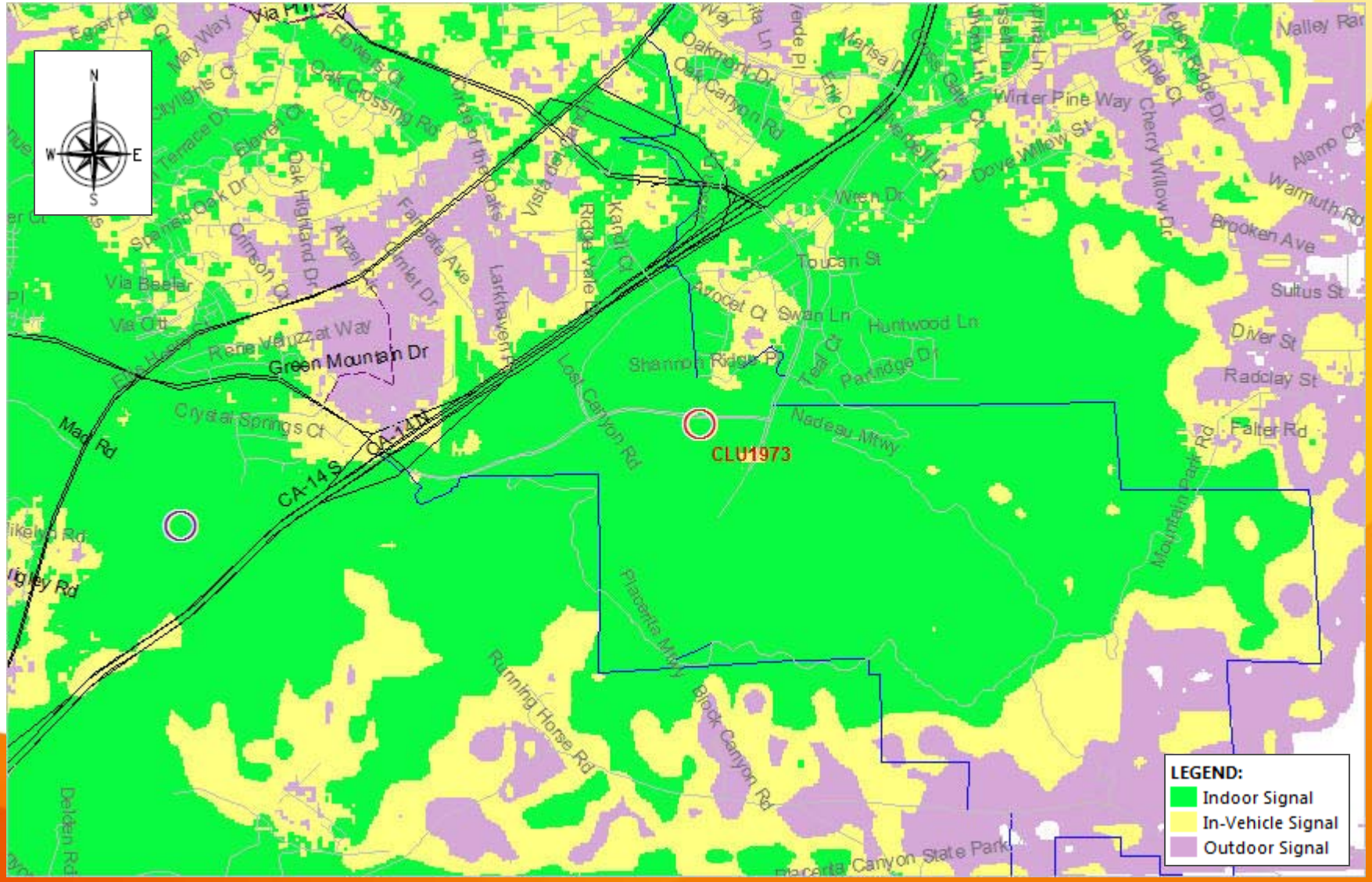
at&t

LTE Coverage – -- Prior to NSB Site CLU4250



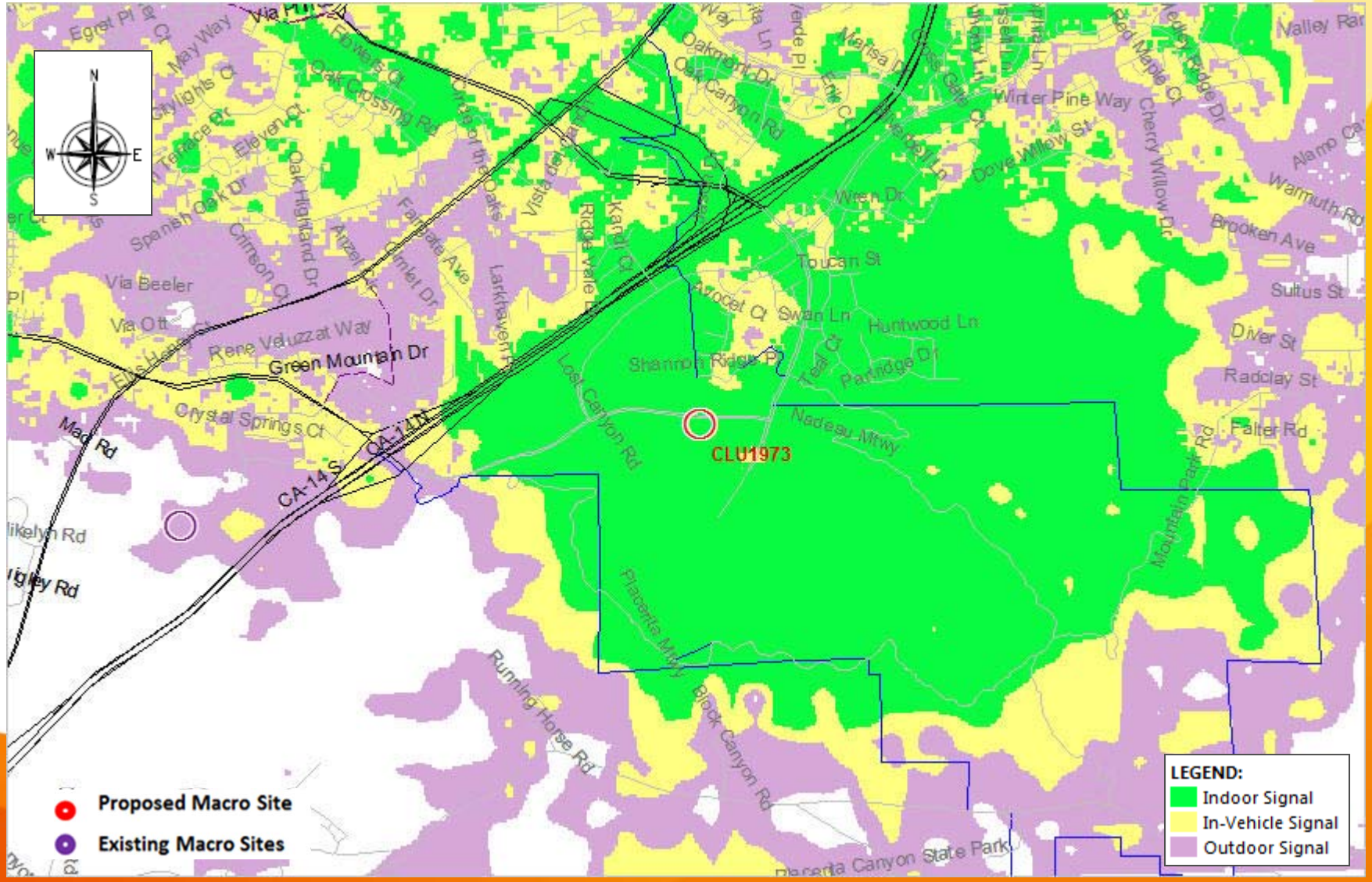
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LTE Coverage -- with CLU4250 Proposed and Neighboring Sites



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LTE Coverage – with Site CLU4250 Proposed STANDALONE



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Coverage Legend

In-Building Service: In general, the areas shown in dark green should have the strongest signal strength and be sufficient for most in-building coverage. However, in-building coverage can and will be adversely affected by the thickness/construction type of walls, or your location in the building (i.e., in the basement, in the middle of the building with multiple walls, etc.)

In-Transit Service: The areas shown in the yellow should be sufficient for on-street or in-the-open coverage, most in-vehicle coverage and possibly some in-building coverage.

Outdoor Service: The areas shown in the purple should have sufficient signal strength for on-street or in-the-open coverage, but may not have it for in-vehicle coverage or in-building coverage.