alpha®

an EnerSys® company

HDN™
High Density Networked DC Distribution
Technical Manual
Effective: April 2020

HDN™ DISTRIBUTION PANEL
High Density Networked DC Distribution

INPUT A
INPUT B
ALARM

alpha®
an EnerSys company
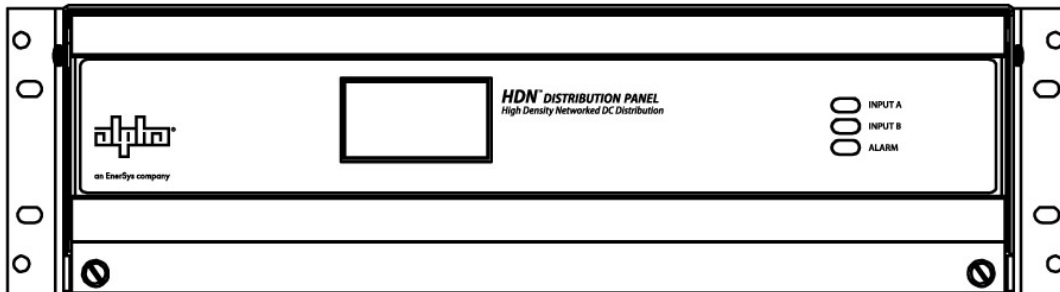
Safety Notes

Alpha Technologies Services, Inc. considers customer safety and satisfaction its most important priority. To reduce the risk of injury or death and to ensure continual safe operation of this product, certain information is presented differently in this manual. Alpha® tries to adhere to ANSI Z535 and encourages special attention and care to information presented in the following manner:

WARNING! GENERAL HAZARD

GENERAL HAZARD WARNING provides safety information to PREVENT INJURY OR DEATH to the technician or user.

WARNING! ELECTRICAL HAZARD

ELECTRICAL HAZARD WARNING provides electrical safety information to PREVENT INJURY OR DEATH to the technician or user.

WARNING! FUMES HAZARD

FUMES HAZARD WARNING provides fumes safety information to PREVENT INJURY OR DEATH to the technician or user.

WARNING! FIRE HAZARD

FIRE HAZARD WARNING provides flammability safety information to PREVENT INJURY OR DEATH to the technician or user.

There may be multiple warnings associated with the call out. Example:

WARNING! ELECTRICAL & FIRE HAZARD

This WARNING provides safety information for both Electrical AND Fire Hazards

CAUTION!

CAUTION provides safety information intended to PREVENT DAMAGE to material or equipment.

NOTICE:

NOTICE provides additional information to help complete a specific task or procedure.

ATTENTION:

ATTENTION provides specific regulatory/code requirements that may affect the placement of equipment and /or installation procedures.

The following sections contain important safety information that must be followed during the installation and maintenance of the equipment and batteries. Read all of the instructions before installing or operating the equipment, and save this manual for future reference.

HDN™
High Density Networked DC Distribution
Technical Manual

C048-692-30 R07, Rev. C

Effective: April 2020

Disclaimer

Images contained in this manual are for illustrative purposes only. These images may not match your installation. Operator is cautioned to review the drawings and illustrations contained in this manual before proceeding. If there are questions regarding the safe operation of this powering system, please contact Alpha Technologies Services, Inc. or your nearest Alpha representative.

Alpha shall not be held liable for any damage or injury involving its enclosures, power supplies, generators, batteries or other hardware if used or operated in any manner or subject to any condition not consistent with its intended purpose or is installed or operated in an unapproved manner or improperly maintained.

Contact Information

Sales information and customer service in USA
(7AM to 5PM, Pacific Time):   1 800 322 5742

Complete Technical Support in USA
(7AM to 5PM, Pacific Time or 24/7 emergency support):   1 800 863 3364

Sales information and Technical Support in Canada: 1 888 462 7487

Website: www.alpha.com

Contents

1.0 Purpose and Applicability

The purpose of this document is to detail the installation and operation instructions for the HDN 300/600 High Density DC Distribution Center.

1.1 Product Model

This document applies to the following configurations of the HDN Compact DC Power Distribution Center:

Table 1. HDN Model Configurations

DESCRIPTION	PART NUMBER
HDN 300; Single Input; 22 AM Breaker Positions; No RTN Bar	C016-1660-10
HDN 300; Single Input; 22 AM Breaker Positions	C016-1661-10
HDN 300; Dual Isolated (A/B) Input; 11A/11B AM Breaker Positions	C016-1662-10
HDN 300; Dual Isolated (A/B) Input; 11A/11B AM Breaker Positions; No RTN Bar	C016-1663-10
HDN 600; Single Input; 22 AM Breaker Positions; No RTN Bar	C016-1720-10
HDN 600; Single Input; 22 AM Breaker Positions	C016-1721-10
HDN 600; Dual Isolated (A/B) Input; 11A/11B AM Breaker Positions	C016-1722-10
HDN 600; Dual Isolated (A/B) Input; 11A/11B AM Breaker Positions; No RTN Bar	C016-1723-10

2.0 Theory of Operation

2.1 Introduction

The HDN is an advanced, high-density DC distribution center for rack-mount telecom and broadband applications. Its robust design distributes power for up to 22 loads. The advanced supervisory control allows local and remote monitoring of not only breaker status, but of individual load current, and input bus current.

2.2 Features

- High-reliability, high-density breaker distribution
- Dual isolated power inputs or single input versions
- Up to 600A maximum total load (model dependent)
- 22 AM breaker positions
- 100A max per breaker position
- Intuitive touchscreen interface
- RGB backlight and bright LEDs indicate status at a glance
- Current monitoring per output
- Form C alarm contacts
- Ethernet module with integrated web Interface and SNMP support (V.1 and V.2)
- Adjustable brackets for 19 in. or 23 in. rack mount installation

3.0 Unpacking and Inspection

The HDN 300/600 High Density DC Distribution Center was carefully packaged at the factory to withstand the normal rigors of shipping. However, you should carefully inspect the box and contents to confirm that no damage has occurred in transit. Most shipping carriers require notification of shipping damage within twenty-four hours of delivery, and it is the responsibility of the recipient to inspect the shipment immediately upon receipt.

3.1 Package Contents

Included with your product are the following items:

- HDN Distribution Panel
- Mounting hardware kit with necessary bolts and washers
- Rear plastic bus bar safety shield

4.0 Installation

The HDN panel can be installed in any standard 19-inch or 23-inch relay rack. The panel itself occupies only 3RU, but it is recommended that space be left free above and below the panel to ease cable routing. It is common to mount the HDN panel at the topmost rack position.

4.1 Installation Preparation

When selecting an installation location, ensure that all of the following conditions are met before proceeding.

4.1.1 Elevated Operating Ambient Temperature

If you install the panel in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, take care to install the equipment in an environment compatible with the maximum ambient temperature (TMA).

4.1.2 Reduced Air Flow

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

4.1.3 Mechanical Loading

Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

4.1.4 Circuit Overloading

Give consideration to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Use appropriate consideration for equipment nameplate ratings when addressing this concern.

4.1.5 Reliable Earthing

Maintain reliable earthing of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

4.1.6 Disconnect Device

A readily accessible disconnect device must be incorporated in the building installation wiring.

4.2 Mounting

✓ ***NOTICE***:

THIS PRODUCT MUST BE INSTALLED WITHIN A RESTRICTED ACCESS LOCATION WHERE ACCESS IS THROUGH THE USE OF A TOOL, LOCK AND KEY, OR OTHER MEANS OF SECURITY, AND IS CONTROLLED BY THE AUTHORITY RESPONSIBLE FOR THE LOCATION. THIS PRODUCT MUST BE INSTALLED AND MAINTAINED ONLY BY QUALIFIED TECHNICIANS.

The HDN can be mounted in a front flush mount configuration or a mid-mount configuration. Depending on the desired configuration, attach the mounting ears accordingly.

Step 1. Orient the rack mount ears appropriately for a 19 or 23 inch rack.

Step 2. For flush mounting, install the rack mount ears using the included Phillips head screws through the two holes near the front of the panel. For mid-mount configuration, use the two holes further back on the sides of the panel.

Step 3. Insert the panel into the rack and attach with included #12-24 rack screws.
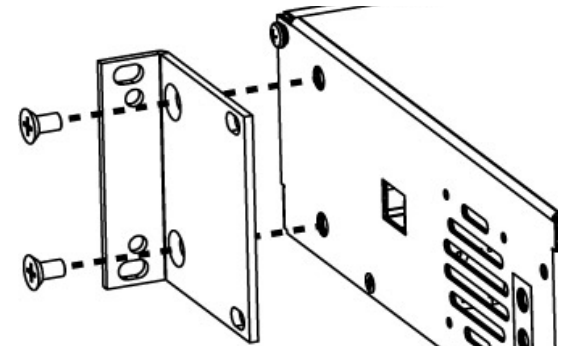
Figure 1. Mounting Ears (19 in. shown)

4.3 Chassis Ground

⚠ CAUTION!

DO NOT ENERGIZE THE PANEL BEFORE CHASSIS GROUND IS CONNECTED.

The chassis ground is located on the side of the panel. A two hole lug landing position is provided. See table below for termination information. A minimum of #6 AWG chassis ground cable is required.

IMPORTANT: Grounding hardware not included. A properly-sized grounding conductor must be installed per NEC (250.122).

Figure 2. Chassis Ground Connection

Table 2. Ground Termination Summary

TERMINATION TYPE	HOLE/ STUD SIZE	CENTER TO CENTER	RECOMMENDED TORQUE VALUE
Threaded Insert	1/4 in.	5/8 in.	8.3 ft·lbs

Step 1. Connect the lug to the chassis with 1/4 in. hardware and tighten. Make sure heat shrink and no-oxide compound are applied appropriately prior to attachment. Recommended Grade 5 Torque Value: 8.3 ft·lbs.

4.4 Input Connections

⚡ WARNING! ELECTRICAL HAZARD

MULTIPLE POWER SOURCES ARE PRESENT, ENSURE ALL INPUT POWER FEEDS ARE NOT ENERGIZED BEFORE INSTALLING THEM. ELECTRICAL INSTALLATION SHOULD ONLY BE PERFORMED BY QUALIFIED PERSONNEL WITH PROPER TOOLS AND PROTECTIVE SAFETY EQUIPMENT.

USE ONLY THE 3/8"-16 X 1" BOLTS, SPLIT WASHERS AND FLAT WASHERS PROVIDED. USE OF ANY OTHER HARDWARE MAY DAMAGE THE PANEL.

✓ NOTICE:

MAKE SURE THAT ALL FEEDER CABLES HAVE HEAT SHRINK APPLIED PRIOR TO TERMINATION, AND THAT NO-OXIDE COMPOUND IS APPLIED TO ALL COPPER-TO-COPPER CONNECTIONS.

SEE SECTION 8 ON PAGE 18 FOR COMPRESSION LUG SPECIFICATIONS, TOOLING, AND ORDERING INFORMATION.

Table 3. Input Termination Information

TERMINATION TYPE	HOLE/ STUD SIZE	CENTER TO CENTER	RECOMMENDED TORQUE VALUE
Through Hole	3/8 in.	Slotted; 5/8 in. - 1 in.	29.2 ft·lbs

Step 1. Install a piece of clear heat shrink tubing (3" diameter x 6" long) over each of the power cables prior to bolting the cable lugs to the bus bars.

Step 2. Connect the incoming DC feeder cables for the A and B power inputs and A and B power returns for the A/B isolated panel. For a single input panel there will be one power input and one return bus bar. Secure the cable lugs to the bus bars with the included 3/8 in. x 1 in. bolts, flat washers and lock washers. The bus bars support lugs with 5/8 in. or 1 in. hole spacing. Recommended Grade 5 Torque Value: 29.2 ft·lbs.

4.5 Alarm Connections

The HDN features two 8p8c modular jacks (RJ-45) for alarm connections on the rear of the panel. The alarm contact pinout is below:

Table 4. Alarm Contact Pinout

PIN 1	PIN 2	PIN 3	PIN 4-8
COM	NC	NO	Reserved

The two jacks allow for easy daisy-chaining with UTP patch cables. If daisy-chaining, the NO (normally open) condition must be monitored.

4.6 Output Connections

⚠️ **CAUTION!**

DO NOT PERFORM THIS STEP ON CIRCUITS WITH BREAKERS INSTALLED. ENSURE NO POWER IS PRESENT ON THE CIRCUIT BEING WIRED BEFORE PROCEEDING.

✔ *NOTICE*:

MAKE SURE THAT ALL CABLES HAVE INSULATED TERMINALS OR HEAT SHRINK APPLIED PRIOR TO TERMINATION, AND THAT NO-OXIDE COMPOUND IS APPLIED TO ALL COPPER-TO-COPPER CONNECTIONS.

SEE SECTION 8 ON PAGE 18 FOR COMPRESSION LUG SPECIFICATIONS, TOOLING, AND ORDERING INFORMATION.

Table 5. Output Termination Information

TERMINATION TYPE	HOLE/ STUD SIZE	CENTER TO CENTER	RECOMMENDED TORQUE VALUE
Threaded Stud	1/4 in.	5/8 in.	8.3 ft·lbs

Step 1. Land the return cable lug to its corresponding position on the return bus bar, then land the hot cable lug to the corresponding position below.

4.7 Rear Safety Cover Installation

⚡ **WARNING! ELECTRICAL HAZARD**

FAILURE TO INSTALL THE PLASTIC SAFETY SHIELDS PROPERLY MAY CREATE AN ELECTRICAL HAZARD. THE PANEL MAY BE ENERGIZED WHEN INSTALLING THE REAR PLASTIC SAFETY COVERS.

The HDN includes a rear safety cover which is to be installed around the rear electrical terminations. The cable knockout points in the plastic will need to be trimmed to match your input/output cable configuration. Once this has been completed, proceed to the following steps:

Step 1. Install the included #8-32 panhead screws into the threaded holes on the sides of the panel.

Step 2. Slide the cover onto the screws installed, then tighten down the screws to secure the cover.

4.8 Installing Circuit Breakers

> ✓ **NOTICE**:
> SEE SECTION 8 ON PAGE 18 FOR CIRCUIT BREAKER ORDERING INFORMATION.

Step 1. Turn the captive mounting screws counterclockwise and lift the front panel.

Step 2. Slide a circuit breaker of sufficient ampacity into the position corresponding to the output channel to be fed.

NOTE: When viewing from the front of the panel, from left to right, the lower channel positions begin on the left and are counted upwards as you move right.

> ⚡ **WARNING! ELECTRICAL HAZARD**
> ENSURE THAT CIRCUIT BREAKERS ARE ORIENTED SUCH THAT THE "ON" POSITION IS AT THE TOP.

Step 3. Push all installed circuit breakers firmly to ensure the terminals are fully seated in their sockets.

5.0 Operation

5.1 How to Review System Status via Display LEDs

The HDN features bright front panel LEDs that allow for the overall panel status to be determined at a glance.

5.1.1 Power Input A

This LED will illuminate BLUE when power is present on the A input.

5.1.2 Power Input B (Dual Input Models Only)

This LED will illuminate BLUE when power is present on the B input.

5.1.3 Alarm

This LED will illuminate RED if a breaker has tripped or if any other alarm condition exists. Under normal conditions this light is not illuminated.

6.0 Supervisory Controller

The HDN panel uses a touchscreen user interface. Interact with the touchscreen by using your fingertip, a stylus, or a capped pen to touch the display and select status information, or to access the menu. In addition to the status LEDs, the backlight of the LCD will change color based on the status of the panel (see 6.5 Operating Conditions on Page 14).

6.1 Home Screen Information

The home screen displays input bus voltage, input bus current, inventoried breakers, and alarm conditions. There are multiple home screens depending on which HDN model is installed (see below). Touch any item on the home screen to access their submenus and displays. Touch the main display area to cycle between home screens.

6.1.1 Home Screens - Single Input Models

1. Input Voltage & Bus Load with a bar graph displaying total load (see Figure 3).

2. Bar graphs showing the total load of all 22 breaker channels. Breakers which are inventoried will be shaded on the bottom of the display (see Figure 4).

6.1.2 Home Screens - Dual Input Models

1. Input Voltage & Bus Load for A & B inputs.

2. Bar graph of the A & B total load.

3. Bar graphs showing the total load of all 22 breaker channels. Breakers which are inventoried will be shaded on the bottom of the display.

6.2 Initial Operation

6.2.1 Breaker Inventory

IMPORTANT: Make sure that all breakers to be inventoried are turned "ON".

Step 1. From the Home Screen, go to the Breakers menu (Settings > Breakers).

Step 2. Select "Take Inventory". All installed and active breakers will be displayed. Follow the on-screen prompts to complete the inventory process (see Figure 5).

6.2.2 Set Breaker Ampacity

From the Breaker menu (Settings > Breakers), set the breaker ampacity by tapping on any of the three number boxes to change the number. The default set ampacity is 100A, which is also the maximum ampacity for an installed single-pole breaker (see Figure 6). 2-pole breakers can be adjusted to a maximum of 200A, and 3-pole breakers support a maximum of 300A. To toggle the number of breaker poles, tap the numbered breaker position on the screen. The display will change to indicate the set number of poles, and which positions are occupied. See Figure 7, which displays circuits B03-05 managed by a 3-pole breaker. NOTE: The position of a multi-pole breaker will be the furthest left position occupied (for example, if a breaker occupies A02-04, the breaker will be identified as Breaker A02).
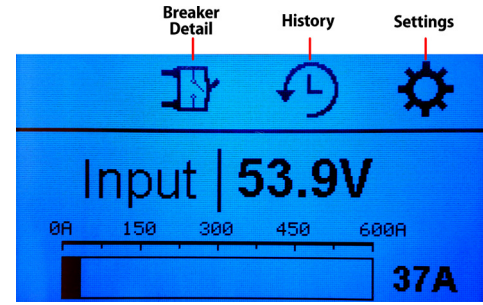

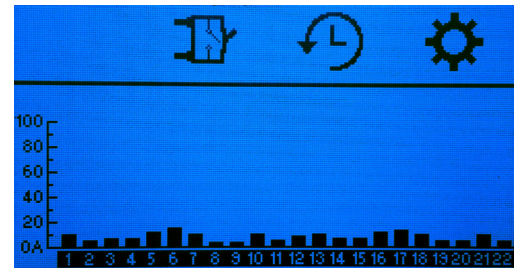Figure 3. Home Screen - HDN Single Input

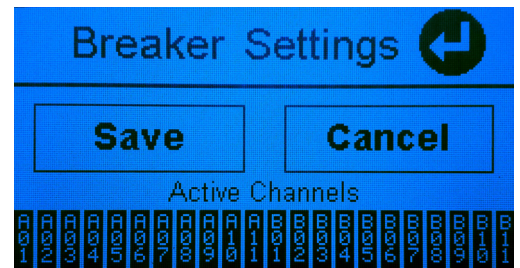Figure 4. Bar Graph Home Screen - HDN Single Input
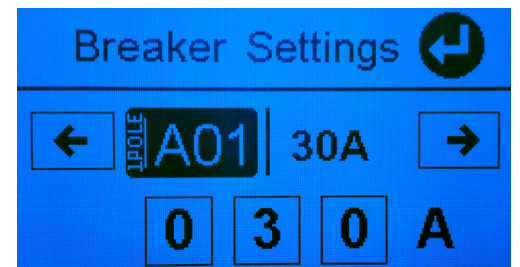

Figure 5. Breaker Inventory

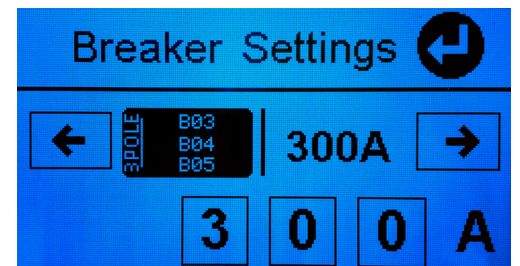Figure 6. Setting Breaker Ampacity

Figure 7. Setting a Multi-Pole Breaker

6.2.3 Warning and Alarm Threshold

From the Breaker menu (Settings > Breakers), set the alarm threshold to any value between 75% and 100% (see Figure 8). This is the amount of breaker utilization which will trigger an overcurrent alarm. A local warning will be sent at 10% less than the set alarm threshold. The default is 80%.

NOTE: This threshold is configured by default to monitor as a redundant panel. It sums the current between the corresponding A and B side outputs.
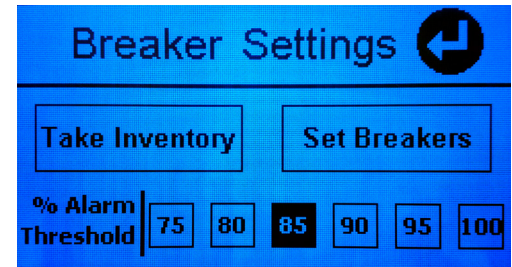
6.2.4 Set Date/Time and Data Log

Access the Data Log menu (Settings > Advanced > Data Log) and select "Date/Time". You can also set the rate in which data is collected on the SD card. The default rate is every 15 minutes. To change the collection rate, go to the Data Log and select "Set Rate".

NOTE: If these actions are not performed, data will not be stored on the SD card.

6.3 Main Menu

6.3.1 Alarm/Warnings Menu

The color of the screen indicates the condition of the panel at a glance. A red screen indicates a critical alarm is present, and orange indicates a warning condition. An alarm icon will be present for both alarm and warning conditions. Press this icon to access the alarm logs, review logs, and to silence the audible alarm locally (see Figure 9).

6.3.2 History

From the History menu, data on voltage and current for busses and individual channels can be accessed (see Figure 10).

6.3.3 Breaker Detail

Shows detailed information about each channel. Cycle through the breakers by touching the left and right arrows on the screen (see Figure 11).

6.4 Settings

6.4.1 System Settings

The following settings are configured in Systems Settings:

- Redundant Monitor (Yes or No, Default Yes)
- Firmware Number Display (on second page)
- Default Home Screen
- Preferred Bar Graph units (Percent Full Load, or Load in Amps)

6.4.2 Breaker Settings

- Take Inventory
- Set Breakers (Set channel ampacity, default is 100A)
- % Alarm Threshold (Warning threshold is -10% from alarm threshold. Default alarm threshold is 80%)

Figure 8. Breaker Settings Menu

Figure 9. Alarm Condition

Figure 10. History

Figure 11. Breaker Detail

6.4.3 Calibration Settings

IMPORTANT: DO NOT adjust any Calibration Settings without direct instruction from Alpha Technologies.

6.4.4 Advanced Settings

- **Memory**
  - **Settings** - Clear settings to factory default. IMPORTANT: Do not perform this function without direction from Alpha Personnel!
  - **Calibration** - Clears calibration. IMPORTANT: Do not perform this function without direction from Alpha Personnel!
  - **EEPROM** - This clears the EEPROM. IMPORTANT: Do not perform this function without direction from Alpha Personnel!
  - **SD Card** - This clears the memory from the on-board SD card.
- **Display** - Allows calibration of display settings such as contrast and touch calibration.
- **Test Modes** - Contains various test settings such as breaker trip and alarm testing which can be useful during installation or for troubleshooting.
- **Data Log**
  - Set Date and Time (NOTE: If Date/Time is not set, data will not be recorded to the SD card)
  - Set Data Sample Rate (Default is every 15 min)

6.5 Operating Conditions

The HDN Supervisory Controller features colored backlit displays, graphic icons and audible alarms to indicate its current operating condition(s).

6.5.1 Normal Condition

A blue screen indicates normal operating conditions.

6.5.2 Warning Condition

A warning condition will only be visible locally and will not cause an alarm contact closure or trigger an SNMP trap. It is denoted on the Supervisory Controller display by an orange screen and the presence of the Alarm/Warning symbol in the upper left hand corner of the home screen (see Figure 12).

Please note that the bus and channel names given below may differ depending on the bus(ses) and/or channel(s) being affected.

NOTE: For multi-pole breakers, the warning condition will show for the primary position (Example: If a two-pole breaker in positions A02-A03 is in warning, then a warning alarm will show for position A02)

Figure 12. Warning Condition

Breaker Overload | A1

This warning will occur when a channel is 10% below the set channel over-current threshold. This threshold is configured in the breaker settings menu (see 6.4.2 Breaker Settings on Page 13).
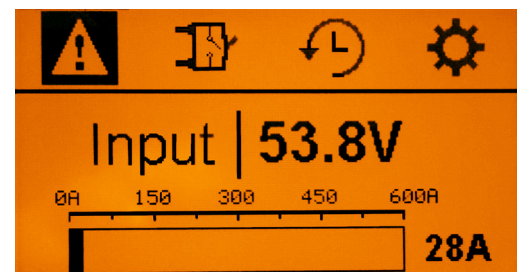
A-B Redundant Warn

This warning indicates that the summed load of busses A and B and are approaching the over-current threshold for one bus. This warning occurs at 10% below the bus over-current threshold.

NOTE: This alarm only occurs when the redundant monitoring feature is enabled. Redundant monitoring is enabled by default (see 6.4.1 System Settings on Page 13).

A1-B1 Redundant Warn

This warning indicates that the summed load of two redundant channels has reached over-current threshold. Redundant channels are channels with the same number value, such as A1 and B1 in a dual input panel, or corresponding channels in paired single input panels.

This threshold can be configured in the breaker setting menu (see 6.4.1 System Settings on Page 13).

Current Sensor Fail

This warning indicates there is an issue with an internal sensor or its circuitry. Try to reset the controller using the reset switch on the left-hand side of the controller. If the warning persists, contact Alpha support for more information and diagnostic steps.

IMPORTANT: Resetting the controller will reset the clock. If you do this, be sure to set the date/time again (see 6.4.4 Advanced Settings on Page 14 for information on setting the date/time).

6.5.3 Alarm Conditions

A red screen indicates that one of the following alarm conditions are present. These are critical alarm conditions that will annunciate locally as well as trigger alarm contact closures and trigger SNMP traps.

Breaker Trip

Occurs if any inventoried breaker trips for any reason.

NOTE: For multi-pole breakers, a breaker trip alarm will show for all occupied positions (Example: If a two-pole breaker in positions A02-A03 is in breaker trip alarm, then an alarm will show for positions A02 and A03)

Non-Inventoried Breaker

Occurs if a breaker is turned on and is not inventoried. To fix this, perform a breaker inventory to add all active channels to inventory (see 6.2.1 Breaker Inventory on Page 12).

Bus Overcurrent

Occurs when a bus exceeds its current alarm threshold. The threshold is set to 80% by default.

High Input Voltage

Alarm is triggered when input voltage exceeds 56V.

Low Input voltage

Alarm is triggered when input voltage drops below 47V.

6.6 Review System Status via the Embedded Web Server

The embedded ethernet module provides remote monitoring via IP-based ethernet networks and a web browser. To view the system status, you will need to connect the ethernet port on the rear of your HDN to your network. By default, the ethernet module is configured from the factory with a static IP address and network settings, as defined below.

6.6.1 Default Static Network Settings

Use these default settings to set up a local network to communicate with the embedded web server:

- **IPV4 Address:** 192.168.123.123
- **Subnet Mask:** 255.255.255.0
- **Default Gateway:** 192.168.123.1
- **Default DNS:** 192.168.123.1
- **Secondary DNS:** 8.8.8.8

Once you establish a connection to the embedded ethernet module, use the following credentials to gain access to the protected data and administrative pages:

- **Username:** root
- **Password:** password

6.6.2 Navigating the Web Server

Once you access the web server you will be able to review the status of the HDN panel. You can also access and change notification, network, and other settings via the Administration Settings tab.

6.6.3 Real-Time Status

Upon loading the HDN web server, the real-time status will be displayed.

Site Information

User can configure these settings under Administration --> Site Settings.
- Site name
- Site location

Input Voltage

- Input voltage (per bus)

Total Bus Load

- A bus load only (single input); A and B bus load (dual input)

A Bus Load

- For single input configurations, A bus load displays channels A01-A22
- For dual input configurations, A bus load displays channels A01-A11

B Bus Load (Dual Input Only)

- B bus load displays channels B01-B11

6.6.4 Administration Home

When accessing the web server for first time, it is necessary to configure the administration settings. Click on the "Administration" tab to access these settings.

Notification Settings

Alert Email Settings

- Enable/disable breaker trip alerting
- Enable/disable threshold alerting
- Enable email notification, SNMP trap notification or both
- Set email notifications per alert
- Set notification rate in minutes

Email & SNMP Settings

Configure SNMP Settings

- SNMP trap source address: 192.168.123.123
- SNMP trap destination address 1: 0.0.0.0
- SNMP trap destination address 2: 0.0.0.0
- Community string: public

Note: module will require reboot when SNMP settings are changed.

Configure email settings

- Outgoing SMTP server: smtp.example@example.com
- Email server port: 25
- User name (email address): default@example.com
- Password: •••••••••
- Recipient(s): sample@example.com

Note: SMTP server must be configured on port 25.

Site Settings

Confgure Site Settings

- Site name
- Site location

Network Settings

Network Configuration Settings

- IP v4 settings

    To update IP v4 settings:

    Step 1. Enter IP in "IP v4 Address" field, then click "Apply".

    Settings have been saved. You must reboot for changes to take effect. To do this:

    Step 2. Click "Administration" tab at top of page, the click "Reboot Device"

- IP v6 settings

Upload Firmware

Follow the instructions on this page to upgrade the firmware on your embedded ethernet module.

Reboot Device

This page allows the user to reboot the embedded Ethernet module while not disrupting normal operation of power equipment.

7.0 Product Specifications

Table 6. Technical Specifications Per Model (HDN 300)

	C016-1660-10, C016-1661-10 (HDN 300)	C016-1662-10, C016-1663-10 (HDN 300)
Type of Input	Single Input	A/B Isolated Input
Circuits	22	22 (11A/11B)
Input Voltage	-48VDC	-48VDC
Input Current	300A Max	300A Max
Maximum AM Breaker Size	100A	100A
Maximum per Circuit Current (AM Breaker)	100A	100A
Max Operating Altitude	2000m	2000m
Max Ambient Temperature	45° C	45° C
Width	17 in.	17 in.
Height	5.25 in. (3RU)	5.25 in. (3RU)
Depth	12.5 in.	12.5 in.

Table 7. Technical Specifications Per Model (HDN 600)

	C016-1720-10, C016-1721-10 (HDN 600)	C016-1722-10, C016-1723-10 (HDN 600)
Type of Input	Single Input	A/B Isolated Input
Circuits	22	22 (11A/11B)
Input Voltage	-48VDC	-48VDC
Input Current	600A Max	600A Max
Maximum AM Breaker Size	100A	100A
Maximum per Circuit Current (AM Breaker)	100A	100A
Max Operating Altitude	2000m	2000m
Max Ambient Temperature	45° C	45° C
Width	17 in.	17 in.
Height	5.25 in. (3RU)	5.25 in. (3RU)
Depth	12.5 in.	12.5 in.

Table 8. Agency Certifications

UL	
UL File Number	E473904
UL Standard	ANSI/UL 60950-1

8.0 Models and Accessories

Table 9. HDN Model Configurations

DESCRIPTION	PART NUMBER
HDN 300; Single Input; 22 AM Breaker Positions; No RTN Bar	C016-1660-10
HDN 300; Single Input; 22 AM Breaker Positions	C016-1661-10
HDN 300; Dual Isolated (A/B) Input; 11A/11B AM Breaker Positions	C016-1662-10
HDN 300; Dual Isolated (A/B) Input; 11A/11B AM Breaker Positions; No RTN Bar	C016-1663-10
HDN 600; Single Input; 22 AM Breaker Positions; No RTN Bar	C016-1720-10
HDN 600; Single Input; 22 AM Breaker Positions	C016-1721-10
HDN 600; Dual Isolated (A/B) Input; 11A/11B AM Breaker Positions	C016-1722-10
HDN 600; Dual Isolated (A/B) Input; 11A/11B AM Breaker Positions; No RTN Bar	C016-1723-10

Table 10. Accessories

DESCRIPTION	PART NUMBER
1-Pole output lug adapter; 45 degree	C590-783-10
1-Pole output lug adapter; 90 degree	C590-784-10
2-Pole output lug adapter; 45 degree	C590-781-10
2-Pole output lug adapter; 90 degree	C590-782-10
3-Pole output lug adapter; 45 degree	C590-806-10
3-Pole output lug adapter; 90 degree	C590-807-10

Table 11. Supported Lugs for Chassis Ground Connections

WIRE GAUGE	ALPHA PART NUMBER	MANUFACTURER	MANUFACTURER PART NUMBER	CRIMP DIE REQUIRED
#6	C538-094-10	Burndy	YAZV6C2TC14FX, Blue, 7	Burndy U5CRT, W5CVT, W5CRT, X5CRT
#4	C538-085-10	Burndy	YAZV4C2TC14FX, Gray, 8	Burndy U4CRT, W2CVT, W2CRT, X2CRT
#2	C538-089-10	Burndy	YAZV2C2TC14FX, Brown, 10	Burndy U4CRT, W2CVT, W2CRT, X2CRT

Table 12. Supported Lugs for Input Connections

WIRE GAUGE	ALPHA PART NUMBER	MANUFACTURER	MANUFACTURER PART NUMBER	CRIMP DIE REQUIRED
4/O AWG	C538-102-10	Burndy	YAZV282TC38FX	Burndy U28RT, W28VT, W28CRT, X28RT
4/O AWG	C538-133-10	Burndy	YAV28L2TC38FX	Burndy U28RT, W28VT, W28RT, X28RT
4/O AWG	C538-220-10	Burndy	YAV28L2NT38FX	Burndy U28RT, W28VT, W28RT, X28RT
4/O AWG	C538-221-10	Burndy	YAZV282NT38FX	Burndy U28RT, W28VT, W28RT, X28RT
4/O AWG	C538-245-10	Burndy	YAV29L2NT38FX	Burndy U29RT, W29VT, W29RT, X29RT
350 MCM	C538-070-10	Burndy	YAZ342NT38FX	Burndy U32RT, W32VT, W32RT
350 MCM	C538-118-10	Burndy	YA34L2TC38FX	Burndy U32RT, W32VT, W32RT
500 MCM	C538-072-10	Burndy	YAZ382NT38FX	Burndy U38XRT
500 MCM	C538-131-10	Burndy	YA38L2NT38FX	Burndy U38XRT
750 MCM	C538-073-10	Burndy	YAZ442NT38FX	Burndy U44XRT

WIRE GAUGE	ALPHA PART NUMBER	MANUFACTURER	MANUFACTURER PART NUMBER	CRIMP DIE REQUIRED
750 MCM	C538-138-10	Burndy	YA44L2NT38FX	Burndy U44XRT

Table 13. Supported Lugs for Output Connections

WIRE GAUGE	ALPHA PART NUMBER	MANUFACTURER	MANUFACTURER PART NUMBER	CRIMP DIE REQUIRED
#8 AWG	C538-018-10	Burndy	YAZ8C2TC14FX, Red, 49	Burndy U8CRT, W8CVT, W8CRT, X8CRT
#6 AWG	C538-094-10	Burndy	YAZV6C2TC14FX, Blue, 7	Burndy U5CRT, W5CVT, W5CRT, X5CRT
#6 AWG	C538-165-10*	Burndy	YAZV6C2TC14FX90, Blue, 7	Burndy U5CRT, W5CVT, W5CRT, X5CRT
#4 AWG	C538-085-10	Burndy	YAZV4C2TC14FX, Gray, 8	Burndy U4CRT, W2CVT, W2CRT, X2CRT
#2 AWG	C538-173-10	Burndy	YAV2CL2NT14FX, Brown, 10	Burndy U2CRT, W4CVT, W4CRT, X4CRT
#2 AWG	C538-275-10	Burndy	YAV2CL2NT14FX90, Brown, 10	Burndy U2CRT, W4CVT, W4CRT, X4CRT
#2 AWG	C538-284-10	Burndy	YAZV2C2NT14FX90, Brown, 10	Burndy U2CRT, W4CVT, W4CRT, X4CRT

Appendix A: Mechanical Drawings

A.1 HDN 300 Single Input; No RTN (C016-1660-10)
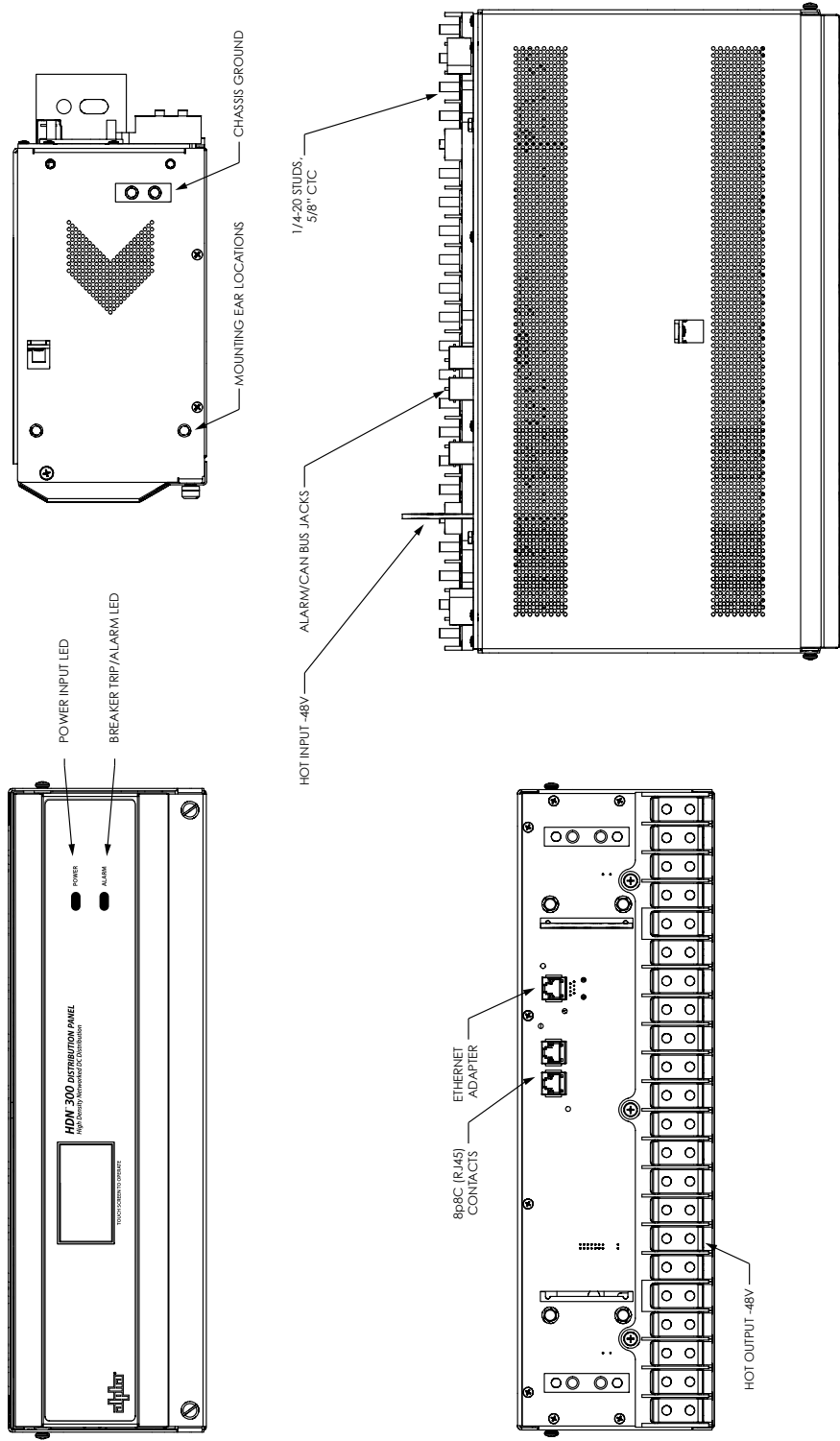
A.2 HDN 300 Single Input (C016-1661-10)

CHASSIS GROUND

MOUNTING EAR LOCATIONS

1/4-20 STUDS, 5/8" CTC

ALARM/CAN BUS JACKS

HOT INPUT -48V

POWER INPUT LED

BREAKER TRIP/ALARM LED

POWER

ALARM

HDN 300 DISTRIBUTION PANEL
High Density Networked DC Distribution

TOUCH SCREEN TO OPERATE

alpha

ETHERNET ADAPTER

8p8C (RJ45) CONTACTS

OUTPUT RETURNS +48V

HOT OUTPUT -48V
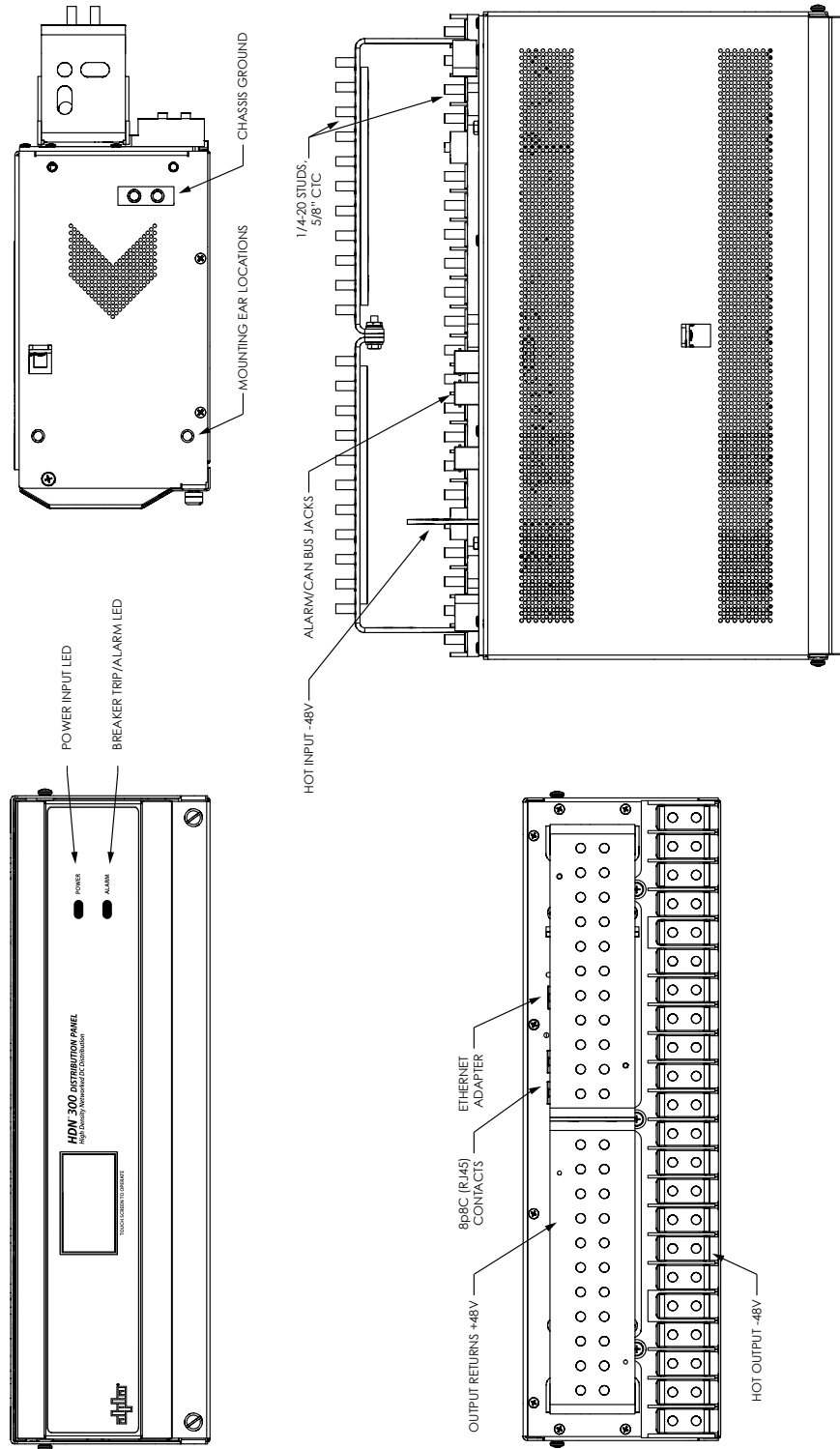
A.3 HDN 300 Dual Input (C016-1662-10)

CHASSIS GROUND

MOUNTING EAR LOCATIONS

1/4-20 STUDS, 5/8" CTC

B HOT INPUT -48V

ALARM/CAN BUS JACKS

A HOT INPUT -48V

A POWER INPUT LED

B POWER INPUT LED

BREAKER TRIP/ALARM LED

INPUT A   INPUT B   ALARM

HDN 300 DISTRIBUTION PANEL
High Density Networked DC Distribution

TOUCH SCREEN TO OPERATE

alpha

ETHERNET ADAPTER

8p8C (RJ45) CONTACTS

OUTPUT RETURNS +48 V

HOT OUTPUT -48 V
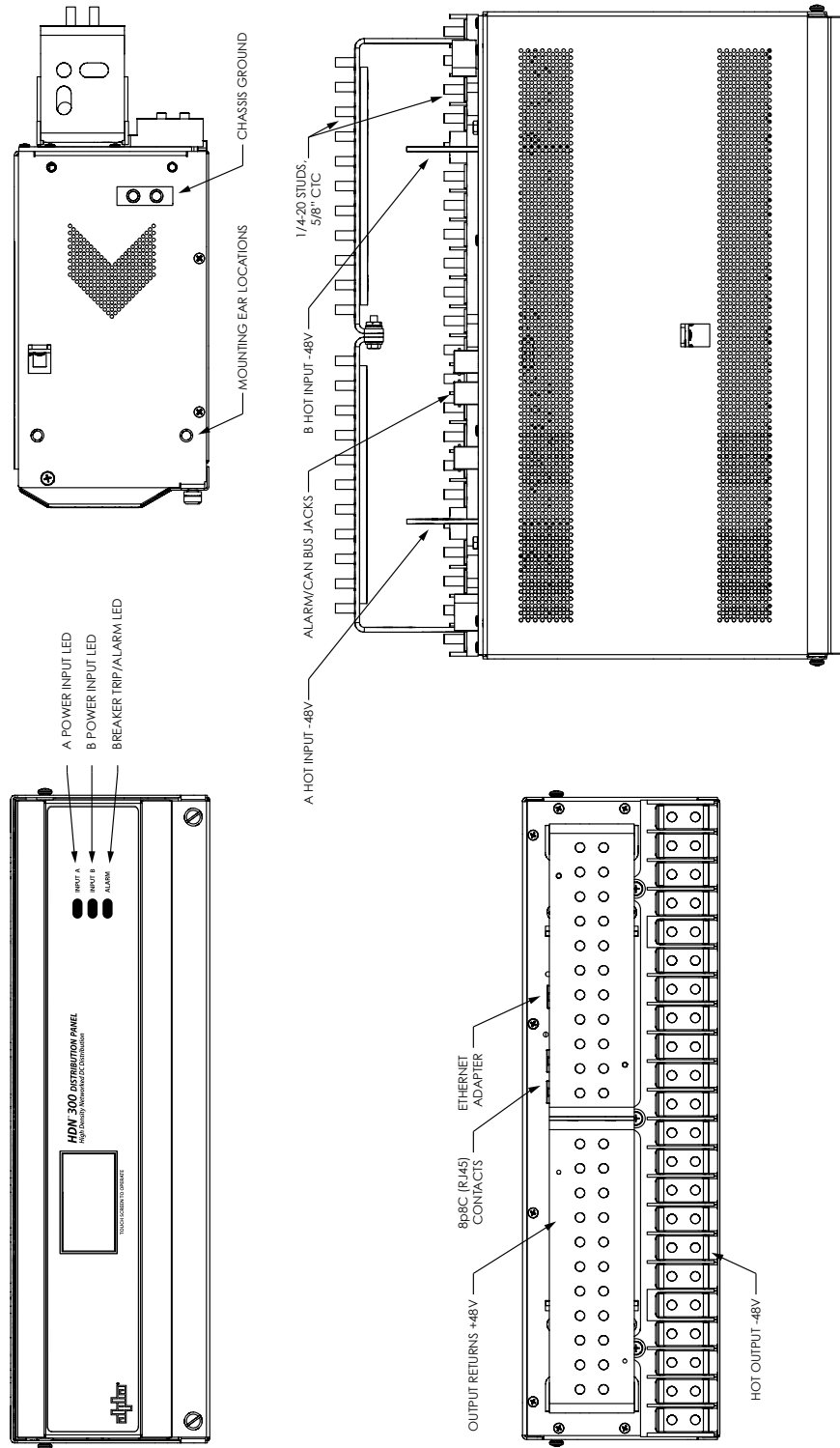
A.4 HDN 300 Dual Input; No RTN (C016-1663-10)

CHASSIS GROUND

MOUNTING EAR LOCATIONS

1/4-20 STUDS, 5/8" CTC

B HOT INPUT -48V

ALARM/CAN BUS JACKS

A HOT INPUT -48V

A POWER INPUT LED

B POWER INPUT LED

BREAKER TRIP/ALARM LED

INPUT A

INPUT B

ALARM

HDN 300 DISTRIBUTION PANEL
High Density Networked DC Distribution

TOUCH SCREEN TO OPERATE

alpha

ETHERNET ADAPTER

8p8C (RJ45) CONTACTS

HOT OUTPUT -48V
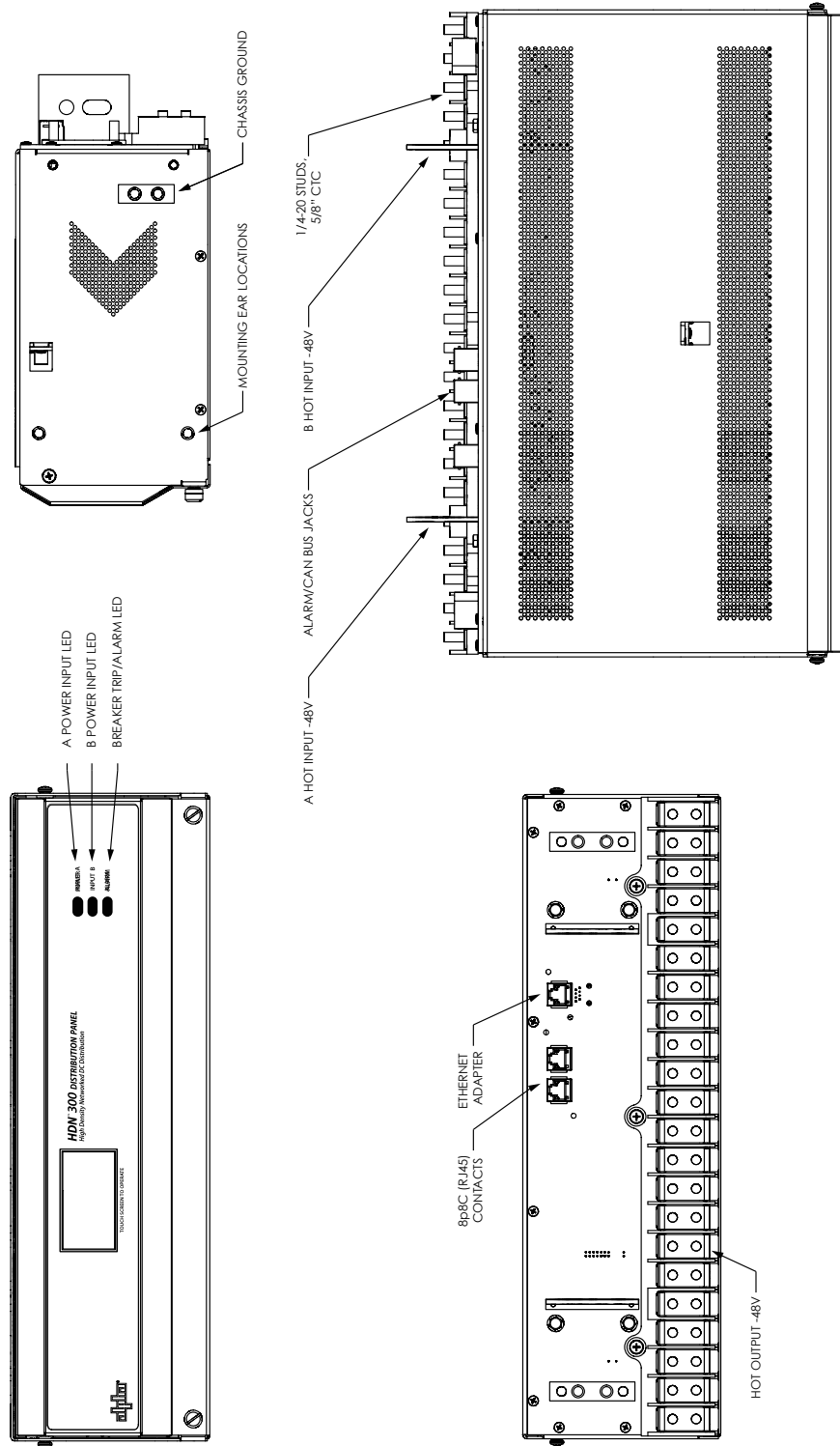
A.5 HDN 600 Single Input; No RTN (C016-1720-10)

CHASSIS GROUND

MOUNTING EAR LOCATIONS

1/4-20 STUDS, 5/8" CTC

ALARM/CAN BUS JACKS

HOT INPUT -48V

POWER INPUT LED

BREAKER TRIP/ALARM LED

POWER

ALARM

HDN 600 DISTRIBUTION PANEL
High Density Networked DC Distribution

TOUCH SCREEN TO OPERATE

alpha

ETHERNET ADAPTER

8p8C (RJ45) CONTACTS

HOT OUTPUT -48V
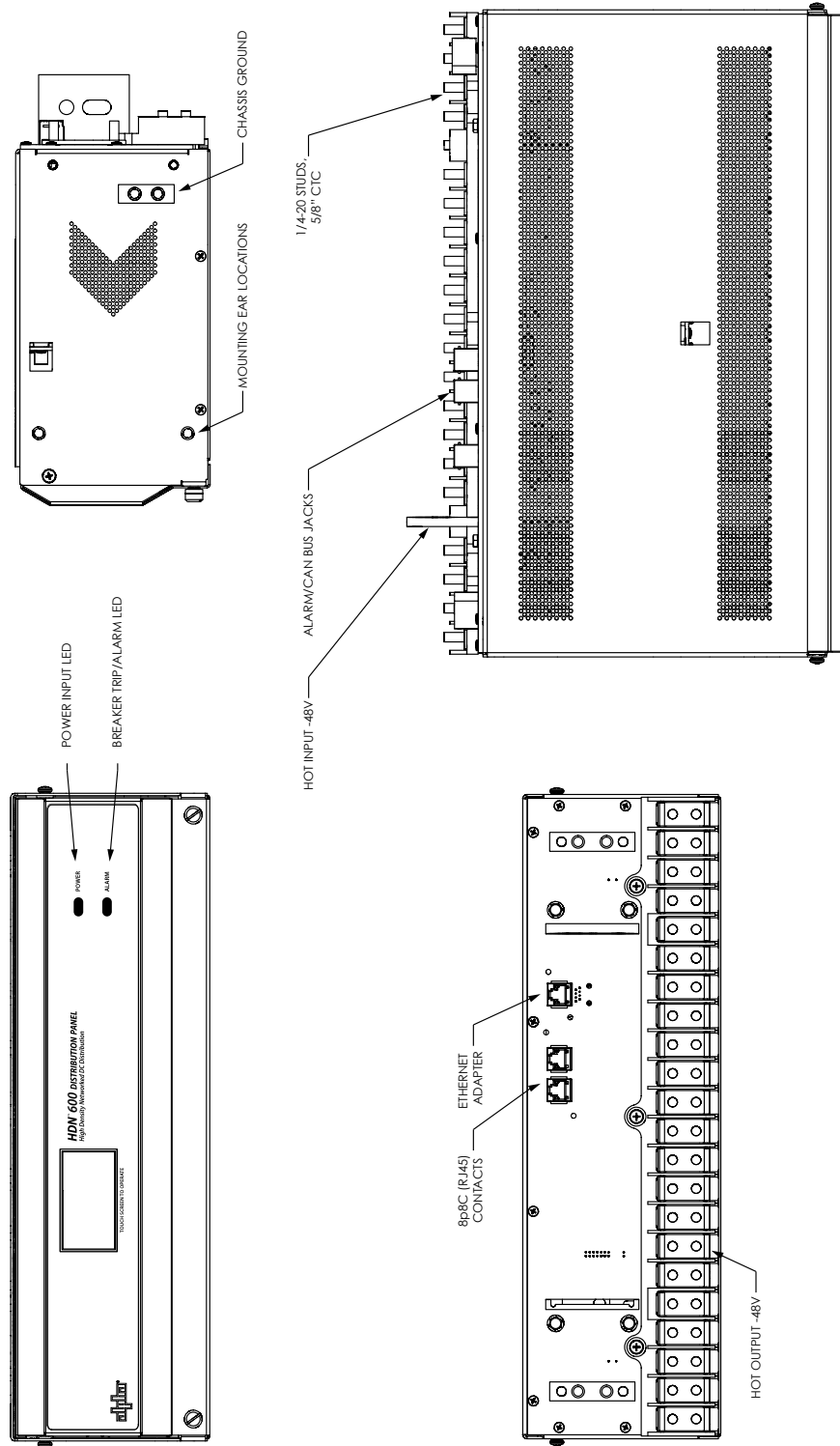
A.6 HDN 600 Single Input (C016-1721-10)

CHASSIS GROUND

MOUNTING EAR LOCATIONS

1/4-20 STUDS, 5/8" CTC

ALARM/CAN BUS JACKS

HOT INPUT -48V

POWER INPUT LED

BREAKER TRIP/ALARM LED

POWER

ALARM

HDN 600 DISTRIBUTION PANEL
High Density Networked DC Distribution

ETHERNET ADAPTER

8p8C (RJ45) CONTACTS

OUTPUT RETURNS +48V

HOT OUTPUT -48V
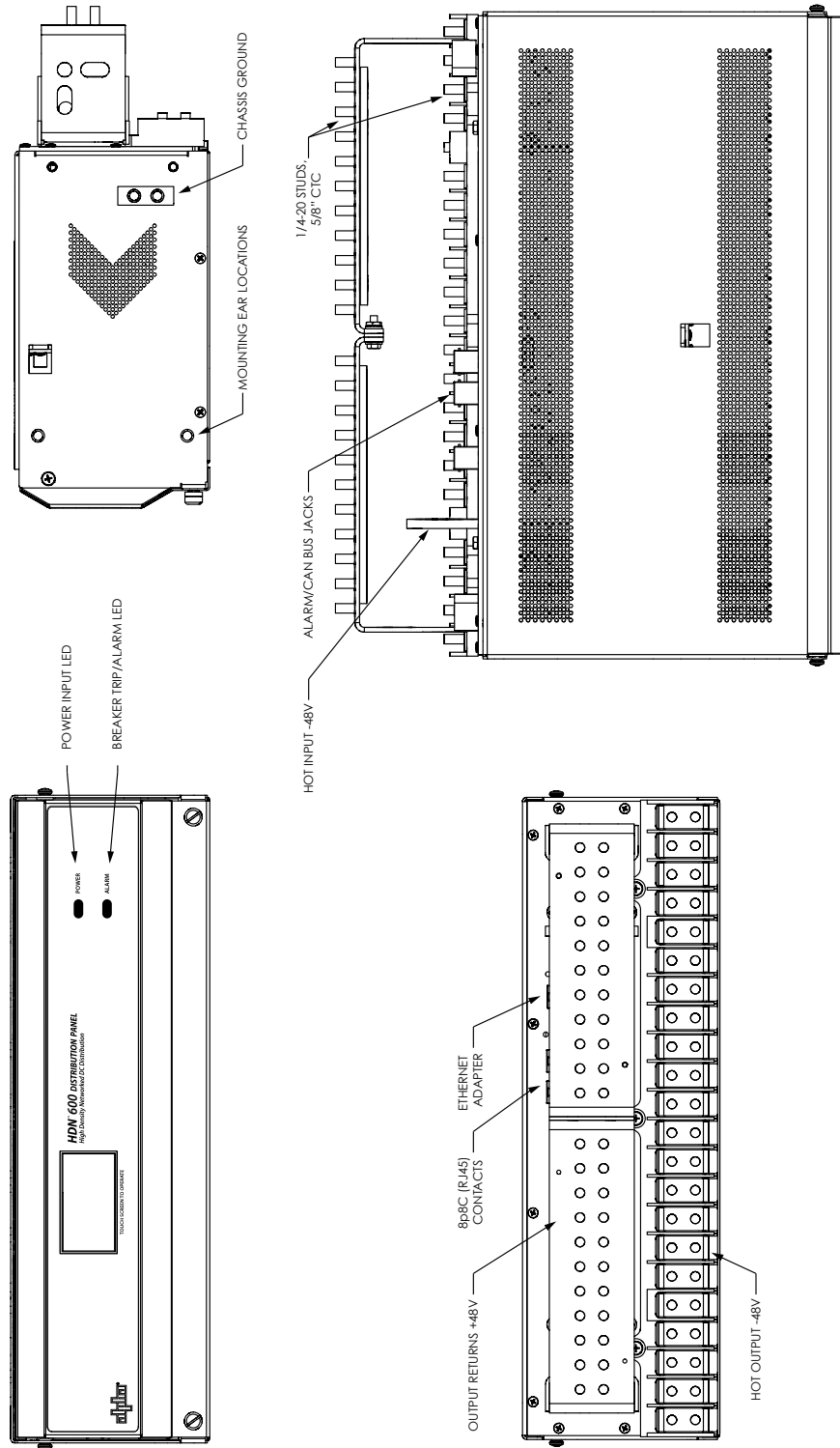
A.7 HDN 600 Dual Input (C016-1722-10)
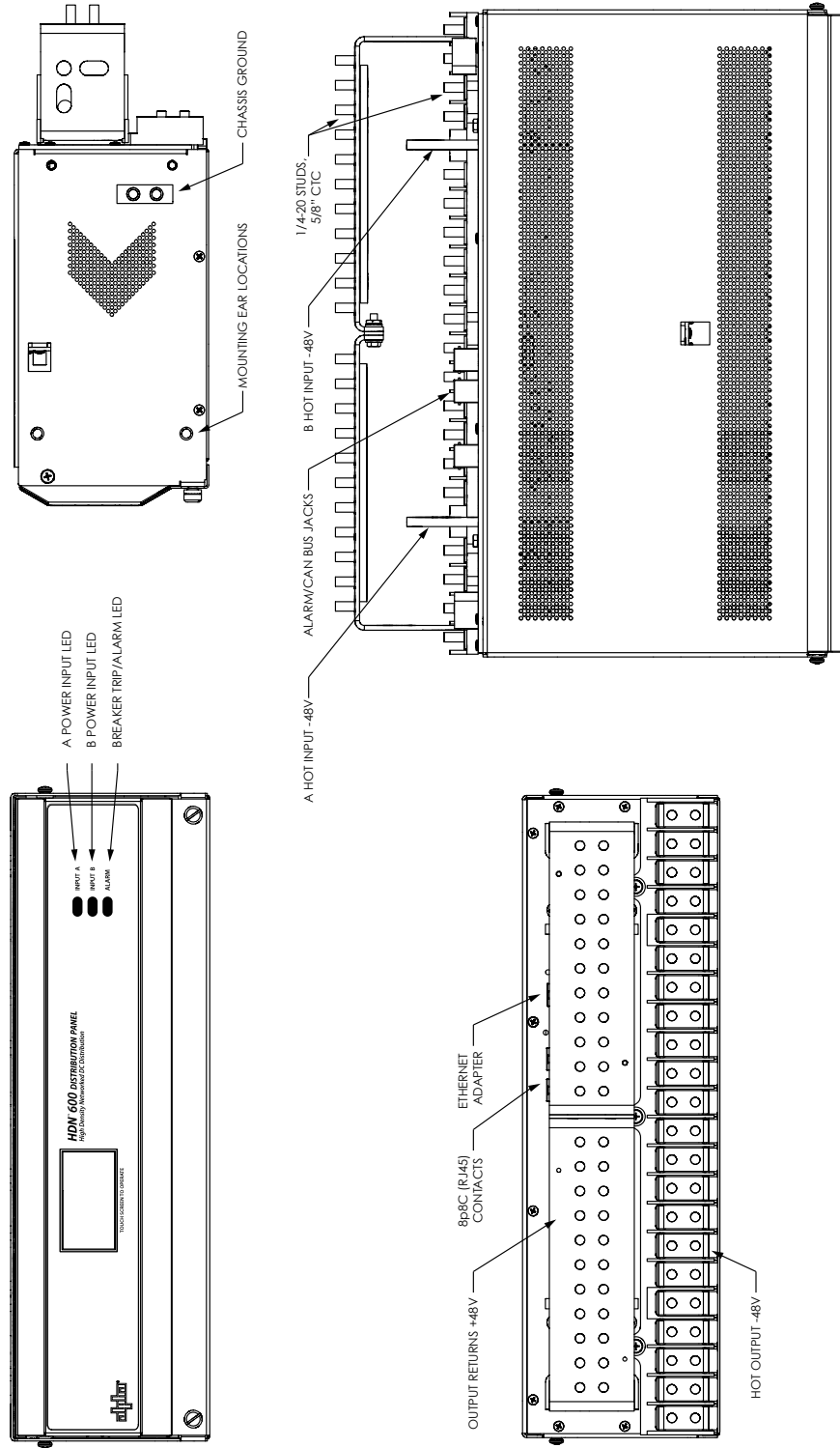
A.8 HDN 600 Dual Input; No RTN (C016-1723-10)

CHASSIS GROUND

MOUNTING EAR LOCATIONS

1/4-20 STUDS, 5/8" CTC

B HOT INPUT -48V

ALARM/CAN BUS JACKS

A HOT INPUT -48V

A POWER INPUT LED

B POWER INPUT LED

BREAKER TRIP/ALARM LED

POWER A
INPUT B
ALARM

HDN 600 *DISTRIBUTION PANEL*
High Density Networked DC Distribution

TOUCH SCREEN TO OPERATE

alpha

ETHERNET ADAPTER

8p8C (RJ45) CONTACTS

HOT OUTPUT -48V