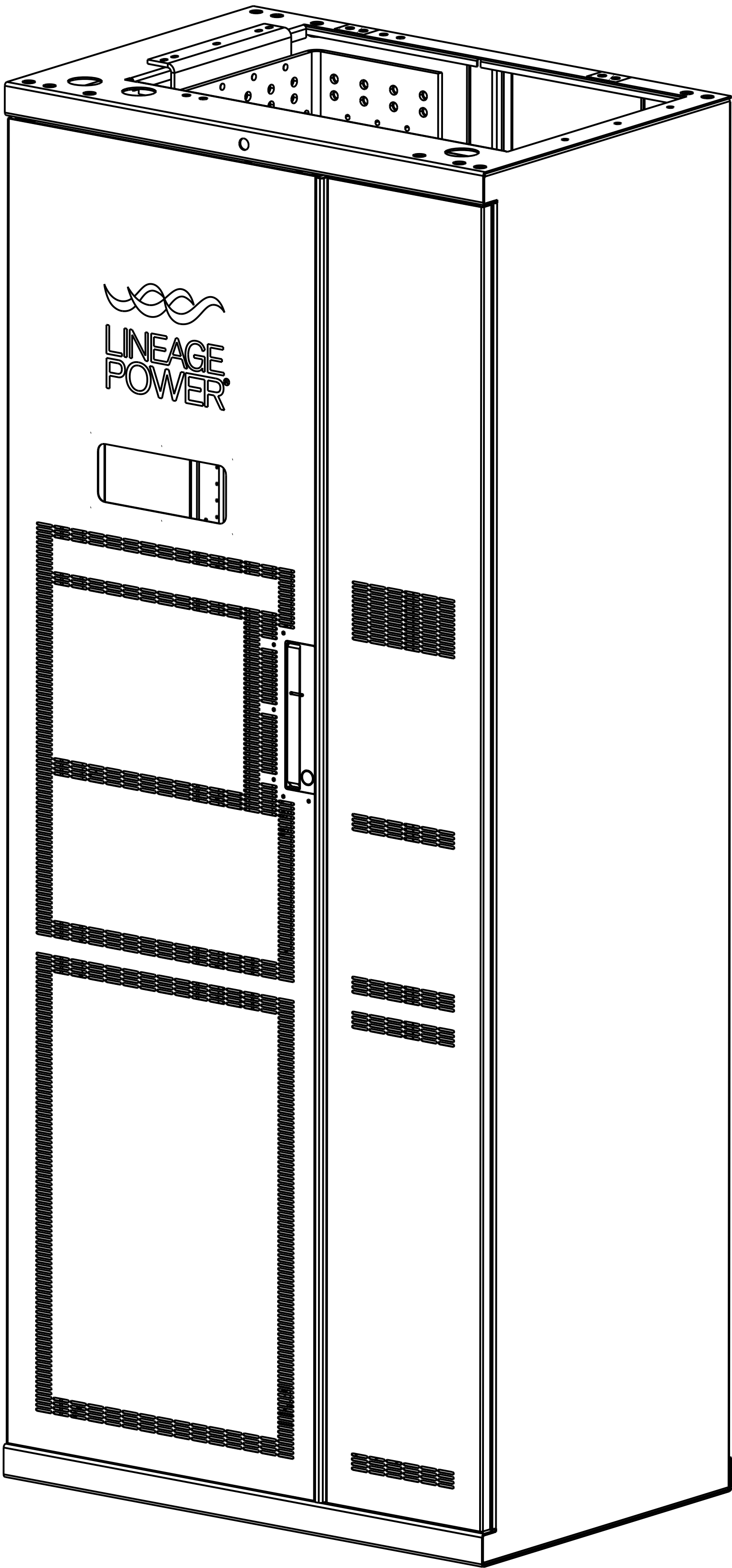
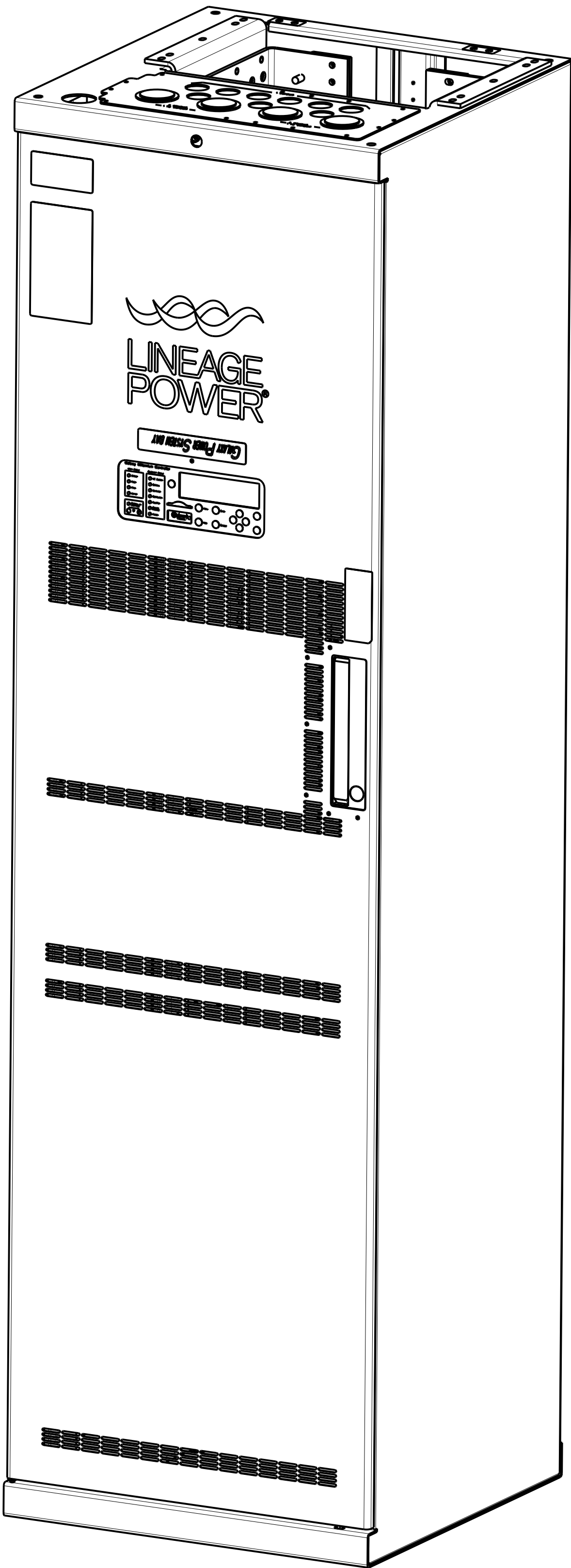


GPS4848/100
GALAXY POWER SYSTEM ORDERING GUIDE



7 FOOT (24" WIDE) CABINET (STD)
6 FOOT (24" WIDE) CABINET (NON-STD)

7 FOOT HIGH (36" WIDE) CABINET

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| H569434_C3A | ASSEM | 25 | 0 |
| H569434_A | DRAWING | 25 | 0+ |
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| RELATED DRAWINGS | | | |
|------------------|------------------------|--|--|
| I67-792-I55 | GPS4848/100 USER GUIDE | | |
| I67-792-I57 | GPS INSTALLATION GUIDE | | |
| T833I430-SD | WIRING DIAGRAM | | |

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|--|----------|---|-------|-------|----------|
| TITLE GPS4848/100 ORDERING GUIDE | | | | | |
| DRAWING DESCRIPTION GALAXY POWER SYSTEM | | | | | |
| LINEAGE POWER | | LINEAGE POWER - PROPRIETARY USE PURSUANT TO COMPANY INSTRUCTIONS | | | |
| THIRD ANGLE PJTN | DOC TYPE | DRAWING ID | SHEET | ISSUE | DWG SIZE |
| | DWG | H569-434 | AI | 27 | C2/AIR |

General

The Galaxy Power System (GPS) 4848/100 supports -48 volt DC telecommunications powering solutions up to 14,080A. GPS4848/100 components includes 595 series fan cooled 200/220A rectifiers; Millennium II controller; battery disconnect/reconnect options; and a comprehensive line of fuse and circuit breaker DC distribution options in 6ft or 7ft tall cabinets. The modular front access design ensures easy access, simple installation and fast maintenance and allows the system to expand incrementally as power needs grow.

System Overview

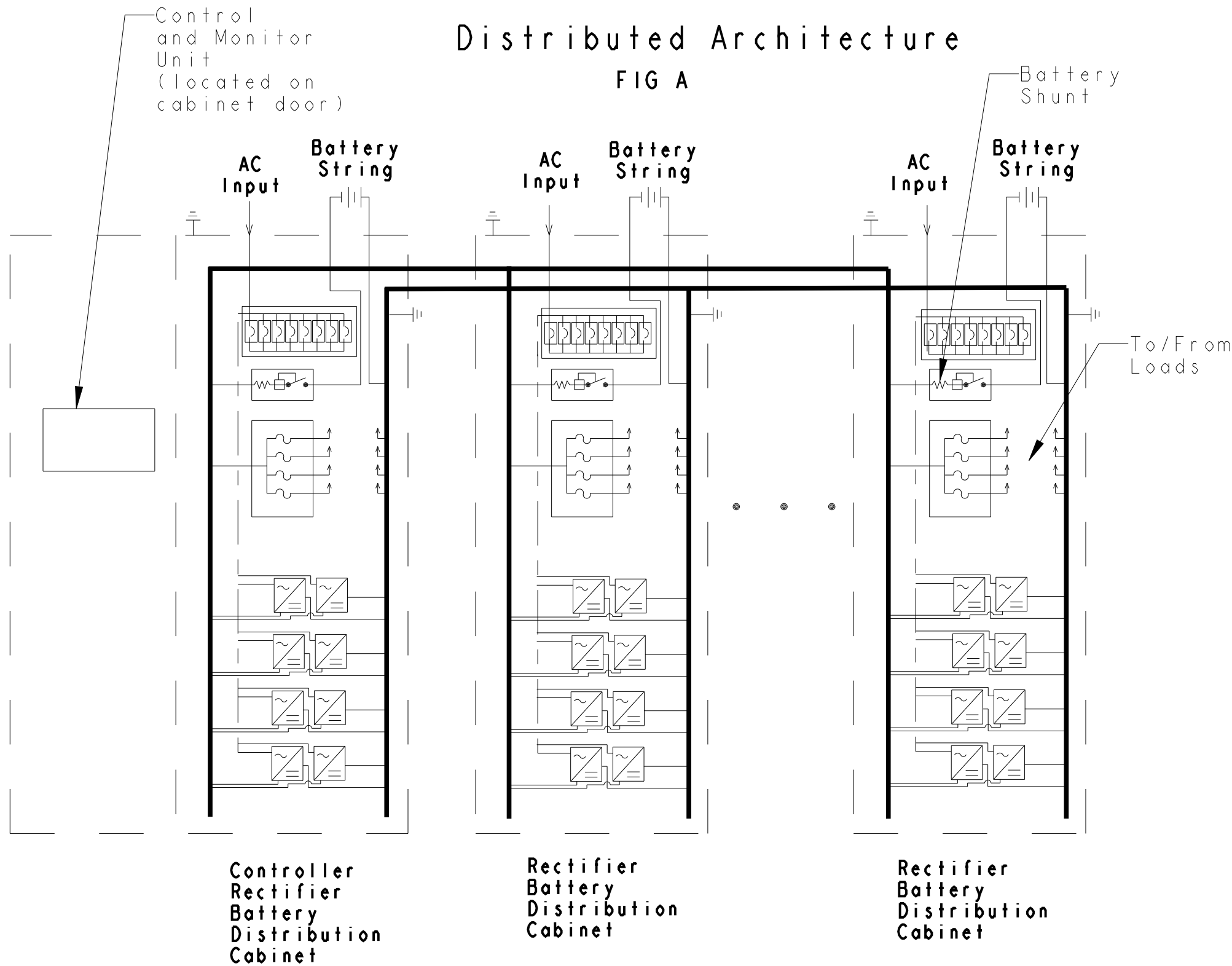
The GPS4848/100 power system accepts alternating current (AC) power from the commercial utility or a standby power source and rectifies it to produce direct current (DC) power for powering external equipment (loads). Batteries may be connected in parallel with the rectifiers to provide backup DC power when the commercial or standby AC is lost. AC power is distributed to each rectifier through an AC input panel. The rectifiers convert the AC power to a regulated DC voltage. The DC voltage is distributed to float the batteries through the battery connection panels and to the loads through fuses or circuit breakers on DC distribution panels. A variety of control, monitoring, and alarm functions are available to provide the user with system diagnostics, real-time as well as history information, and module control.

Architecture

The GPS4848/100 individual cabinets may be connected together in two basic architectures (distributed or centralized) to form systems. The supplemental bays may be to the right, the left, or both sides of the initial bay. These two architectures contain the same basic modules but are arranged in different cabinet configurations. Cabinets require a minimum rear air clearance of 3 inches. (If cabinets are located back-to-back, total air clearance between both cabinets would be 6 inches.)

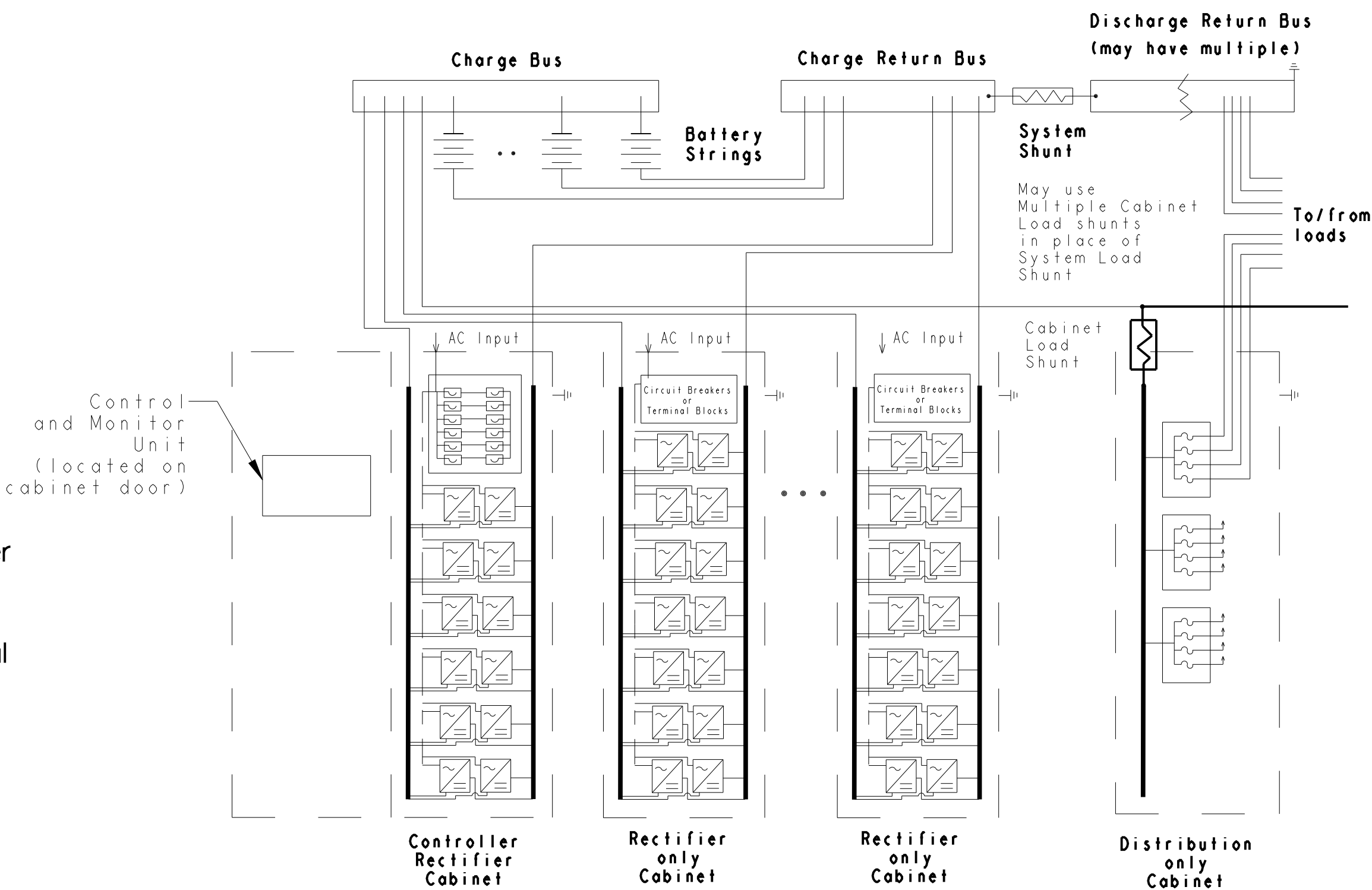
Distributed Architecture

A distributed architecture is best thought of as small systems combined together to form a much larger system. Each small system (cabinet) contains an entire DC power plant that includes AC input, rectifiers, battery connection modules (with external batteries), and DC distribution modules. The DC power generated by the rectifiers and supported by the batteries in a given cabinet will approximately equal the DC power distributed to the loads from that cabinet. The DC power of each cabinet is electrically interconnected so that power may be shared (up to 1600A) between the cabinets. This sharing allows for imbalances in cabinet loads (due to improper sizing, or rectifier or battery module failure). The distributed architecture is summarized as follows: Each cabinet generates and distributes all the DC power it needs but the cabinet is able to borrow power from the other cabinets in the system that have excess capacity (see Figure A). The amount of borrowing within the system may not exceed a total of 1600A, the rating of the interconnecting bus bars. Growth of the system is accomplished by adding another small system (cabinet) and interconnecting it to the other cabinets. Distributed architecture systems can produce up to 14,080 amps of power (64 rectifiers x 220A). See sheet C9B for example of interconnecting bus bars.



Centralized Architecture

Fig B



Centralized Architecture

The centralized architecture is best thought of as all the rectifiers and all the batteries in the system connected together at a central point, then taken from that central point to the distribution modules, and then in turn to the system loads. Since all the system power is brought together at a central point, the size of the central point must be sized for the ultimate capacity of the system (see Figure B). Growth of the system is accomplished by adding rectifiers (either to an existing cabinet or in a new cabinet), adding distribution panels (either to an existing cabinet or in a new cabinet), and adding batteries. Centralized architecture systems can only be sized up to 10,000A of power because of the limitations on centralized busing and shunt capacity. Table 1E and sheets C9 and C9A show various bus bar arrangements offered. J85504A-I are busing arrangements mounted over batteries for cabled systems (see sheet C9). ED833II-30 are busing configurations mounted over the cabinets for bus bar systems (see sheet C9A).

System Modules

Cabinet

Cabinets are available in either 6 foot or 7 foot heights. (Distribution only cabinets are available in 36 inches wide) Each cabinet is equipped with a front door and two bus bars rated at} 1600A in distributed architecture cabinets 3080A in centralized achitecture rectifier only cabinets 4800A in centralized architecture distribution only cabinet.

Each cabinet is equipped with cabinet terminal boards (BLJ and BIC) and a large alarm indicating lamp. The terminal boards provide a means to gather all cabinet alarms and control signals in the cabinet, light the cabinet alarm lamp, and communicate with the controller.

Rectifier


The 595 series rectifier is a fan cooled 200/220 ampere switch-mode rectifier (SMR). It converts 50 to 60 hertz, 3-phase 208/240/480 AC power into highly regulated and filtered -48 volt DC power. The rectifiers are pluggable with all interconnections (AC input, DC output, and control) made automatically during insertion. The rectifiers communicate to the controller via a digital RS-485 serial interface cable allowing all rectifier settings to be handled by the controller. No settings or adjustments at the rectifier are required. The rectifier is UL recognized for both the US and Canadian markets and complies with UL 1950 and meets EN60950 requirements.

Rectifier Options:

- 595A 480VAC applications fit one per shelf
- 595LTA 480VAC applications fit two per shelf
- 595B 208/240VAC applications fit one per shelf.
- 595LTB 208/240VAC applications fit two per shelf.

(Groups 300 and above) rectifier configurations have two rectifier shelf positions and hold either one 595A/B or two 595LTA/B. All other rectifier configurations use rectifier shelves that hold a single 595A/B or 595LTA/B with a filler bracket kit (Table 3A). Cabinets equipped with up to four shelves (up to 8 rectifiers) are intended to be used in Distributed Architectures. Cabinets equipped with 5 to 8 shelves (up to 14 rectifiers) are intended to be used in Centralized Architectures.

The rectifier, when connected to a Galaxy controller, provides the following features: output current "walk-in", electronic current limit, selective high voltage shut down, internal selective high voltage shut down, back-up high voltage shutdown, forced load sharing, output circuit breaker, output voltage adjustment, fan alarm and control, thermal alarm, current display, short circuit protection, communications alarm, lamp test switch, power on/standby switch. If the controller should fail the rectifier will maintain the voltage that was last issued by the controller. The office load will therefore always be protected from overvoltage.

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| TITLE GPS4848/100 ORDERING GUIDE | | | | | |
| DRAWING DESCRIPTION GALAXY POWER SYSTEM | | | | | |
|  | DOC TYPE | H569-434 | SHEET | ISSUE | DWG SIZE |
| | DWG | | A2 | 27 | C2/AIR |

Controller

The Galaxy Millennium II controller has replaced the Millennium and SC controllers. Similar in appearance to the Millennium door mounted controller, the Millennium II combines the Basic, Intelligent and Gateway (Internet) board together in a single board. It uses an RS485 bus to serially monitor and control rectifiers, converters, ringers and peripheral modules called RPM's. It can monitor and control external power equipment, including standby generators, converter plants and inverters.

Local viewing and setting of system parameters and various alarm thresholds, user-definable alarm inputs and relays can be accessed either by a LCD graphics display with intuitive navigation or by the local RS-232 port connected to a notebook computer. Remote access is available through a IO/100 Base-T network connection to the world wide web (internet) or your enterprise network (intranet) using standard browsers such as Microsoft Internet Explorer or Netscape Navigator. There is also an optional BSM5 56k bps modem available.

The controller has an 8 line 40 character LCD display and 12 LED status indicators. With the BIC9 and BLJ3 bay boards, 595 series rectifiers, and version 7.5 or later of the controller software, the controller can monitor and control up to 64 rectifiers. The RS-485 interface automates the installation process for rectifiers and eliminates the need for potentiometers and dip switches to set individual rectifiers. The controller provides system voltage control, distribution alarm monitoring, battery module control, alarm outputs, control and alarm inputs, battery reserve time prediction, system alarm history, load statistics and auto boost. Using remote monitoring modules (RPM's), the controller can gather information from up to 270 points via a digital serial Local Area Network (LAN). The remote modules can measure DC current shunts, temperatures, binary signals, AC voltages, and operate control relays.

In Centralized Architectures, the controller is capable of monitoring a single shunt (plant shunt) or multiple cabinet shunts to determine the load on the power system. In the Distributed Architecture, the system load is determined by the controller subtracting the sum of the battery charge currents (measured from the BIC) from the sum of the rectifier currents.

Feature List:

Controller: (64) Rectifier control, engine transfer, alarm reporting, alarm cut-off, alarm test, float/boost mode control, automatic rectifier restart, slope/thermal compensation, low voltage disconnect, automatic rectifier sequencing, battery discharge test, alarm history, real time clock, user configurable alarms, ANSI T1.317 interface, callback security, RS-232/485 access, energy management, automatic rectifier sequence control, inventory management, maintenance reminders, remote communication over the internet.

BIC: LVBD control, LVLD control, temperature probe inputs, alarm inputs, bay audible and visual indicators, battery voltage and shunt measurement.

Modem card: Remote communication at up to 56K baud.

Data Switch card: Communication across single phone line to multiple pieces of equipment.

AC Input Panels

The GPS4848/100 operates from 380/480 or 208/240, 3 phase commercial power over a frequency range of 47-63 Hertz plus protective earth ground (3W + PE). The three phases are bused through a three pole circuit breaker to each rectifier in the cabinet. There are two typical connection schemes.

The first scheme is to locate these circuit breakers in the cabinet with the rectifiers. In this scheme, there is an external AC panel board equipped with a larger primary circuit breaker providing protected AC to each cabinet, or a dual AC feed in which two primary breakers are used with each feeding half of the rectifiers in the cabinet.

The second scheme is to locate the circuit breakers feeding each rectifier in the external AC panel board. In this scheme, wiring from these circuit breakers is connected to a terminal strip in the cabinet that is wired to each rectifier.

Battery Connection Panels

(Distributed Architecture ONLY)

Batteries may be connected to the cabinets through contactors (with a shunt), fuses (with a shunt), circuit breakers (with a shunt) or a shunt only. All battery panels are equipped with shunts. The shunts are required in the Distributed Architecture system to get a system load reading. These shunts are read by the BIC (bay interface card) which then communicates the information to the controller. The contactor, circuit breaker and fuse panels are equipped with alarm cards that report back to the controller if the battery string is taken off the system bus.

Disconnect voltage levels on contactor panels are controlled by the Galaxy controller. Fuses and circuit breakers provide only overload protection for current into or out of the batteries. They do not provide short circuit current protection of the batteries, since they are located in the cabinet and not at the batteries. They do, however, provide a convenient way to disconnect the batteries from the system bus for maintenance.

Contactors for low voltage battery disconnect include either a single 1200A contactor or dual 500A contactors. The 1200A contactor may have 0-6 DIN-style fuses. The disconnect voltage levels are controlled by the system controller.

There is a single or dual DIN style fuse panel available. The fuses provide only overload protection for current into or out of the battery. They do not provide short circuit protection of the battery cables since the fuse is located in the cabinet and not at the batteries. They do however provide a convenient place to disconnect batteries from the plant bus for maintenance.

An off-line equalize (OLE) panel is available for connection to three battery sections. Each section may be individually removed from the system bus and placed on to an isolated bus where a DC-to-DC converter (ES671) may be used to raise that battery section to as high as 66 VDC.

DC Distribution Panels

A wide variety of DC distribution panels are available. The panels utilize either fuses (US or DIN styles) or circuit breakers (US or DIN styles). Both fuse and circuit breaker panels have protectors in sizes from 1-800A to satisfy a wide range of distribution needs. Most of the larger size protectors (100A or larger) have load monitoring shunts equipped in each load protector path. When used with the remote peripheral monitoring modules (RPMs) of the controller, accurate measurement of these loads is available for history and sizing. The DC distribution panels may be equipped with a ground return bar for connecting the load return internal to the bay. However, these are not required if a central external ground bar is used. Each panel is equipped with an alarm card which communicates to the controller any operated fuse or circuit breaker as well as provides a visual LED indicating an operated protector. Panels may be equipped with low voltage load disconnect (LVLD) contactors for load-shedding applications.

All of the DC distribution panels may be used in either the Centralized or Distributed Architectures. Panels may be installed in the field.

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|  | DOC TYPE DWG | H569-434 | SHEET A3 | ISSUE 27 |
| | | | | DWG SIZE C2/AIR |

A

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How to Order a GPS4848/100 System

Systems and components may be ordered only by comcode.

Follow the steps listed below to determine the desired configuration and fill in the choices on sheet BI.

1. Choose the type of architecture.
2. Choose the type of controller. Only one controller per system is required. For supplemental bays, choose no controller.
3. Choose the type of AC input module along with the quantity of shelves and rectifiers. Distributed systems have up to 4 shelves per cabinet (up to 8 rectifiers) and centralized systems have up to 7 shelves per cabinet (up to 14 rectifiers) per cabinet. For a distribution-only cabinet, choose no rectifiers.
4. Choose the type of battery panel for distributed architecture. For centralized architecture, choose no battery panel.
5. Choose as many DC distribution panels as desired that will fit in the remaining space in the cabinet. The total available mounting space for all equipment is either 72 inches for 7 ft cabinets or 60 inches for 6 ft cabinets.

Once the desired configuration has been selected, compare that configuration against the list of available configurations shown on this sheet. If a system matching your requirements is not shown, contact Tyco product management.

| GPS4848/100 STANDARD CONFIGURATIONS FOR DISTRIBUTED ARCHITECTURE | | | |
|--|-------------------------------|--------------------------------------|-------------------------|
| ORDERING CODE | DESCRIPTION | PLANT TYPE PER SAFETY AGENCY REPORTS | SAFETY AGENCY APPROVALS |
| DISTRIBUTED ARCHITECTURE SYSTEMS - INITIAL CABINETS | | | |
| I0897931I | H569-434 GI e/w GI6, G20, G3I | H | UL, C-UL, CE, NEBS-3 |
| I08986233 | H569-434 GI e/w GI6, G20, G32 | H | UL, C-UL, CE, NEBS-3 |
| I08970393 | H569-434 GI e/w GI6, G22, G3I | C | UL, C-UL, CE, NEBS-3 |
| I0898624I | H569-434 GI e/w GI6, G22, G32 | C | UL, C-UL, CE, NEBS-3 |
| I08979329 | H569-434 GI e/w GI6, G24, G3I | T | UL, C-UL, CE, NEBS-3 |
| I089704I9 | H569-434 GI e/w GI6, G24, G32 | T | UL, C-UL, CE, NEBS-3 |
| I08979337 | H569-434 GI e/w GI6, G26, G3I | T | UL, C-UL, CE, NEBS-3 |
| I08983008 | H569-434 GI e/w GI6, G26, G32 | T | UL, C-UL, CE, NEBS-3 |
| DISTRIBUTED ARCHITECTURE SYSTEMS - SUPPLEMENTAL CABINETS | | | |
| I08830092 | H569-434 GI e/w GI3, G20, G3I | H | UL, C-UL, CE, NEBS-3 |
| I089251I6 | H569-434 GI e/w GI3, G20, G32 | H | UL, C-UL, CE, NEBS-3 |
| I08830050 | H569-434 GI e/w GI3, G22, G3I | C | UL, C-UL, CE, NEBS-3 |
| I08885I04 | H569-434 GI e/w GI3, G22, G32 | C | UL, C-UL, CE, NEBS-3 |
| I08485285 | H569-434 GI e/w GI3, G24, G3I | T | UL, C-UL, CE, NEBS-3 |
| I0884330I | H569-434 GI e/w GI3, G24, G32 | T | UL, C-UL, CE, NEBS-3 |
| I08892688 | H569-434 GI e/w GI3, G26, G3I | T | UL, C-UL, CE, NEBS-3 |
| I08785882 | H569-434 GI e/w GI3, G26, G32 | T | UL, C-UL, CE, NEBS-3 |

| GPS4848/100 STANDARD CONFIGURATIONS FOR CENTRALIZED ARCHITECTURE | | | |
|--|--|--------------------------------------|-------------------------|
| ORDERING CODE | DESCRIPTION | PLANT TYPE PER SAFETY AGENCY REPORTS | SAFETY AGENCY APPROVALS |
| CENTRALIZED ARCHITECTURE SYSTEMS - INITIAL CABINETS | | | |
| I08970344 | H569-434 G2 e/w GI6, G2I, G33 | M | UL, C-UL, CE, NEBS-3 |
| I0897035I | H569-434 G2 e/w GI6, G23, G33 | P | UL, C-UL, CE, NEBS-3 |
| I08970369 | H569-434 G2 e/w GI6, G25, G33 | T | UL, C-UL, CE, NEBS-3 |
| I08970377 | H569-434 G2 e/w GI6, G27, G33 | T | UL, C-UL, CE, NEBS-3 |
| I08982752 | H569-434 G2 e/w GI6, G29, G33 | AB | UL, C-UL, CE, NEBS-3 |
| I08970385 | H569-434 G2 e/w GI6, G29, G33, (5) G43A, G90 | AB | UL, C-UL, CE, NEBS-3 |
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| CENTRALIZED ARCHITECTURE SYSTEMS - SUPPLEMENTAL CABINETS | | | |
| I08256280 | H569-434 G2 e/w GI2, G2I, G33 | M | UL, C-UL, CE, NEBS-3 |
| I082563I4 | H569-434 G2 e/w GI2, G23, G33 | P | UL, C-UL, CE, NEBS-3 |
| I08254368 | H569-434 G2 e/w GI2, G25, G33 | T | UL, C-UL, CE, NEBS-3 |
| I08256249 | H569-434 G2 e/w GI2, G27, G33 | T | UL, C-UL, CE, NEBS-3 |
| I088734I5 | H569-434 G2 e/w GI2, G29, G33 | AB | UL, C-UL, CE, NEBS-3 |
| I08843590 | H569-434 G2 e/w GI2, G29, G33, (5) G43A, G90 | AB | UL, C-UL, CE, NEBS-3 |
| I08965492 | H569-434 G2 e/w GI2, GI28, G33 | T | UL, C-UL, CE, NEBS-3 |
| I08969I48 | H569-434 G2 e/w GI2, GI29, G33 | T | UL, C-UL, CE, NEBS-3 |
| I08969I55 | H569-434 G2 e/w GI2, GI30, G33 | T | UL, C-UL, CE, NEBS-3 |
| I08969I7I | H569-434 G2 e/w GI2, GI3I, G33 | T | UL, C-UL, CE, NEBS-3 |
| CCI09I67607 | H569-434 G2 e/w GI9, G430, G33 | T | UL, C-UL, CE, |
| CCI09I676I5 | H569-434 G2 e/w GI8C, G430, G33 | T | UL, C-UL, CE, |
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TITLE
GPS4848/100 ORDERING GUIDE

DRAWING DESCRIPTION
GALAXY POWER SYSTEM

LINEAGE POWER

DOC TYPE
DWG

H569-434

SHEET
A4

ISSUE
27

DWG SIZE
C2/AIR

A

B

C

D

E

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G

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GPS4848/100 SPECIFICATIONS

| OUTPUT | |
|---------------------------|---|
| OPERATING VOLTAGE RANGE | 44 - 58 VDC |
| CURRENT | 200 - 10,000 A (200 A GROWTH STEPS) |
| VOLTAGE REGULATION | ± 0.5% |
| RIPPLE | < 100 mV rms |
| NOISE | < 2mV PSOPHOMETRIC |
| CURRENT LIMIT SET POINT | 595A3/B3: 60-220A (30-110%) |
| | 595LTA/LTB: 66 - 220A (30 - 110%) |
| INPUT | |
| VOLTAGE | 595A3 & 595LTA: 320 - 530 Vac DELTA, 3-WIRE |
| | 595B3 & 595LTB: 176 - 254 Vac DELTA, 3-WIRE |
| INPUT CURRENT | 595A3 & 595LTA: 20/25Aoc AT 480/380 Vac |
| | 595B3 & 595LTB: 40/35Aoc AT 208/220 |
| FREQUENCY | 47 - 63 Hz |
| RECTIFIER POWER FACTOR | > 0.98 FOR LOADS > 50% |
| SYSTEM EFFICIENCY | > 0.88 |
| TOTAL HARMONIC DISTORTION | < 5% FOR LOADS > 50% |
| PHYSICAL | |
| CABINET SIZE | (23.6x23.6x84in) OR (23.6x23.6x72in) OR (36x23.6x84in) |
| CABINET WEIGHT | SEE SHEET C6 |
| RECTIFIER SIZE | 595A/595B: 210x445x470mm (8.3x17.5x18.5in) |
| | 595LTA/595LTB: 226x264x462mm (8.9x10.4x18.2in) |
| RECTIFIER WEIGHT | 595A/595B: 31 kg (68 lbs) |
| | 595LTA/595LTB: 22 kg (48 lbs) |
| ENVIRONMENTAL (OPERATING) | |
| TEMPERATURE | 0°C - 50°C (32°F - 122°F) |
| RELATIVE HUMIDITY | 5 - 95% |
| ALTITUDE | -50 - 4000m (-164 - 13123 FT) (NOTE 1) |
| AUDIBLE NOISE | < 60 dBa AT ROOM TEMPERATURE |
| EMC | FCC LEVEL A: EN55022, CLASS B |
| HEAT DISSIPATED | 595A/LTA: 1030 W PER RECTIFIER AT 220A, 57VDC OUTPUT |
| | 595B/LTB: 1180 W PER RECTIFIER AT 220A, 55VDC OUTPUT (ALSO 595A/B PRIOR TO 595A3/B3 SI:3) |
| EARTHQUAKE | ZONE 4 UPPER FLOORS, NO TOP BRACING REQUIRED |
| ELECTROMAGNETIC IMMUNITY | 10 V/METER OVER 20-2000 MHz |

NOTES
1. FOR ALTITUDES OVER 1500m, DERATE THE TEMPERATURE BY 0.656°C PER 100m


ASSOCIATED CIRCUITS AND FIGURES

| CODE | DESCRIPTION | CIRCUIT DRAWING | FIGURE | WIRING | APPARATUS |
|----------------------------|--|----------------------------|------------------------|--------|-------------------|
| SYSTEMS | | | | | |
| H569-434 GI | DISTRIBUTED ARCH | T83314-30 | H4 | | CA,FJ |
| H569-434 G2 | CENTRALIZED ARCH | T83314-30 | H4 | | CB,FJ |
| CONTROLLERS | | | | | |
| H569-434 GIO [DA] | GALAXY RC | T83314-30 | 3B | | E |
| | | T83386-30 | I,HI | | A,C |
| H569-434 GII [DA] | GALAXY SC | T83314-30 | 3A, 3C | | F,G,EB,X |
| | | T83217-30 | IB,2,HIB, H2A, H2AA,H3 | | AG,AC,GF, AW,U,AF |
| I079588II | SC INTELLIGENCE | T83217-30 | IB,HIB | | BE,BW |
| I079424I9 | SC INTEL., TLI | T83217-30 | IB,HIB,H7 | | BF,BW |
| I0794235I | SC MODEM | T83217-30 | IB,HIB | | CB |
| I07940710 | SC PERIPHERAL | T83217-30 | IB,HIB | | DF |
| I07958829 | SC DATA SWITCH | T83217-30 | IB,HIB | | DE |
| 601792450 | SC RESERVE TIME | T83217-30 | I | | |
| H569-434 GI2 | NO CONTROLLER | ---- | | | |
| H569-434 GI3 | NO CONTROLLER | ---- | | | |
| H569-434 GI4 [DA] | GALAXY MILLENNIUM | T83314-30 | 3F,3D | | EA,FB,FC, X,FK |
| | | T83413-30 | I,HI,H2 | | |
| H569-434 GI5 [DA] | GALAXY MILLENNIUM WITH INTELLIGENCE | T83314-30 | 3F,3D | | EA,FB,FC, FG,X,FK |
| | | T83413-30 | I,HI,H2, H4,H5 | | |
| H569-434 GI6 | GALAXY MILLENNIUM II WITH INTELLIGENCE AND GATEWAY | T83413-30 | 3H,3D | | |
| | | T83413-30 | I,HI,H2, H4,H5 | | |
| H569-434 GI8C | NO CONTROLLER (GROUPS 300 AND UP) | ---- | | | |
| H569-434 GI8D | NO CONTROLLER (GROUPS 300 AND UP) | ---- | | | |
| H569-434 GI9 | GALAXY MILLENNIUM II WITH INTELLIGENCE AND GATEWAY (FOR GROUPS 300 AND UP) | T83413-30 | 3H,3D | | |
| | | T83413-30 | I,HI,H2, H4,H5 | | |
| I08284662 | MILL. INTELLIGENCE KIT | T83413-30 | H4,H5 | | |
| I08284639 | MILL. MODEM KIT | T83413-30 | H4 | | |
| I08284605 | MILL. DATASWITCH KIT | T83413-30 | AH | | |
| REMOTE PERIPHERAL MONITORS | | | | | |
| I0846946I | 22IF MODULE | T83275-30 | 2,HI | H2 | AA |
| I08469503 | 22IC MODULE | T83275-30 | 2,HI | H2 | FF |
| I0829843I | 22IA MODULE | T83275-30 | 2,HI | H2 | DD |
| I08298498 | 22IB MODULE | T83275-30 | 2,HI | H2 | EE |
| I08469479 | 22ID MODULE | T83275-30 | 2,HI | H2 | BB |
| I08469495 | 22IJ MODULE | T83275-30 | 2,HI | H2 | CC |
| I08298449 | 222A MODULE | T83275-30 | 2,HI | H2 | GG |
| I08298456 | 214A MODULE | T83275-30 | 4,H4 | H2 | H |
| I08274242 | 223T MODULE | T83275-30 | 2,H3 | H2 | HH |
| I08298514 | 210E MODULE | 157-O10-202 PRODUCT MANUAL | | | |

ASSOCIATED CIRCUITS AND FIGURES

| CODE | DESCRIPTION | CIRCUIT DRAWING | FIGURE | WIRING | APPARATUS |
|-----------------------------------|-----------------------|-----------------|--------|--------|-------------|
| AC INPUT AND RECTIFIERS | | | | | |
| H569-434 G20, G20A, G220 | 4 RECT., 208VAC CB | T83314-30 | IC,6B | | (4)BW,(4)XD |
| H569-434 G21, G21A | 6 RECT., 208VAC CB | | ID,6B | | (6)BW,(6)XD |
| H569-434 G22, G22A,G22B,G22C | 4 RECT., 480VAC CB | | IB,6B | | (4)BW,(4)XC |
| H569-434 G23 | 6 RECT., 480VAC CB | | ID,6B | | (6)BW,(6)XC |
| H569-434 G24, G24A, G24C, G224 | 4 RECT., 208VAC TS | | IE,6B | | (4)BW |
| H569-434 G25, G25A, G25C | 6 RECT., 208VAC TS | | IE,6B | | (6)BW |
| H569-434 G26, G226 G26A,G26B,G26C | 4 RECT., 480VAC TS | | IE,6B | | (4)BW |
| H569-434 G27 | 6 RECT., 480VAC TS | | IE,6B | | (6)BW |
| H569-434 G28, G428 | I200A DIST ONLY | | 2B | | |
| H569-434 G29, G429, G430 | 4800A DIST ONLY | | 2C | | |
| H569-434 G70, G270 | 4 RECT., 480VAC CB | | IC,6B | | (4)BW,(4)XF |
| H569-434 G71 | 6 RECT., 480VAC CB | | ID,6B | | (6)BW,(6)XF |
| H569-434 GI28 | 8 RECT., 480VAC TS | | IE,6B | | (8)BW |
| H569-434 G320 | 4 RECT., 208VAC CB | | IC,6E | | |
| H569-434 G321 | 6 RECT., 208VAC CB | | ID,6E | | |
| H569-434 G322 | 4 RECT., 480VAC CB | | IB,6E | | |
| H569-434 G323 | 6 RECT., 480VAC CB | | ID,6E | | |
| H569-434 G324 | 4 RECT., 208VAC TS | | IE,6E | | |
| H569-434 G325 | 6 RECT., 208VAC TS | | IE,6E | | |
| H569-434 G325C | 6 RECT., 208VAC TS | | IE,6E | | |
| H569-434 G326 | 4 RECT., 480VAC TS | | IE,6E | | |
| H569-434 G327 | 6 RECT., 480VAC TS | | IE,6E | | |
| H569-434 G327C | 6 RECT., 480VAC TS | | IE,6E | | |
| H569-434 G328 | 6-12 RECT., 480VAC TS | | IX,6E | | |
| H569-434 G329 | 6-12 RECT., 208VAC TS | | IX,6E | | |
| H569-434 G330 | 8 RECT., 480VAC TS | | IE,6E | | |
| H569-434 G330C | 8 RECT., 480VAC TS | | IE,6E | | |
| H569-434 G331 | 4 RECT., 208VAC TS | | IE,6E | | |
| H569-434 G331C | 4 RECT., 208VAC TS | | IE,6E | | |
| H569-434 G332 | 7-14 RECT., 480VAC TS | | IX,6E | | |
| H569-434 G333 | 7-14 RECT., 208VAC TS | | IX,6E | | |
| H569-434 G334 | 6-12 RECT., 480VAC CB | | IW,6E | | |
| H569-434 G335 | 6-12 RECT., 208VAC CB | | IW,6E | | |
| H569-434 G370 | 4 RECT., 480VAC CB | | IC,6E | | |
| H569-434 G371 | 6 RECT., 480VAC CB | | ID,6E | | |
| I089618I4 | 595B3 200A RECT | | 6B | | BT |
| I08961822 | 595A3 200A RECT | | 6B | | BS |
| I08979238 | 595LTA 220A RECT | | 6E | | |
| I08990405 | 595LTB 220A RECT | | 6E | | |

ASSOCIATED CIRCUITS AND FIGURES
CONTINUED ON NEXT SHEET

| | | | | | |
|---|----------|----------|-------|-------|----------|
| TITLE GPS4848/100 ORDERING GUIDE | | | | | |
| DRAWING DESCRIPTION - | | | | | |
|  | DOC TYPE | H569-434 | SHEET | ISSUE | DWG SIZE |
| | DWG | | C1 | 27 | C2/AIR |

A

B

C

D

E

F

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| ASSOCIATED CIRCUITS AND FIGURES | | | | | |
|---------------------------------|---------------------|-----------------|--------|--------|-----------|
| CODE | DESCRIPTION | CIRCUIT DRAWING | FIGURE | WIRING | APPARATUS |
| BATTERY PANELS | | | | | |
| H569-434 G30 | (2) LVBD | T833I4-30 | 4A | | SA,X |
| H569-434 G3I | (I) LVBD | T833I4-30 | 4B | | SB,X |
| H569-434 G32 | BATT SHUNT | T833I4-30 | 4F | | TA,X |
| H569-434 G32A | BATT SHUNT | T833I4-30 | 4F | | TN,X |
| H569-434 G33 | NO BATT SECTION | ---- | | | |
| H569-434 G34 | (2) NH3 FUSE | T833I4-30 | 4C | | R,X |
| H569-434 G35 | (I) NH3 FUSE | T833I4-30 | 4D | | S,X |
| H569-434 G37 | OLE W/ LVBD | T833I4-30 | 4N | | TH,X |
| H569-434 G38 | OLE | T833I4-30 | 4N | | TJ,X |
| H569-434 G80 | LVBD, (2) NH3 FUSES | T833I4-30 | 4B,4G | | SB,TD,X |
| H569-434 G8I | LVBD, (4) NH3 FUSES | T833I4-30 | 4B,4G | | SB,TD,X |
| H569-434 G82 | LVBD, (6) NH3 FUSES | T833I4-30 | 4B,4G | | SB,TD,X |
| H569-434 G86 | CBs | T833I4-30 | 4P | | TK,X |
| H569-434 G87 | CBs W. LVBD | T833I4-30 | 4P | | TL,X |
| BATTERY CIRCUIT BREAKERS | | | | | |
| I08945494 | 400A CB | T833I4-30 | | | ZZH |

| ASSOCIATED CIRCUITS AND FIGURES | | | | | |
|---------------------------------|---------------------------|-----------------|--------|--------|-------------|
| CODE | DESCRIPTION | CIRCUIT DRAWING | FIGURE | WIRING | APPARATUS |
| DC DISTRIBUTION PANELS | | | | | |
| H569-434 G40,40A | I4 POS CB, 3-100A | T833I4-30 | 5B | | ABI,CD,X |
| H569-434 G4I,4IA | 22 POS CB, 3-100A | T833I4-30 | 5B | | ACI,CD,X |
| H569-434 G42,42A | 3 POS CB, I25-600A | T833I4-30 | 5E | | AF,CC,X |
| H569-434 G43,43A | 6 POS CB, I25-800A | T833I4-30 | 5A | | AA,CC,X |
| H569-434 G43B,43C | 6 POS CB, I25-800A LVLD | T833I4-30 | 5A | LA,LB | AA,LL,CC,X |
| H569-434 G45,45A | I4 POS CB, 3-100A LVLD | T833I4-30 | 5B | LA,LB | ABI,LL,CD,X |
| H569-434 G46,46A | 22 POS CB, 3-100A LVLD | T833I4-30 | 5B | LA,LB | ACI,LL,CD,X |
| H569-434 G47,47A | 3 POS CB, I25-600A LVLD | T833I4-30 | 5E | LA,LB | AF,LL,CD,X |
| H569-434 G48,48A | 5 POS CB, I25-800A | T833I4-30 | 5A | | AN,CC,X |
| H569-434 G48B,48C | 5 POS CB, I25-800A LVLD | T833I4-30 | 5A | LA,LB | AN,LL,CC,X |
| H569-434 G50,50A | I4 POS FUSE, 5-50A | T833I4-30 | 5B | | ABI,CD,X |
| H569-434 G5I,5IA | 22 POS FUSE, 5-50A | T833I4-30 | 5B | | ACI,CD,X |
| H569-434 G52,52A | IO POS FUSE, 3-60A | T833I4-30 | 5H | | AM,CD,X |
| H569-434 G52B,52C | IO POS FUSE, 3-60A LVLD | T833I4-30 | 5H | LA,LB | AM,LL,CD,X |
| H569-434 G53,53A | 2 POS FUSE, IOO-600A | T833I4-30 | 5G | | ALI,CC,X |
| H569-434 G55,55A | I4 POS FUSE, 5-50A LVLD | T833I4-30 | 5B | LA,LB | ABI,LL,CD,X |
| H569-434 G56,56A | 22 POS FUSE, 5-50A LVLD | T833I4-30 | 5B | LA,LB | ACI,LL,CD,X |
| H569-434 G57,57A | 2 POS FUSE, IOO-600A LVLD | T833I4-30 | 5G | LA,LB | ALI,LL,CC,X |
| H569-434 G54,54A | 5 POS FUSE, 70-225A | T833I4-30 | 5J | | AT,CC,X |
| H569-434 G54B,54C | 5 POS FUSE, 70-225A LVLD | T833I4-30 | 5J | LA,LB | AT,LL,CC,X |
| H569-434 G58 | 6 POS GMT FUSE, I-7.5A | T833I4-30 | 5K | | AZ |
| H569-434 G59,59A | 2 POS FUSE, 300-600A | T833I4-30 | 5N | | AY, X |
| H569-434 G60,60A | I4 POS CB, 80-I25A | T833I4-30 | 5F | | AS,CD,X |
| H569-434 G60B,60C | I4 POS CB, 80-I25A LVLD | T833I4-30 | 5F | LA,LB | AS,LL,CD,X |
| H569-434 G6I,6IA | IO POS CB, 80-I25A | T833I4-30 | 5F | | AS,CC,X |
| H569-434 G6IB,6IC | IO POS CB, 80-I25A LVLD | T833I4-30 | 5F | LA,LB | AS,LL,CC,X |
| H569-434 G65,65A | I4 POS FUSE, I-32A | T833I4-30 | 5F | | AS,CD,X |
| H569-434 G65B,65C | I4 POS FUSE, I-32A LVLD | T833I4-30 | 5F | LA,LB | AS,LL,CD,X |
| H569-434 G66,66A | IO POS FUSE, I-50A | T833I4-30 | 5F | | AS,CD,X |
| H569-434 G66B,66C | IO POS FUSE, I-50A LVLD | T833I4-30 | 5F | LA,LB | AS,LL,CD,X |
| H569-434 G67,67A | 8 POS FUSE, 4-I60A | T833I4-30 | 5C | | AD,CD,X |
| H569-434 G67B,67C | 8 POS FUSE, 4-I60A LVLD | T833I4-30 | 5C | LA,LB | AD,LL,CD,X |
| H569-434 G68,68A | 2 POS FUSE, 32-400A | T833I4-30 | 5A | | AE,CC,X |
| H569-434 G68B,68C | 2 POS FUSE, 32-400A LVLD | T833I4-30 | 5A | LA,LB | AE,LL,CC,X |
| H569-434 G95,95A | IO POS CB, 3-I50A | T833I4-30 | 5B | | AP,CD,X |
| H569-434 G96,96A | IO POS CB, 3-100A | T833I4-30 | 5B | | API,CD,X |
| H569-434 G96B,96C | IO POS CB, 3-100A LVLD | T833I4-30 | 5B | LA,LB | API,LL,CD,X |
| H569-434 G97,97A | I4 POS CB, 3-I50A | T833I4-30 | 5B | | AU,CD,X |
| H569-434 G97B,97C | I4 POS CB, 3-I50A LVLD | T833I4-30 | 5B | LA,LB | AU,LL,CD,X |
| H569-434 G98,98A | 22 POS CB, 3-I50A | T833I4-30 | 5B | | AW,CD,X |
| H569-434 G98B,98C | 22 POS CB, 3-I50A LVLD | T833I4-30 | 5B | LA,LB | AW,LL,CD,X |

| ASSOCIATED CIRCUITS AND FIGURES | | | | | |
|------------------------------------|---------------------|-----------------|--------|--------|-----------|
| CODE | DESCRIPTION | CIRCUIT DRAWING | FIGURE | WIRING | APPARATUS |
| DC DISTRIBUTION PANELS (CONTINUED) | | | | | |
| H569-434 GIOI | G43 E/W (6) I75A CB | T833I4-30 | 5A | | AA,(6)ZD |
| H569-434 GIO2 | G43 E/W (6) 225A CB | T833I4-30 | 5A | | AA,(6)ZF |
| H569-434 GIO3 | G43 E/W (3) 400A CB | T833I4-30 | 5A | | AA,(3)ZH |
| H569-434 GIO4 | G43 E/W (2) 600A CB | T833I4-30 | 5A | | AA,(2)ZK |
| H569-434 GIO6 | G42 E/W (3) I75A CB | T833I4-30 | 5E | | AF,(3)ZD |
| H569-434 GIO7 | G42 E/W (3) 255A CB | T833I4-30 | 5E | | AF,(3)ZF |
| H569-434 GIO8 | G42 E/W (I) 400A CB | T833I4-30 | 5E | | AF,(I)ZH |
| H569-434 GIO9 | G42 E/W (I) 600A CB | T833I4-30 | 5E | | AF,(I)ZK |
| H569-434 GIIO | G48 E/W (5) I75A CB | T833I4-30 | 5A | | AN,(5)ZD |
| H569-434 GIIf | G48 E/W (5) 225A CB | T833I4-30 | 5A | | AN,(5)ZF |
| H569-434 GIi2 | G48 E/W (2) 400A CB | T833I4-30 | 5A | | AN,(2)ZH |
| H569-434 GIi3 | G48 E/W (I) 600A CB | T833I4-30 | 5A | | AN,(I)ZK |
| LARGE CIRCUIT BREAKERS | | | | | |
| I083I2794 | I25A CB | T833I4-30 | | | ZB |
| I08606732 | I50A CB | T833I4-30 | | | ZC |
| I083I2802 | I75A CB | T833I4-30 | | | ZD |
| I083I28I0 | 225A CB | T833I4-30 | | | ZF |
| I083I2828 | 300A CB | T833I4-30 | | | ZG |
| I083I2836 | 400A CB | T833I4-30 | | | ZH |
| I083I2844 | 500A CB | T833I4-30 | | | ZJ |
| I083I285I | 600A CB | T833I4-30 | | | ZK |
| I08984782 | 800A CB | T833I4-30 | | | ZL |

NOTES

I. APPARATUS OPTION CC IS THE LARGE LUG RETURN BUS AND CD IS THE SMALL LUG RETURN BUS. THESE OPTIONS ARE ONLY ON PANELS IF THE INTERNAL RETURN BUS OPTION IS ORDERED.

| | | | | | |
|---|----------|----------|--|----------|--------|
| TITLE GPS4848/100 ORDERING GUIDE | | | | | |
| DRAWING DESCRIPTION - | | | | | |
|  | DOC TYPE | H569-434 | | SHEET | ISSUE |
| | DWG | | | C2 | 27 |
| | | | | DWG SIZE | C2/AIR |

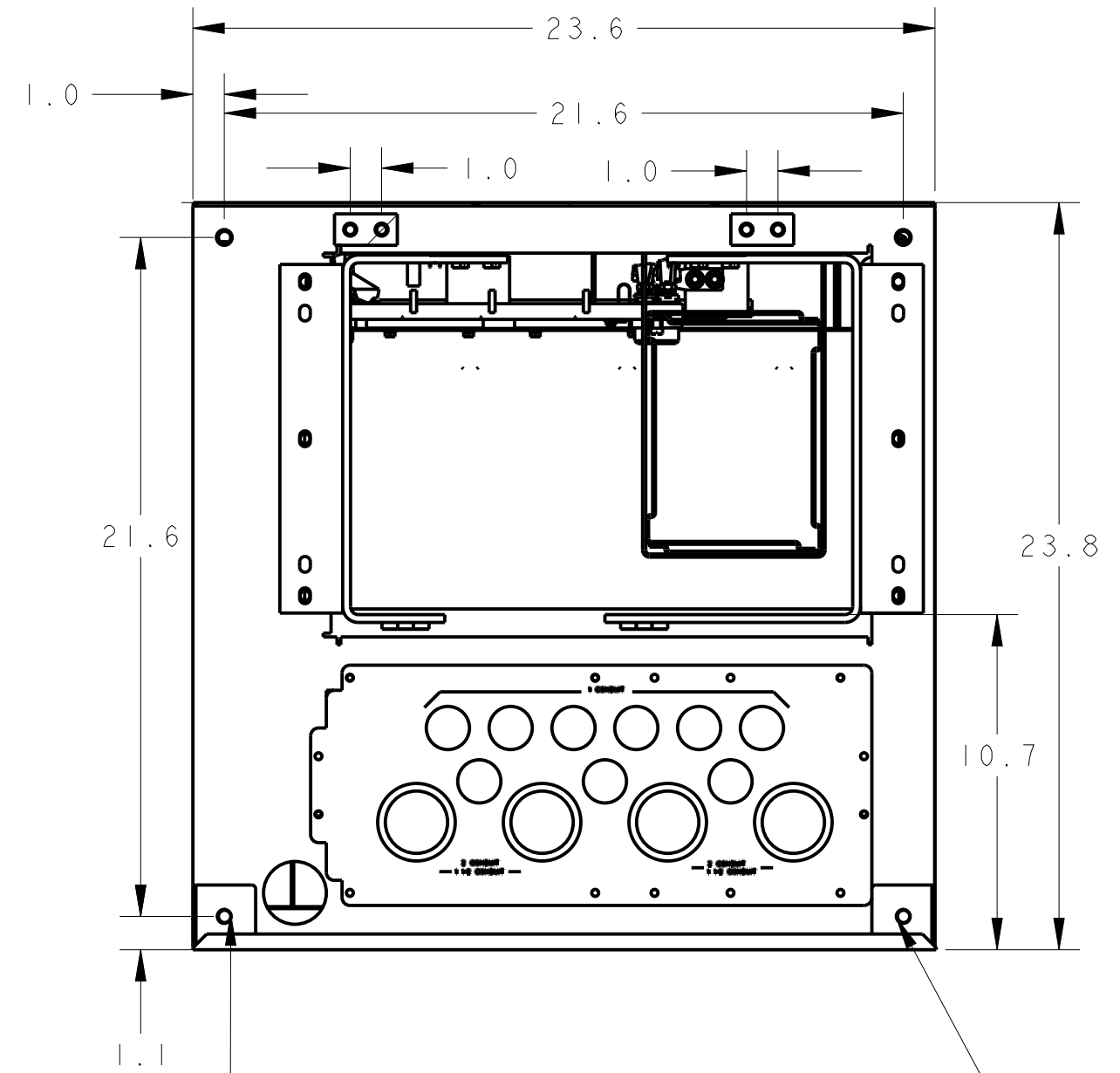
FRONT VIEW
CIRCUIT BREAKER
(DOOR REMOVED)

FACIA COVER FOR
DISTRIBUTED
ARCHITECTURE OR
848535332 MOUNTING
PLATE FOR RPM'S

TERMINAL STRIP
FRONT VIEW
(DOOR REMOVED)

7 FOOT HIGH CABINET DIMENSIONS
(DUAL RECTIFIER SHELVES)
(GROUP 300's)

TOP VIEW

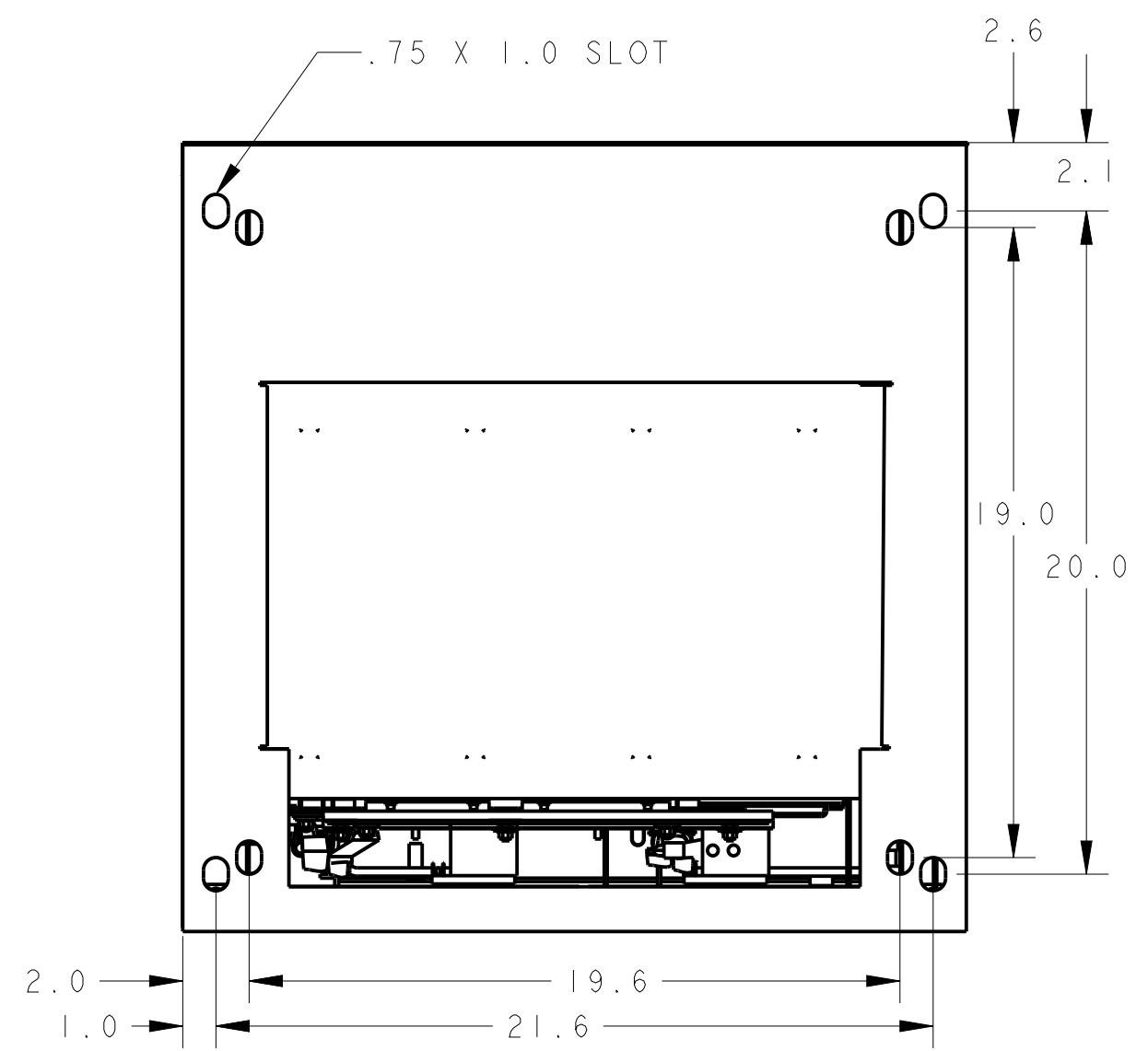


AC PLATE PROVIDES:
9 HOLES FOR 1" CONDUIT
4 HOLES FOR 1 1/2" CONDUIT
4 HOLES FOR 2" CONDUIT

M8 PEM NUTS
FOR FRAME GROUND

M10 WELD NUTS
(PROVIDED ARE 4
ADAPTERS TO 5/8"
THREADED ROD)
(4 PLACES)

BOTTOM VIEW



INITIAL BAY
G2 E/W (1) G19, (1) G334

REMOVE COVER PLATE
PRIOR TO INSTALLATION OF
595A/B RECTIFIER IN SHELF

CONSULT FACTORY IF
INSTALLING 595A/B RECTIFIER

TITLE
GPS4848/100 ORDERING GUIDE
DRAWING DESCRIPTION



DOC TYPE
DWG

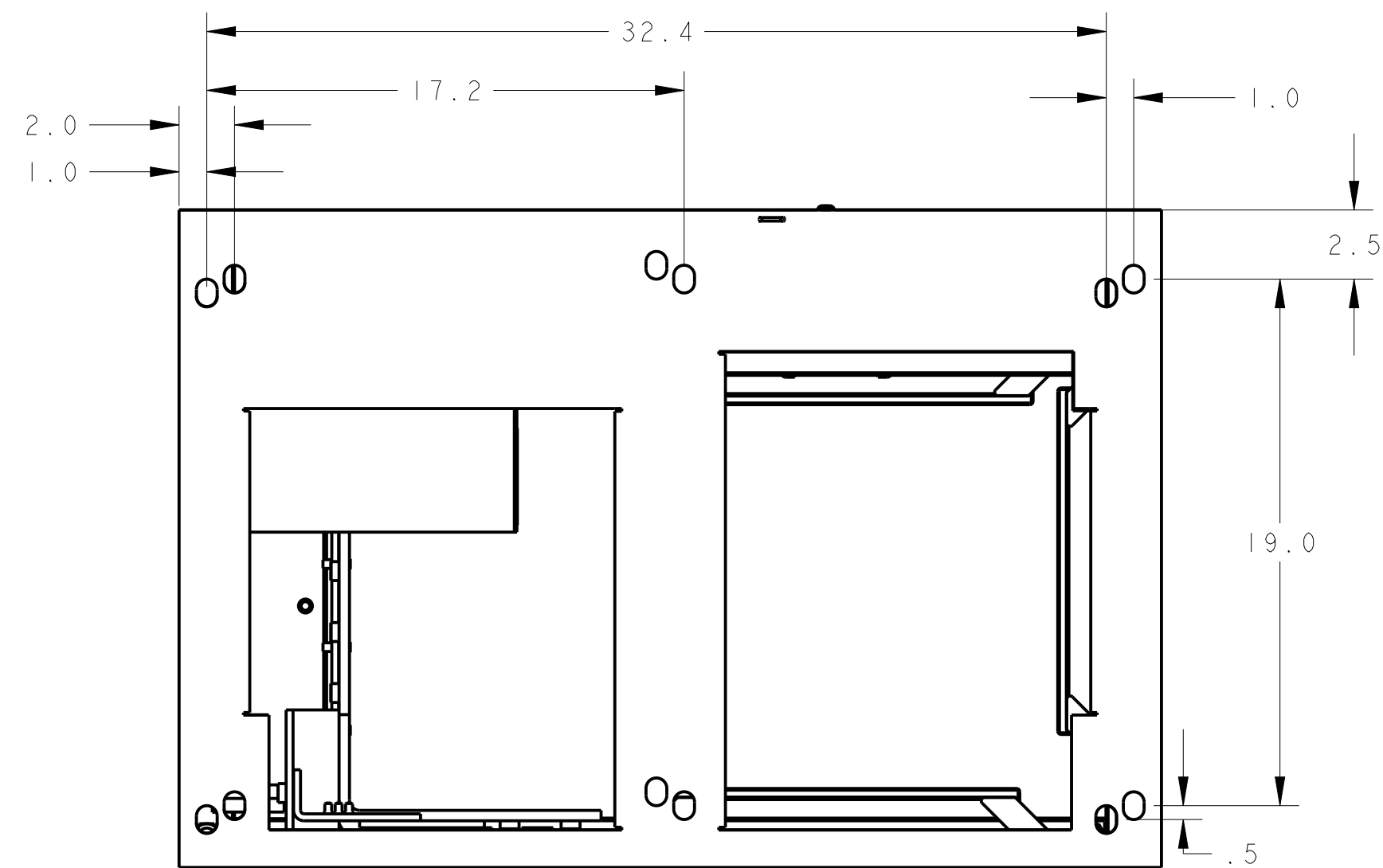
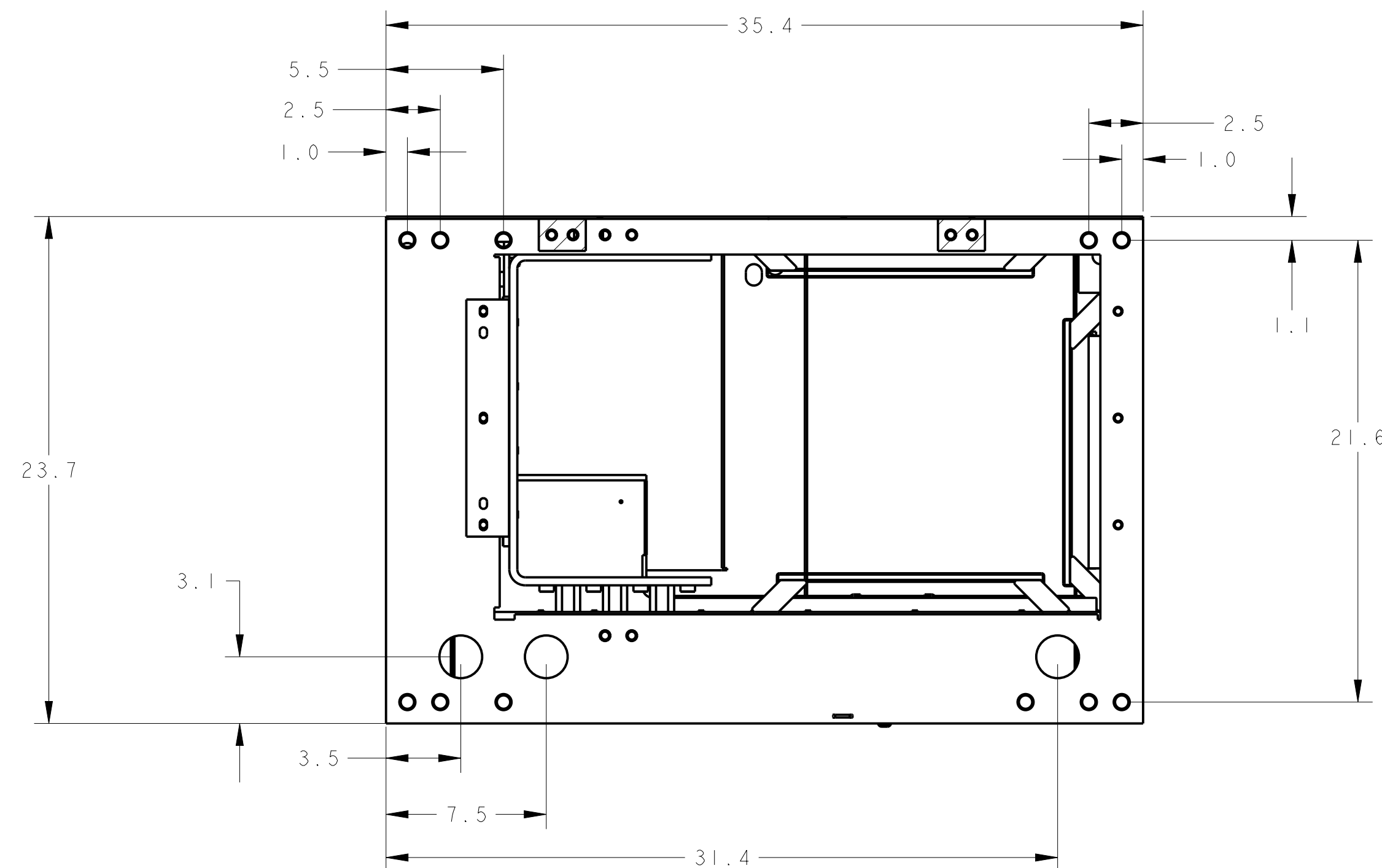
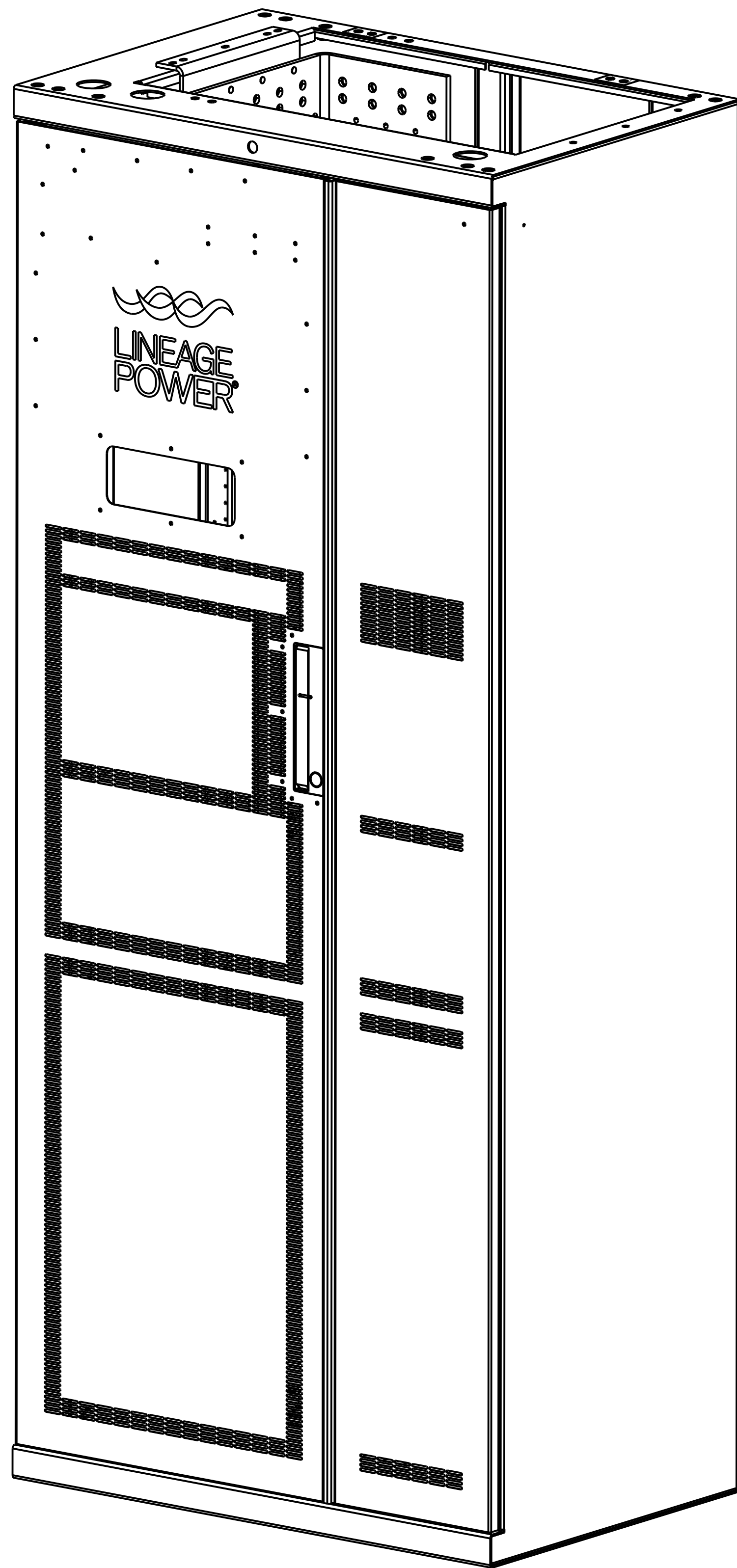
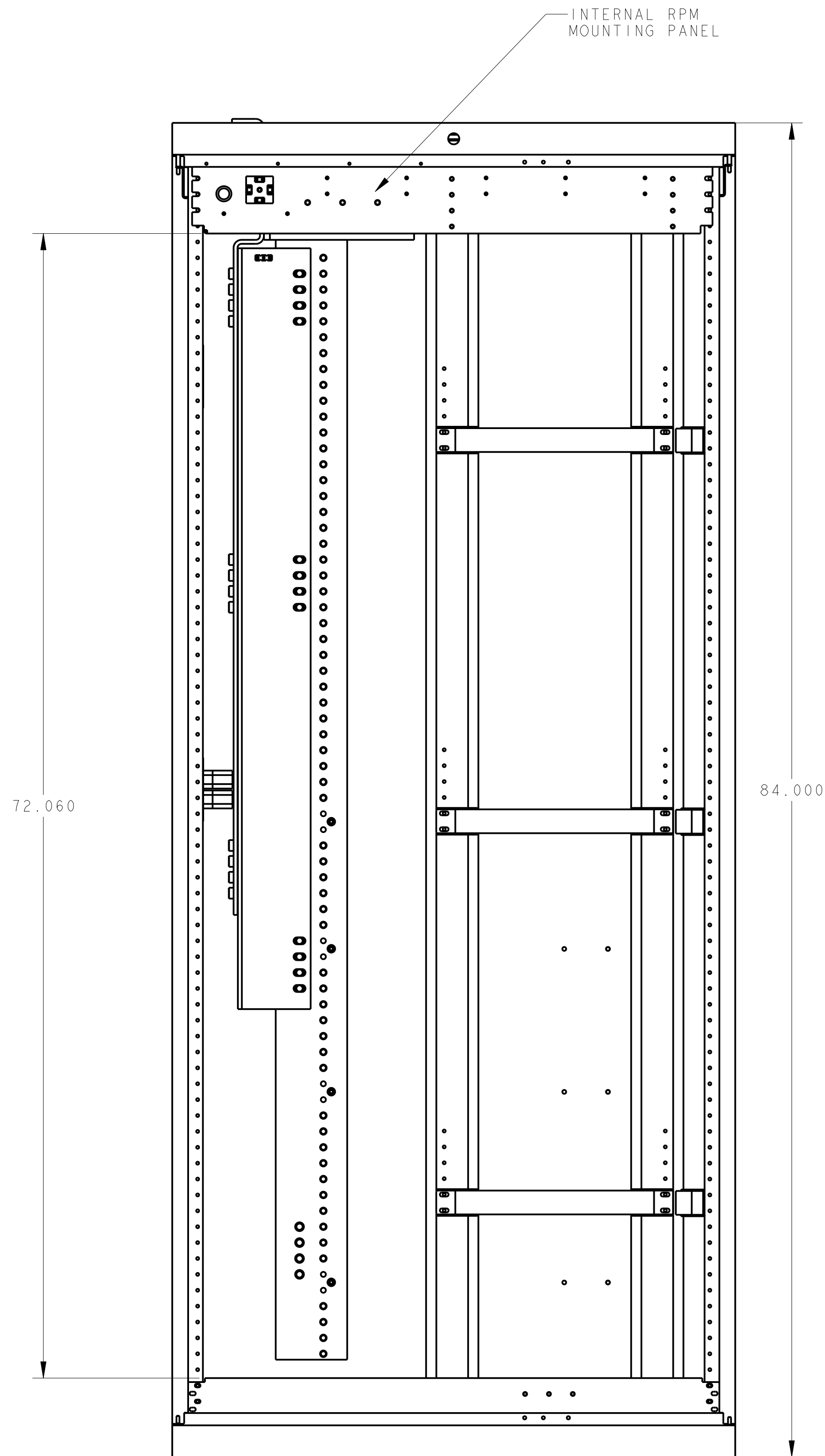
H569-434

SHEET
C3

ISSUE
25

DWG
SIZE
C2/AIR

7 FOOT 36 INCH WIDE
DISTRIBUTION ONLY CABINET
H569-434 G430



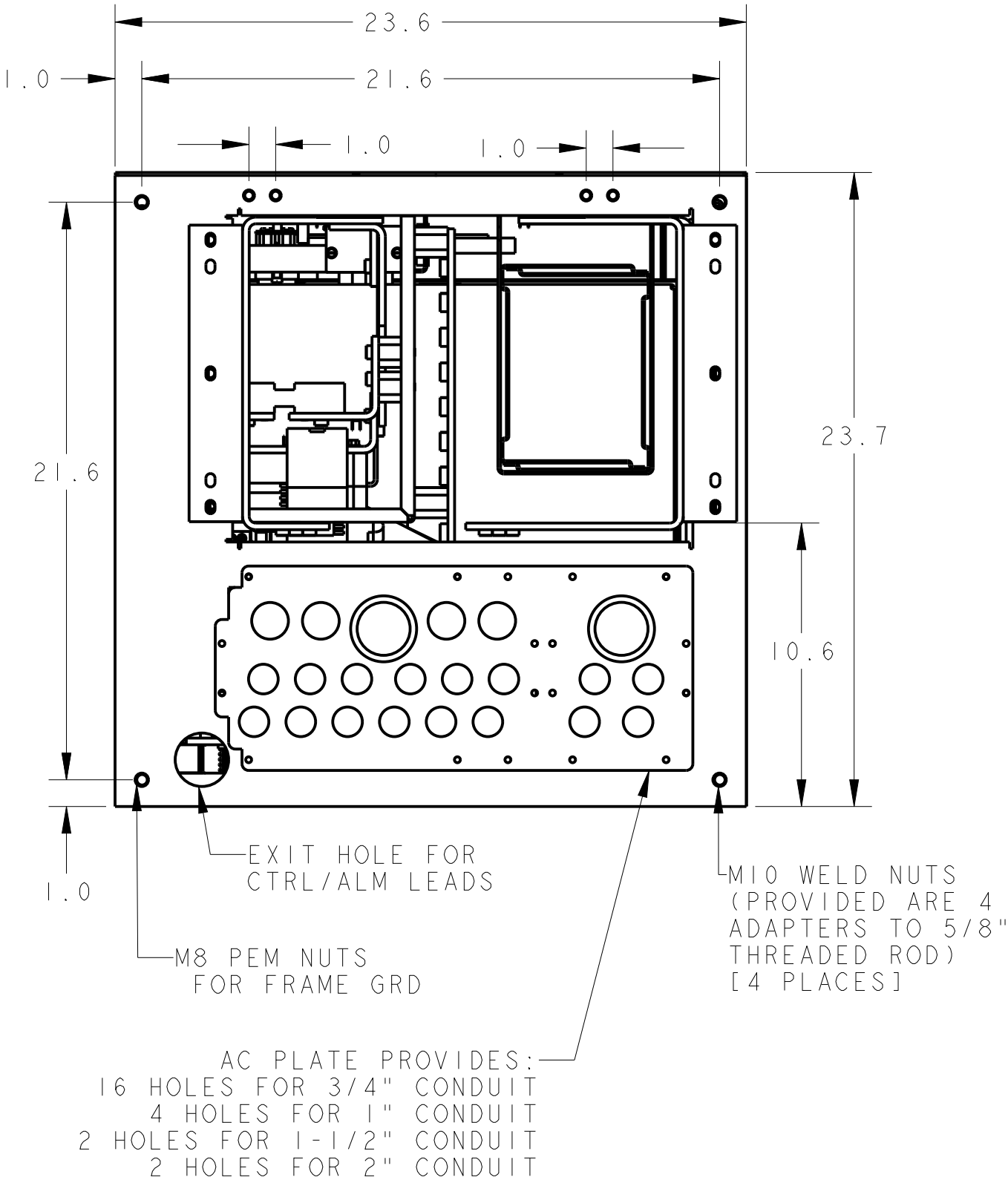
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|  | CTRL LOC | H569434_C | SHEET | ISSUE |
| | DJ | | C3A | 27 |
| | | DWG SIZE C2/AIR | | |

7 FOOT HIGH CABINET DIMENSIONS
(SINGLE RECTIFIER SHELVES)
(GROUP 22 SHOWN)

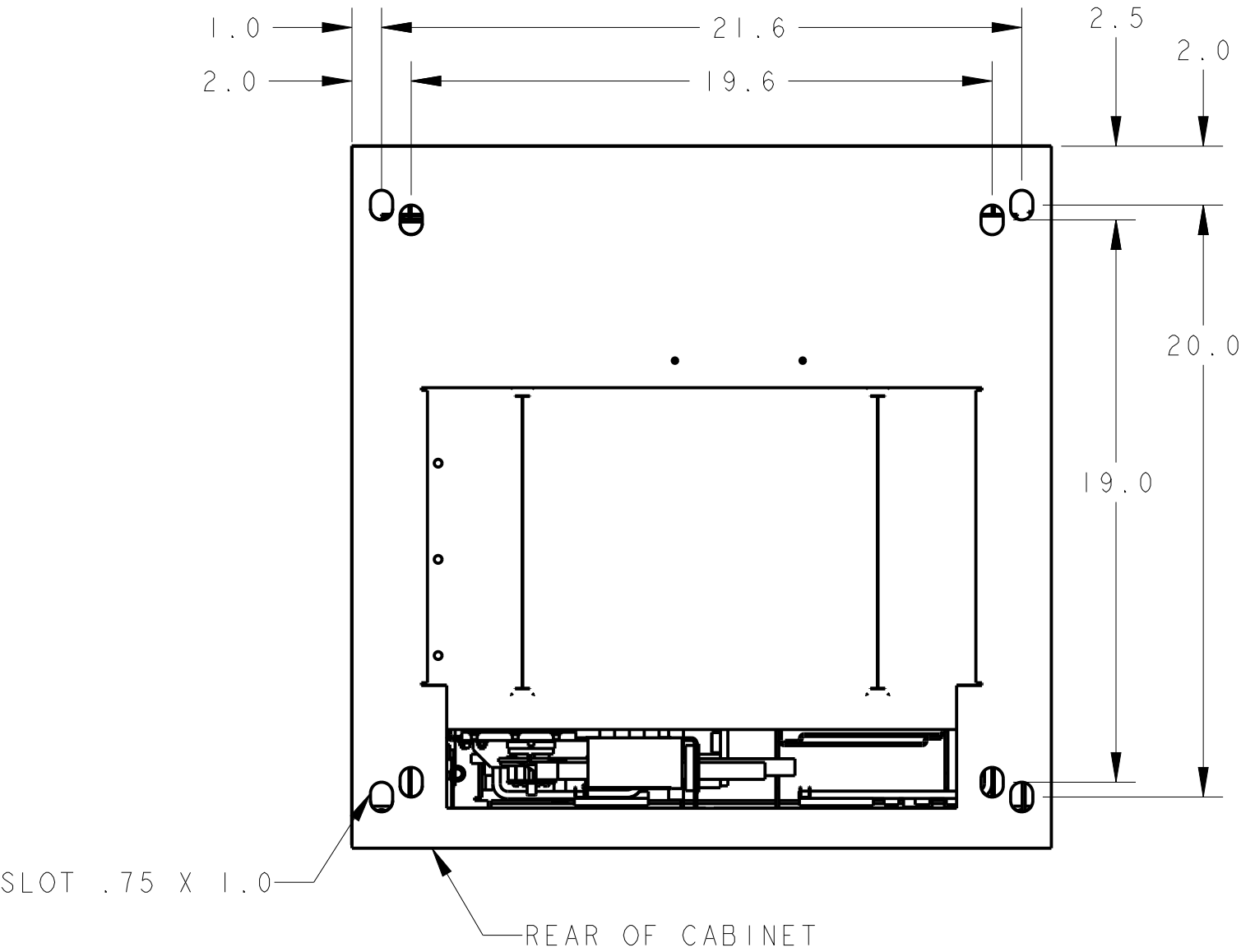
INITIAL BAY
G1 E/W G14, G22, G31, G42A, G40
TYPICAL CONFIGURATION

FACIA COVER FOR DISTRIBUTED
ARCHITECTURE OR 848535332
MOUNTING PLATE FOR RPMs

TOP VIEW



BOTTOM VIEW



TITLE
GPS4848/100 ORDERING GUIDE
DRAWING DESCRIPTION
-



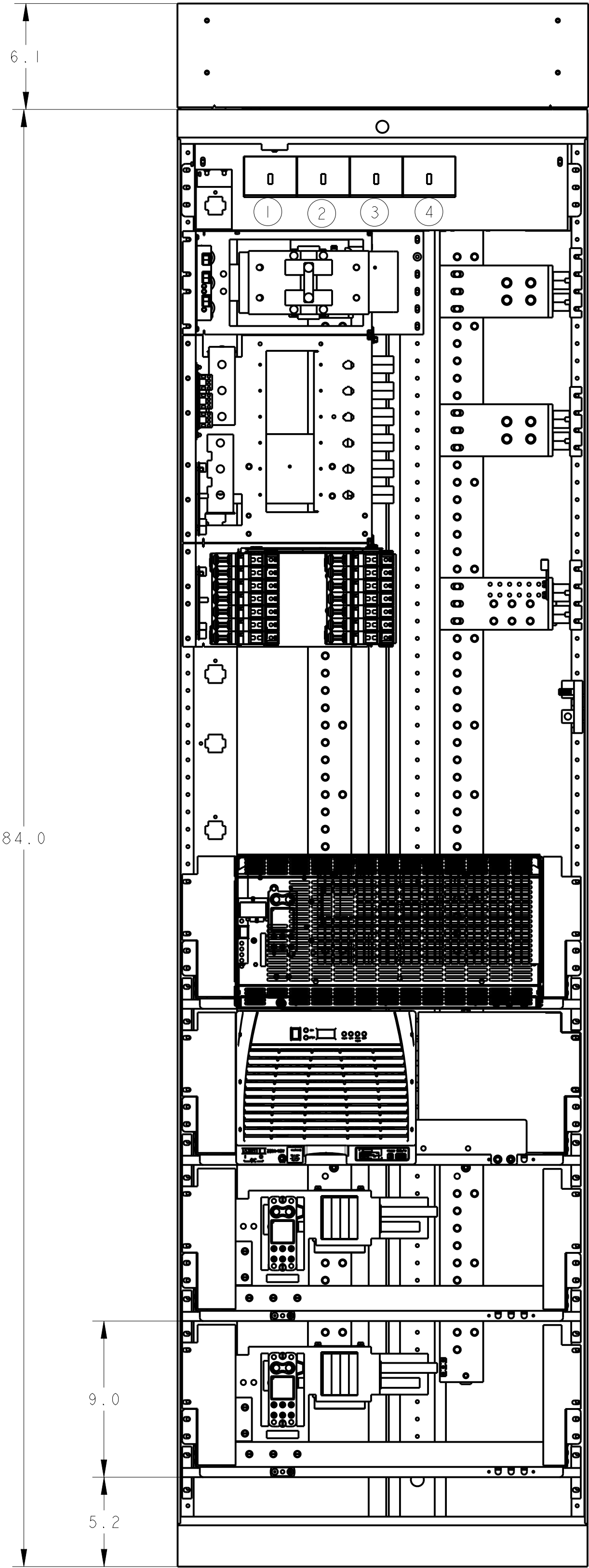
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H569-434

SHEET
C3B

ISSUE
27

DWG
SIZE
C2/AIR



4

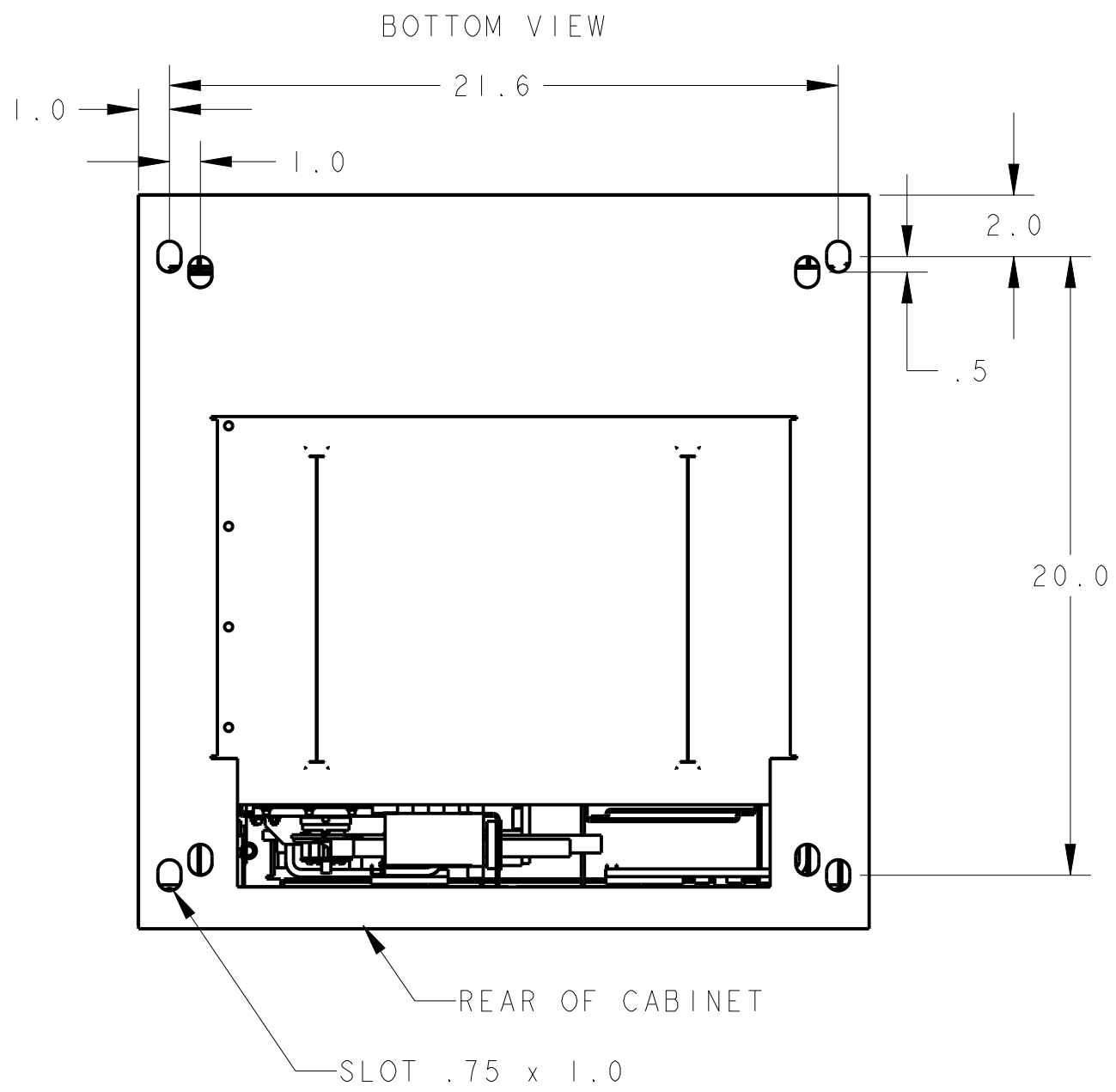
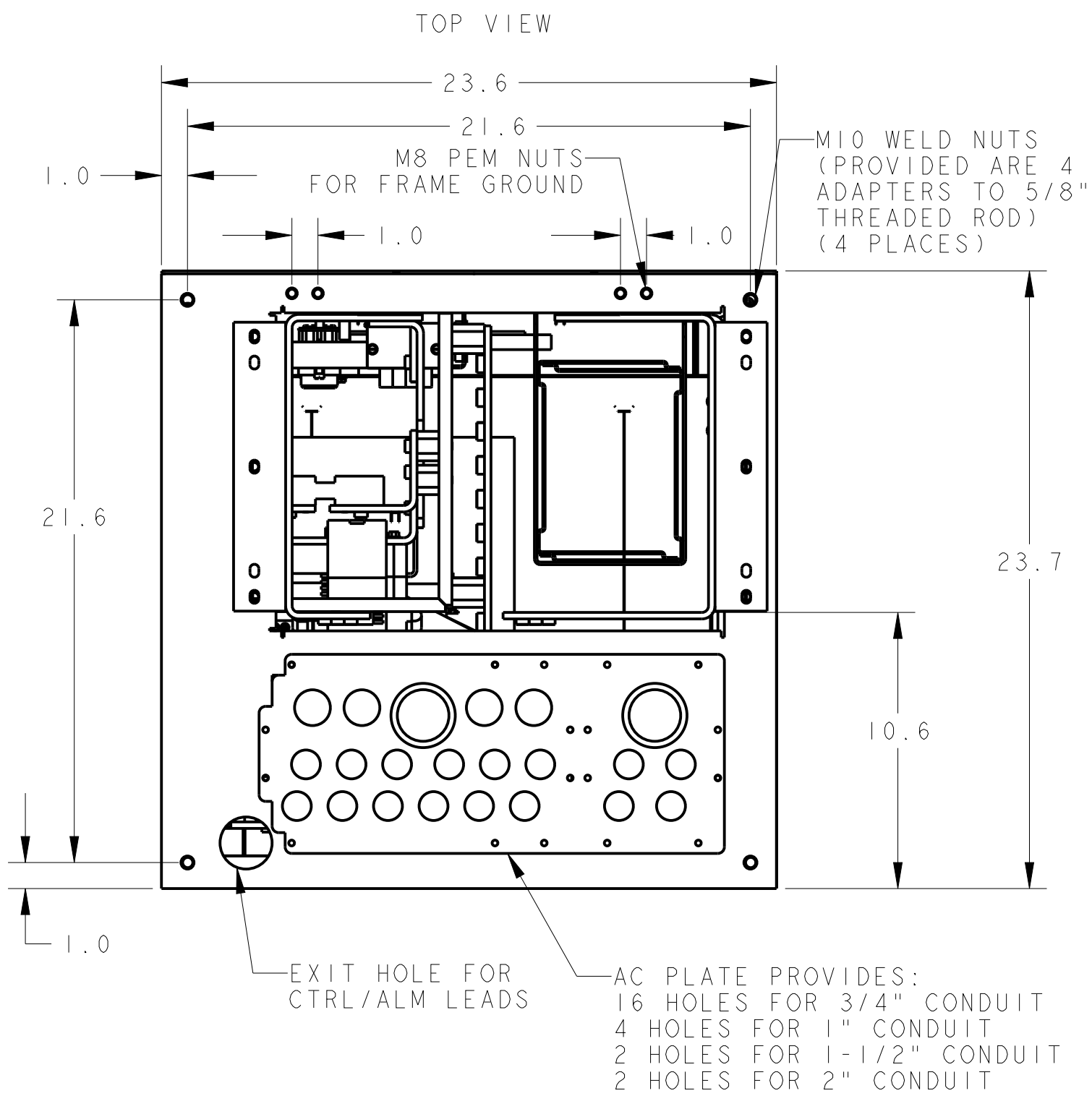
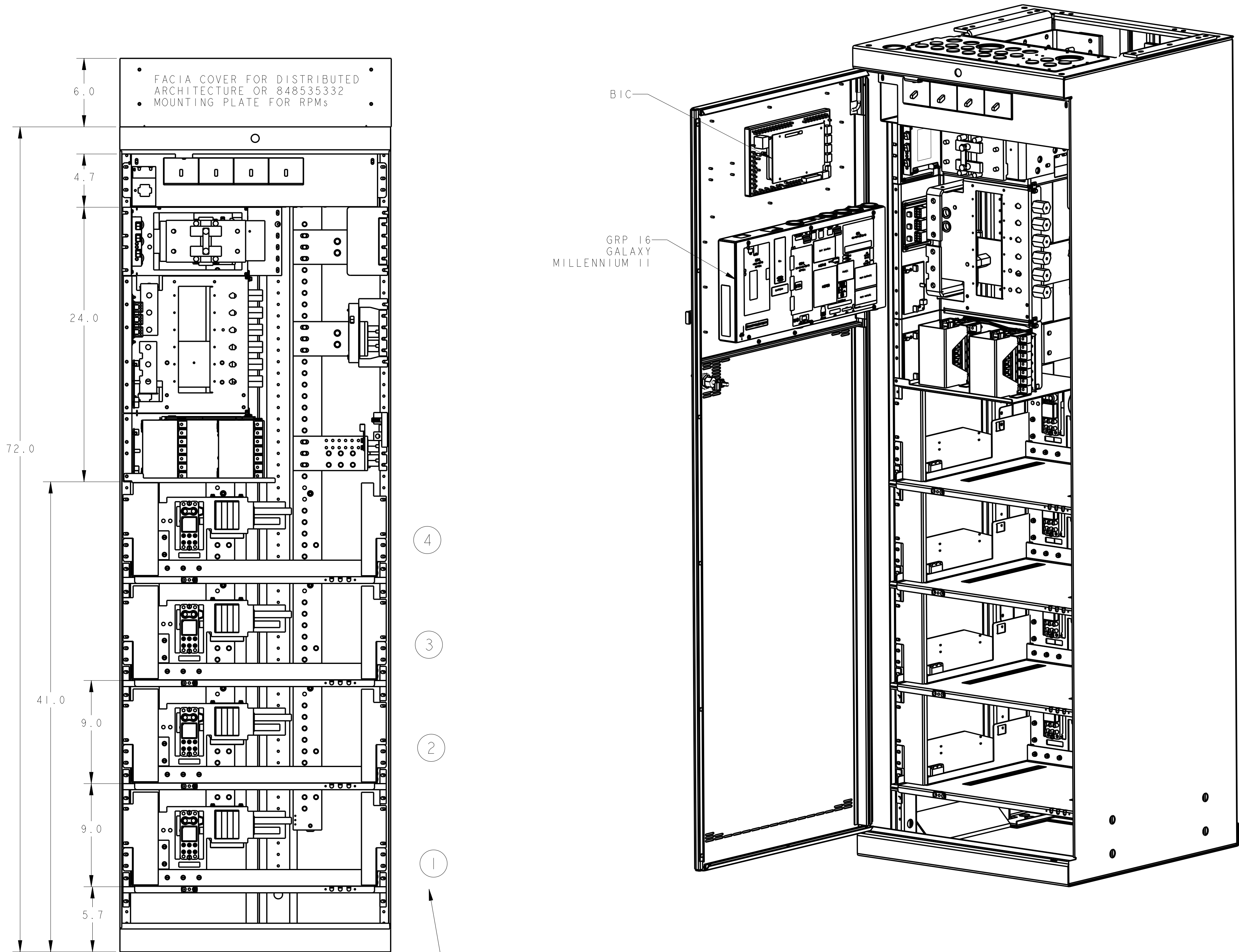
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RECTIFIER NUMBERING SEQUENCE

6 FOOT HIGH CABINET DIMENSIONS
(SINGLE RECTIFIER SHELVES)
(GROUP 200's)



SCALE 3/16
SCALE 3/16

TITLE
GPS4848/100 ORDERING GUIDE
DRAWING DESCRIPTION
-



DOC TYPE
DWG

H569-434

SHEET
C3C

ISSUE
25

DWG
SIZE
C2/AIR

A

B

C

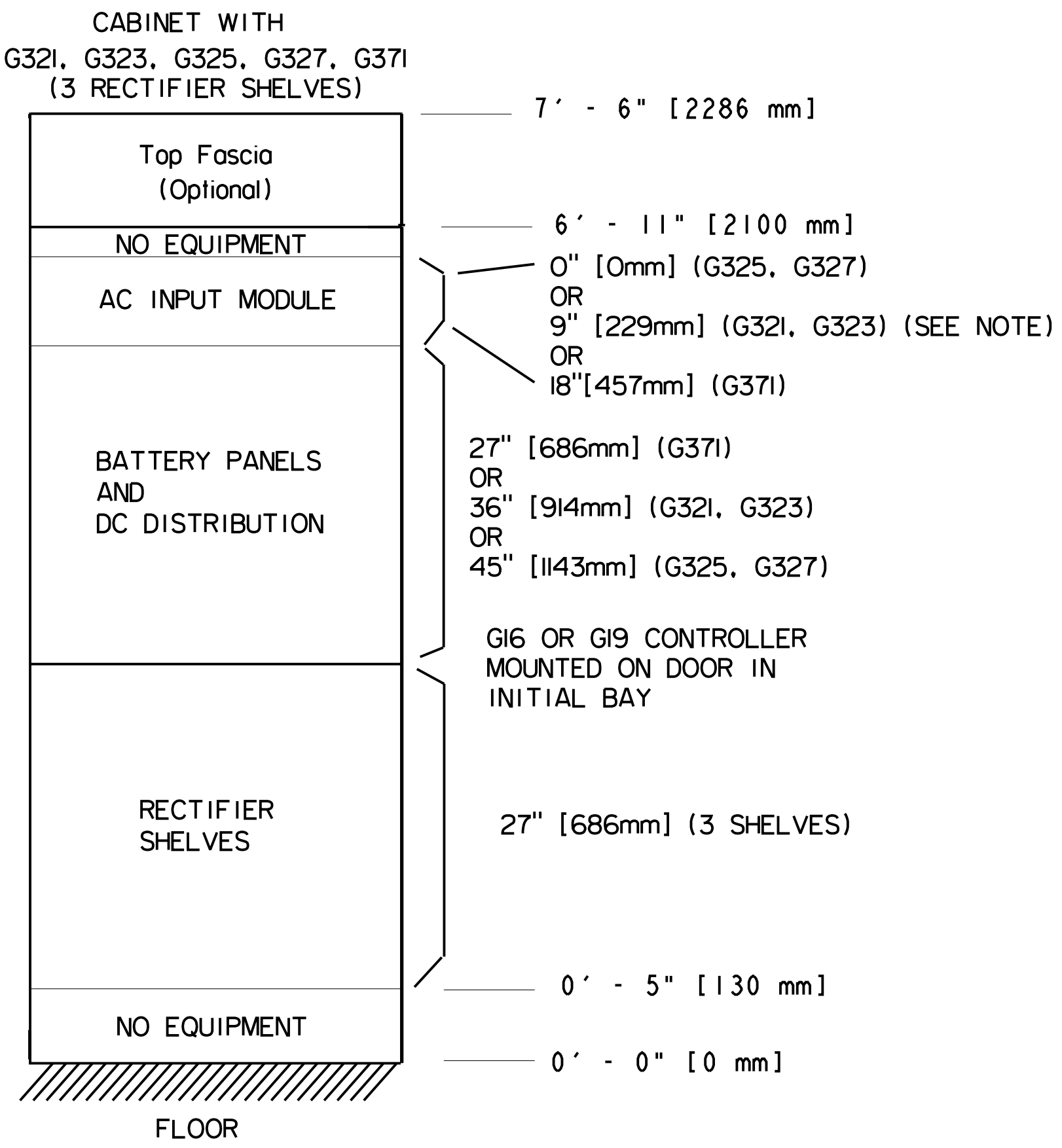
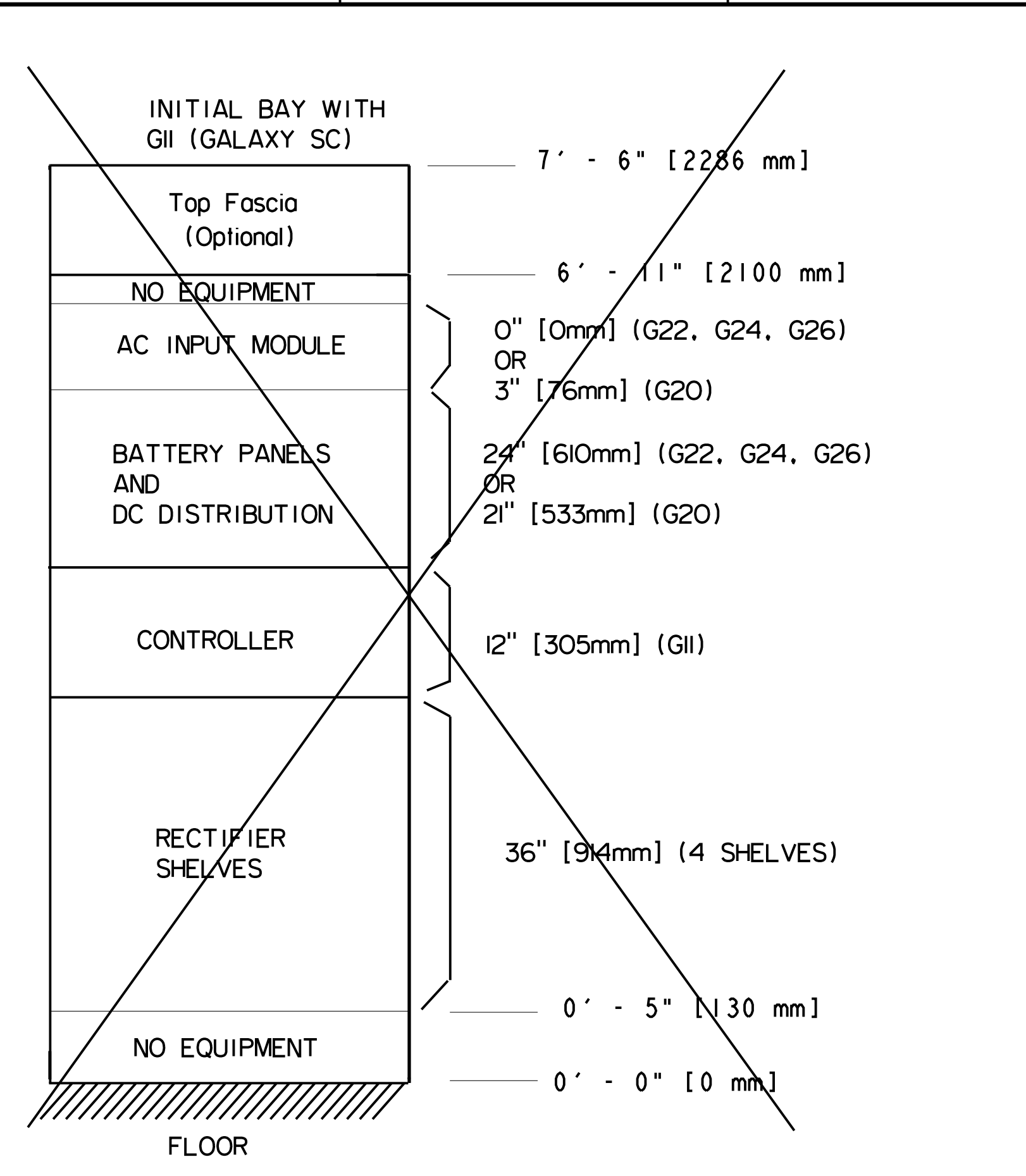
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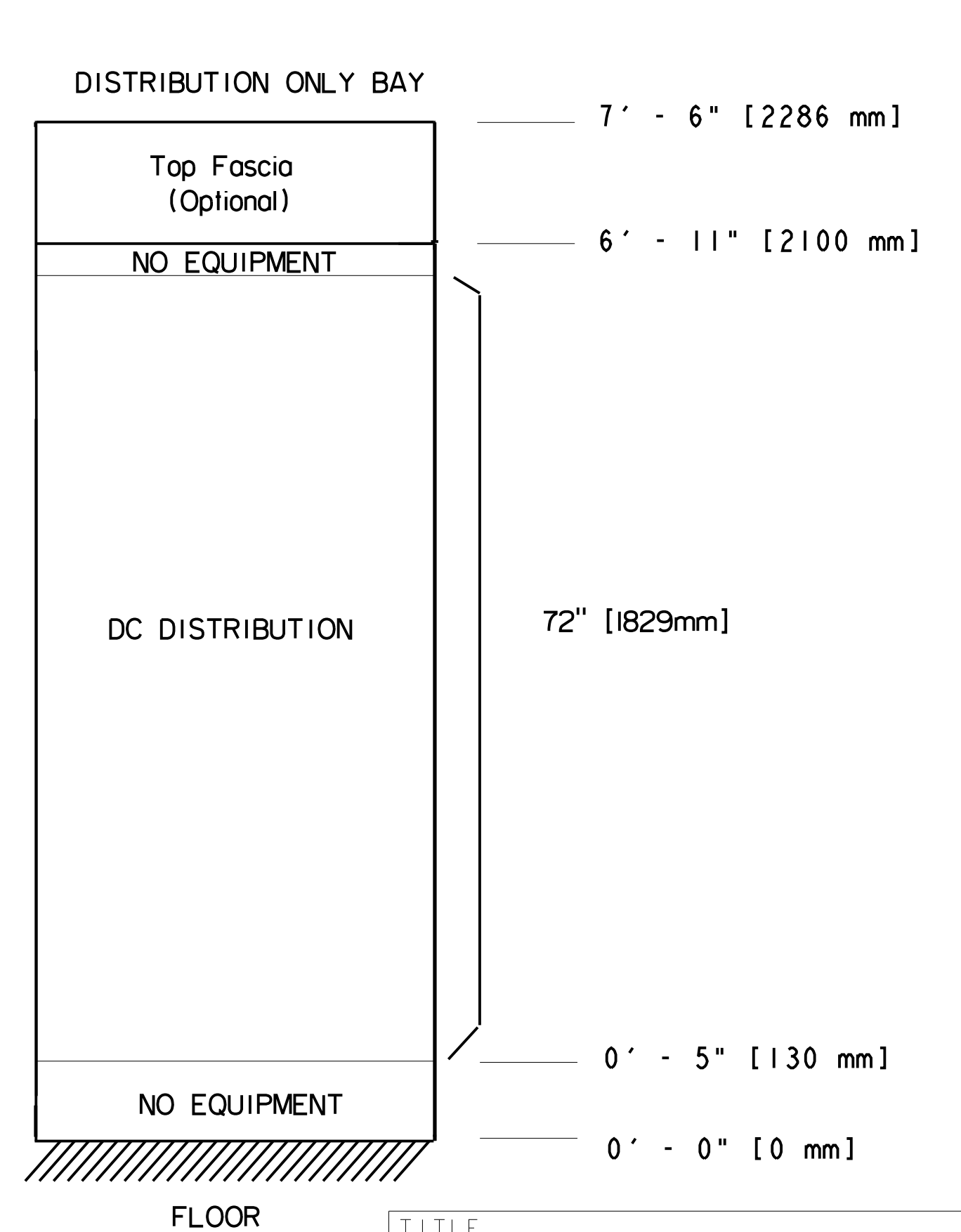
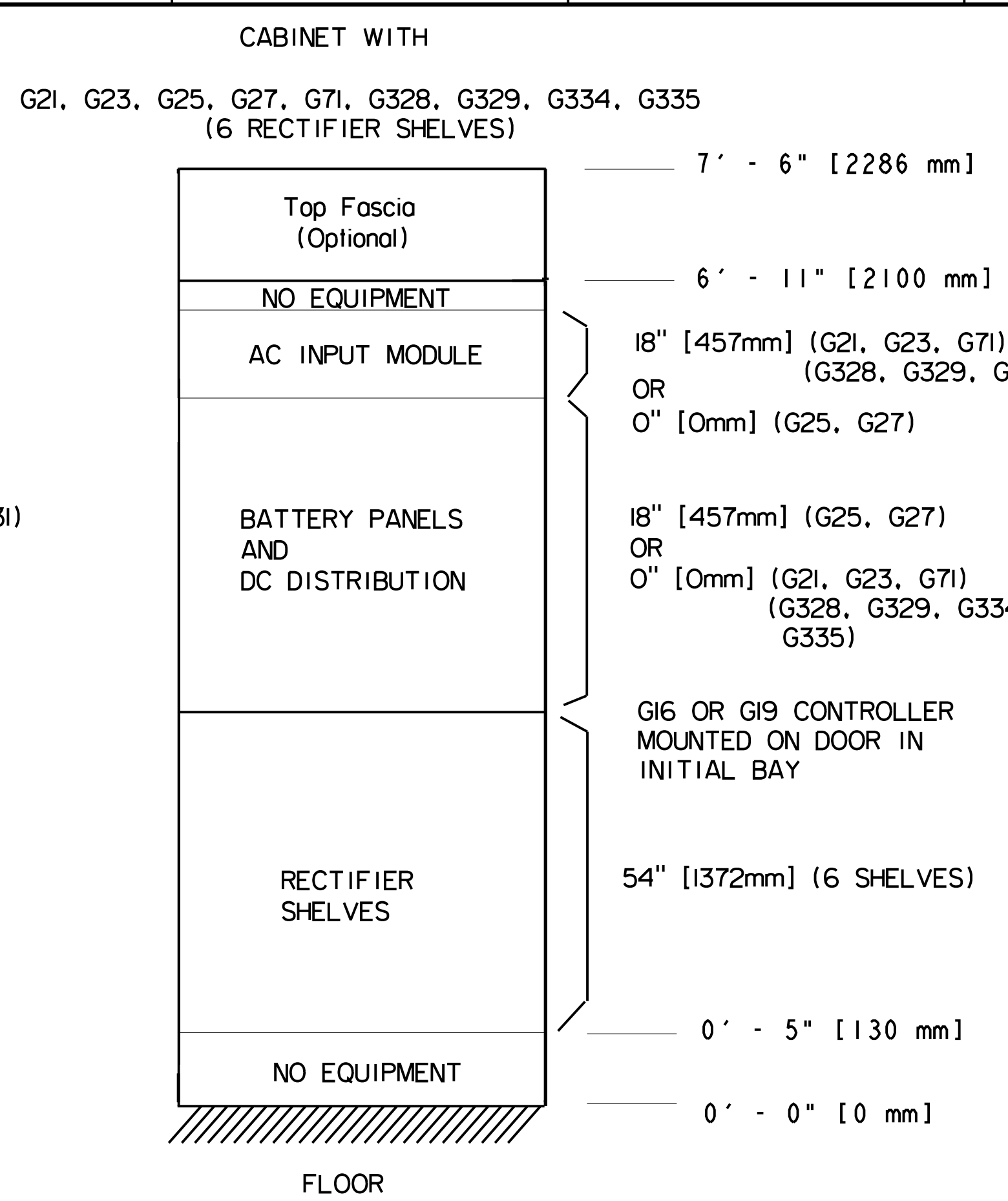
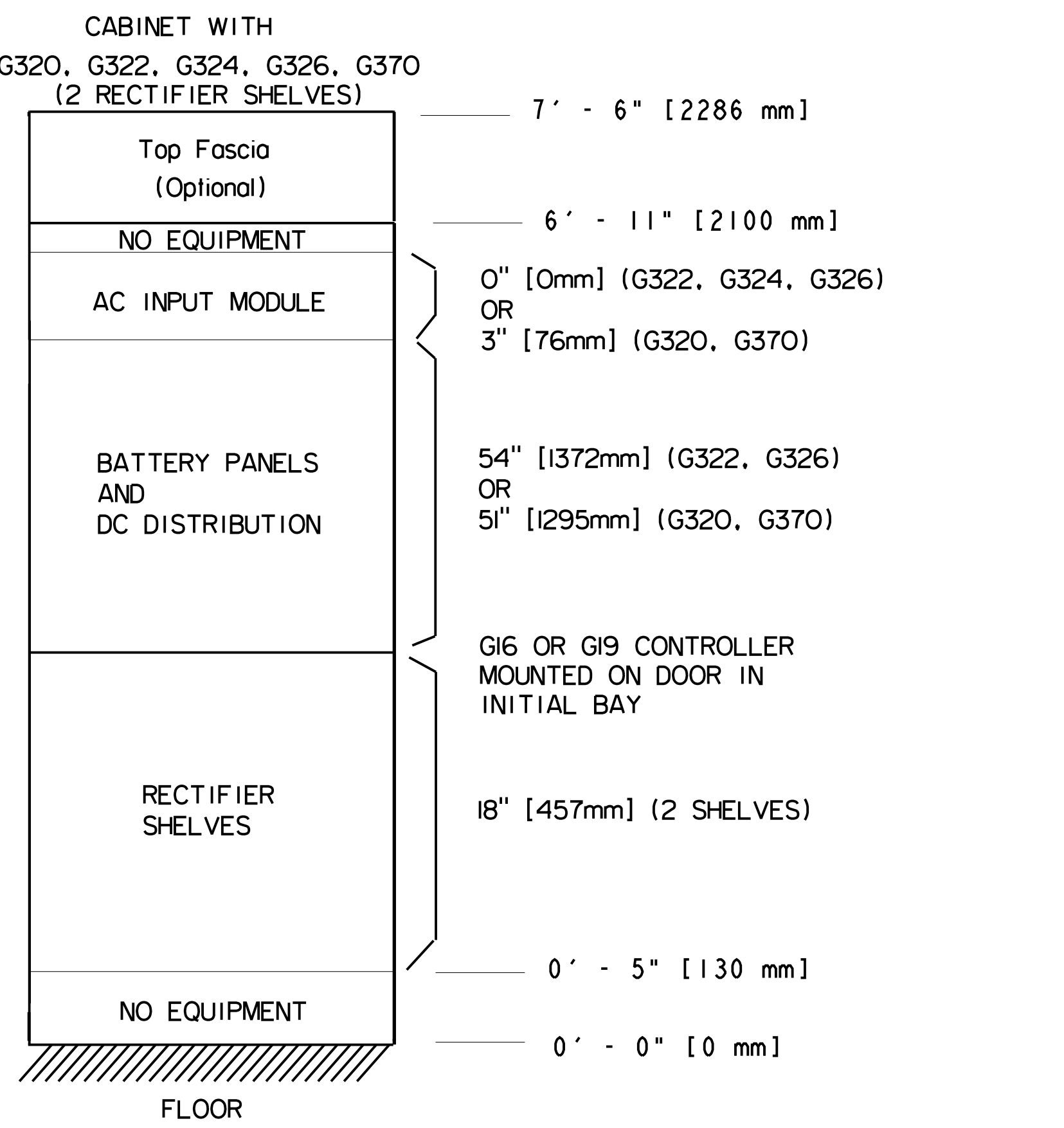
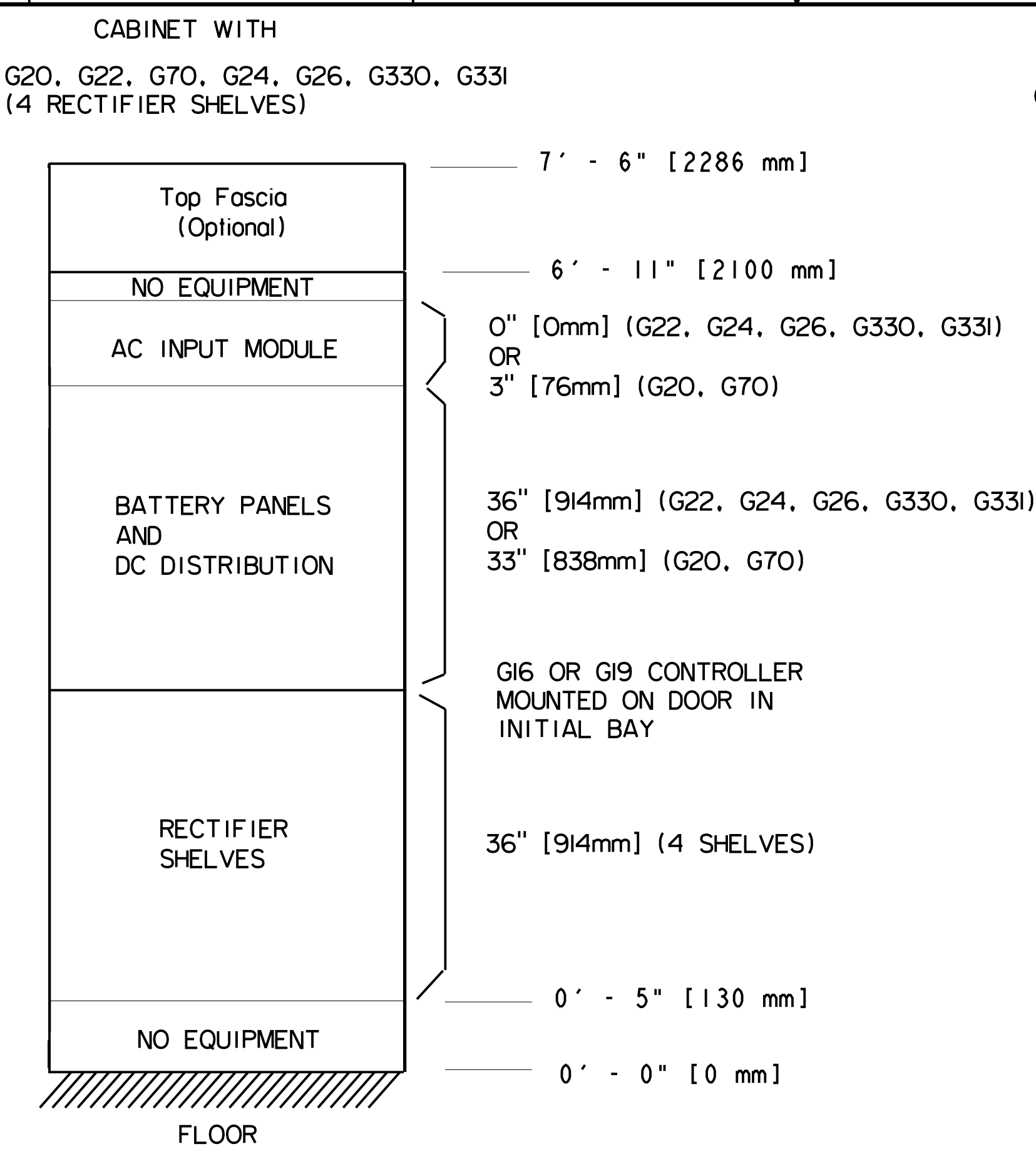
F

G

H



NOTE: PRIOR TO 12/1/2006, AC INPUT MODULE
VERTICAL HEIGHT WAS 18" FOR G32I AND G323



CABINET SPACE

CABINET-MOUNTED
EQUIPMENT

MOUNTING RULES

THE FOLLOWING RULES APPLY TO INSTALLATION
OF BATTERY PANELS AND DC DISTRIBUTION
PANELS.

1. ONLY ONE BATTERY CONNECTION PANEL IS
ALLOWED PER CABINET.


2. G32 BATTERY PANEL MOUNTS BEHIND THE
AC INPUT PANEL. ALL OTHER PANELS MOUNT
DIRECTLY BELOW THE AC INPUT PANEL.

3. DC DISTRIBUTION PANELS ARE MOUNTED
DIRECTLY BELOW THE BATTERY PANEL.
PANELS ARE MOUNTED DIRECTLY BENEATH
EACH OTHER WITH NO EMPTY SPACE BETWEEN.
BLANK PANELS, IF ORDERED, ARE MOUNTED
BELOW THE DC DISTRIBUTION PANELS.
PANELS SHOULD BE MOUNTED FROM THE TOP
DOWN IN THE FOLLOWING ORDER:

| MOUNTING ORDER: | MOUNTING ORDER CONTINUED: | MOUNTING ORDER CONTINUED: |
|--------------------|---------------------------------|---------------------------------|
| G43B | G96A | G6I |
| G43C | G96B | G6IA |
| GIOI | G96C | G6O |
| GIO2 | G98 | G6OA |
| GIO3 | G98A | G6OB |
| GIO4 | G98B | G6OC |
| GIOA | G98C | G6IB |
| GIO2A | G97 | G6IC |
| GIO3A | G97A | G65B |
| GIO4A | G97B | G65C |
| G43 | G97C | G66B |
| G43A | G40 | G66C |
| G48 | G50 | G93 |
| G48A | G40A | G90 |
| G48B | G50A | G9I |
| G48C | G45 | G92 |
| GIO6 | G55 | |
| GIO7 | G45A | |
| GIO8 | G55A | |
| GIO9 | G4I | |
| GIO6A | G5I | |
| GIO7A | G4IA | |
| GIO8A | G5IA | |
| GIO9A | G46 | |
| G42 | G56 | |
| G42A | G46A | |
| G47 | G56A | |
| G47A | G68 | |
| G53, G53A | G68A | |
| G59, G59A | G68B | |
| G57 | G68C | |
| G57A | G67 | |
| G54 | G67A | |
| G54A | G67B | |
| G54B | G67C | |
| G54C | G66 | |
| G52 | G66A | |
| G52A | G65 | |
| G52B | G65A | |
| G52C | | |
| G96 | | |

(CONTINUED ON NEXT SHEET)

TITLE
GPS4848/100 ORDERING GUIDE
DRAWING DESCRIPTION
-

LINEAGE POWER

DOC TYPE
DWG

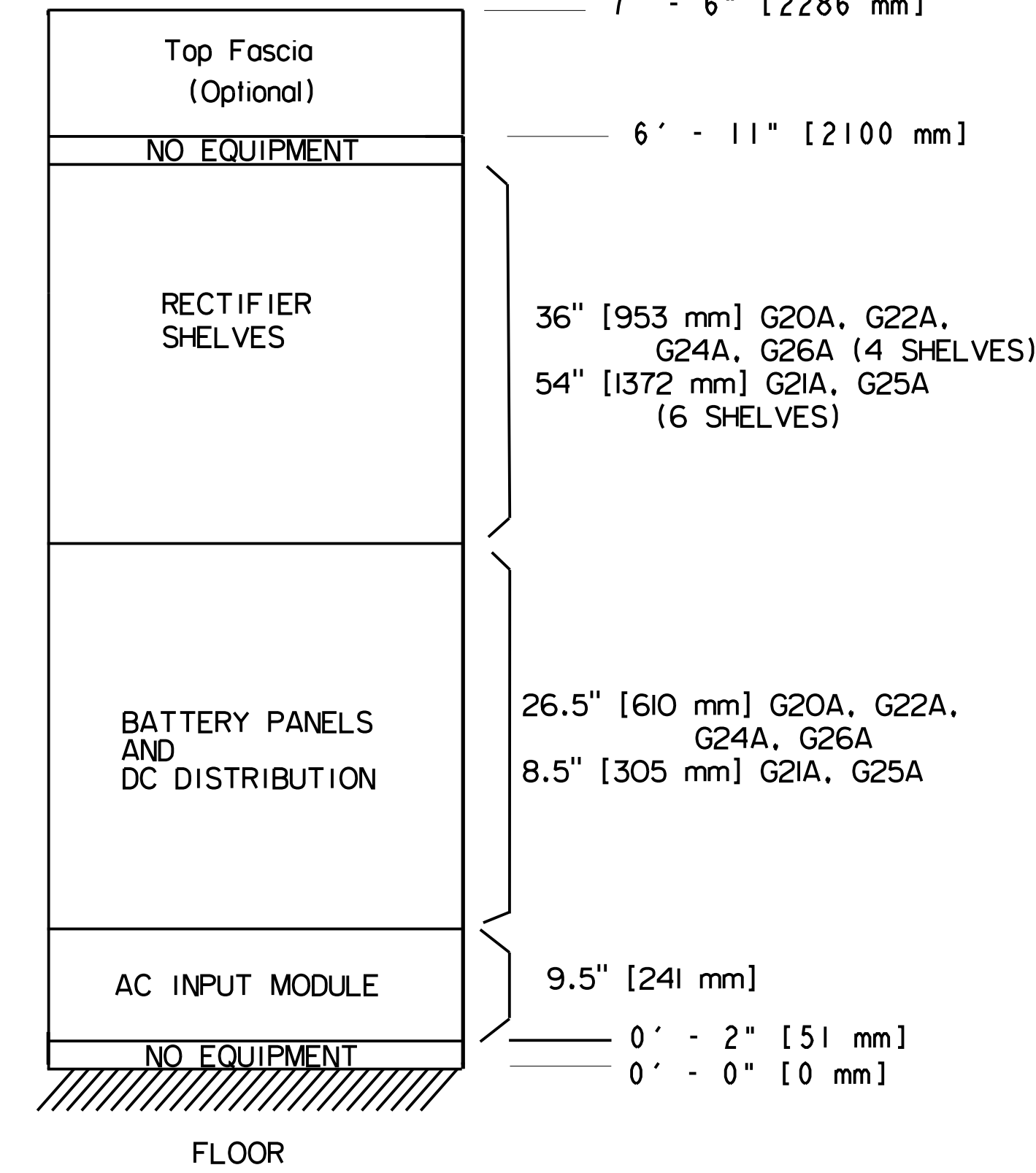
H569-434

SHEET
C4

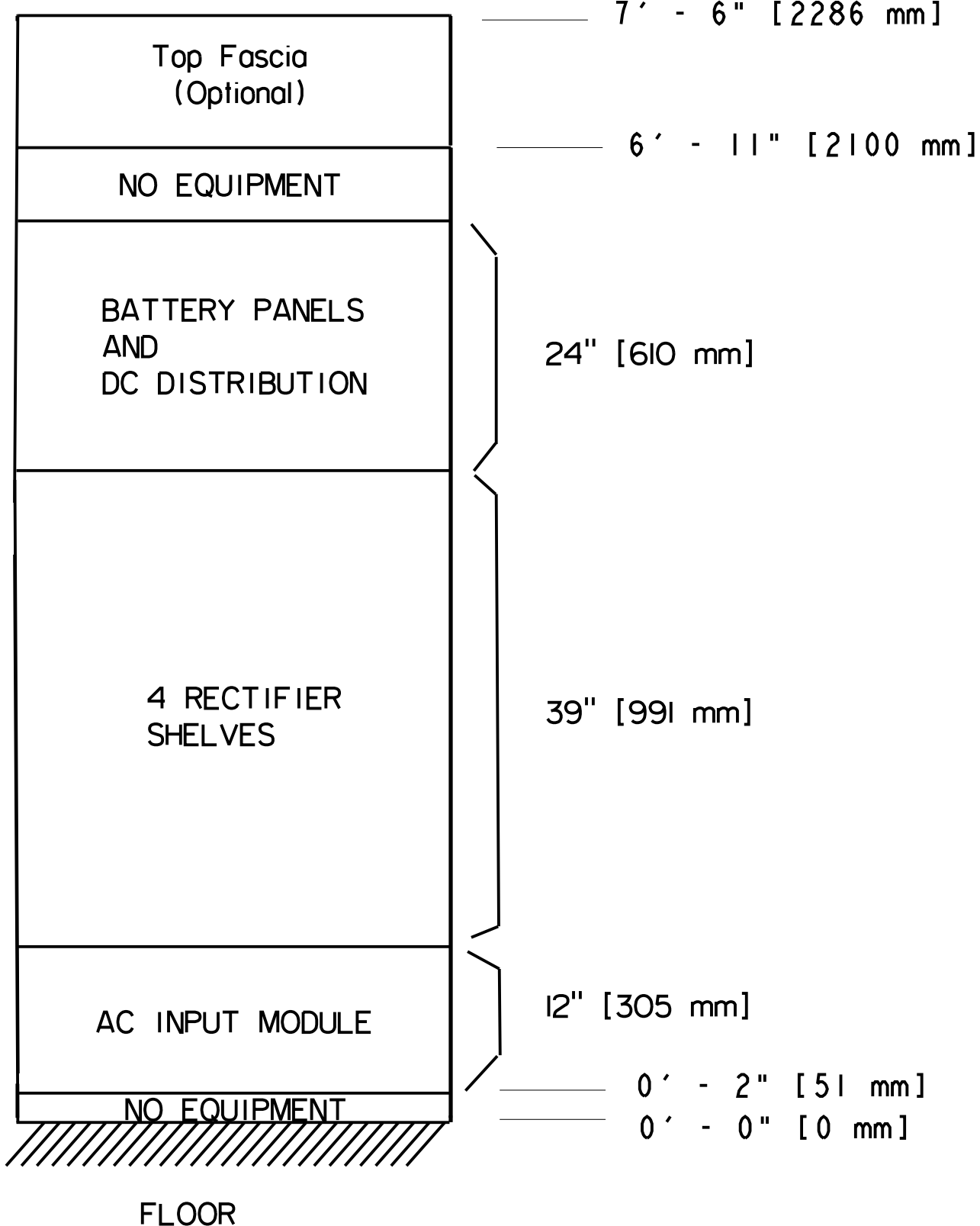
ISSUE
27

DWG
SIZE
C2/AIR

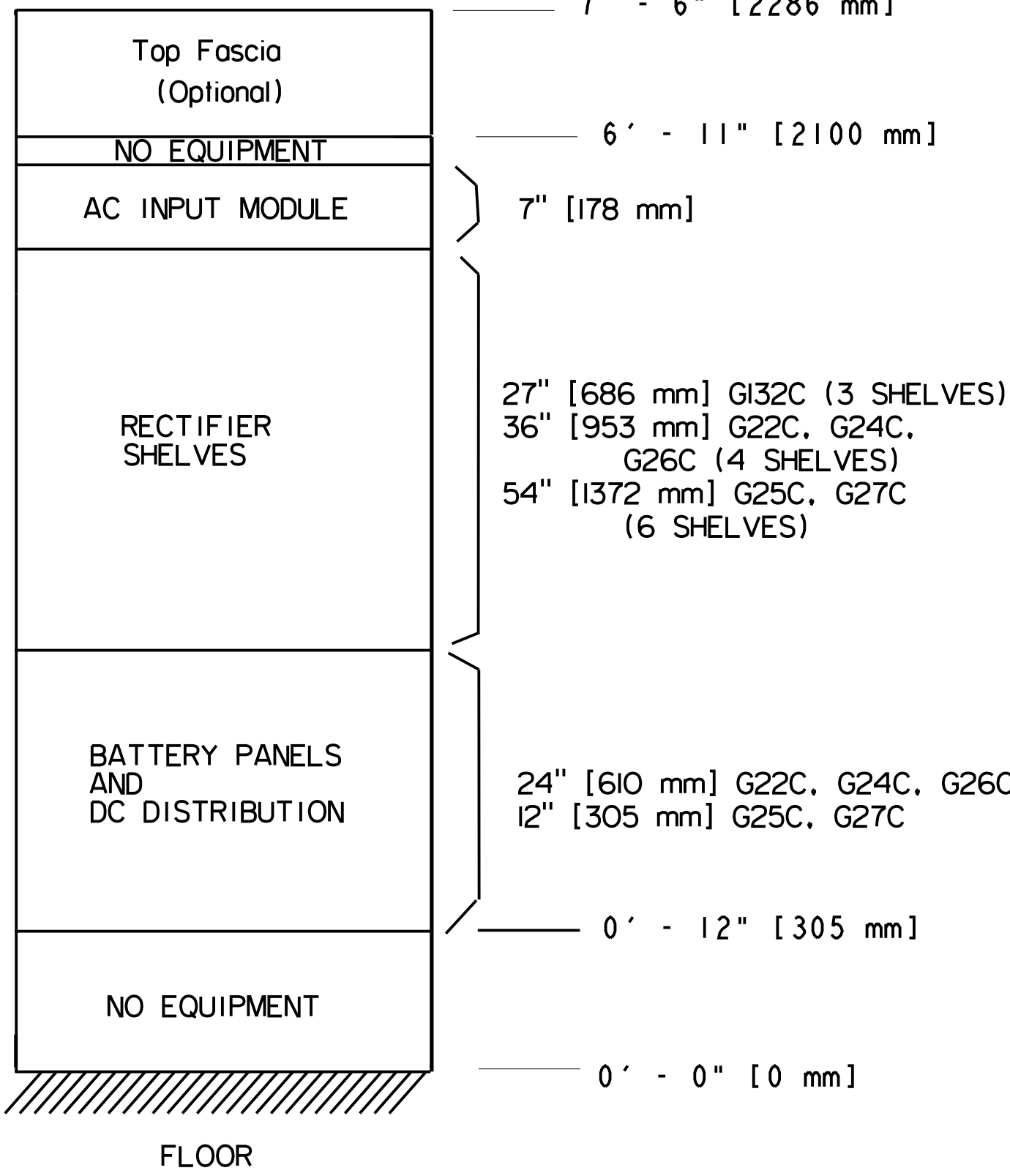
CABINET WITH
"A" OPTION AC PANEL
G20A, G21A, G22A, G24A, G25A, G26A
(BOTTOM FEED AC INPUT AND
BOTTOM BATT/LOAD LEADS OUTPUT)



CABINET WITH
"B" OPTION AC PANEL
G22B, G26B
(BOTTOM FEED AC INPUT AND
TOP BATT/LOAD LEADS OUTPUT)



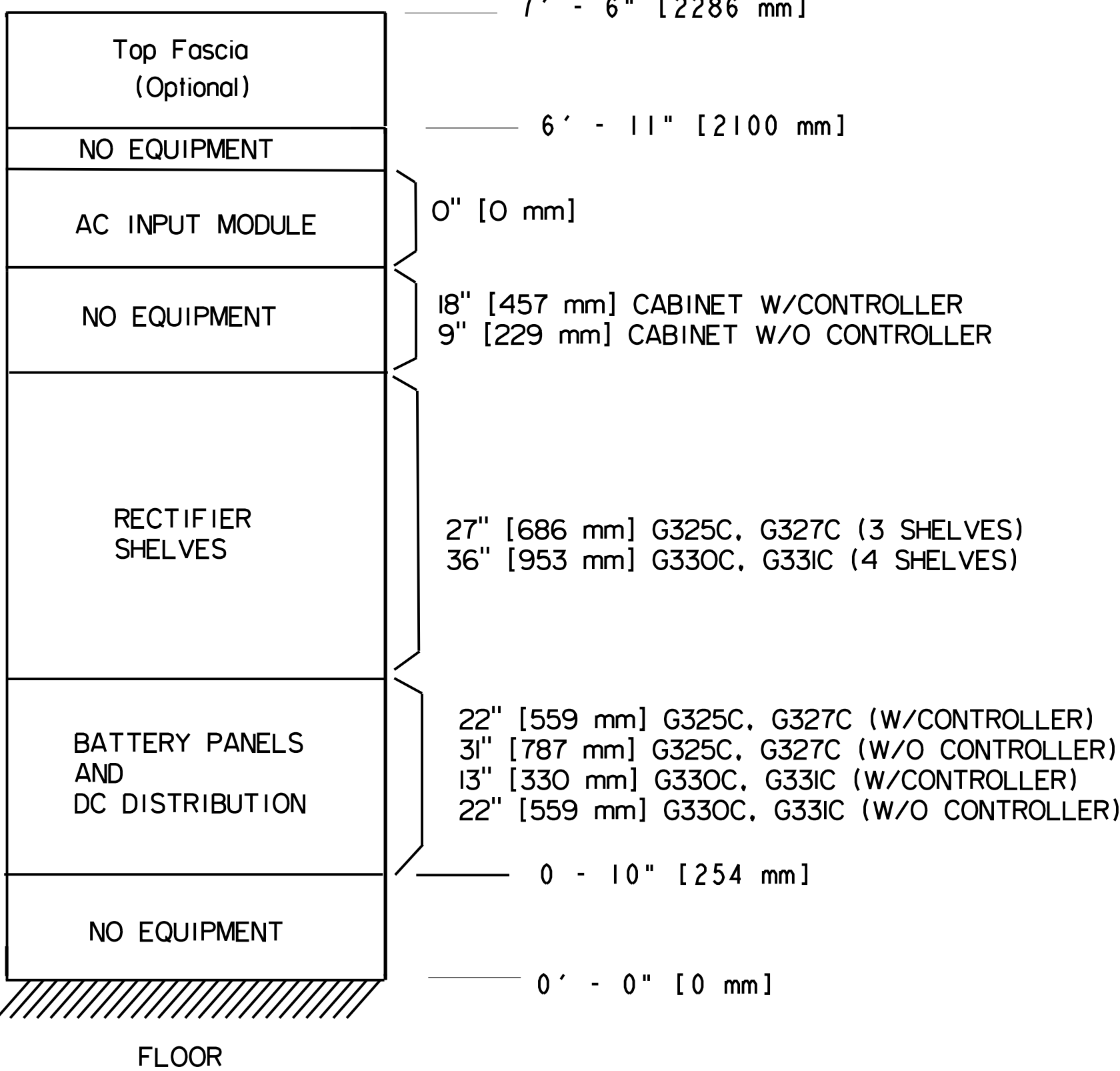
CABINET WITH
"C" OPTION AC PANEL
G22C, G24C, G25C, G26C, G27C, G132C
(TOP FEED AC INPUT AND
BOTTOM BATT/LOAD LEADS OUTPUT)



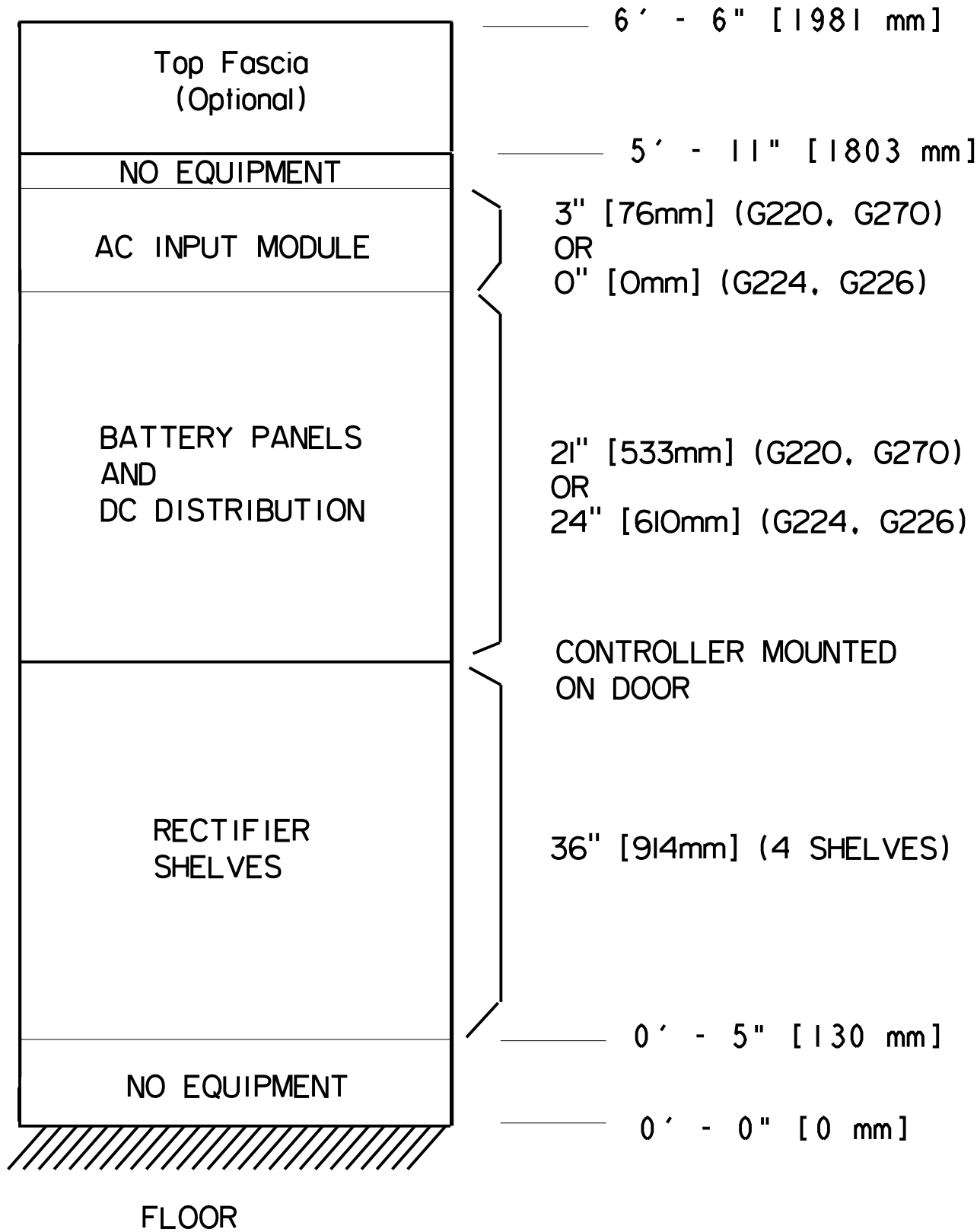
CABINET SPACE

CABINET-MOUNTED
EQUIPMENT (CONTINUED)


DUAL RECTIFIER SHELF CABINET
WITH "C" OPTION AC PANEL
G325C, G327C, G330C, G331C
(TOP FEED AC INPUT AND
BOTTOM BATT/LOAD LEADS OUTPUT)



INITIAL BAY WITH
G16 (GALAXY MILLENNIUM II)
AND 4 RECTIFIER SHELVES

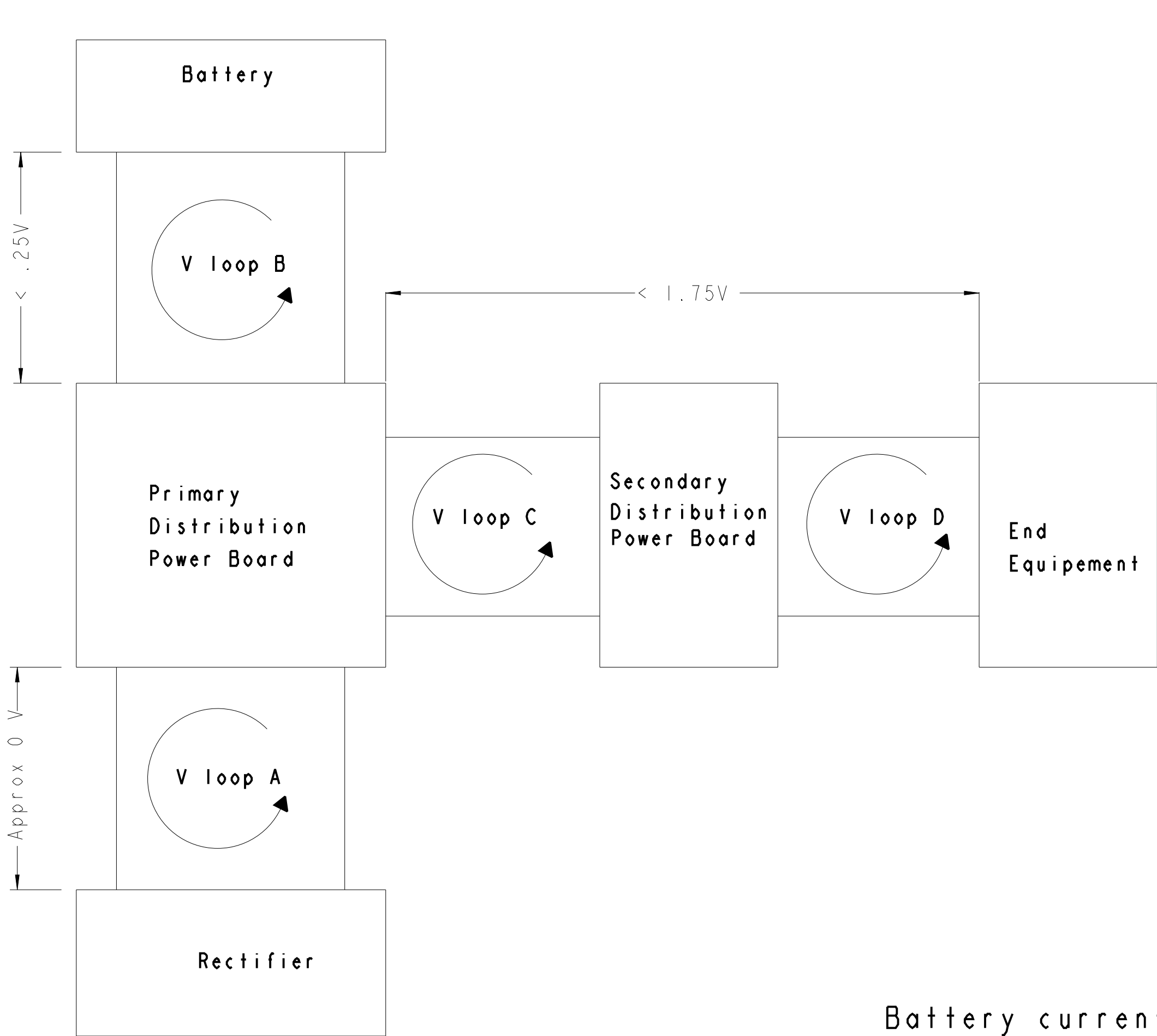


6 FOOT HIGH
CABINET

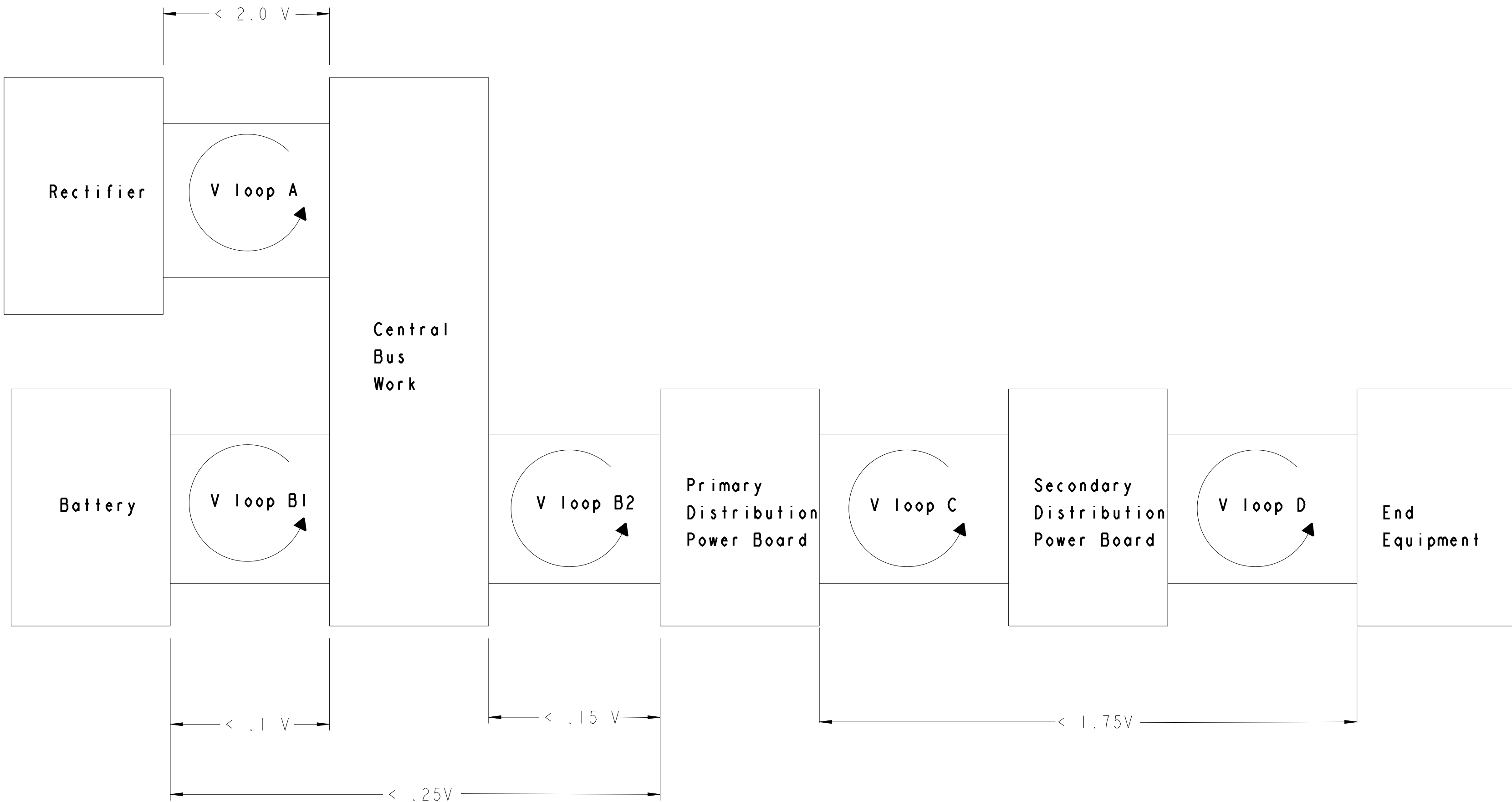
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|---|----------|----------|-------|-------|
| TITLE | | | | |
| GPS4848/100 ORDERING GUIDE | | | | |
| DRAWING DESCRIPTION | | | | |
| - | | | | |
|  | DOC TYPE | H569-434 | SHEET | ISSUE |
| | DWG | | C4A | 27 |
| DWG SIZE | | C2/AIR | | |

VOLTAGE DROP CALCULATIONS

Distributed Architecture



Centralized Architecture



of cables =
$$\frac{\text{Battery current/hr} \times \text{Cable resitance/ft} \times \text{total loop length}}{\text{Loop voltage drop}}$$

TYPICAL VALUES FOR VOLTAGE DROP CALCULATIONS


| CABLE | | BATTERY DISCHARGE AMPERES | | | | | | | | | | | | | | |
|-----------------------------------|--------------------|--------------------------------|--------------------------------------|--------|--------|----------------------|------------------|--------------------------------------|--------|--------|---------|------------------|--------------------------------------|--------|--------|--------|
| KS24194 L2 WIRE (CLASS I FLEX) | OHMS/FT AT 20°C | ROUND CELLS KS20472 LIST IS | | | | UNIGY II 3A-85-33 | | | | | 2VR375E | | | | | |
| | | HOURS RESERVE | END OF DISCHARGE VOLTS PER STRING | | | | HOURS RESERVE | END OF DISCHARGE VOLTS PER STRING | | | | HOURS RESERVE | END OF DISCHARGE VOLTS PER STRING | | | |
| | | | 42.0 V | 43.2 V | 44.2 V | 45.1 V | | 42.0 V | 43.2 V | 44.2 V | 45.1 V | | 42.0 V | 43.2 V | 44.2 V | 45.2 V |
| 2 | 0.000172 | 1 | 735 | 600 | 575 | 440 | 1 | 740 | 672 | 640 | 517 | 1 | 161.8 | 150.6 | 137.9 | 129.1 |
| 1/0 | 0.000109 | 2 | 435 | 420 | 403 | 341 | 2 | 477 | 452 | 433 | 400 | 3 | 84.1 | 82.8 | 80.2 | 76.2 |
| 2/0 | 0.0000868 | 3 | 371 | 347 | 319 | 280 | 3 | 364 | 348 | 336 | 315 | 5 | 61.7 | 61.0 | 59.3 | 56.4 |
| 4/0 | 0.0000546 | 4 | 304 | 287 | 268 | 242 | 4 | 296 | 284 | 276 | 266 | 8 | 44.5 | 43.7 | 42.8 | 40.8 |
| 350MCM | 0.0000334 | 5 | 260 | 247 | 235 | 213 | 5 | 250 | 242 | 236 | 224 | 10 | 37.8 | 37.3 | 36.5 | 35.0 |
| 500MCM | 0.0000234 | 6 | 231 | 220 | 210 | 193 | 6 | 218 | 212 | 207 | 197 | 15 | 28.5 | 28.1 | 27.6 | 26.6 |
| 750MCM | 0.0000157 | 8 | 188 | 181 | 176 | 163 | 8 | 175 | 171 | 166 | 159 | 20 | 22.5 | 22.3 | 21.9 | 21.1 |
| KS24194 L3 WIRE (CLASS B STD) | OHMS/FT AT 20°C | | | | | | | | | | | 24 | 19.4 | 19.2 | 18.9 | 18.2 |
| 2 | 0.000169 | | | | | | | | | | | | | | | |
| 1/0 | 0.000106 | | | | | | | | | | | | | | | |
| 2/0 | 0.000084 | | | | | | | | | | | | | | | |
| 4/0 | 0.000052 | | | | | | | | | | | | | | | |
| 350MCM | 0.000032 | | | | | | | | | | | | | | | |
| 500MCM | 0.000022 | | | | | | | | | | | | | | | |
| 750MCM | 0.000015 | | | | | | | | | | | | | | | |

TITLE

GPS4848/100 ORDERING GUIDE

DRAWING DESCRIPTION

-



DOC TYPE

DWG

H569-434

SHEET

C5

ISSUE

27

DWG SIZE

C2/AIR

A

B

C

D

E

F

G

H

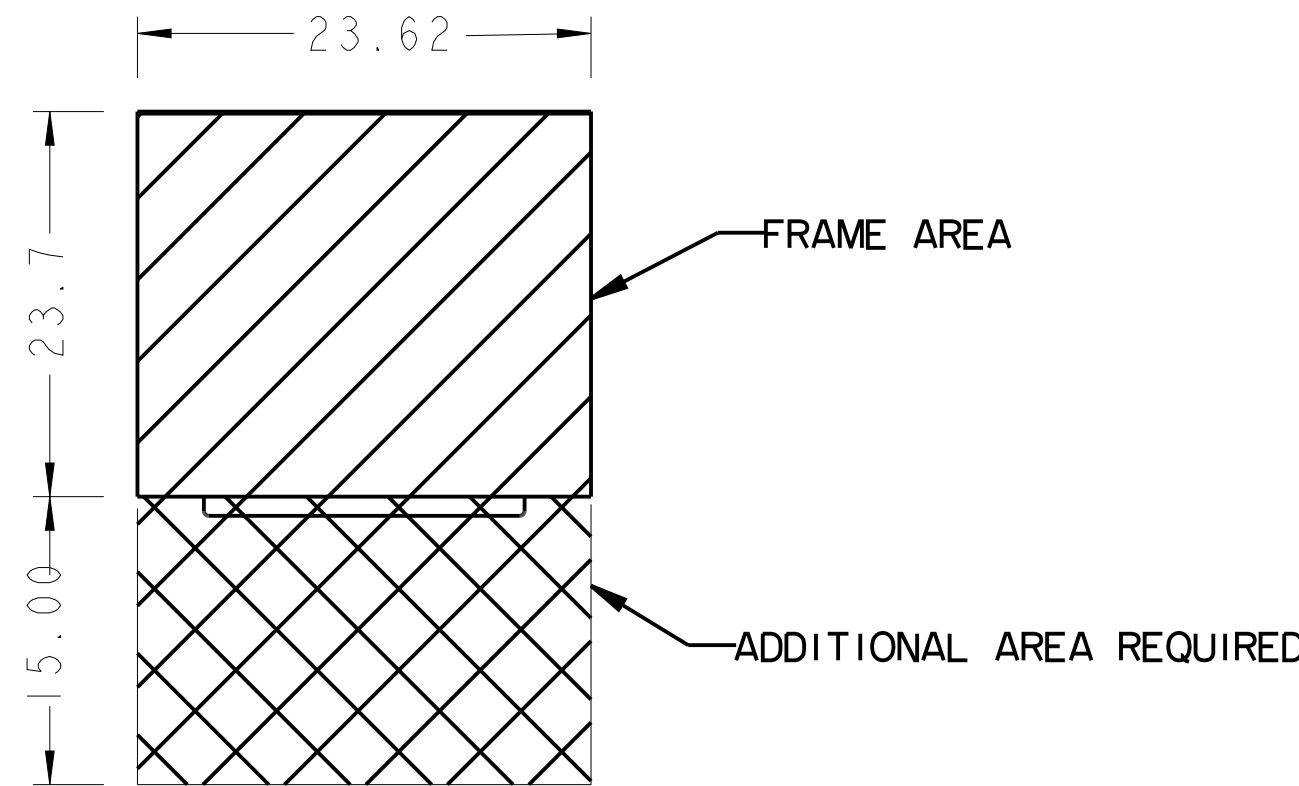
WEIGHTS OF SYSTEM COMPONENTS

| H569-434 CODE | DESCRIPTION | LBS. | KG |
|--------------------------------|---|------|-------|
| CABINETS | | | |
| GI | FULL-HEIGHT CABINET, DOOR, INFRASTRUCTURE, AND CONNECTING BUSES | 255 | 115.9 |
| G2 | FULL-HEIGHT CABINET, DOOR, AND INFRASTRUCTURE | 235 | 106.8 |
| G430 | FULL-HEIGHT WIDE CABINET, DOOR, AND INFRASTRUCTURE | 350 | |
| CONTROLLERS | | | |
| GII | GALAXY SC | 40 | 18.2 |
| GI4, GI5, GI6, GI9 | GALAXY MILLENNIUM II | 12 | 5.5 |
| AC INPUT AND RECTIFIER SHELVES | | | |
| G20, A & G220 & G320 | AC BOX WITH (4) 208VAC CBS | 35 | 15.9 |
| G21, A | AC BOX WITH (6) 208VAC CBS | | |
| G22, A,B,C & G322 | AC BOX WITH (4) 480VAC CBS | 26.5 | 12 |
| G23, G323 | AC BOX WITH (6) 480VAC CBS | | |
| G24, A, C, & G324 | AC BOX WITH (4) POS. 208VAC TS | 8 | 3.6 |
| G25, A, C, & GI28 & G325, C | AC BOX WITH (6) POS. 208VAC TS | 8 | 3.6 |
| G26, A,B,C & G326 | AC BOX WITH (4) POS. 480VAC TS | 8 | 3.6 |
| G27, G327, C | AC BOX WITH (6) POS. 480VAC TS | 8 | 3.6 |
| G70, G270, G370 | AC BOX WITH (4) 480VAC CBS | 35 | 15.9 |
| G71, G371 | AC BOX WITH (6) 480VAC CBS | | |
| G328, G332 | AC BOX WITH (14) POS. 480VAC TS | 19 | 8.6 |
| G329, G333 | AC BOX WITH (14) POS. 208VAC TS | 19 | 8.6 |
| G330, C | AC BOX WITH (8) POS. 480VAC TS | 8 | 3.6 |
| G331, C | AC BOX WITH (8) POS. 208VAC TS | 8 | 3.6 |
| G334 | AC BOX WITH (12) POS. 480VAC CBS | 57 | 25.9 |
| G335 | AC BOX WITH (12) POS. 208VAC CBS | 57 | 25.9 |
| P/O ALL AC GRPS EXCEPT NOTED | (I) SINGLE RECTIFIER SHELF | 14 | 6.4 |
| P/O AC GROUPS 300 AND UP | (I) DUAL RECTIFIER SHELF | 14 | 6.4 |
| I0896I8I4 | 595B3 RECITIFER | 68 | 31 |
| I0896I822 | 595A3 RECTIFIER | 68 | 31 |
| I08979238 | 595LTA RECTIFIER | 48 | 22 |
| I08990405 | 595LTB RECTIFIER | 48 | 22 |
| BATTERY PANELS | | | |
| G30 | (2) LVBD | 43 | 19.5 |
| G31 | (1) LVBD | 31 | 14.1 |
| G32 | BATT SHUNT | 12 | 5.5 |
| G33 | NO BATT SECTION | 0 | 0 |
| G34 | (2) NH3 FUSE | 22 | 10 |
| G35 | (1) NH3 FUSE | 19 | 8.6 |
| G37 | OLE W/ LVBD | 65 | 29.5 |
| G38 | OLE | 55 | 25 |
| I084I0572 | OLE CONVERTER | 5 | 2.2 |
| G80 | LVBD, (2) NH3 FUSES | 53 | 24.1 |
| G81 | LVBD, (4) NH3 FUSES | 75 | 35.1 |

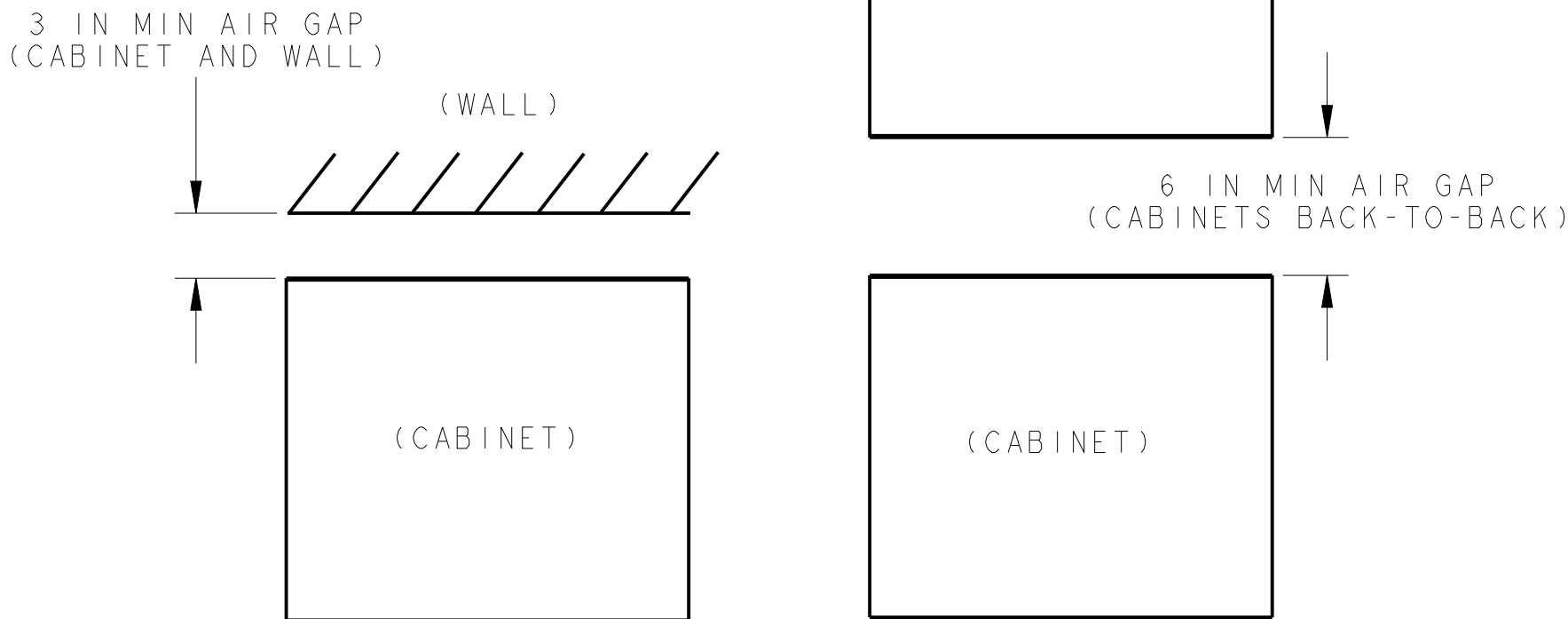
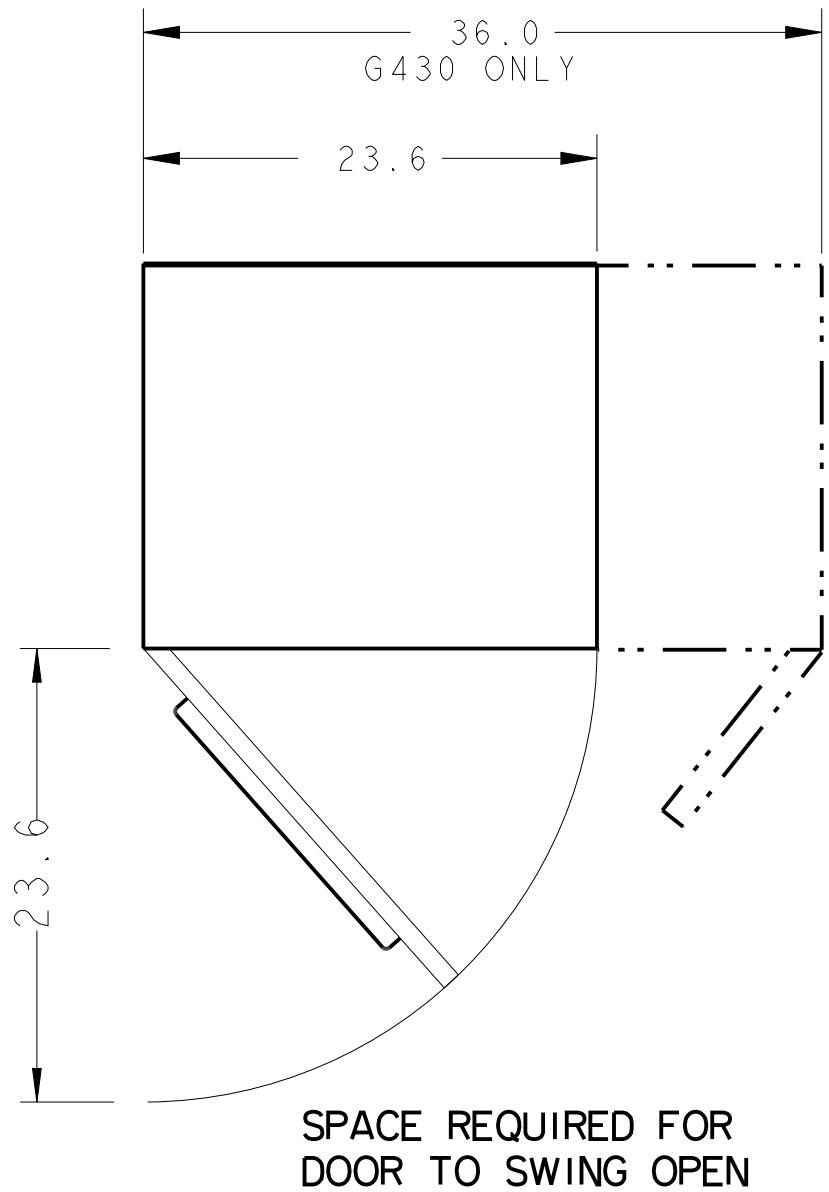
| H569-434 CODE | DESCRIPTION | LBS. | KG |
|------------------------|---|------|------|
| BATTERY PANELS | | | |
| G82 | LVBD, (6) NH3 FUSES | 97 | 44.1 |
| G86 | CBs | 20.5 | 12 |
| G87 | CBs W/ LVBD | 26.5 | 12 |
| ---- | 2-POLE BATTERY CIRCUIT BREAKER WITH SHUNT | 7 | 3.2 |
| DC DISTRIBUTION PANELS | | | |
| G40,40A | 14 POS CB, 3-100A | 8 | 3.6 |
| G41,41A | 22 POS CB, 3-100A | 14 | 6.4 |
| G42,42A | 3 POS CB, 125-600A | 14 | 6.4 |
| G43,43A | 6 POS CB, 125-800A | 20 | 9.1 |
| G43B,43C | 6 POS CB, 125-800A LVLD | 26 | 11.8 |
| G45,45A | 14 POS CB, 3-100A LVLD | 13 | 5.9 |
| G46,46A | 22 POS CB, 3-100A LVLD | 19 | 8.6 |
| G47,47A | 3 POS CB, 125-600A LVLD | 20 | 9.1 |
| G48,48A | 5 POS CB, 125-800A | 18 | 8.2 |
| G48B,48C | 5 POS CB, 125-800A LVLD | 24 | 10.9 |
| G50,50A | 14 POS FUSE, 5-50A | 8 | 3.6 |
| G51,51A | 22 POS FUSE, 5-50A | 14 | 6.4 |
| G52,52A | 10 POS FUSE, 3-60A | 19 | 8.6 |
| G52B,52C | 10 POS FUSE, 3-60A LVLD | 24 | 10.9 |
| G53,53A | 2 POS FUSE, 100-600A | 34 | 15.5 |
| G55,55A | 14 POS FUSE, 5-50A LVLD | 13 | 5.9 |
| G56,56A | 22 POS FUSE, 5-50A LVLD | 19 | 8.6 |
| G57,57A | 2 POS FUSE, 100-600A LVLD | 44 | 20 |
| G59,59A | 2 POS FUSE, 300-600A | 44 | 20 |
| G54,54A | 5 POS FUSE, 70-225A | 34 | 15.5 |
| G54B,54C | 5 POS FUSE, 70-225A LVLD | 44 | 20 |
| G58 | 6 POS GMT FUSE, 1-7.5A | 2 | .9 |
| G60,60A | 14 POS CB, 1-63A | 9 | 4.1 |
| G60B,60C | 14 POS CB, 1-63A LVLD | 14 | 6.4 |
| G61,61A | 10 POS CB, 80-125A | 13 | 5.9 |
| G61B,61C | 10 POS CB, 80-125A LVLD | 18 | 8.2 |
| G65,65A | 14 POS FUSE, 1-32A | 9 | 4.1 |
| G65B,65C | 14 POS FUSE, 1-32A LVLD | 17 | 7.7 |
| G66,66A | 10 POS FUSE, 1-50A | 9 | 4.1 |
| G66B,66C | 10 POS FUSE, 1-50A LVLD | 14 | 6.4 |
| G67,67A | 8 POS FUSE, 4-160A | 15 | 6.8 |
| G67B,67C | 8 POS FUSE, 4-160A LVLD | 20 | 9.1 |
| G68,68A | 2 POS FUSE, 32-400A | 18 | 8.2 |
| G68B,68C | 2 POS FUSE, 32-400A LVLD | 23 | 10.5 |
| G90 | 6 INCH BLANK PANEL | 5 | 2.3 |
| G91 | 9 INCH BLANK PANEL | 8 | 3.6 |
| G92 | 12 INCH BLANK PANEL | 10 | 4.5 |
| G93 | 3 INCH BLANK PANEL | 2.5 | 1.1 |
| G95,95A | 10 POS CB, 3-150A | 18.5 | 8.4 |
| G96,96A | 10 POS CB, 3-100A | 18.5 | 8.4 |
| G96B,96C | 10 POS CB, 3-100A LVLD | 23.5 | 10.7 |
| G97,97A | 14 POS CB, 3-150A | 18.5 | 8.4 |
| G97B,97C | 14 POS CB, 3-150A LVLD | 23.5 | 10.7 |
| G98,98A | 22 POS CB, 3-150A | 25 | 11.4 |

| H569-434 CODE | DESCRIPTION | LBS. | KG |
|-------------------------------|--|------|------|
| DC DISTRIBUTION PANELS, CONT. | | | |
| G98B,98C | 22 POS CB, 3-150A LVLD | 30 | 13.6 |
| ---- | LARGE CIRCUIT BREAKER FOR G42,43,47,48 (AVERAGE WEIGHT PER POLE) | 3 | 1.4 |
| ---- | PLUG-IN CIRCUIT BREAKER OR FUSE HOLDER FOR G40,41,45, 46,50,51,55,56,96,97 (AVERAGE WEIGHT PER POLE) | .25 | .1 |
| ---- | RETURN BUS BAR | 5 | 2.3 |

FLOOR LOADING INFORMATION



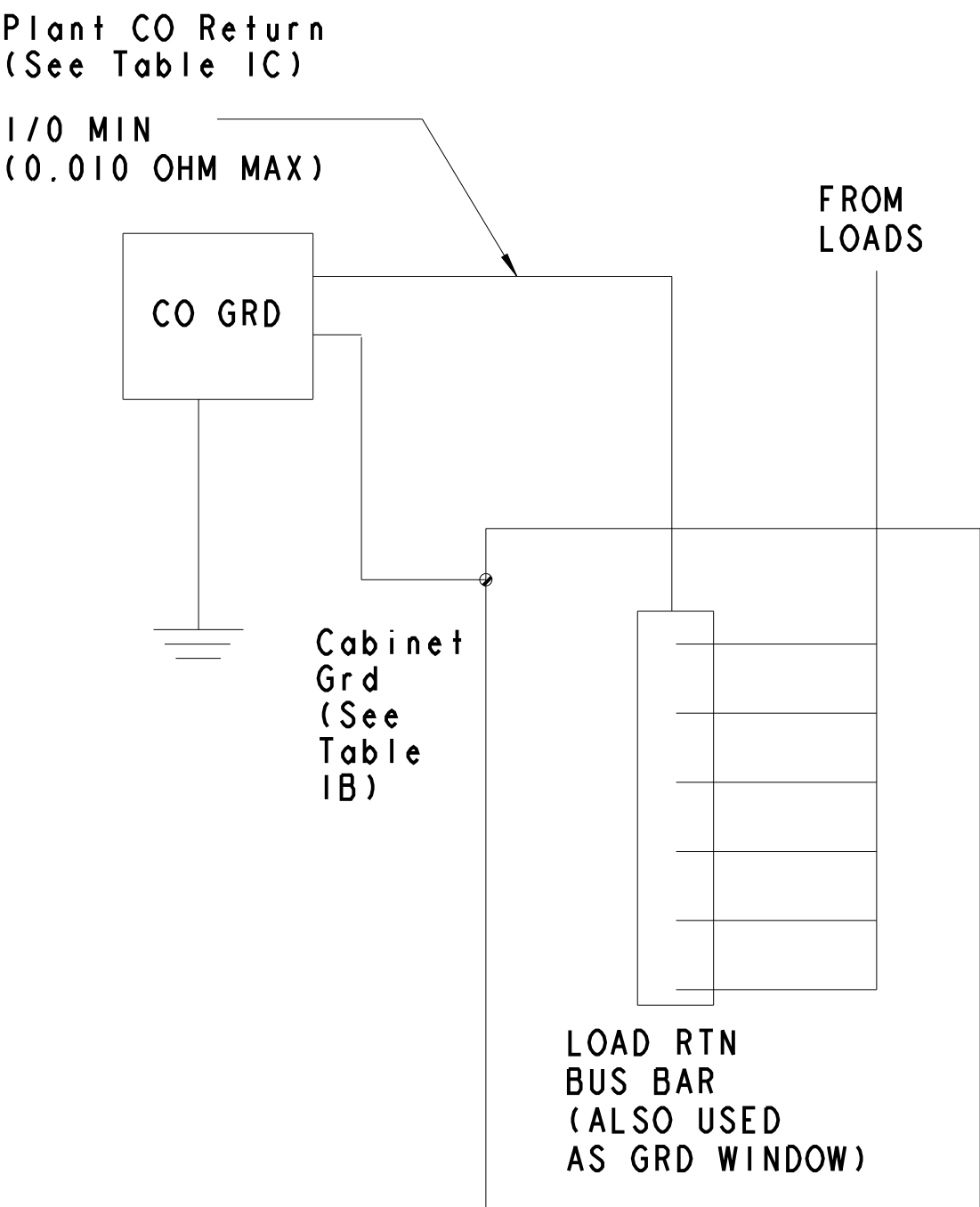
FLOOR LOADING STANDARD: 115 LBS/SQ FT
STANDARD FRONT AISLE: 30 INCHES
STANDARD REAR AISLE: 24 INCHES



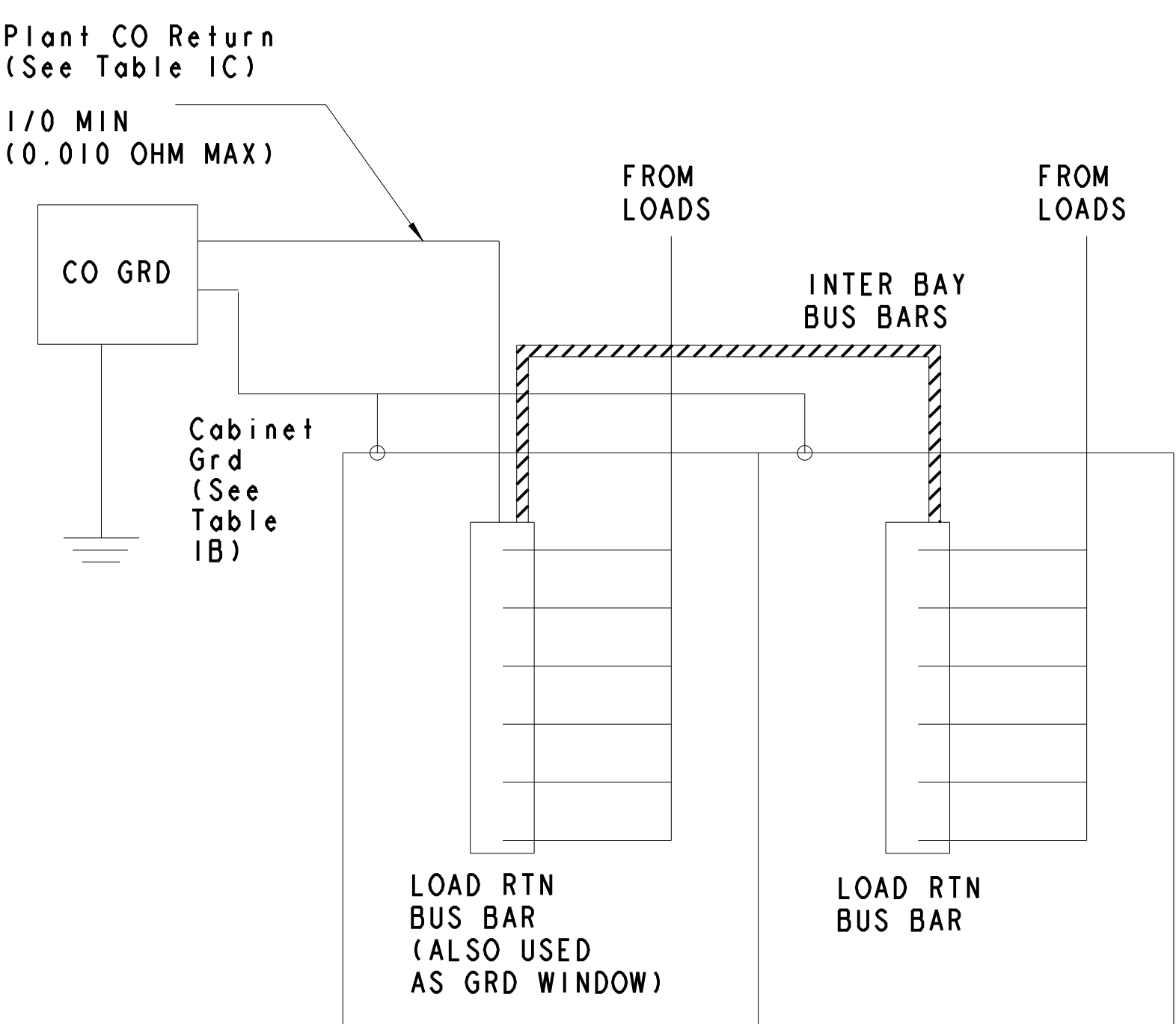
MINIMUM AIR GAP
REQUIREMENTS FOR CABINET
(GRPS. 300 AND UP)

| | | | | | |
|-------------------------------------|----------|----------|-------|-------|----------|
| TITLE GPS4848/100 ORDERING GUIDE | | | | | |
| DRAWING DESCRIPTION - | | | | | |
| | DOC TYPE | H569-434 | SHEET | ISSUE | DWG SIZE |
| | DWG | | C6 | 27 | C2/AIR |

GPS POWER SYSTEMS RECOMMENDED GROUNDING FOR ESS SWITCHES (DISTRIBUTED ARCHITECTURE)



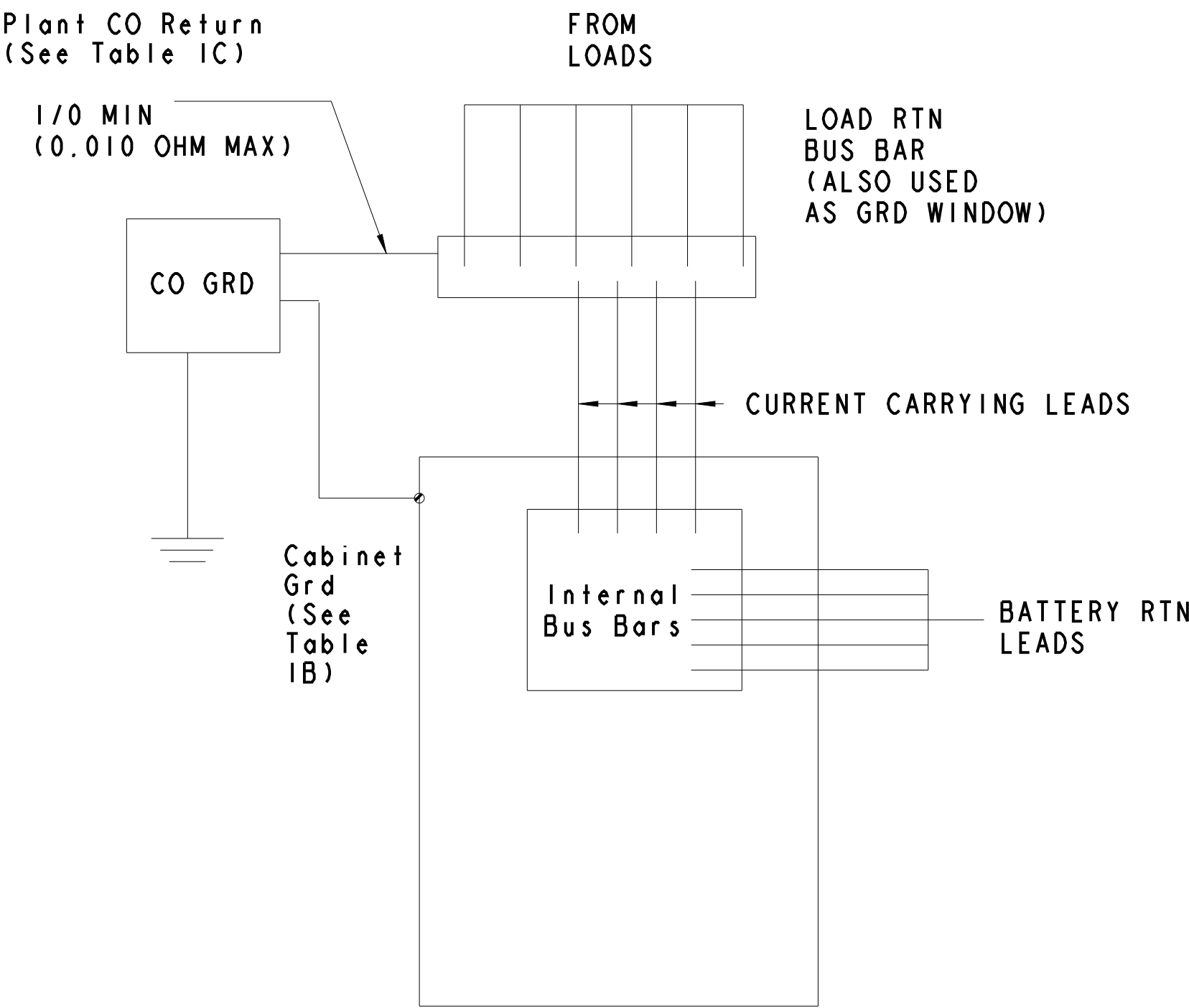
GPS SINGLE CABINET
INTERNAL LOAD RTN
Figure 1



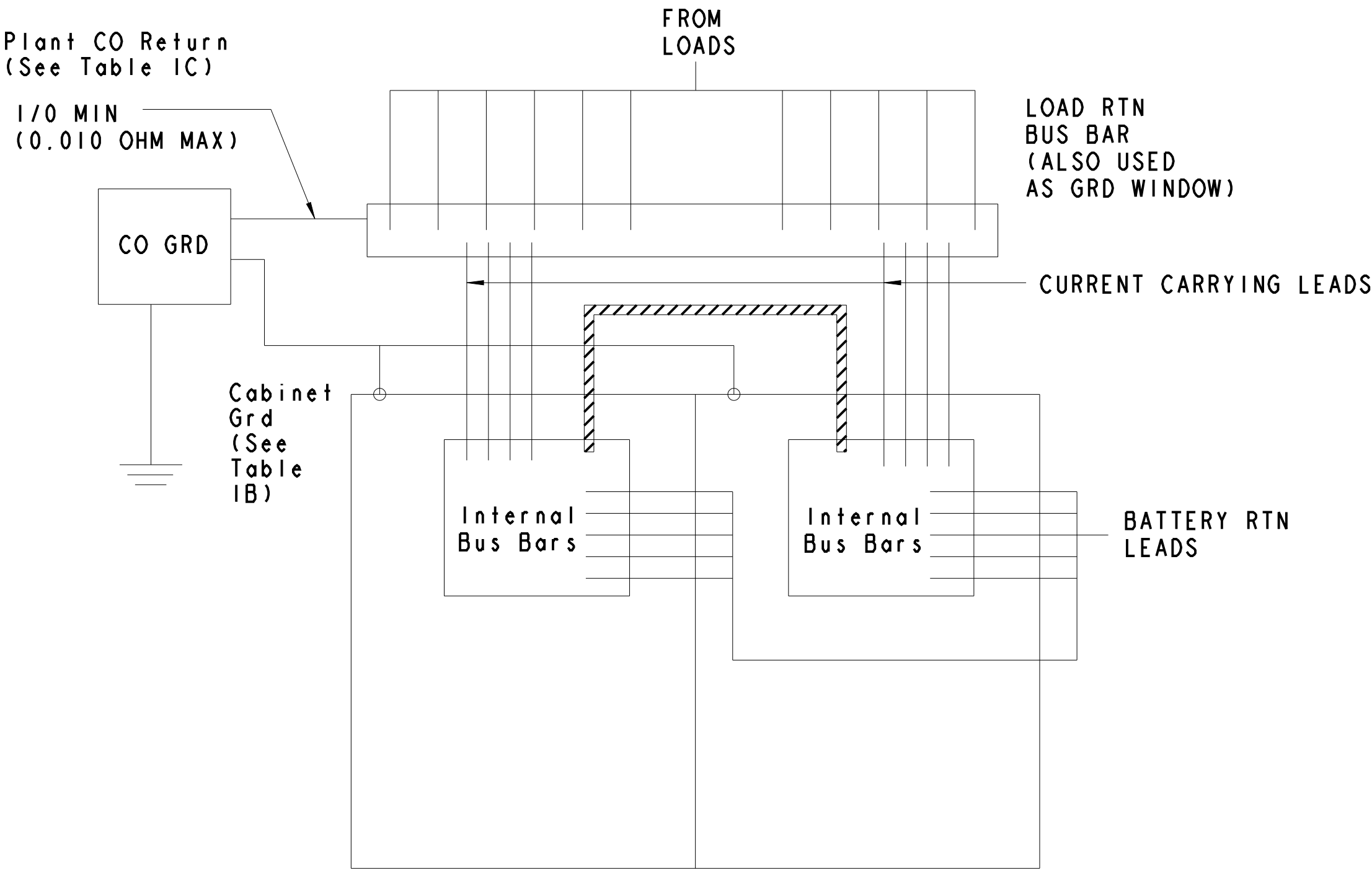
GPS MULTI CABINET
INTERNAL LOAD RTN
Figure 3

- Notes:
- 1) To determine Frame Ground wire size use the following formula:
$$\text{Circular mils} = (11.1 \times I \times L) / V$$


where I = 10 x the largest overcurrent protection device rating
V = 90% of the minimum circuit voltage
L = length of the equipment grounding conductor in feet
(Ref EIMP88NJ0009)
 - 2) To determine the Plant CO Return wire size use the switch manufacturer's recommendations or local guidelines.
 - 3) To determine the Current Carrying wire size and quantity consider the wire ampacity and the voltage drop during discharge.



GPS SINGLE CABINET
EXTERNAL LOAD RTN
Figure 2

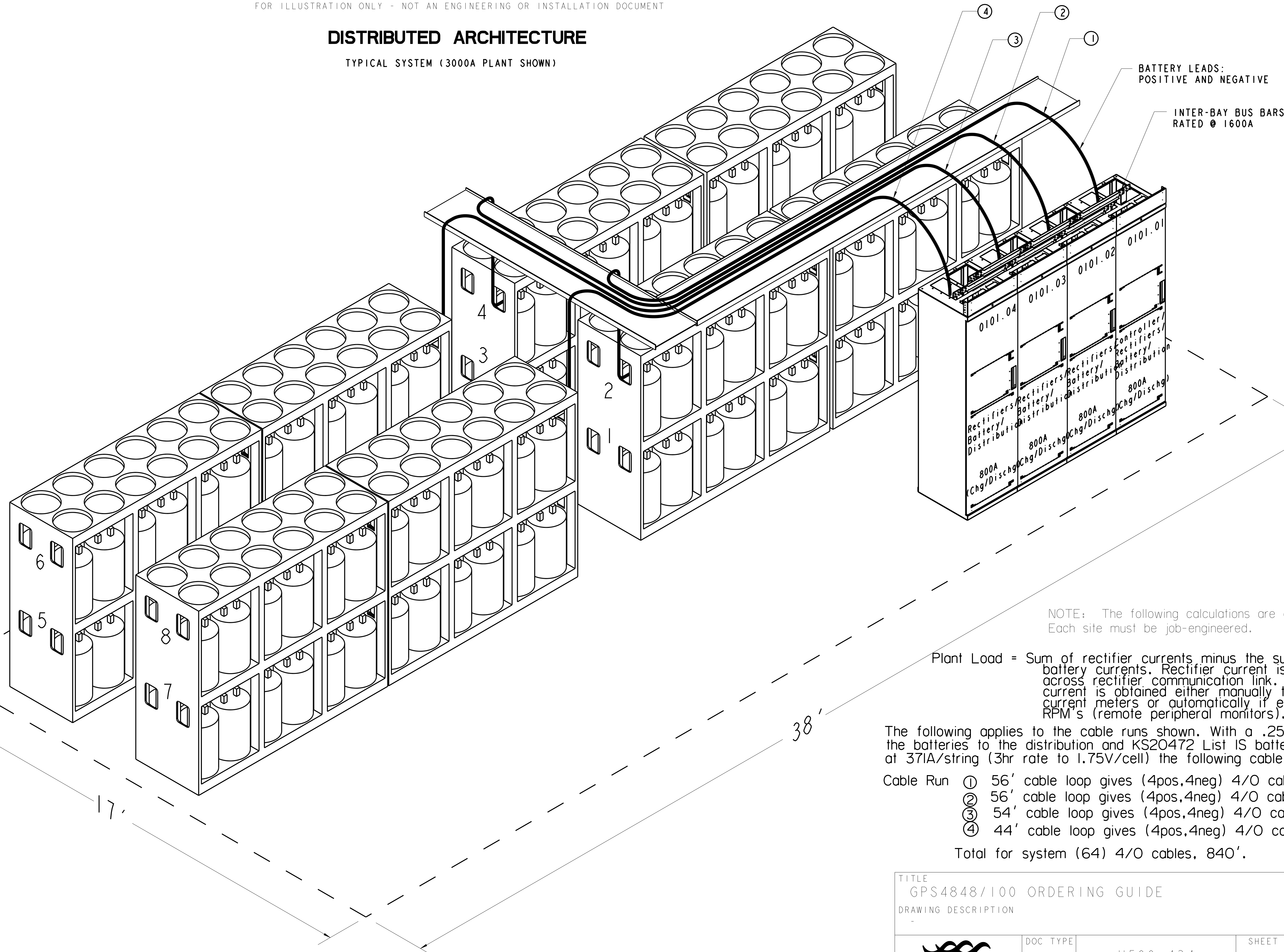


GPS MULTI CABINET
EXTERNAL LOAD RTN
Figure 4

| | | | | |
|---|----------|----------|--------------------|-------|
| TITLE GPS4848/100 ORDERING GUIDE | | | | |
| DRAWING DESCRIPTION - | | | | |
|  | DOC TYPE | H569-434 | SHEET | ISSUE |
| | DWG | | C7 | 27 |
| | | | DWG SIZE C2/AIR | |

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DISTRIBUTED ARCHITECTURE
TYPICAL SYSTEM (3000A PLANT SHOWN)




NOTE: The following calculations are only an example.
Each site must be job-engineered.

Plant Load = Sum of rectifier currents minus the sum of the battery currents. Rectifier current is obtained across rectifier communication link. Battery current is obtained either manually through battery current meters or automatically if equipped with RPM's (remote peripheral monitors).

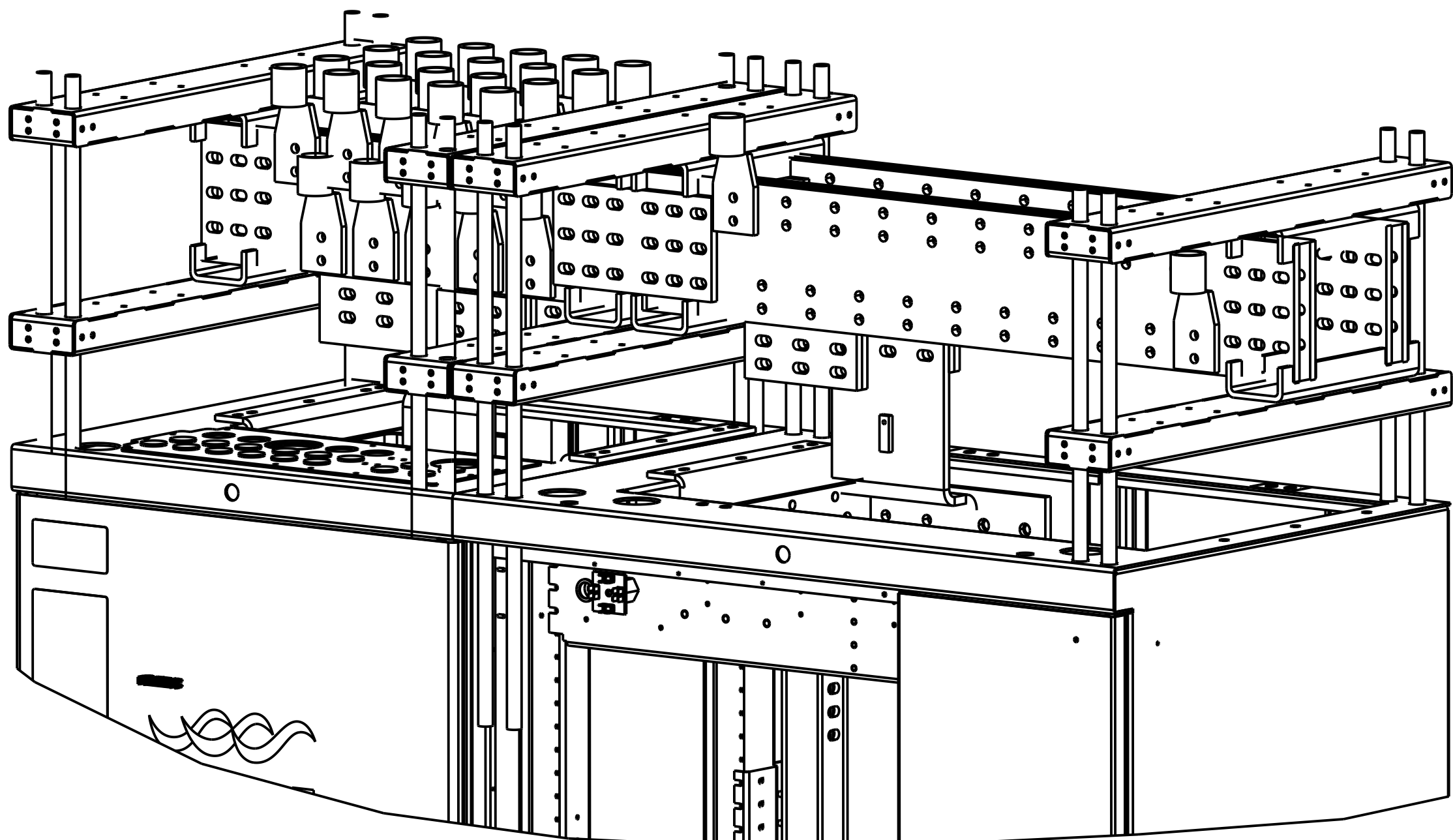
The following applies to the cable runs shown. With a .25V drop from the batteries to the distribution and KS20472 List IS batteries discharged at 371A/string (3hr rate to 1.75V/cell) the following cable can be calculated.

- Cable Run
- ① 56' cable loop gives (4pos,4neg) 4/O cables/string
 - ② 56' cable loop gives (4pos,4neg) 4/O cables/string
 - ③ 54' cable loop gives (4pos,4neg) 4/O cables/string
 - ④ 44' cable loop gives (4pos,4neg) 4/O cables/string

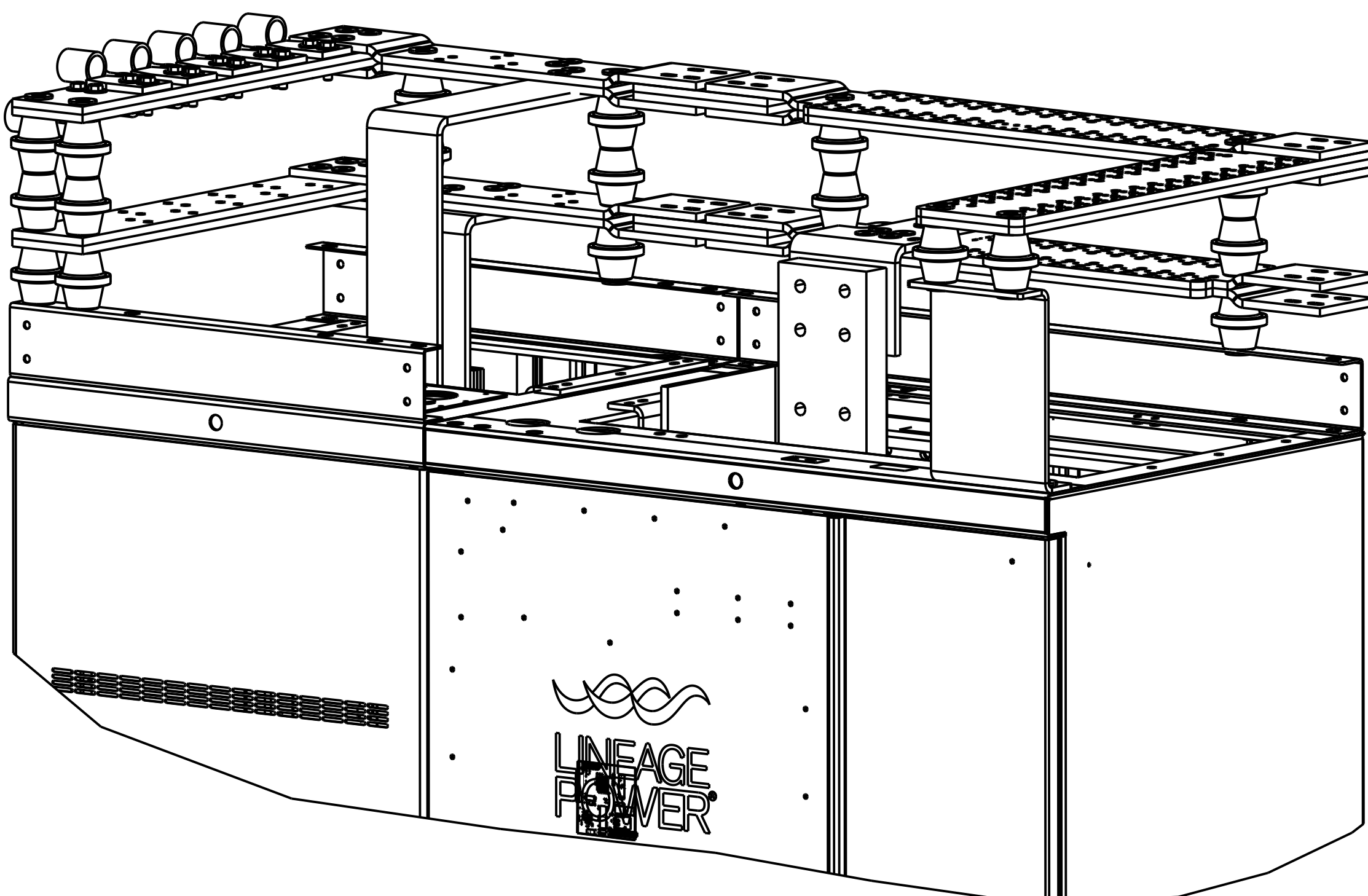
Total for system (64) 4/O cables, 840'.

| | | | | |
|---|----------|----------|----------|-------|
| TITLE | | | | |
| GPS4848/100 ORDERING GUIDE | | | | |
| DRAWING DESCRIPTION | | | | |
| - | | | | |
|  | DOC TYPE | H569-434 | SHEET | ISSUE |
| | DWG | | C8 | 27 |
| | | | DWG SIZE | |
| | | | C2/AIR | |

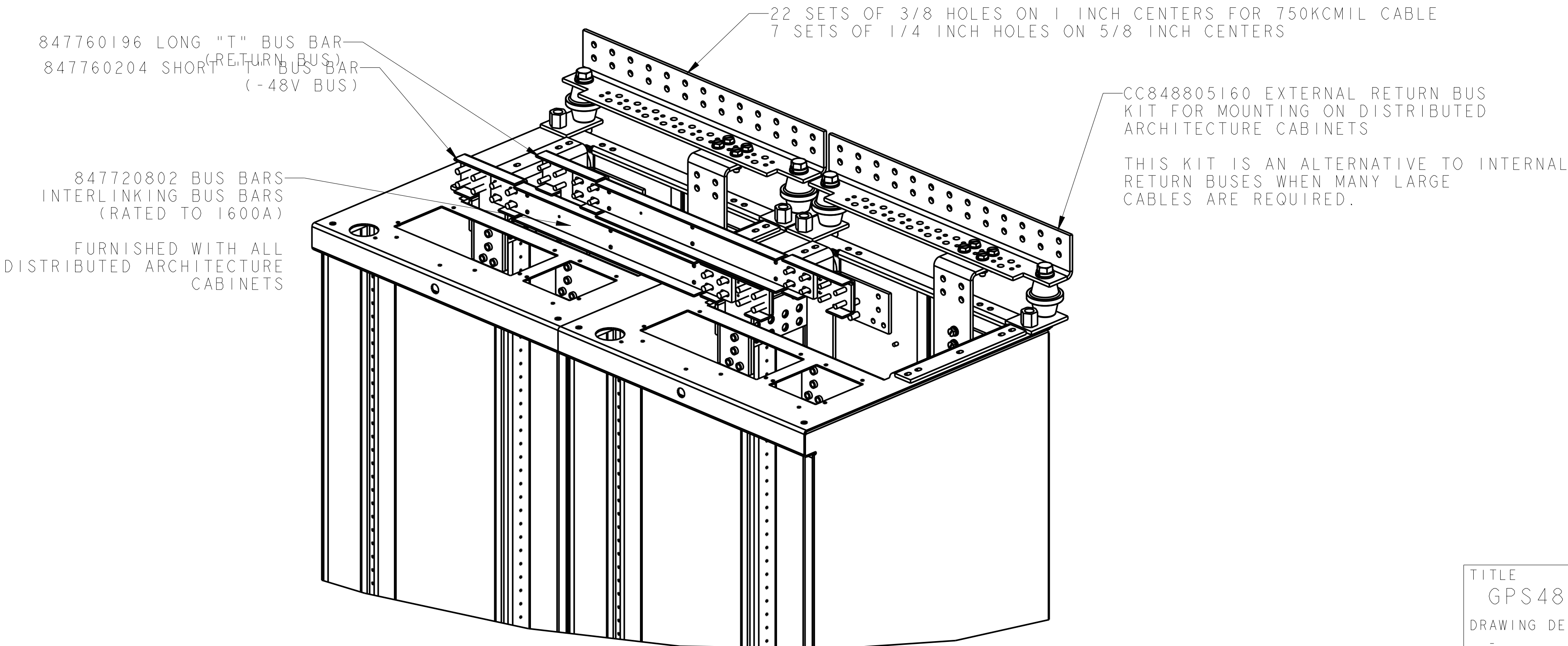
GPS CENTRALIZED
BUS BAR SYSTEM
ED83311-30 GRP 101 AND GRP102




GPS CENTRALIZED
BUS BAR SYSTEM
ED83311-30 GRP 111 AND GRP 112



GPS DISTRIBUTED
BUS BAR SYSTEM
CC848850160

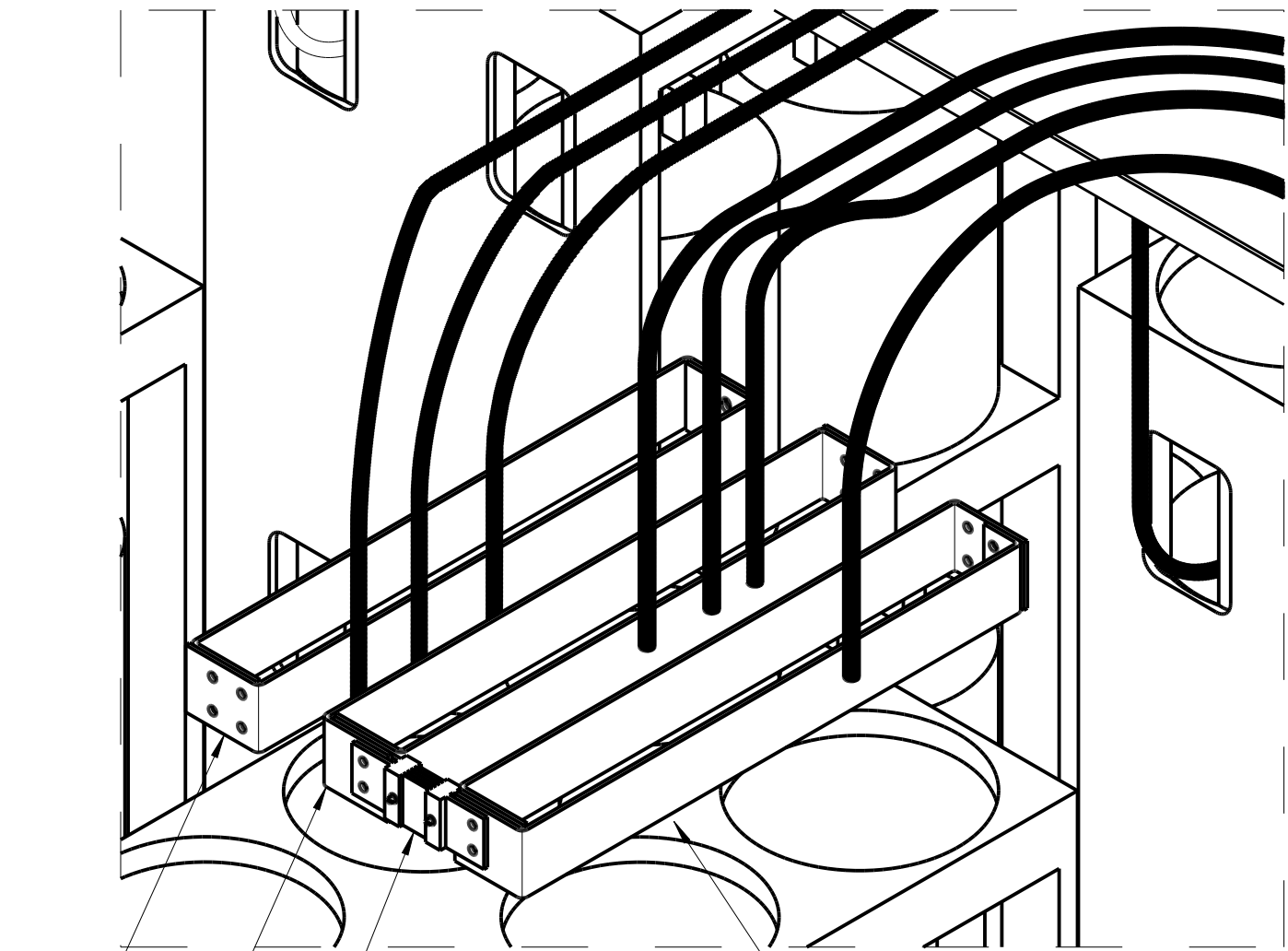


| | | | | |
|---|----------|----------|--------------------|-------|
| TITLE | | | | |
| GPS4848/100 ORDERING GUIDE | | | | |
| DRAWING DESCRIPTION | | | | |
| - | | | | |
|  | DOC TYPE | H569-434 | SHEET | ISSUE |
| | DWG | | C8A | 27 |
| | | | DWG SIZE C2/AIR | |

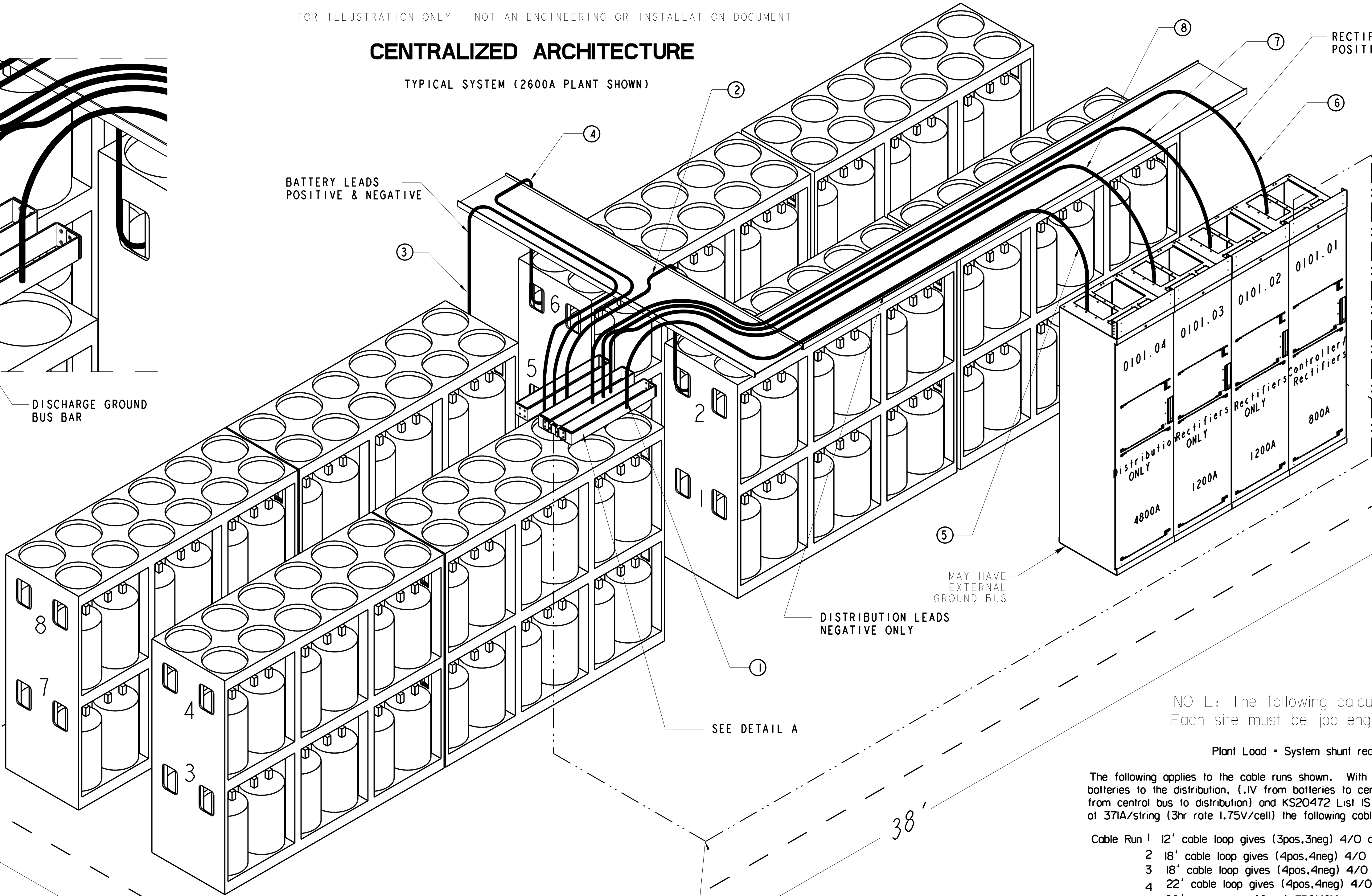
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CENTRALIZED ARCHITECTURE

TYPICAL SYSTEM (2600A PLANT SHOWN)



BATTERY BUS BAR
DETAIL A
(SEE J85504A-1)



NOTE: The following calculations are only an example.
Each site must be job-engineered.

Plant Load = System shunt reading

The following applies to the cable runs shown. With a .25V drop from the batteries to the distribution, (.1V from batteries to central bus, .15V from central bus to distribution) and KS20472 List IS batteries discharged at 371A/string (3hr rate 1.75V/cell) the following cable can be calculated.

- Cable Run 1 12' cable loop gives (3pos,3neg) 4/O cables/string
2 18' cable loop gives (4pos,4neg) 4/O cables/string
3 18' cable loop gives (4pos,4neg) 4/O cables/string
4 22' cable loop gives (4pos,4neg) 4/O cables/string
5 20' cable gives (6neg) 750MCM cables

Using a 1V drop and cable ampacity (assume cable loaded to a maximum of 65% rating) from the rectifiers to the central bus the following cable can be calculated.

- Cable Run 6 52' cable loop 8 800A gives (4pos,4neg) 350MCM cables/cabinet
7 46' cable loop 8 1200A gives (6pos,6neg) 350MCM cables/cabinet
8 40' cable loop 8 1200A gives (6pos,6neg) 350MCM cables/cabinet

Total for system: (60) 4/O cables 536'
(6) 750MCM cables 120'

TITLE
GPS4848/100 ORDERING GUIDE
DRAWING DESCRIPTION



DOC TYPE
DWG

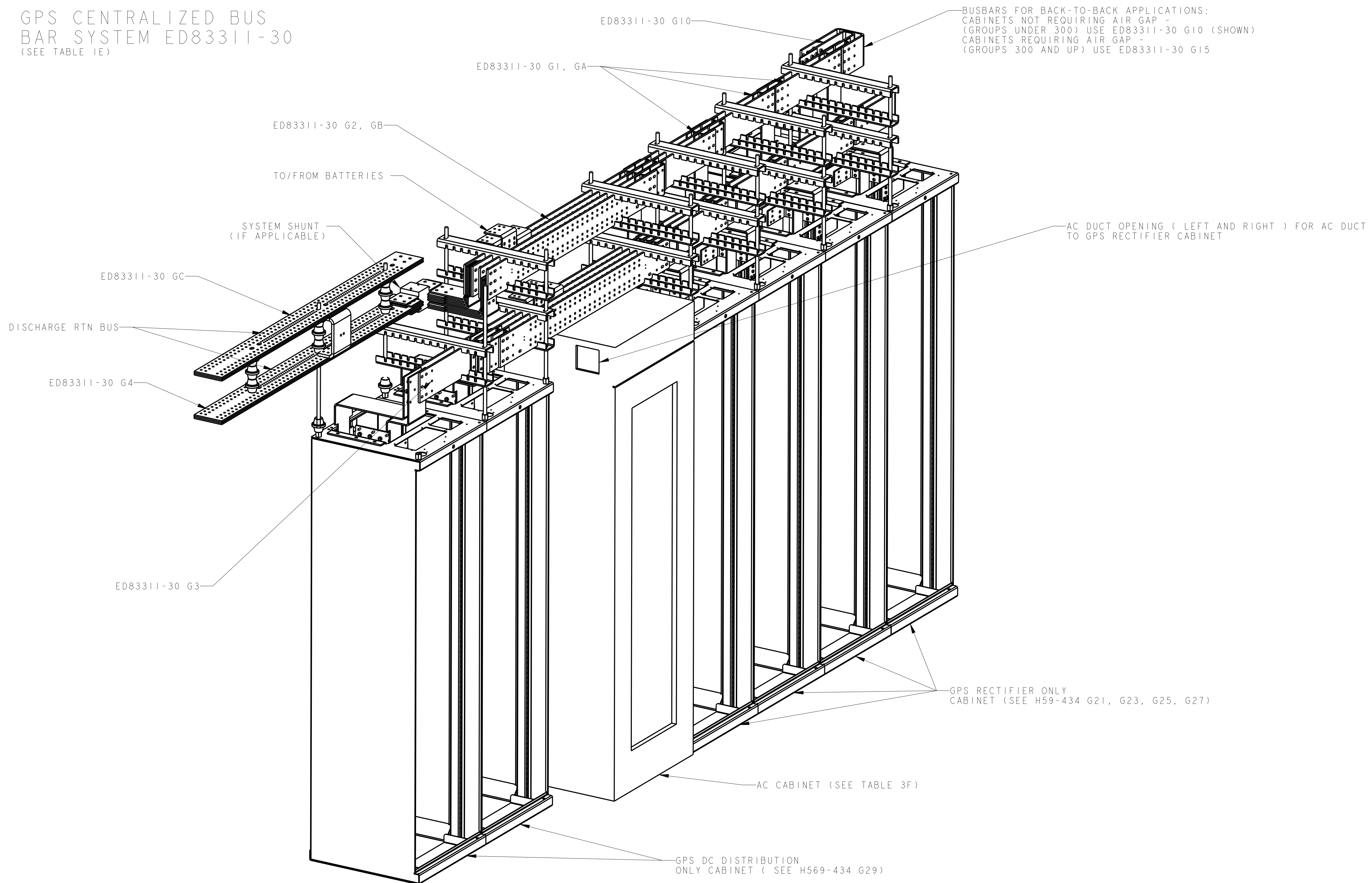
H569-434

SHEET
C9

ISSUE
27

DWG
SIZE
C2/AIR

GPS CENTRALIZED BUS BAR SYSTEM ED83311-30 (SEE TABLE 1E)



TITLE
GPS4848/100 ORDERING GUIDE
DRAWING DESCRIPTION
-



DOC TYPE
DWG

H569-434

SHEET
C9A

ISSUE
27

DWG
SIZE
C2/AIR

LOAD LEAD SHORT CIRCUIT CURRENT CALCULATIONS

PROVIDE CABLE RUN LENGTHS AS LEAST AS LONG AS THE MINIMUM LENGTH INDICATED IN THE TABLE BELOW TO ASSURE THAT THE SHORT CIRCUIT CURRENTS ARE LESS THAN THE INTERRUPT CURRENT RATING OF THE FUSE OR CIRCUIT BREAKER CHOSEN.

1. FIND THE INTERRUPT CURRENT RATING OF THE CHOSEN FUSE OR CIRCUIT BREAKER FROM TABLES 6 (6A, 6B ...)
2. SEE THE TABLE BELOW FOR THE MINIMUM LENGTH (L) FOR THE ENGINEERED CABLE SIZE TO BE RUN AT THE INTERRUPT RATING FOUND IN STEP 1.

A MINIMUM CABLE LENGTH FOR A GIVEN CABLE SIZE AND PROTECTOR TYPE MUST BE USED TO ENSURE PROPER SHORT CIRCUIT PROTECTION IN THE CASE OF A BOLTED FAULT

| CABLE SIZE | MINIMUM LENGTH "L" REQUIRED TO LIMIT THE CURRENT TO AN INTERRUPT RATING OF: | | | |
|--------------------------|---|----------|----------|---------|
| | 100KA | 25KA | 14KA | 10KA |
| 10 GA (6 mm2) | ---- | ---- | ---- | 5 FEET |
| 8 GA (10 mm2) | ---- | ---- | ---- | 8 FEET |
| 6 GA (16 mm2) | ---- | 5 FEET | 9 FEET | 12 FEET |
| 4 GA (25 mm2) | ---- | 8FEET | 14 FEET | 19 FEET |
| 2 GA (35 mm2) | 3 FEET | 12 FEET | 21 FEET | 30 FEET |
| 1/0 GA (50 mm2) | 5 FEET | 19 FEET | 34 FEET | ---- |
| 2/0 GA (70 mm2) | 6 FEET | 24 FEET | 43 FEET | ---- |
| 4/0 GA (120 mm2) | 10 FEET | 38 FEET | 68 FEET | ---- |
| (2) 4/0 GA ((2) 120 mm2) | 19 FEET | 76 FEET | 136 FEET | ---- |
| (3) 4/0 GA ((3) 120 mm2) | 29 FEET | 113 FEET | 204 FEET | ---- |
| (4) 4/0 GA ((4) 120 mm2) | 39 FEET | 152 FEET | 272 FEET | ---- |
| 350 MCM | 17 FEET | 63 FEET | 116 FEET | ---- |
| (2) 350 MCM | 32 FEET | 125 FEET | 232 FEET | ---- |
| (3) 350 MCM | 47 FEET | 188 FEET | 348 FEET | ---- |

FIGURE 1

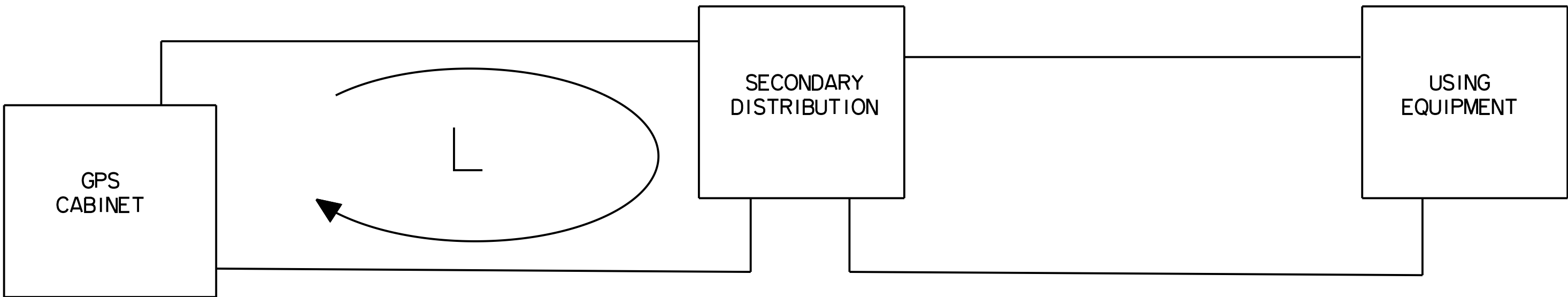


FIGURE 2

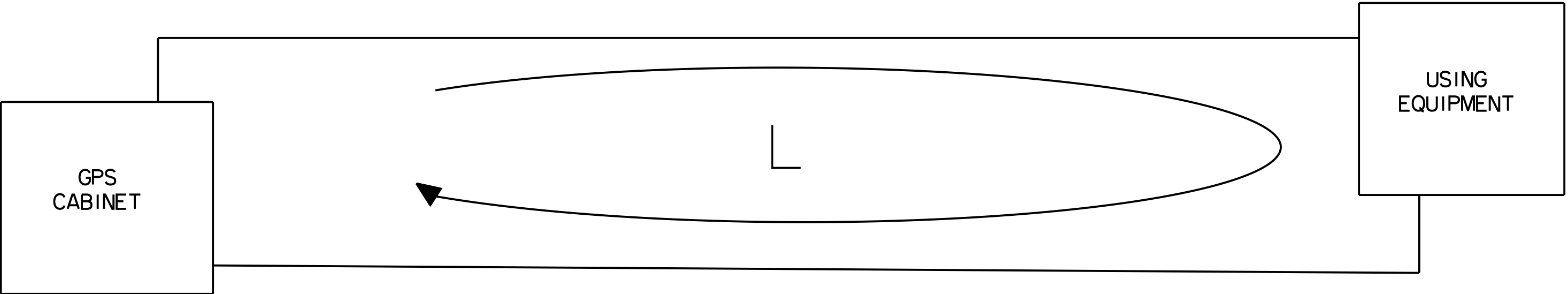
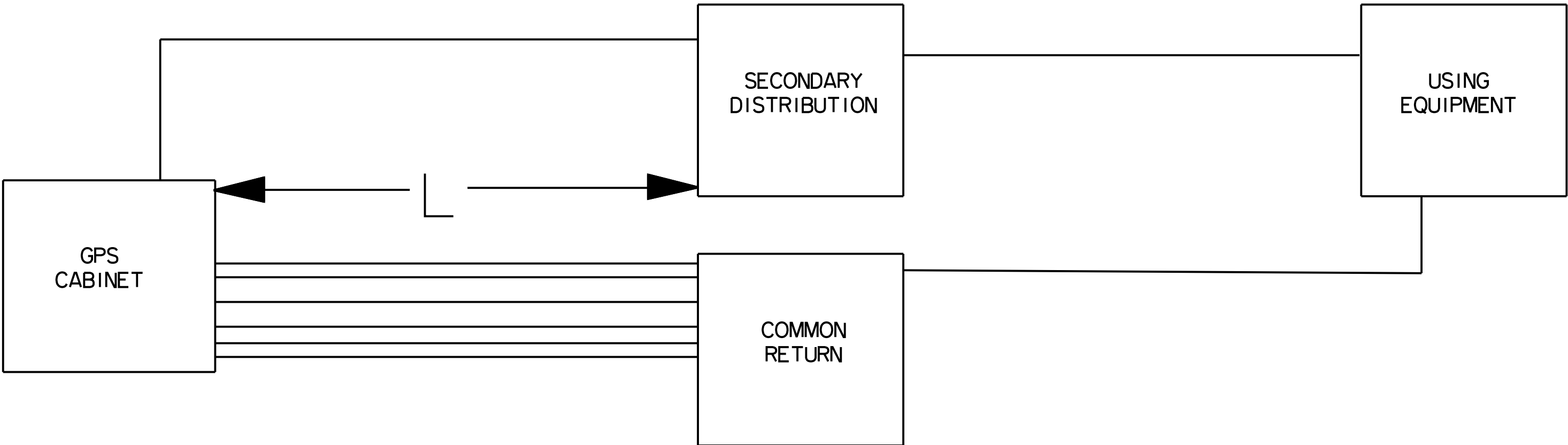



FIGURE 3
(NOT RECOMMENDED)



| | | | | |
|---|----------|----------|-------|-------|
| TITLE GPS4848/100 ORDERING GUIDE | | | | |
| DRAWING DESCRIPTION - | | | | |
|  | DOC TYPE | H569-434 | SHEET | ISSUE |
| | DWG | | C10 | 27 |
| DWG SIZE C2/AIR | | | | |

B

C



F



G

H

JOB SITE DOCUMENTATION

1 COPY FOR EACH CABINET

NOTES

1. NUMBERS AND INFORMATION SHOWN SHALL BE STAMPED OR OTHERWISE MARKED ON THE PANELS BY THE INSTALLER IN ACCORDANCE WITH INFORMATION SHOWN IN TABLE A.
2. WIRE TERMINALS TO BE USED ARE WP-91412.


TABLE A - BATTERY CONNECTION INFORMATION

| LINE | BAY | PANEL POS IN BAY | H569-434 GROUP | POS ON PANEL | BATTERY INFORMATION | | | WIRE | | BATTERY MONITORING | | | NOTES |
|------|-----|------------------------|-------------------|--------------------|------------------------|--------------------|------------|---------------|----------|--------------------|-----------------|----------|---------|
| | | | | | BATTERY DESIGNATION | CAPACITY (AMPS) | PART NO | QTY & SIZE | STYLE | MODULE NO | CHANNEL TYPE | CH NO | |
| 0 | 00 | A | G00 | 0-0 | BATT 00 00 | 000 | 00000 | (0) 0 | KS-00000 | 00 | 00V | 0 | EXAMPLE |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
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TABLE B - DISCHARGE FUSE AND CIRCUIT BREAKER INFORMATION

| LINE | BAY | PANEL POS IN BAY | H569-434 GROUP | POS ON PANEL | FUSE OR CIRCUIT BREAKER | | | WIRE | | LOAD SHUNT MONITORED | | | PANEL LOAD DISCONNECT | | NOTES |
|------|-----|------------------------|-------------------|--------------------|-------------------------|--------------------|--------|---------------|----------|----------------------|--------------|----------|--------------------------|-------|---------|
| | | | | | FEEDING DESIGNATION | CAPACITY (AMPS) | NO | QTY & SIZE | STYLE | SHUNT SIZE | MODULE NO | CH NO | RELAY | SET | |
| 0 | 00 | B | G00 | 0-0 | CPDC-00 LDA | 000 | CB 0.0 | (0) 0 | KS-00000 | 000A, 00mV | 00 | 0 | UR 0 | 00.0V | EXAMPLE |
| I | | | | | | | | | | | | | | | |
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| 20 | | | | | | | | | | | | | | | |

TITLE
GPS4848/100 ORDERING GUIDE
DRAWING DESCRIPTION
-

LINEAGE POWER

DOC TYPE
DWG

SHEET
f2

ISSUE
25

DWG
SIZE
C2/AIR

H569-434

A

B

C

D

E

F

G

H

JOB SITE DOCUMENTATION

CIRCLE OR FILL IN JOB SITE INFORMATION

SC-F AND MILLENNIUM CONTROLLER PROGRAMMER’S GUIDE

| VOLTAGE | | | | |
|---|--|-------|----------|--------------------|
| SETTING | LOW | HIGH | DEFAULT | JOB SITE |
| I) SYSTEM FLOAT VOLTAGE | | | | |
| I) SYSTEM FLOAT VOLTAGE | 44 | 56* | 52.08 | |
| A) VERY LOW VOLTAGE ALARM | 40 | 5I | 46 | |
| B) BATTERY ON DISCHARGE ALARM | 46 | 55 | 5I | |
| C) HIGH FLOAT VOLTAGE ALARM | 50 | 60 | 53 | |
| D) HIGH VOLTAGE SHUTDOWN | | | | |
| i) CONTROLLER SOFTWARE | 50 | 60 | 53.6 | |
| ii) CONTROLLER HARDWARE | NOT APPLICABLE (PLANT HAS SERIAL RECT INTERFACE) | | | |
| iii) RECTIFIER SOFTWARE | 50 | 60 | 55.5 | |
| iv) RECTIFIER HARDWARE | ---- | ---- | 59.5 | NOT ADJUSTABLE |
| 2) SYSTEM VOLTAGE BOOST | | | | |
| A) FRONT PANEL BOOST | SW202 (3) BJB (SC) OR BSH (MILL) BOARD | | DISABLED | ENABLED / DISABLED |
| B) EXTERNAL BOOST ** | SW202 (2) BJB (SC) OR BSH (MILL) BOARD | | ENABLED | ENABLED / DISABLED |
| C) AUTO TIMER BOOST AFTER BATTERY DISCHARGE ** | ---- | ---- | OFF | OFF / QRCT / TIMED |
| i) TIME | 1 HR | 24 HR | 8 HR | |
| D) BOOST VOLTAGE | 44 | 60* | 52.08 | |
| E) BATTERY ON DISCHARGE | 46 | 55 | 5I | |
| F) HIGH FLOAT VOLTAGE ALARM | 52 | 60 | 53 | |
| G) HIGH VOLTAGE SHUTDOWN | | | | |
| i) CONTROLLER SOFTWARE | 52 | 60 | 53.6 | |
| ii) CONTROLLER HARDWARE | NOT APPLICABLE (PLANT HAS SERIAL RECT INTERFACE) | | | |
| iii) RECTIFIER SOFTWARE | 52 | 60 | 55.5 | |
| iv) RECTIFIER HARDWARE | ---- | ---- | 59.5 | NOT ADJUSTABLE |
| * CONTROLLER HAS 60V MAX, RECTIFIER HAS 58V MAX ** INTELLIGENT CONTROLLER FEATURE ONLY | | | | |

| 3) SYSTEM SHUNT | | |
|--|-----------------|--|
| SETTING | SHUNT TYPE | JOB SITE |
| A) SHUNT PRESENCE | LOAD | NONE (DISTRIBUTED) LOAD (CENTRALIZED) |
| B) SHUNT mV | LOAD OR BATTERY | 50 (DISTRIBUTED) 25 / 50 / 60 / 100 / 150 (CENTRALIZED) |
| C) SHUNT CURRENT | LOAD OR BATTERY | 150 / 600 / 1000 / 1500 (DISTRIBUTED) * 50 / 100 / 150 / 200 / 300 (CENTRALIZED) ** 400 / 600 / 800 / 1000 (CENTRALIZED) ** 1200 / 1300 / 2000 (CENTRALIZED) ** 2400 / 2600 / 3000 (CENTRALIZED) ** 4000 / 5000 / 5200 (CENTRALIZED) ** 6000 / 8000 (CENTRALIZED) ** 10000 / 12000 (CENTRALIZED) ** |
| * SHUNT I WILL BE FACTORY SET BASED ON WHICH BATTERY CONNECTION PANEL IS ORDERED AND DATA WILL BE TRANSFERRED TO CONTROLLER THROUGH THE BAY INTERFACE CARDS (BICS). ** SHUNT IS DIRECTLY CONNECTED TO CONTROLLER, NOT THROUGH BAY INTERFACE CARD (BIC). | | |

4) RECTIFIER CONTROL

| SETTING | LOW | HIGH | DEFAULT | JOB SITE |
|--|---|------|---------|--------------------|
| A) I LIMIT (CURRENT) | | | | |
| i) FLOAT | 30% | 110% | 110% | |
| ii) BOOST | 30% | 110% | 110% | |
| B) LD SHARE (LOAD) | ---- | ---- | ENABLED | ENABLED / DISABLED |
| C) AUTO RESTART AFTER RFA ▪ | SW202 (7) BJB (SC) OR BSH (MILL) BOARD | | ENABLED | ENABLED / DISABLED |
| D) REMOTE TURN ON ▪ | SW203 (7) BJM (SC) OR BSJ (MILL) BOARD | | ENABLED | ENABLED / DISABLED |
| E) REMOTE TURN OFF ▪ | SW203 (8) BJM (SC) OR BSJ (MILL) BOARD | | ENABLED | ENABLED / DISABLED |
| F) EFFICIENCY ALGORITHM ▪ ▪▪ | SW204 (1) BJH (SC) OR BSJ (MILL) BOARD | | ENABLED | ENABLED / DISABLED |
| ▪ INTELLIGENT CONTROLLER FEATURE ONLY | | | | |
| ▪▪ EFFICIENCY ALGORITHM SHOULD BE DISABLED FOR DISTRIBUTED ARCHITECTURE SYSTEMS AND IS NOT RECOMMENDED FOR SWITCHED MODE RECTIFIERS. | | | | |

5) ENGINE TRANSFER

| SETTING | LOW | HIGH | DEFAULT | JOB SITE |
|---|---------|---------|---------|----------|
| 5) CONTROLLER SEQUENCING * | | | | |
| A) INITIAL DELAY | 1 SEC | 600 SEC | 1 SEC | |
| B) SEQUENCE INTERVAL | 0.1 SEC | 600 SEC | 1 SEC | |
| * REQUIRES EXTERNAL EQUIPMENT TO GENERATE START OF SEQUENCING (ETR, RO) | | | | |

6) VOLTAGE DISCONNECT CONTACTOR

| SETTING | LOW | HIGH | DEFAULT | JOB SITE |
|--|-----|------|---------|----------|
| A) CONTACTOR 1 TYPE | | | | |
| i) RECONN VOLTAGE * | 44 | 55 | 48 | |
| ii) DISCONN VOLTAGE * | 40 | 50 | 44 | |
| B) CONTACTOR 2 TYPE | | | | |
| i) RECONN VOLTAGE | 44 | 55 | 48 | |
| ii) DISCONN VOLTAGE | 40 | 50 | 44 | |
| C) CONTACTOR 3 TYPE | | | | |
| i) RECONN VOLTAGE | 44 | 55 | 48 | |
| ii) DISCONN VOLTAGE | 40 | 50 | 44 | |
| * IF DISCONNECTED DUE TO TEMPERATURE, RECONNECT WILL ALSO BE DUE TO TEMPERATURE (SEE SECTION I3) | | | | |


7) ALARMS

| SETTING | DEFAULT | JOB SITE |
|---------------------------|----------|--------------------|
| A) ALARM TEST | ENABLED | ENABLED / DISABLED |
| B) REMOTE ALARM TEST | DISABLED | ENABLED / DISABLED |
| C) HV DURING ALARM TEST | DISABLED | ENABLED / DISABLED |
| D) ALARM CUT OFF CRITICAL | ENABLED | ENABLED / DISABLED |
| E) ALARM CUT OFF MAJOR | ENABLED | ENABLED / DISABLED |
| F) ALARM CUT OFF MINOR | ENABLED | ENABLED / DISABLED |

8)MODEM AND DATASWITCH PORTS

(INTELLIGENT CONTROLLER FEATURE ONLY)

| SETTING | | DEFAULT | | JOB SITE | |
|---|---------------------|------------|---------------|-----------------------------|-------------------|
| A) PASSWORDS | | HARDWARE | SOFTWARE | HARDWARE | SOFTWARE |
| i) USER | | ---- | LINEAGE | ---- | |
| ii) SUPER-USER | | ---- | SUPER-USER | ---- | |
| iii) ADMINISTRATOR | | ---- | ADMINISTRATOR | ---- | |
| B) LOCAL PORT | | | | | |
| i) TYPE | | TERMINAL | TERMINAL | LOG/TERMINAL | LOG/TERMINAL |
| ii) PERMISSION SW203 (6) BJH (SC) OR BSJ (MILL) | | R & W | R & W | R & W / R ONLY | R & W / R ONLY |
| C) MODEM PORT | | | | | |
| i) PERMISSION SW203 (4) BJH (SC) OR BSJ (MILL) | | R & W | R & W | R & W / R ONLY | R & W / R ONLY |
| ii) CALL ON ALARM | | NONE | | ALARMS | |
| a) PHONE #1 | | TYPE: DATA | | DATA PAGER # ALARM | |
| b) PHONE #2 | | TYPE: DATA | | DATA PAGER # ALARM | |
| c) PHONE #3 | | TYPE: DATA | | DATA PAGER # ALARM | |
| d) PHONE #4 | | TYPE: DATA | | DATA PAGER # ALARM | |
| e) ALT PHONE #1 | | TYPE: DATA | | DATA PAGER # ALARM | |
| D) AUXILIARY PORT | | | | | |
| i) TYPE | | RS-232 | | RS-232 / RS-485 | |
| ii) PERMISSION SW203 (5) BJH (SC) OR BSJ (MILL) | | R & W | R & W | R & W / R ONLY | R & W / R ONLY |
| E) DATA SWITCH | | | | | |
| PORT 1 | CONNECTED EQUIPMENT | GALAXY | | GALAXY/OMNI/ECS/MCS/RAS/XCS | |
| | CONN EQUIP PASSWORD | LINEAGE | | | |
| | PASS THRU ALARMS | DISABLED | | ENABLED / DISABLED | |
| PORT 2 | CONNECTED EQUIPMENT | GALAXY | | GALAXY/OMNI/ECS/MCS/RAS/XCS | |
| | CONN EQUIP PASSWORD | LINEAGE | | | |
| | PASS THRU ALARMS | DISABLED | | ENABLED / DISABLED | |
| PORT 3 | CONNECTED EQUIPMENT | GALAXY | | GALAXY/OMNI/ECS/MCS/RAS/XCS | |
| | CONN EQUIP PASSWORD | LINEAGE | | | |
| | PASS THRU ALARMS | DISABLED | | ENABLED / DISABLED | |
| PORT 4 | CONNECTED EQUIPMENT | GALAXY | | GALAXY/OMNI/ECS/MCS/RAS/XCS | |
| | CONN EQUIP PASSWORD | LINEAGE | | | |
| | PASS THRU ALARMS | DISABLED | | ENABLED / DISABLED | |
| PORT 5* | CONNECTED EQUIPMENT | GALAXY | | GALAXY/OMNI/ECS/MCS/RAS/XCS | |
| | CONN EQUIP PASSWORD | LINEAGE | | | |
| | PASS THRU ALARMS | DISABLED | | ENABLED / DISABLED | |
| PORT 6* | CONNECTED EQUIPMENT | GALAXY | | GALAXY/OMNI/ECS/MCS/RAS/XCS | |
| | CONN EQUIP PASSWORD | LINEAGE | | | |
| | PASS THRU ALARMS | DISABLED | | ENABLED / DISABLED | |
| * MILLENNIUM ONLY | | | | | |

| | | | | | |
|---|--|----------|----------|-------|-----------------|
| TITLE | | | | | |
| GPS4848/100 ORDERING GUIDE | | | | | |
| DRAWING DESCRIPTION | | | | | |
| - | | | | | |
|  | | DOC TYPE | | SHEET | ISSUE |
| DWG | | | H569-434 | F3 | 25 |
| | | | | | DWG SIZE C2/AIR |

CONTINUED
ON NEXT
SHEET

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9) BATTERY SECTION INFORMATION

| A) SECTION 1 | | | G) SECTION 7 | | |
|----------------------|-----------------------|---------|----------------------|-----------------------|---------|
| SETTING | JOB SITE | | SETTING | JOB SITE | |
| i) STRING TYPE | L-IS / L-508 / VR-375 | | i) STRING TYPE | L-IS / L-508 / VR-375 | |
| ii) NO OF STRINGS | | | ii) NO OF STRINGS | | |
| RPM | ADDRESS | CHANNEL | RPM | ADDRESS | CHANNEL |
| iii) PILOT CELL VOLT | | | iii) PILOT CELL VOLT | | |
| iv) MID-POINT VOLT | | | iv) MID-POINT VOLT | | |
| v) CHG/DISCHG CUR | | | v) CHG/DISCHG CUR | | |
| vi) TEMPERATURE | | | vi) TEMPERATURE | | |
| B) SECTION 2 | | | H) SECTION 8 | | |
| SETTING | JOB SITE | | SETTING | JOB SITE | |
| i) STRING TYPE | L-IS / L-508 / VR-375 | | i) STRING TYPE | L-IS / L-508 / VR-375 | |
| ii) NO OF STRINGS | | | ii) NO OF STRINGS | | |
| RPM | ADDRESS | CHANNEL | RPM | ADDRESS | CHANNEL |
| iii) PILOT CELL VOLT | | | iii) PILOT CELL VOLT | | |
| iv) MID-POINT VOLT | | | iv) MID-POINT VOLT | | |
| v) CHG/DISCHG CUR | | | v) CHG/DISCHG CUR | | |
| vi) TEMPERATURE | | | vi) TEMPERATURE | | |
| C) SECTION 3 | | | K) SECTION 9 | | |
| SETTING | JOB SITE | | SETTING | JOB SITE | |
| i) STRING TYPE | L-IS / L-508 / VR-375 | | i) STRING TYPE | L-IS / L-508 / VR-375 | |
| ii) NO OF STRINGS | | | ii) NO OF STRINGS | | |
| RPM | ADDRESS | CHANNEL | RPM | ADDRESS | CHANNEL |
| iii) PILOT CELL VOLT | | | iii) PILOT CELL VOLT | | |
| iv) MID-POINT VOLT | | | iv) MID-POINT VOLT | | |
| v) CHG/DISCHG CUR | | | v) CHG/DISCHG CUR | | |
| vi) TEMPERATURE | | | vi) TEMPERATURE | | |
| D) SECTION 4 | | | M) SECTION 10 | | |
| SETTING | JOB SITE | | SETTING | JOB SITE | |
| i) STRING TYPE | L-IS / L-508 / VR-375 | | i) STRING TYPE | L-IS / L-508 / VR-375 | |
| ii) NO OF STRINGS | | | ii) NO OF STRINGS | | |
| RPM | ADDRESS | CHANNEL | RPM | ADDRESS | CHANNEL |
| iii) PILOT CELL VOLT | | | iii) PILOT CELL VOLT | | |
| iv) MID-POINT VOLT | | | iv) MID-POINT VOLT | | |
| v) CHG/DISCHG CUR | | | v) CHG/DISCHG CUR | | |
| vi) TEMPERATURE | | | vi) TEMPERATURE | | |
| E) SECTION 5 | | | N) SECTION 11 | | |
| SETTING | JOB SITE | | SETTING | JOB SITE | |
| i) STRING TYPE | L-IS / L-508 / VR-375 | | i) STRING TYPE | L-IS / L-508 / VR-375 | |
| ii) NO OF STRINGS | | | ii) NO OF STRINGS | | |
| RPM | ADDRESS | CHANNEL | RPM | ADDRESS | CHANNEL |
| iii) PILOT CELL VOLT | | | iii) PILOT CELL VOLT | | |
| iv) MID-POINT VOLT | | | iv) MID-POINT VOLT | | |
| v) CHG/DISCHG CUR | | | v) CHG/DISCHG CUR | | |
| vi) TEMPERATURE | | | vi) TEMPERATURE | | |
| F) SECTION 6 | | | O) SECTION 12 | | |
| SETTING | JOB SITE | | SETTING | JOB SITE | |
| i) STRING TYPE | L-IS / L-508 / VR-375 | | i) STRING TYPE | L-IS / L-508 / VR-375 | |
| ii) NO OF STRINGS | | | ii) NO OF STRINGS | | |
| RPM | ADDRESS | CHANNEL | RPM | ADDRESS | CHANNEL |
| iii) PILOT CELL VOLT | | | iii) PILOT CELL VOLT | | |
| iv) MID-POINT VOLT | | | iv) MID-POINT VOLT | | |
| v) CHG/DISCHG CUR | | | v) CHG/DISCHG CUR | | |
| vi) TEMPERATURE | | | vi) TEMPERATURE | | |

10) BATTERY RECHARGE CURRENT LIMIT

REQUIRES DISTRIBUTED ARCHITECTURE WITH REMOTE PERIPHERAL MONITORING MODULES LINKED TO BATTERY SECTION SHUNTS

CHANGES TO THE PLANT VOLTAGE MAY OCCUR DURING ACTIVATION OF THIS FEATURE

| SETTING | LOW | HIGH | DEFAULT | JOB SITE |
|--|-------|-------|----------|--------------------|
| A) RCHG CURLIM | ---- | ---- | DISABLED | ENABLED / DISABLED |
| B) RCL THRESH PER BATTERY SECTION | IOA * | IOOOA | IOOOA | |
| * RECHARGE CURRENT LIMIT LOW IS EQUAL TO (TOTAL NUMBER OF RECTIFIERS / TOTAL NUMBER OF BATTERY SECTIONS) X 60A (30% OF 200A) | | | | |

11) BATTERY RESERVE TIME PREDICTION (TOTAL PLANT)

SEE TABLE 2E AND ASSOCIATED NOTES FOR REQUIRED EQUIPMENT

| SETTING | LOW | HIGH | DEFAULT | JOB SITE |
|--|------|--------|---------|-----------------------|
| A) BATTERY TYPE | ---- | ---- | L-IS | L-IS / L-508 / VR-375 |
| B) NUMBER OF STRINGS | 1 | 32 | 2 | |
| C) CELLS PER STRING | ---- | ---- | 24 | 24 |
| D) END OF DISCHARGE VOLTS PER CELL | 1.75 | 1.95 | 1.75 | |
| E) RESERVE TIME LOW ALARM * | 0 HR | 100 HR | 2 HR | |
| * ALARM ONLY ENABLED DURING BATTERY ON DISCHARGE | | | | |

14) GALAXY GATEWAY COMMUNICATION OVER INTERNET (INTELLIGENT CONTROLLER FEATURE ONLY)

OBTAIN THESE SETTINGS FROM BUILDING NETWORK ADMINISTRATOR

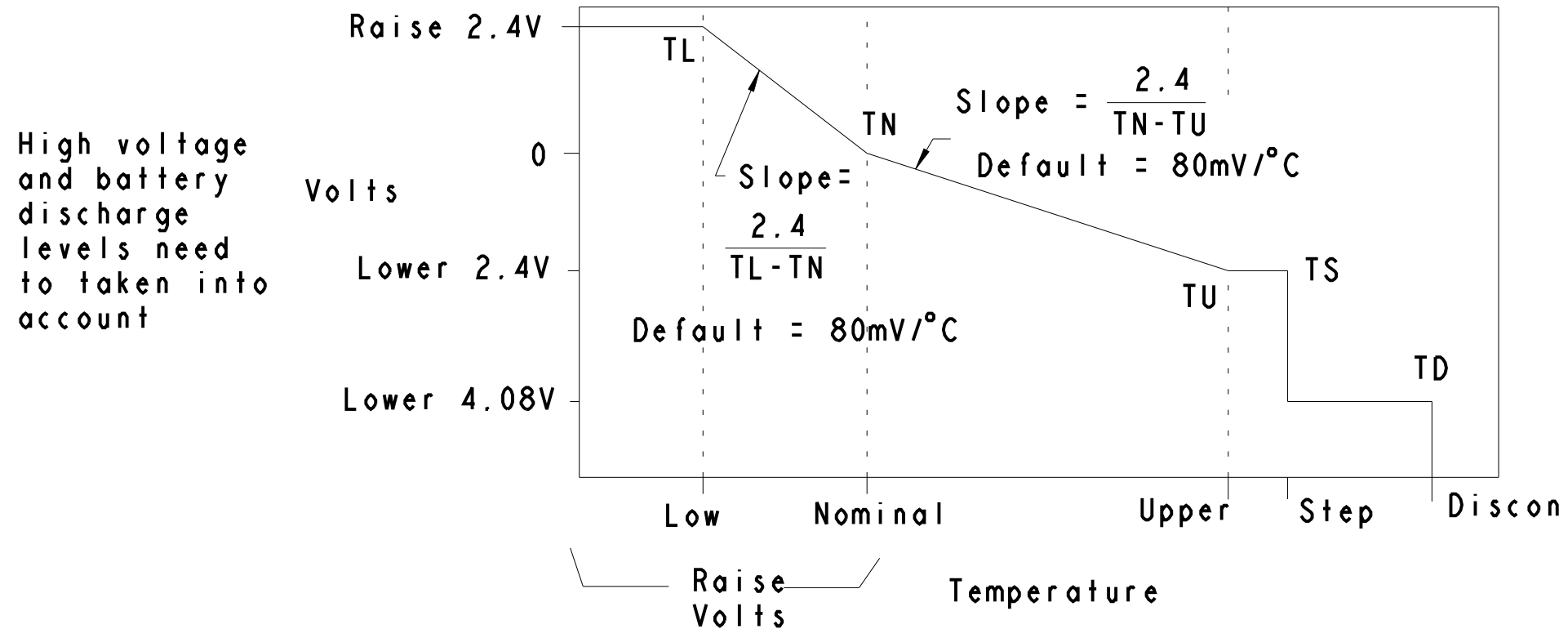
| SETTING | SOFTWARE DEFAULT | JOB SITE |
|--------------------------------|------------------|----------|
| IP ADDRESS | 000.000.000.000 | |
| SUBNET MASK | 000.000.000.000 | |
| HOST NAME | 000.000.000.000 | |
| DEFAULT GATEWAY IP ADDRESS | 000.000.000.000 | |
| | | |
| SETTING | SOFTWARE DEFAULT | JOB SITE |
| GATEWAY ADMINISTRATOR PASSWORD | networkadm | |
| | | |
| SETTING | SOFTWARE DEFAULT | JOB SITE |
| SW203-1 ON BSJ BOARD | ENABLED | ENABLED |
| SW203-5 ON BSJ BOARD | ENABLED | ENABLED |

BATTERY THERMAL PROTECTION

| SETTING | LOW | HIGH | DEFAULT | JOB SITE |
|----------------------------------|--------------|--------------|--------------|--------------------|
| 12) SLOPE THERMAL COMPENSATION * | | | | |
| A) STC | ---- | ---- | DISABLED | ENABLED / DISABLED |
| B) RAISE VOLTS | ---- | ---- | DISABLED | ENABLED / DISABLED |
| C) LOW TEMP (TL) | -5°C (23°F) | 20°C (68°F) | -5°C (23°F) | |
| D) NOMINAL TEMP (TN) *** | 15°C (59°F) | 30°C (86°F) | 25°C (77°F) | |
| E) UPPER TEMP (TU) *** | 30°C (86°F) | 55°C (131°F) | 55°C (131°F) | |
| F) STEP TEMP (TS) | 45°C (113°F) | 85°C (185°F) | 55°C (131°F) | |

13) TEMPERATURE DISCONNECT **

| | | | | |
|--|----------------------------------|--------------|--------------|---------|
| A) TEMP UNITS | ---- | ---- | °C | °C / °F |
| B) DISCONN TEMP (TD) | 30°C (86°F) | 90°C (194°F) | 75°C (167°F) | |
| C) RECONNECT | 3°C BELOW DISCONNECT TEMPERATURE | | | |
| <p>* MAY BE USED WITHOUT TEMPERATURE DISCONNECT FEATURE. REQUIRES REMOTE PERIPHERAL MONITORING (RPM) MODULES, 2IOE MODULES, OR IOKΩ BATTERY TEMPERATURE PROBE (SEE TABLE 2E). WITH THE RPMs, THE CONTROLLER WILL USE THE MAXIMUM TEMPERATURE OUT OF ALL THE TEMPERATURES REPORTED WHICH CAN BE AT MOST ONE PER BATTERY SECTION (SEE 9-BATTERY SECTION INFORMATION). WITH THE IOKΩ TEMPERATURE PROBE, ONLY ONE TEMPERATURE IS AVAILABLE TO THE CONTROLLER. WITH THE BASIC CONTROLLER, TEMPERATURES SENSED THROUGH THE BIC ARE NOT READ BY THE CONTROLLER AND CANNOT BE USED FOR SLOPE THERMAL COMPENSATION.</p> | | | | |
| <p>** MAY BE USED WITHOUT SLOPE THERMAL COMPENSATION FEATURE. REQUIRES BATTERY SECTIONS WITH VOLTAGE DISCONNECT FEATURE (SET VOLTAGE DISCONNECT AS TYPE = BATT) (SEE 6-CONTACTOR SETTINGS), AND ALSO EITHER 2IOE MODULE OR IOKΩ BATTERY TEMPERATURE PROBE (SEE TABLE 2E). WITH THE 2IOE, THE CONTROLLER WILL ACT ON THE MAXIMUM TEMPERATURE REPORTED OUT OF ALL THE TEMPERATURES, WHICH MAY BE AT MOST ONE PER BATTERY SECTION. THE DISCONNECT WILL ACT ON ALL BATTERY SECTIONS AT ONCE, NOT JUST THE SECTION REPORTING THE MAXIMUM TEMPERATURE (SEE 9-BATTERY SECTION INFORMATION). WITH THE IOKΩ BATTERY TEMPERATURE PROBE, ONLY A SINGLE TEMPERATURE IS AVAILBLE TO THE CONTROLLER.</p> | | | | |
| <p>*** FOR SOFTWARE VERSIONS BEFORE 7.5, NOMINAL TEMP DEFAULT WAS 15C AND UPPER TEMP DEFAULT WAS 30C. THESE STC PARAMETERS MUST BE ADJUSTED TO MORE TYPICAL VALUES (RECOMMEND 25C (77F) & 55C (131F) RESPECTIVELY FOR A 3mV/°C SLOPE) WHEN STC IS ENABLED.</p> | | | | |



TITLE
GPS4848/100 ORDERING GUIDE
DRAWING DESCRIPTION
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DOC TYPE
DWG

H569-434

SHEET
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DWG
SIZE
C2/AIR