

ARGUS™

Power System Manual

025-790-B0



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Power

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POWER SYSTEM MANUAL

025-790-B0

Drawing List:

The following drawings are included in this manual to provide the necessary information required for routine operation and fault diagnosis of the unit.

P.S. Installation Guide	- #022-000-C0
Circuit Breaker Spare Parts	- #022-000-G1
Main Parts List	- #025-790-20
Outline Drawing	- #025-790-04
Schematic, Power System	- #025-790-05
Schematic, Fuse/Bkr Alarm PCB	- #700-011-05
Schematic, NRN Fuse Panel	- #020-009-05

Manuals to be included with this manual are as follows:

018-008-B0	SD03 Supervisory Panel
010-002-B0	RST 48/50 Rectifier
018-012-B0	Auto Equalize Panel

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POWER PLANT AND BATTERY INSTALLATION GUIDE 022-000-C0



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POWER PLANT AND BATTERY INSTALLATION GUIDE 022-000-C0

NOTE: Photographs contained in this manual are for illustrative purposes only. These photographs may not exactly match your installation.

NOTE: Review the drawings and illustrations contained in this manual before proceeding. If there are questions regarding the safe operation of this power plant, please contact Argus Technologies or your nearest Argus representative.

Contacting Argus Technologies

Further information can be found on the Argus website at www.argusdcpower.com. Questions can also be directed to the Argus technical support hot line at 1-888-GO-ARGUS (1-888-462-7487) for toll free calls within Canada and the U.S.A. Other locations call + 604-436-5547.

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ATTACHMENTS

The cover page, document 02n-nnn-B0 (where 02n-nnn is the Argus number assigned to your order), typically lists the documents and drawings included in your manual. This is to provide the necessary information required for installation, routine operation and fault diagnosis, for example:

Bill of Materials	02n-nnn-20
Outline Drawing	02n-nnn-04
Schematic Drawing	02n-nnn-05
Warranty Policy	048-507-10
Factory Service Information	048-527-10

And may include:

Specifications	02n-nnn-B1
Circuit Breaker Spare Parts List	022-000-G1
Battery Layout	P/N TBA

MANUALS

This documentation package may include, where applicable, the following product manuals:

Pathfinder 24V-3kW	010-539-B2
CSM11 DC/DC Converter, 24V Input, 48V Output	012-548-B2
SM04 System Control Panel	018-543-B2
Breaker Panel, Front Access, 20-Position, Plug-in	020-589-B2

1 INTRODUCTION AND SAFETY INFORMATION

This is a generic installation guide intended to be applicable for various types of Argus power plants, including front access systems (e.g. Trio) and traditional power plants. For battery installation refer to the manufactures guidelines for more specific information.

1.1 Save These Instructions

This section contains important instructions that should be followed during the installation and maintenance of equipment and batteries. **Please read all of the instructions before operating the equipment, and save this manual for future reference.**

A licensed electrician **MUST** perform connection to the branch circuit of service feed. Installation of the power supply and batteries must be performed by, or under the direct supervision of service personnel knowledgeable of the required electrical and battery safety precautions.

If instructions in this manual conflict with local electrical codes, those instructions shall be superseded by the local code.

The following safety symbols will be found throughout this manual, carefully read all information and abide by the instructions:



DANGEROUS VOLTAGE

This symbol indicates a dangerous voltage exists in this area of the product



GAS HAZARD

This symbol indicates a gas hazard exists in the area of vented batteries



NO MATCHES OR OPEN FLAMES

This symbol indicates a fire or explosive hazard exists in the area of the product

The following levels of warning will be used with the above symbols:

DANGER: You **WILL** be **KILLED** or **SERIOUSLY INJURED** if instructions are not followed closely

WARNING: You **CAN** be **KILLED** or **SERIOUSLY INJURED** if instructions are not followed closely

CAUTION: You **CAN** be **INJURED** or equipment can be **DAMAGED** if instructions are not followed closely

1.2 Electrical Safety



WARNING

Hazardous voltages are present at the input of the power plant. The DC output from the rectifiers and the battery system, though not dangerous in voltage, has a high short-circuit current capacity that may cause severe burns and electrical arcing.

Before working with any live battery or power plant, the following precautions should be followed:

- Remove all metallic jewelry; e.g., watches, rings, eyeglasses, necklaces.
- Safety glasses with side shields must be worn at all times.
- Tools with insulated handles must be used.

Lethal voltages are present within the power plant. Never assume that an electrical connection or conductor is not energized. Check the circuit with a voltmeter with respect to the grounded portion of the enclosure (both AC and DC) prior to any installation or removal procedure.

Do not work alone under hazardous conditions.

A licensed electrician is required to install permanently wired equipment.

Input voltages can range up to 480VAC. Ensure that utility power is disabled before beginning installation or removal.

Ensure no liquids or wet clothes contact internal components.

Hazardous electrically live parts inside this unit are energized from batteries even when the AC input power is disconnected.

1.3 Battery Safety

Servicing and connection of batteries shall be performed by, or under the direct supervision of, personnel knowledgeable of batteries and the required safety precautions.

Always wear eye protection, rubber gloves, and a protective vest when working near batteries. Remove all metallic objects from hands and neck.

Use tools with insulated handles; do not rest tools on top of batteries.

Batteries contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Battery post terminals and related accessories contain lead and lead compounds; wash hands after handling. (California Proposition 65)



WARNING

Follow battery manufacturer's safety recommendations when working around battery systems.

**WARNING**

Do not smoke or present an open flame when batteries (especially vented batteries) are on charge. Batteries vent hydrogen gas when on charge, which creates an explosion hazard.

Batteries are hazardous to the environment and should be disposed of safely at a recycling facility. Consult the battery manufacturer for recommended local authorized recyclers.

1.4 Mechanical Safety

Keep hands and tools clear of fans. Fans are thermostatically controlled and will turn on automatically.

Power supplies can reach extreme temperatures under load.

Use caution around sheet metal components and sharp edges.



2 INSPECTION

2.1 Packing Materials

All Argus products and components are shipped in rugged, double walled boxes and suspended via solid inserts to minimize shock that may occur during transportation. Packaging assemblies and methods are tested to National Safe Transit Association standards.

Power plants are custom packaged in heavy-duty plywood crates.

Power plants are also packaged with Cortex. This plastic wrap contains a corrosive inhibitor that protects the plant from corrosion for up to two years while in the crate.

Rectifiers and batteries are shipped on individual pallets. Batteries are packaged per manufacturer's guidelines.

2.1.1 Returns for Service

Save the original shipping container. If the equipment needs to be returned for service, it should be packaged in its original shipping container. If the original container is unavailable, make sure the equipment is packed with at least three inches of shock-absorbing material to prevent shipping damage. Argus Technologies is not responsible for damage caused by the improper packaging of returned equipment.

2.2 Check for Damage

Prior to unpacking the batteries, power plant or components, note any damage to the shipping container. Unpack the equipment and inspect the exterior for damage. If any damage is observed contact the carrier immediately.

Continue the inspection for any internal damage. In the unlikely event of internal damage please inform the carrier and contact Argus Technologies for advice on the consequence of any damage.



Verify that you have all the necessary parts per your order for the proper assembly of your power plant.



Call Argus Technologies if you have any questions before you proceed: 1 (888) 462-7487.

3 INSTALLATION

This section is provided for qualified personnel to install and interconnect the power components within the Argus Power Plant.

3.1 Tools Required

Various tools are essential for DC power plant installation. Use this list as a guide:

- Electric drill with hammer action 1/2" capacity
- Battery lifting apparatus (as required)
- Various crimping tools and dies, to match lugs used in installation
- Digital voltmeter equipped with test leads
- Load bank of sufficient capacity to load largest rectifier into current limit
- Cable cutters
- Torque wrench: 1/4" drive, 0-150 in/lbs
- Torque wrench: 3/8" drive, 0-100 ft/lbs
- Insulating canvases as required (2' x 2', 1' x 1', 3' x 3', etc.)
- Various insulated hand tools (see Figure 1) including:
 - Combination wrenches
 - Ratchet and socket set
 - Various screwdrivers
 - Electricians knife
 - Fine tipped slot screwdrivers ("tweaker")
- Battery safety spill kit (required for wet cells only) including:
 - Protective clothing
 - Face shields
 - Gloves
 - Baking soda
 - Eye wash equipment
- Cutters and wire strippers (#14 to #22 AWG) [0.34 to 2.5 mm²].



Figure 1—Example of an insulated tool kit

For battery installation refer primarily to the manufacturer's guidelines for more specific information.

3.2 Power Plant Assembly and Mounting

The power plant must be mounted in a clean and dry environment. Sufficient free space must be provided at the front and rear of the plant. This is to meet the cooling requirements of the rectifiers utilized in the plant and to allow easy access to the power plant components.

3.2.1 Rack Mounted Plants

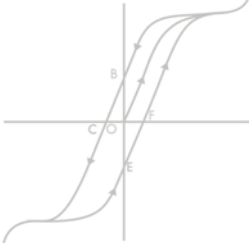
Attach the power plant to the customer-provided relay rack using mounting screws and star washers to ensure an electrical bond between plant chassis and relay rack.

3.2.2 Floor Mounted Plants

Secure the plant to a concrete floor utilizing either heavy duty anchors (1/2" x 2-1/2") or, for wooden floors, heavy-duty lag screws (5/8" x 2-1/2"). Use appropriately-sized flat washers.

Use isolating kits if required to insulate plant from the floor.

It is recommended that the relay rack be secured to the overhead cable tray. Argus does not supply the mechanical details necessary for overhead support.



NOTE: Review the safety instructions provided at the beginning of this manual.

3.3 Battery Installation

3.3.1 Preparation/Mounting

The battery should be located in a temperature-controlled environment. The temperature should be regulated at approx. 25 °C (77 °F). Significantly lower temperatures reduce performance and higher temperatures decrease life expectancy.

Provide adequate ventilation for the battery. VRLA batteries, though not requiring the special ventilation requirements of a flooded battery, should not be installed in an airtight enclosure. Hydrogen gas may be vented in a fault condition; i.e., failed battery.

Before assembly, clean cells as per the battery manufacturer's recommendations. First neutralize any acid with a baking soda and water solution. Then wipe the cells with clean water.

3.3.2 Installation of Batteries in Argus Power Plants

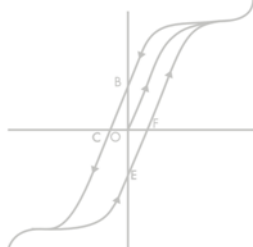
Locate batteries on shelf or in cabinet provided, with a minimum of 1/2" between cells or mono-blocs if possible. Ensure that the battery output cables will reach the (+) and (-) termination cells of the series string and that the batteries are orientated correctly for easy installation of the inter-cell connectors. Remove any no-oxide "A" grease from battery terminals, burnish terminal posts with a non-metallic brush, polishing pad or 3M type scotch pad, apply a light coating of no-oxide "A" anti-corrosion grease to the terminal posts. If lead plated intercell connectors are used they should also be burnished and no-oxide "A" applied to the contact surfaces. Install all intercell connectors.

After assembly, cells should be numbered and "as received" readings taken, including specific gravity, cell voltage and temperature. One cell will be designated as the pilot cell; this is usually the cell with either the lowest specific gravity or voltage. Refer to manufactures literature for guidelines (see following table – typical VRLA Battery Maintenance Report).

3.3.3 Installation of External Batteries

Assemble battery rack (if required) and the cells or mono-blocks as per the installation instructions supplied with the batteries, with a minimum of 1/2" between cells if possible. Remove any no-oxide "A" grease from battery terminals, burnish terminal posts with a non-metallic brush, polishing pad or 3M type scotch pad, apply a light coating of no-oxide "A" to the terminal posts. Intercell connector contact surfaces should also be burnished and no-oxide "A" applied. Install all intercell and inter-tier connectors.

After assembly, cells should be numbered and "as received" readings taken, including specific gravity, cell voltage and temperature. One cell will be designated as the pilot cell; this is usually the cell with either the lowest specific gravity or voltage. Refer to manufacturer's literature for guidelines (see Table A).



Company: _____ Date: _____
 Address: _____
 Battery location and/or number: _____
 No. of cells: _____ Type: _____ Date new: _____
 Date installed: _____ Float voltage: _____ Ambient temp.: _____

Cell Readings

Cell #	Serial #	Voltage	Specific Gravity	Ohms	Mhos	Observations
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

Remarks and recommendations: _____

Readings taken by: _____

Table A—Typical VRLA battery maintenance report

4 CABLING

4.1 AC Cabling

Shut off power to the AC distribution panel, if possible, before proceeding.

Cable and connect from the AC distribution panel to each rectifier, follow the connection information detailed in the rectifier manual. With the modular rectifiers it is recommended to pre-cable all rectifier positions to allow for easy addition of future rectifiers. If connection is to a 3-phase AC service, care should be taken to balance the load across the phases.

4.2 Rectifier Sensing

There are various methods of providing rectifier output voltage sensing. Refer to the documentation package that comes with your power plant components.

4.2.1 SD Equipped Power Plants

- Built in internal sensing. No connections required.
- Remote sensing referenced to battery, with no temperature compensation. (Note: Power Plant supervisory panel should be equipped with the rectifier remote sensing option.) Cable and connect leads from sense termination on the supervisory panel to the battery termination details.

Final connection to battery live should not be made, insulate and leave unconnected.

- If the battery temperature compensation feature is ordered in addition to remote sensing, the rectifier sense leads from the batteries will be terminated at the temperature compensation unit.

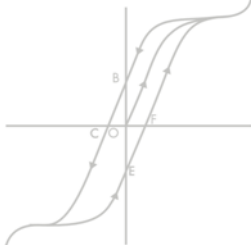
4.2.2 SM Equipped Power Plants

- With a SM system the rectifier will regulate its voltage to the charge voltage displayed on the SM02.
- To regulate at the battery the charge input connection to the SM02 should be removed and the charge input connection should be directly to the battery.

4.3 Battery

Battery cables should be sized for a .25 V drop from battery to the distribution panel at full load including anticipated growth. The cables should also meet ampacity requirements. Cables terminating directly on battery posts or connection details should be secured so that there is no stress on the battery posts. Lead plated lugs and lead plated or stainless steel hardware should be used on all terminations with vented batteries to reduce corrosion.

Cable and connect cables from power plant to battery termination details. Terminating points should be burnished and no-oxide “A” grease applied.



Refer to the documentation package that comes with your power plant components.

Final connection to battery live should not be made. Insulate and leave disconnected.

4.4 Alarms

All applicable alarms should be connected to the local alarm-sending unit from the power plant. The deluxe supervisory panels provide a central point for all external alarm lead connections. The more basic panels provide for some alarm terminations such as low/high voltage but alarms such as rectifier or converter fail may have to be connected directly to the rectifier or converter. The type of alarm input required by the alarm sending unit determines how the alarm contacts are configured and wired; i.e. form “A”, “B” or “C” wired for ground sending, battery sending, loop closure, loop open, etc. Some supervisory panels require jumpers to be moved to configure the alarm contacts as form “A” or “B”.

4.5 Grounding

The isolated power plant battery return bus (BRB) should be connected to the building master ground bus (MGB) or floor ground bus (FGB) in a larger building. This acts as a system reference and as a low impedance path to ground for surges, transients, noise, etc. The MGB or FGB should have a direct low impedance path to the building grounding system; i.e. the water main. The cable from the power plant to the MGB or FGB should be sized to provide sufficient ampacity to clear the largest fuse or breaker on the power plant, excluding the battery protection fuse or circuit breaker; this is the minimum requirement. Other factors including length of cable and special grounding requirements of the load should also be factored in. The insulated cable should be equipped with two-hole crimp type lugs and should not have any tight bends or kinks.

Plant Ampacity	Typical Ground Reference Conductor Size
< 30A	#10
30-100A	#6-2
100-400A	0000
400-800A	350 MCM
> 800A	750 MCM

Table B—Typical ground reference conductor selection

The power plant frame must also be connected to the MGB or FGB. This is done for personnel safety and to meet many telco-grounding requirements. Cable should be #6 AWG (16mm) for small to medium size power plants and 2/0 for large plants (> 800A).

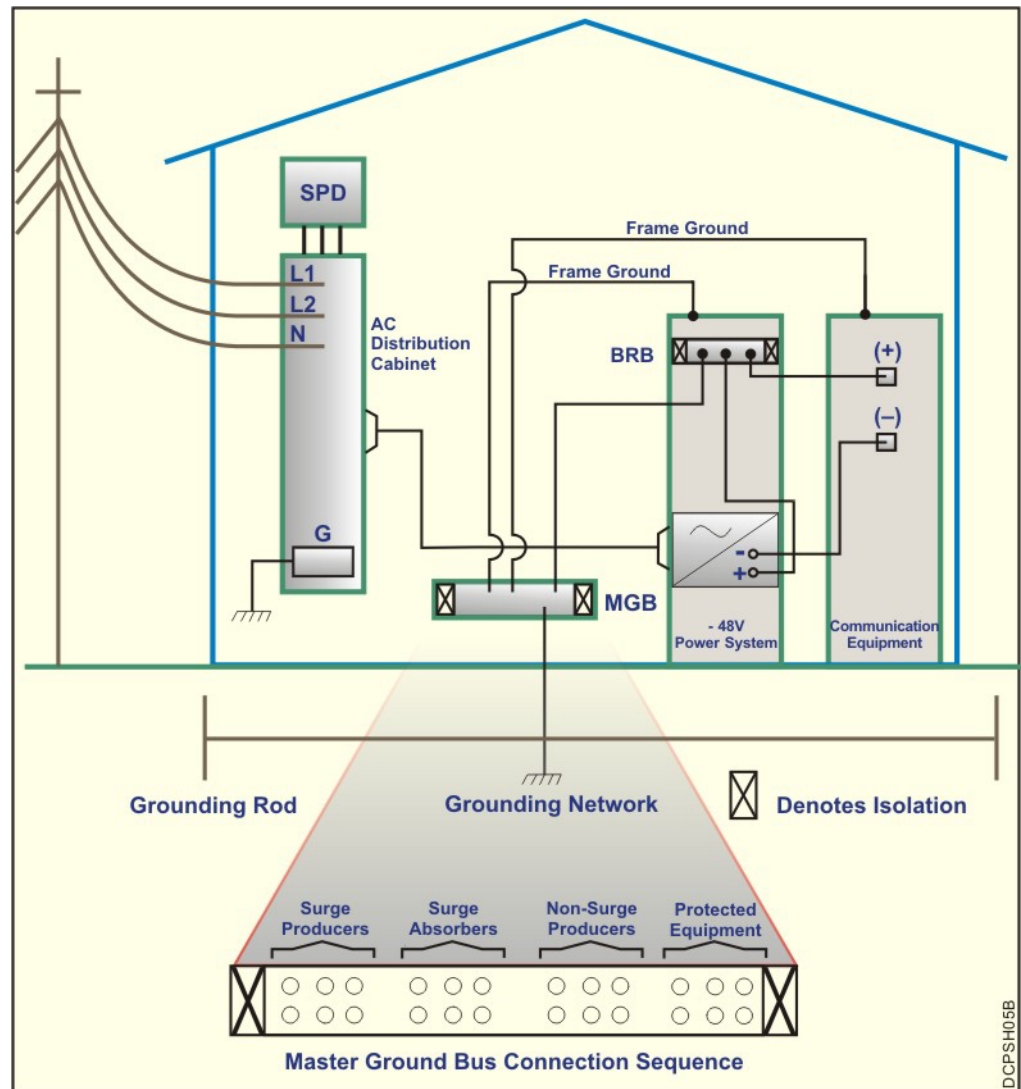


Figure 2-Plant grounding

4.6 Distribution

Refer to guidelines supplied with the load equipment. Typically distribution cables are sized to provide a .5 V loop drop at full load as well as meeting ampacity requirements of the protection fuse or circuit breaker.

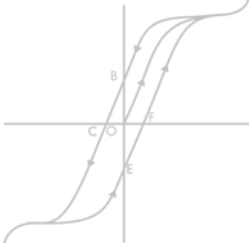
5 POWER UP PROCEDURE

5.1 SD Based Power Plants

1. Ensure battery is disconnected, fuses pulled, rectifiers removed and AC is off.
2. Triple check the polarity of all connections.
3. Turn up the plant with one rectifier, verify operation of system.
4. Verify that the battery voltage is correct and no cells are reversed and connect/turn on battery.
5. Install and turn up all rectifiers in the plant.
6. Check/adjust system parameters.
7. Verify the functionality of all system alarm relays.
8. Initial charge system battery as per manufactures specification. Record cell readings following installation specification.
9. Perform battery testing capacity, conductance, impedance, etc. if required.
10. When everything has been completed ensure that all alarms have been cleared.

5.2 SM Based Power Plants

1. Ensure battery is disconnected, fuses pulled, rectifiers removed and AC is off.
2. Triple check the polarity of all connections.
3. Turn up the plant with one rectifier, verify operation of system.
4. Verify that the battery voltage is correct and no cells are reversed and connect/turn on battery.
5. Install and turn up all rectifiers in the plant.
6. Check/adjust SM02 parameters as per configuration sheet.
7. Download settings to rectifiers.
8. Verify the functionality of all system alarm relays.
9. Initial charge system battery as per manufactures specification. Record cell readings following installation specification.
10. Perform battery testing capacity, conductance, impedance, etc. if required.
11. When everything has been completed ensure that all alarms have been cleared.
12. Enable the battery features (if applicable): - Temperature compensation - Auto-Equalize - Charge current control, etc.
13. Enable Plug and Play feature.



6 INITIAL CHARGE AND DISCHARGE TEST

After installation of batteries it is usually necessary to “initial charge” the batteries to ensure proper operation and to eliminate plate sulfation. Follow guidelines supplied with the battery and record initial charge readings; i.e. specific gravity, cell voltage, charge current and temperature.

Battery warranty may be void if batteries are not initial charged following the manufacturer's guidelines and proper records are kept.

Some VRLA batteries do not require initial charging if placed on charge within 3-6 months of manufacture, check with the manufacturer. After the equalization period battery voltage should be reduced to the recommended float level.

Once the batteries have been initial charged it is suggested to perform a short duration-high rate discharge test on the batteries to verify the connections on the batteries and also to verify that there are no open or failed cells. Cell voltages should be monitored during this process.

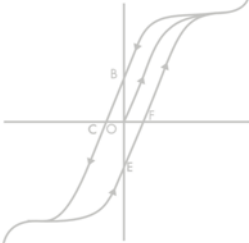
- Discharge for 15 minutes at the C/8 rate.
- Record cell voltages every 5 minutes.
- Check for overheating connections.



7 TEST AND COMMISSIONING (OVERVIEW)

All Argus power plant components undergo thorough factory testing. All levels/alarms are set to predetermined values as detailed in their individual component manuals except where custom levels are specified. Good installation practice is to check the operation of all features and alarms and to set the power plant levels in accordance with the specific requirements of your plant.

The individual plant component manuals detail the methodology for testing and calibration of all components.



Complete all necessary documentation; i.e. battery reports (Table A), DC wiring lists (Tables C and D), AC distribution tables (Table E), floor plans, etc. Tag wires, fill out identification strips, and identify circuit breakers.

EQUIPMENT RELAY RACK UNIT CIRCUIT																
LINE	NAME OF CIRCUIT	EQUIPMENT		SCHEMATIC	NUMBER	WIRING DIAGRAM				QTY OF UNITS	CKT NUMBERING	NOTES	RR BAY	REMARKS		
		NUMBER	LIST OF GROUP			FIGURE	EQUIPPED	OPTION	FIGURE						WIRING	APP
1																
5																
10																
15																
20																
25																
30																
35																
40																
45																
50																
55	A	B	C	D	E	F	G	H	I	J	K	L	M	N	R	



—ASSIGNMENT OF NEG. 48 VOLT BATTERY & GROUND LEADS—										
LINE	DISTRIBUTION FUSE/C.B. INFO & STP					GRD IDENT (NOTE 1)	EQUIPMENT SERVED			
	FUSE PANEL	FUSE NO.:	FUSE CAPACITY				STAMPING INFO	FEEDER SIZE		
			UNIT	DIST	ALARM			BAT A	BAT B	GRD
60										
65										
70										
75										
80										
85										
90										
95										
100										
105										
110										
115										
120										
125										
130										
135										
140										
145										
150										
155							C.O— GRD			
COL	A	B	C	D	E	F	G	H	J	
									K	

Table D–Typical DC wiring list, example 2



TEL AC PWR DISTG SERV CAB NO. 115/230V AC 60 CY 1 PH 3 W														
AC SERVICE														
FROM BUILDING					CABINET					TO SERVICE				
WIRING					WIRING					WIRING				
WIRING					WIRING					WIRING				
WIRING					WIRING					WIRING				
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CIRCUIT BREAKER PART NUMBERS
(WHEN ORDERED LOOSE)

APPROVED: _____

ISSUED: _____

PART NO.	DESCRIPTION	CIRCUIT DESIGNATION OR REMARKS
----------	-------------	-----------------------------------

AMS Circuit Breakers (Bolt-in Type)

470-248-10	CB,Mag, 0.5A 65VDC,w/ Aux Sw, #10-32 Stud	
470-055-10	CB,Mag, 1A 65VDC,w/ Aux Sw, #10-32 Stud	
470-168-10	CB,Mag, 2A 65VDC,w/ Aux Sw, #10-32 Stud	
470-056-10	CB,Mag, 3A 65VDC,w/ Aux Sw, #10-32 Stud	
470-050-10	CB,Mag, 5A 65VDC,w/ Aux Sw, #10-32 Stud	
470-051-10	CB,Mag,10A 65VDC,w/ Aux Sw, #10-32 Stud	
470-077-10	CB,Mag,15A 65VDC w/ Aux Sw, #10-32 Stud	
470-047-10	CB,Mag,20A 65VDC,w/ Aux Sw, #10-32 Stud	
470-087-10	CB,Mag,25A 65VDC,w/ Aux Sw, #10-32 Stud	
470-052-10	CB,Mag,30A 65VDC,w/ Aux Sw, #10-32 Stud	
470-036-10	CB,Mag,35A 65VDC,w/ Aux Sw, #10-32 Stud	
470-048-10	CB,Mag,40A 65VDC,w/ Aux Sw, #10-32 Stud	
470-049-10	CB,Mag,50A 65VDC,w/ Aux Sw, #10-32 Stud	
470-137-10	CB,Mag,60A 65VDC,w/ Aux Sw, 1/4-20 Stud	
470-112-10	CB,Mag,70A 65VDC,w/ Aux Sw, 1/4-20 Stud	
470-064-10	CB,Mag,80A 65VDC,w/ Aux Sw, 1/4-20 Stud	
470-113-10	CB,Mag,90A 65VDC,w/ Aux Sw, 1/4-20 Stud	
470-054-10	CB,Mag,100A 65VDC,w/ Aux Sw, 1/4-20 Stud	

AM Circuit Breakers (Fuse Clip / Snap-in Type)

470-191-10	CB,Mag,5A 65VDC,w/ Aux Sw,Snap-In	
470-192-10	CB,Mag,10A 65VDC,w/ Aux Sw,Snap-In	
470-193-10	CB,Mag,15A 65VDC,w/ Aux Sw,Snap-In	
470-194-10	CB,Mag,20A 65VDC,w/ Aux Sw,Snap-In	
470-195-10	CB,Mag,25A 65VDC,w/ Aux Sw,Snap-In	
470-196-10	CB,Mag,30A 65VDC,w/ Aux Sw,Snap-In	
470-203-10	CB,Mag,40A 65VDC,w/ Aux Sw,Snap-In	
470-197-10	CB,Mag,45A 65VDC,w/ Aux Sw,Snap-In	
470-204-10	CB,Mag,50A 65VDC,w/ Aux Sw,Snap-In	
747-090-20	CB,Mag,2P,60A 65VDC,w/ Aux Sw,Snap-In, w/Adaptor	

AMS Circuit Breakers (5/16" Bullet, Plug-in Type)

470-260-10	CB, 1A 80VDC,5/16" Bull Term,Mid-trip	
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CIRCUIT BREAKER PART NUMBERS
(WHEN ORDERED LOOSE)

APPROVED: _____

ISSUED: _____

PART NO.	DESCRIPTION	CIRCUIT DESIGNATION OR REMARKS
470-234-10	CB, 5A 80VDC,5/16" Bull Term, Mid-trip	
470-235-10	CB,10A 80VDC,5/16" Bull Term, Mid-trip	
470-236-10	CB,15A 80VDC,5/16" Bull Term, Mid-trip	
470-237-10	CB,20A 80VDC,5/16" Bull Term, Mid-trip	
470-238-10	CB,25A 80VDC,5/16" Bull Term, Mid-trip	
470-239-10	CB,30A 80VDC,5/16" Bull Term, Mid-trip	
470-240-10	CB,40A 80VDC,5/16" Bull Term, Mid-trip	
470-233-10	CB,50A 80VDC,5/16" Bull Term, Mid-trip	
470-241-10	CB,60A 80VDC,5/16" Bull Term, Mid-trip	
470-242-10	CB,70A 80VDC,5/16" Bull Term, Mid-trip	
470-243-10	CB,80A 80VDC,5/16" Bull Term, Mid-trip	
470-244-10	CB,90A 80VDC,5/16" Bull Term, Mid-trip	
470-245-10	CB,100A 80VDC,5/16" Bull Term, Mid-trip	

CD Circuit Breakers

470-251-10	CB,Mag, 5A 125VDC,w/ Aux Sw, 1/4-20 Stud
470-069-10	CB,Mag, 5A 125VDC,w/ Aux Sw, #10-32 Stud
470-252-10	CB,Mag,10A 125VDC,w/ Aux Sw, 1/4-20 Stud
470-070-10	CB,Mag,10A 125VDC,w/ Aux Sw, #10-32 Stud
470-253-10	CB,Mag,15A 125VDC,w/ Aux Sw, 1/4-20 Stud
470-085-10	CB,Mag,15A 125VDC,w/ Aux Sw, #10-32 Stud
470-254-10	CB,Mag,20A 125VDC,w/ Aux Sw, 1/4-20 Stud
470-071-10	CB,Mag,20A 125VDC,w/ Aux Sw, #10-32 Stud
470-255-10	CB,Mag,30A 125VDC,w/ Aux Sw, 1/4-20 Stud
470-072-10	CB,Mag,30A 125VDC,w/ Aux Sw, #10-32 Stud
470-256-10	CB,Mag,40A 125VDC,w/ Aux Sw, 1/4-20 Stud
470-073-10	CB,Mag,40A 125VDC,w/ Aux Sw, #10-32 Stud
470-257-10	CB,Mag,50A 125VDC,w/ Aux Sw, 1/4-20 Stud
470-074-10	CB,Mag,50A 125VDC,w/ Aux Sw, #10-32 Stud
470-042-10	CB,Mag,60A 125VDC,w/ Aux Sw, 1/4-20 Stud
470-075-10	CB,Mag,70A 125VDC,w/ Aux Sw, 1/4-20 Stud
470-259-10	CB,Mag,80A 125VDC,w/ Aux Sw, 1/4-20 Stud
470-202-10	CB,Mag,90A 125VDC,w/ Aux Sw, 1/4-20 Stud
470-076-10	CB,Mag,100A 125VDC,w/ Aux Sw, 1/4-20 Stud
470-061-10	CB,Mag 110A 125VDC,w/ Aux Sw, 1/4-20 Stud

BILL OF MATERIAL
48V Pos.Gnd 400A Power Plant

APPROVED: _____

ISSUED : _____

CIRCUIT DESIG/REM

ITEM	QTY	PART #.	DESCRIPTION	
1	1 ea	020-003-20 List 0,16	Assy,Gnd Bar,600A,23"	
2	1 ea	020-532-20 List 0,23,50	400A Shunt/Termination Panel,23"	
	1 ea	List 92	400A Shunt, 400A Shunt/Termination Panel	
3	1 ea	018-008-20 List 0,2,23,50 ,76,77,80,81,82,83	SD03 48V,Meter & Alarm,Pnl,Assy	
	1 ea	List 92	400A Meter	
4	1 ea	018-012-20 List 0,2,23,50	Auto Equalize Timer,Pnl,Assy,48V,23"	
5	1 ea	020-095-20 List 0,2,10,23,50	2-61-600A Fuse Panel	Battery Fuse Panel
6	2 ea	020-009-20 List 0,2,10,23,50	8-0-30A Fuse Panel,48V	FUSE PNLS 1-2(6A-6B)
7	3 ea	010-002-20 List 0,12,19/23,50,84,87,92,93	RST 48/50 Final Assy	
8	1 ea	030-510-20 List 0,23,50,81	7'x 23"Relay Rack,Untapped	
9	1 ea	460-145-10	400A Fuse "TPL Type"	Install in item 5
10	1 ea	567-079-10	Sheet,Cvr,38"x6" (23" Rly Rack)	Install in item 5
11	1 ea	591-246-P1	Pnl,Blkg,Rly Rack,3-1/2"x23",Stl,Hybrid Gra	
12	1 ea	591-143-XX	Bar,ETP Cu,0.25x2.00x22.00"	

BILL OF MATERIAL
48V Pos.Gnd 400A Power Plant

APPROVED: _____

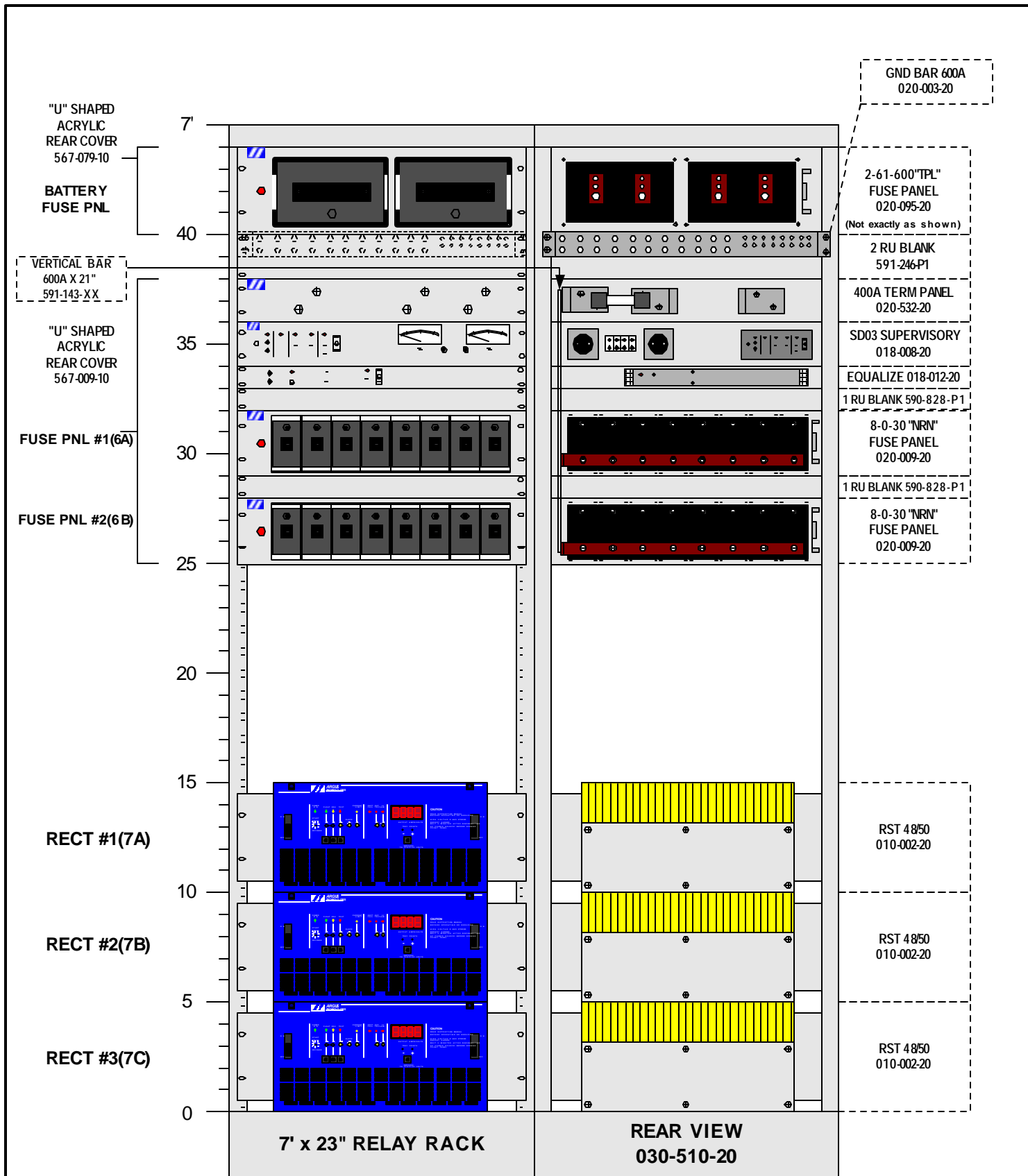
ISSUED : _____
CIRCUIT DESIG/REM

ITEM	QTY	PART #.	DESCRIPTION	
13	2 ea	590-828-P1	Blank Panel, 1.75" x 23"	
14	1 ea	567-009-10	Sheet, 1/8"x37.5"x25",Clr	
15	8 ea	460-076-10	Fu, 9/16"x2", 10A 125V, Fast	INSTALL 4X IN EACH PANEL
16	8 ea	460-078-10	Fu, 9/16"x2", 20A 250V, Fast	INSTALL 4X IN EACH PANEL
17	16 ea	460-003-10	Fu, Alm Ind (Pin Style), 500mA 300V, (Red)	SHIP LOOSE
18	3 ea	877-022-20 List 0	Hrnss, Wire, Rect Ctrl, Distrn End, #6 Wire	
19	3 ea	877-015-20 List 0, 1	Harness Wire, Rectifier O/P #6 Wire Rectifier	
20	2 ea	590-853-P1	Cable Tie Brackets	INSTALL ON RACK
22	1 ea	591-027-P1	Guard, Tgl Sw, SD02, Stl, Hybrid Gra	INSTALL IN ITEM #4.

REF. 025-790-04 DWG. A Assy Dwg, 48V Pos.Gnd 400A Power Plant
REF. 025-790-05 DWG. B Schem Dwg, 48V Pos.Gnd 400A Power Plant

REVISIONS

P/A 2002-07-02 Pilot Production
A 2002-07-26 ITEM #13 WAS QTY 1.
ITEMS #21 & 22 ADDED.



DRAWN: SRS/SK
DATE: 2002/07/26

TITLE: 48V POS.GND 400A POWER PLANT

CONFIG:

CHECKED:

ISSUED:

SHEET: 1 OF 1

A SIZE

TYPE: V1

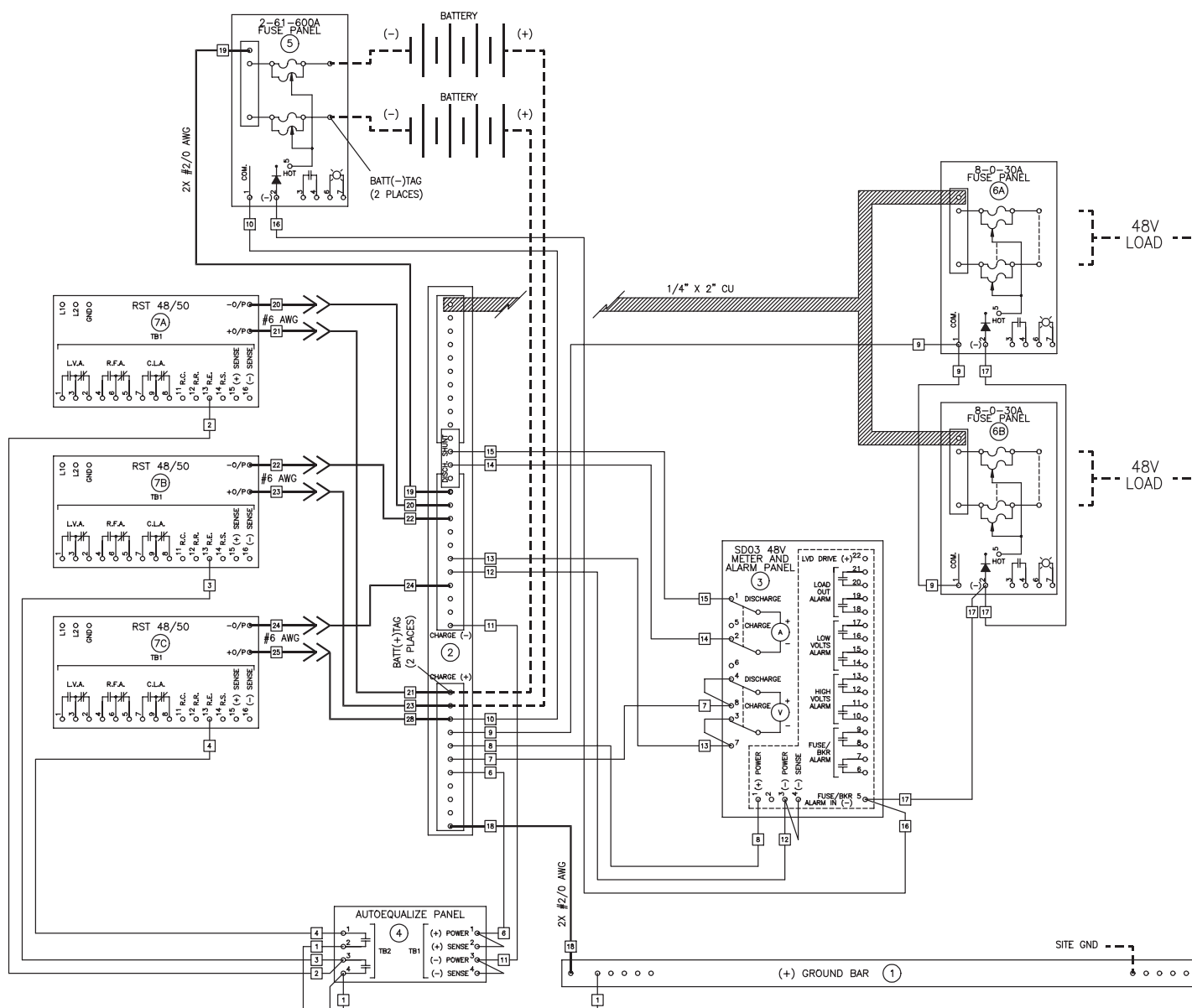
QUOTE:

APPROVED:

DWG NO: 025-790-04

REV: A

REVISIONS			
LTR	DESCRIPTION	DATE	APPD
A	REV'D FOR RELEASE	02-07	



AMP	RECT. / CONV. (MINIMUM)	PLANT WIRING (MINIMUM)	VERTICAL COPPER BARS (TYP.) (MINIMUM)
15	#10	#10	1/4 x 3"
30 / 50	#6	#6	1/4 x 3"
100	#2	#2	1/4 x 3"
150	#1/0	#1/0	1/4 x 3"
200	#2/0	#2/0	1/4 x 3"
300	2 x #1/0	2 x #1/0	1/4 x 3"
400	2 x #2/0	2 x #2/0	1/4 x 3"
600	2 x #4/0	2 x #4/0	1/4 x 3"
800	3 x #4/0	3 x #4/0	1/4 x 3"
1000	4 x #3/0	4 x #3/0	1/4 x 3"
1200	4 x #4/0	4 x #4/0	1/4 x 3"

- NOTES:
- 1) USE ABOVE TABLE FOR PLANT AND RECTIFIER WIRING. INDIVIDUAL RECTIFIER WIRES ARE IN CONTACT. PLANT WIRES ARE NOT.
 - 2) FOR CONTINUOUS OPERATION, IT IS RECOMMENDED THAT SHUNTS ARE NOT RUN AT MORE THAN 80% THE RATED CURRENT UNDER NORMAL CONDITIONS.
 - 3) DASHED LINES DENOTE CUSTOMER WIRING.
 - 4) ALL WIRES ARE #18WG EXCEPT AS NOTED.
 - 5) NUMBERS IN SUBSCRIPTS REFER TO ITEM NUMBERS ON BILL OF MATERIALS.
 - 6) "1" REFERS TO WIRE TAG NUMBERS ON WIRES.
 - 7) "1" REFERS TO TERMINALS ON DIGITAL METER.
 - 8) WIRE TAGS #5,26,27 ARE NOT USED.

LTR	DESCRIPTION	QTY
	FINISHED HOLE LEGEND	
THESE DESIGNS AND SPECIFICATIONS ARE THE PROPERTY OF ARGUS TECHNOLOGIES AND SHALL NOT BE COPIED OR USED FOR MANUFACTURING WITHOUT ITS WRITTEN CONSENT.		
DESIGN	S.K. D2-07-16	MATERIAL
DRAWN	S.K. D2-07-16	
CHECKED	S.K. 02-07	
APPROVED	H.N. 02-07	FINISH
TOLERANCES (UNLESS OTHERWISE NOTED)		
		SCALE N/A
TITLE		
48V POS.GND 400A POWER PLANT		
ISSUE DATE	SHEET 1 OF 1	REV A
SIZE TYPE DWG NO.	025-790-05	

