SOLA HD

Three-Phase Power Conditioner

Solatron™ Plus Series

Instruction Manual

Contents

1.0 Important Safety Instructions

This manual contains important safety instructions that should be followed during the installation of the Solatron™ Plus. Please read all safety, installation, and operating instructions before attempting to install or operate the unit.

1.1 Safety Precautions—Warnings

- The unit must be installed and accessed by qualified personnel only.
- Disconnect incoming power while installing the unit and before accessing the interior of the enclosure. The unit contains components which are at line voltage with or without a load being supplied.
- All enclosures must be grounded using the provided grounding lugs and/or studs. Applicable National Electrical Codes and local codes must be observed.

2.0 Warnings Defined

⚠ **DANGER!** Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.

⚠ **WARNING!** Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

⚠ **CAUTION!** Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

3.0 Introduction

The SolaHD Solatron™ Plus Series is designed to provide a tightly regulated, isolated voltage source to sensitive loads. It increases reliability by improving efficiency and extending the useful life of protected loads.

Input voltages from -25% to +10% are corrected to ±3% of nominal voltage with a response time of <1.5 cycle (typical). Output voltage regulation is accomplished by using silicon rectifier switches and a multi-tap transformer arrangement. Tap transitions are made in a secondary control circuit and at less than full load current, eliminating voltage notching during each transition.

3.1 Features

Rugged Construction: All magnetic and electronic components have been designed to insure that the Solatron™ Plus will provide the specified voltage regulation to the most demanding electrical loads.

Protection: All units protect against system transients and overvoltages using a Surge Protection Device (minimum 80 kA surge current rating).

No Harmonic Interactions: The unit is unaffected by harmonic voltages and currents, and produces no distortion during normal operation.

High Overload Capacity: Motor starting and momentary overloads will not trip the unit, and output short circuits will not damage the unit.

Diagnostic Display: Panel mounted indicating lights for bypass and high temperature conditions.

Fail-Safe Bypass: SCR, power supply, and other component failures will result in an automatic electronic bypass with no interruption to the load – nominal input/output voltage with isolation and surge suppression active.

4.0 Installation Instructions

4.1 Unpacking

Upon receipt of the unit, immediately inspect the enclosure(s) and contents for obvious signs of damage and/or mishandling (loose parts, enclosure dents or holes). If damaged, photograph the unit, inform the carrier, and contact SolaHD for a Return Material Authorization (RMA) number.

4.2 Mounting

The unit must be mounted on a concrete floor or other non-flammable surface. The minimum spacing around the enclosure must be as indicated in Figure 1 to ensure adequate ventilation.

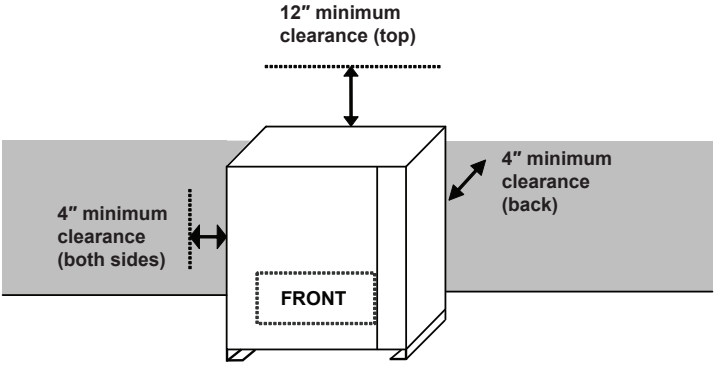

Figure 1. Minimum spacing requirement, excluding spacing required for condit entry/exit.

4.3 Environmental

The following environmental conditions must be met:

- Ambient Temperature: 0°C – 40°C (32°F – 104°F)
- Relative Humidity: 95%, non-condensing
- Surrounding air free of flammable or combustible materials
- Enclosure not subjected to falling or splashing water, unless specific precautions have been taken to protect the unit (i.e., NEMA3 or 3R enclosure)

⚠ **WARNING! Failure to comply with the above environmental conditions voids the warranty.**

4.4 Electrical Connections

The unit is designed to operate from a voltage source as indicated on the nameplate and to power loads where maximum continuous kVA does not exceed the nameplate indication. **Ensure that the source voltage and maximum load kVA conform to the nameplate rating on the front of the unit.**

The unit is installed much like a transformer, between the supply lines and the load(s) being protected as shown in Figure 2.

4.4.1 Conduit Entry/Exit Locations

The conduit entry/exit holes must be punched in the sides or back of the rear portion of the enclosure (the side with the transformers), so that the power conductors run to the circuit breaker and output lugs through the hole(s) provided in the barrier panel. See Figure 2.

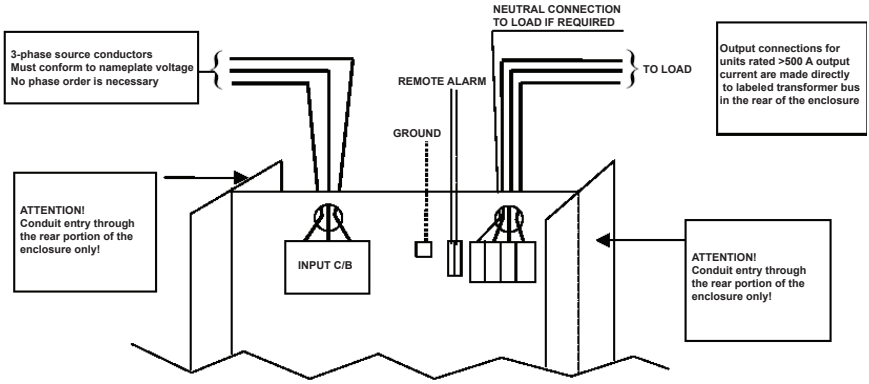

Figure 2. Electrical Connections (3-phase unit shown)

NOTE: Each ac output power circuit shall be provided with overcurrent protection for all ungrounded conductors. It is the responsibility of the purchaser to provide provisions for this overcurrent protection. The overcurrent protection device shall be a circuit breaker or fuse for use as a branch circuit protection. The voltage rating of the protective device for a three-phase system shall be based on the phase-to-phase voltage. The rating of the overcurrent protective device must meet the requirements of the National Electrical Code Article 240. **Failure to accomplish this will void the UL1012 listing.**

4.4.2 Lug Size Table (per phase)

Three-Phase	Input		Output	
	208/240 V	480/600 V	208/240 V	480/600 V
20	#10-1/0	#10-1/0	#14-2/0	#14-2/0
30	#14-4/0	#10-1/0	#14-2/0	#14-2/0
50	#14-4/0	#10-1/0	#14-2/0	#14-2/0
75	#14-4/0	#10-1/0	(2) #6-350	#14-2/0
NOTE: All lugs accept Al/Cu wire.				

4.5 Startup

Power may be applied to the unit AFTER the following conditions have been met:

- All power and ground cable connections have been secured.
- The enclosure has been closed.
- The circuit breaker operating mechanism is in the OFF (open) position. The smaller, auxiliary circuit breakers should be in the ON (closed) position.

5.0 Diagnostics

5.1 Indicator Lights

The unit contains 3 indicator lights on the front panel and a remote alarm relay.

5.1.1 Green Light

Condition normal. The remote alarm relay is open.

5.1.2 Middle Amber Light

A transformer over-temperature has been detected. The output voltage is not regulated under this condition in order to minimize transformer losses. The remote alarm relay is closed. In order to reset this condition, the unit must be turned off, allowed to return to normal temperature, and then turned back on.

Check to ensure the load kVA does not exceed the nameplate kVA. Make sure the ambient temperature does not exceed 40°C.

5.1.3 Right Amber Light

The unit has gone into bypass due to a failed SCR or firing board malfunction. Under this condition the unit will not regulate the output voltage. The remote alarm relay is closed; the unit needs to be reset. (See “5.1.4”.) A qualified electrician should determine whether there is a permanent problem.

5.1.4 Reset the Auxiliary Breaker

1. Open the main circuit breaker.
2. Remove the front cover.
3. Reset the auxiliary breaker by opening and closing the breaker (so both breaker handles are in the up position).
4. Replace the front cover.
5. Close the input circuit breaker.
6. If the unit auto-bypasses immediately or after a short period of time, the unit requires service. Call SolaHD Technical Service at (800) 377-4384 for assistance.

5.2 Remote Alarm

The unit is equipped with a normally closed remote alarm contact rated 0.6 A, 120 V ac, accessible at TB1 next to the output connector block. The alarm contact will be CLOSED under the following circumstances:

1. There is no power applied to the unit.
2. Power is applied, but the main input circuit breaker is open.
3. The power supply has failed.
4. There is an over-temperature condition or the unit has auto-bypassed.

6.0 Troubleshooting

Problem	Required Action
No lights are lit after power is applied	Ensure the circuit breaker is “ON”. Check the source voltage.
Input circuit breaker trips	Ensure continuous load kVA does not exceed nameplate kVA.
Green light out; amber light lit	See “5.0 Diagnostics”.
For further assistance, please contact SolaHD Technical Support at (800) 377-4384/(847) 268-6651 or by e-mail at solahd.technicalservices@emerson.com.	

7.0 Specifications

ELECTRICAL				
Power Ratings	20, 30, 50, 75 kVA; Three-phase			
Nominal Voltages	63TAA3** units: 208 V ac input, 208 Y/120 V ac output, 60 Hz	63TCA3** units: 480 V ac input, 208 Y/120 V ac output, 60 Hz	63TCC3** units: 480 V ac input, 480 Y/277 V ac output, 60 Hz	63TDA3** units: 600 V ac input, 280 Y/120 V ac output, 60 Hz
Input Voltage Range	-25% to +10% of nominal rated voltage			
Output Voltage Range	Regulated to ±3% of nominal voltage with an input voltage range of -25% to +10%			
Response Time	Responds to any line variation in <1.5 cycles (typical)			
Operating Frequency	57–63 Hz			
Load Power Factor	No restrictions			
Insulation Resistance	100 megohms from winding to core measured at 500 V dc			
Efficiency	96% typical			
Overload Capacity	1000% of rated load for 1 s; 200% of rated load for 1 min.			
EMI	<0.2 gauss at a distance of 3 ft.			
ENVIRONMENTAL				
Audible Noise	<50 dBA at 3 ft.			
Ambient Temperature	Operating: 0°C to 40°C; Storage: 0°C to 80°C			
Operating Altitude	Up to 10,000 ft. (3,030 m) without derating			
Operating Humidity	0–95% (relative), non-condensing			
PROTECTION				
Under Voltage	Output voltage will switch to bypass mode when input is less than 50% of nominal. Regulated output voltage will be re-established once input voltage is within specifications.			
Short Circuit	Input circuit breaker			
Over-temperature	Amber lamp indication of over-temperature at approximately 180°C. Unit switches to bypass mode until internal temperature is reduced to specified value.			
NOISE SUPPRESSION				
Common Mode	150 dB at 100 kHz			
Normal Mode	65 dB at 100 kHz			
Surge Protection	80 kA per phase; tested to ANSI/IEEE Standard C62.41 A & B			
MECHANICAL				
Connections	Field wired terminal blocks			
Dimensions, in. (mm)	H: 42 in. (1016 mm), W: 28 in. (712 mm), D: 26 in. (661 mm)			
Weight, lb. (kg)	20 kVA: 600 lb. (273 kg)	30 kVA: 750 lb. (341 kg)	50 kVa: 950 lb. (432 kg)	75 kVA: 1200 lb. (545 kg)
Agency Approvals	UL1012, UL1449-2, cUL (Canadian Standard C22.2 No. 125). Complies with Part 15 Subpart J of FCC rules for a Class A computing device.			

8.0 Maintenance

⚠ **WARNING! All maintenance should be performed by qualified personnel only, with the incoming power disconnected (except as required to measure voltage). Qualified personnel MUST be familiar with industrial electrical equipment and all safety precautions required to service such equipment.**

The unit requires no maintenance when operating under proper environmental conditions.

If the unit is equipped with fans for forced air cooling, the air intake filters must be checked once per month and cleaned if necessary.

9.0 Warranty

9.1 Warranty Information

Please see the “Terms & Conditions of Sale”.

SOLAHD

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