Wall Industries, Inc.

DATASHEET
Rev. E

PSRL0402M SERIES

90~264VAC Input Voltage Range
250W Convection Cooling, 400W with Forced Air
Single Outputs, Active PFC
Medical AC/DC Switching Power Supplies

FEATURES

- Single Outputs
- RoHS Compliant
- High Quality & Reliable Component Usage
- Variable Fan Speed & Low Acoustical Noise
- 90~264VAC Input Voltage Range
- Optional N+1 Forced Active Current Sharing
- Providing Peak Power 700W within 500µs Duty Duration
- MTBF: 100,000 Hours (MIL-HDBK-217F)
- Active Power Factor Corrected to EN61000-3-2 Class D
- Current Monitoring and Remote Voltage Adjustment (Margin)
- U-Chassis and Enclosed with Built-in Fan Mechanical Options
- Short Circuit, Input Circuit, Over Power, Input Voltage, Over Voltage, and Over Temperature Protection
- UL60601-1, EN60601-1, IEC60601-1 (3rd Edition) Medical Approvals

DESCRIPTION

The PSRL0402M series of AC/DC switching power supplies offers up to 400 Watts of output power. This series consists of single output models with active PFC and a 90~264VAC input voltage range. These supplies also have short circuit, input voltage, over voltage, over power, and over temperature protection. Models are available in U-Chassis (Type U) and enclosed with built-in fan (Type E) designs. This series has UL60601-1, EN60601-1, and IEC60601-1 (3rd Edition) medical approvals. Optional N+1 forced active current sharing (suffix "I") is also available. For dual output models see the PSRL0402DM series.

SPECIFICATIONS: PSRL0402M SERIES

All specifications are based on 25ºC, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

INPUT SPECIFICATIONS		
Input Voltage		90 ~ 264VAC full range
Input Frequency		47 to 63Hz
Input Current		6.35A at 90VAC full load
Inrush Current		35A max at 230VAC with full load and cold start
Power Factor Correction		0.98 at 230VAC and full load
OUTPUT SPECIFICATIONS		
Output Voltage		See Table
Output Power *(See Note 2)*		See Table
Output Adjustability		Output adjustable ±5% minimum
Total Regulation		±1%
Output Current		See Table
Minimum Load		1% minimum load is required to maintain the ripple and regulation
Ripple & Noise		±1%
Transient Response		Returns to within 1% in less than 2.5ms for a 50% load change and the peak transient does not exceed 5%
Overshoot		Turn-on/off not exceed 5% over nominal voltage
Hold-Up Time		20ms min. at 80% of full load
Turn-on Delay		1 second maximum at 120VAC
PROTECTION		
Input Circuit Protection (primary)		Two T8A/250V fuses inserted
Over Power Protection		110~140% of I-max and automatic recovery
Input Voltage Protection		Power shutdown under 80 ±5VAC and recovered over 86VAC
Over Voltage Protection		Latching down will occur when output voltage exceeds 130%. Recycle AC input to reset
Short Circuit Protection		Trip without damage and automatic recovery
Over Temperature Protection		Protected in the event of excessive operating ambient 85°C and automatic recovery
GENERAL SPECIFICATIONS		
Switching Frequency		30KHz fixed frequency
Efficiency		70%~80% depending on model
HI-POT test	Input Line to Chassis	1500VAC (2mA DC cut off current) for 3 seconds
	Primary to Secondary	4000VAC for 3 seconds
	Primary to Core	1500VAC for 3 seconds
Burn-in		45±5°C for one hour at 230VAC with full load.
Leakage Current		< 200µA
Grounding Test		Apply 40A from ground pin to the earthed connection point. Max allowable resistance is 0.1Ω
ENVIRONMENTAL SPECIFICATIONS		
Operating Temperature		0°C to +70°C ambient, de-rating at 2.5% per degree from +50°C to +70°C.
Storage Temperature		-20°C to +85°C
Operating Humidity (non-condensing)		5% to 90% RH
Storage Humidity (non-condensing)		5% to 95% RH
Vibration		Frequency 5 to 50Hz, acceleration ±7.35 m/(s x s) on X, Y, and Z axis.
Cooling	U Type Models	Convection
	E Type Models	Fan
MTBF		100,000 hours at 30°C according to MIL-HDBK-217F
FUNCTIONS		
Remote Sense		Designated as **RS+** and **RS-** on the CN3 *(Not available for current sharing models)*
Remote ON/OFF		Designated as **RSW** on the CN3, requires a low signal to inhibit output.
Power Supply ON		Green LED designated as **LED 1** on the PCB
LED Display		Bi-color green **LED** in front panel *(E Type only)*. Any protection occurred or RSW applied low signal will emit orange
Power Good		Designated as **PG** on the CN3 will go high 100-500ms after regulation and goes low 1ms before loss of regulation
Current Sharing		Designated as **CSH** on the CN3, optional single wired forced current sharing function and parallel up to 4 units within 10% accuracy at full load
Current Monitor		Designated as **CMN** on the CN3 for current sense for a 0.5V to 3VDC to represent 0% to 100% output current
Margin (optional)		Designated as **MAG** on the CN3 providing 50% of output voltage remote adjustment by applying 0.4 ~ 5V signal on **MAG**
AC Fail (optional)		Designated as **ACF** on the CN3 to monitor the input voltage. When the input goes under 80 ±5VAC the signal will go low (0), and when the input reaches 86VAC the signal will go high (+5V).
Fan Drive		12VDC/400mA is available to drive an external fan.
PHYSICAL SPECIFICATIONS		
Weight	U Type Models	2.87 lbs (1.3kg)
	E Type Models	3.53 lbs (1.6kg)
Dimensions (L x W x H)	U Type Models	8 x 5 x 1.6 inches (203.2 x 127 x 40.64 mm)
	E Type Models	9 x 5 x 1.6 inches (228.6 x 127 x 40.64 mm)
SAFETY & EMC		
Safety Approvals		UL60601-1[(8)], EN60601-1, IEC60601-1 (3rd Edition)
EMI Conduction & Radiation		EN60601-1-2 class B
Harmonic Current		EN61000-3-2, EN61000-3-3
EMS Immunity		EN60601-1-2, IEC61000-4-2,3, 4, 5, 6, 8, 11

MODEL SELECTION TABLES

U-CHASSIS MODELS (TYPE "U")							
Model Number [1]	Input Voltage Range	Output Voltage [4]	Preset Voltage [4]	Output Current		Output Power [2]	
				Convection	With Forced Air	Convection	With Forced Air
PSRL0402MU-03(I)	90 ~ 264 VAC	2 ~ 3.3 VDC	3.3 VDC	45 A	60 A	148.5W	198W
PSRL0402MU-05(I)		5 ~ 6 VDC	5 VDC	45 A	60 A	225W	300W
PSRL0402MU-12(I)		12 ~ 15 VDC	12 VDC	20.83 A	33.33 A	250W	400W
PSRL0402MU-18(I)		16 ~ 21 VDC	18 VDC	13.89 A	22.22 A	250W	400W
PSRL0402MU-24(I)		22 ~ 30 VDC	24 VDC	10.42 A	16.67 A	250W	400W
PSRL0402MU-36(I)		31 ~ 41 VDC	36 VDC	6.94 A	11.11 A	250W	400W
PSRL0402MU-48(I)		42 ~ 58 VDC	48 VDC	5.21 A	8.33 A	250W	400W

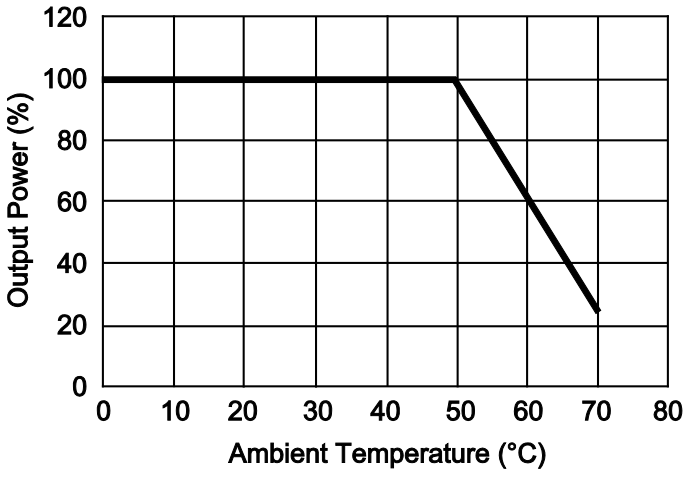
ENCLOSED WITH BUILT-IN FAN MODELS (TYPE "E")					
Model Number [1]	Input Voltage Range	Output Voltage [4]	Preset Voltage [4]	Output Current	Output Power [2]
PSRL0402ME-03(I)	90 ~ 264 VAC	2 ~ 3.3 VDC	3.3 VDC	60 A	198W
PSRL0402ME-05(I)		5 ~ 6 VDC	5 VDC	60 A	300W
PSRL0402ME-12(I)		12 ~ 15 VDC	12 VDC	33.33 A	400W
PSRL0402ME-18(I)		16 ~ 21 VDC	18 VDC	22.22 A	400W
PSRL0402ME-24(I)		22 ~ 30 VDC	24 VDC	16.67 A	400W
PSRL0402ME-36(I)		31 ~ 41 VDC	36 VDC	11.11 A	400W
PSRL0402ME-48(I)		42 ~ 58 VDC	48 VDC	8.33 A	400W

NOTES

1. The "I" suffix denotes forced current sharing option (OR-ring diode). See *page 6* for installation guide.
   Optional top cover (Type "C") is also available for U-Chassis Models. Please call factory for more details.
2. **PSRL0402MU Models** (U-Chassis): 400W max. with 23CFM forced airflow or 250W max with convection cooling.
   PSRL0402ME Models (Enclosed with built-in fan): 400W max with built-in fan airflow.
3. Provides peak power to 700W within 500µs for all models; for longer duty duration must contact manufacturer.
4. All output ranges are covered in agency certifications and the preset voltage will be set as standard models if nothing different is requested. If desired preset output does not appear, please contact factory.
5. 1% minimum load is required to maintain the ripple and regulation specifications.
6. Output is fully isolated.
7. For dual output models see the PSRL0402MD series.
8. This product is Listed to applicable standards and requirements by UL.

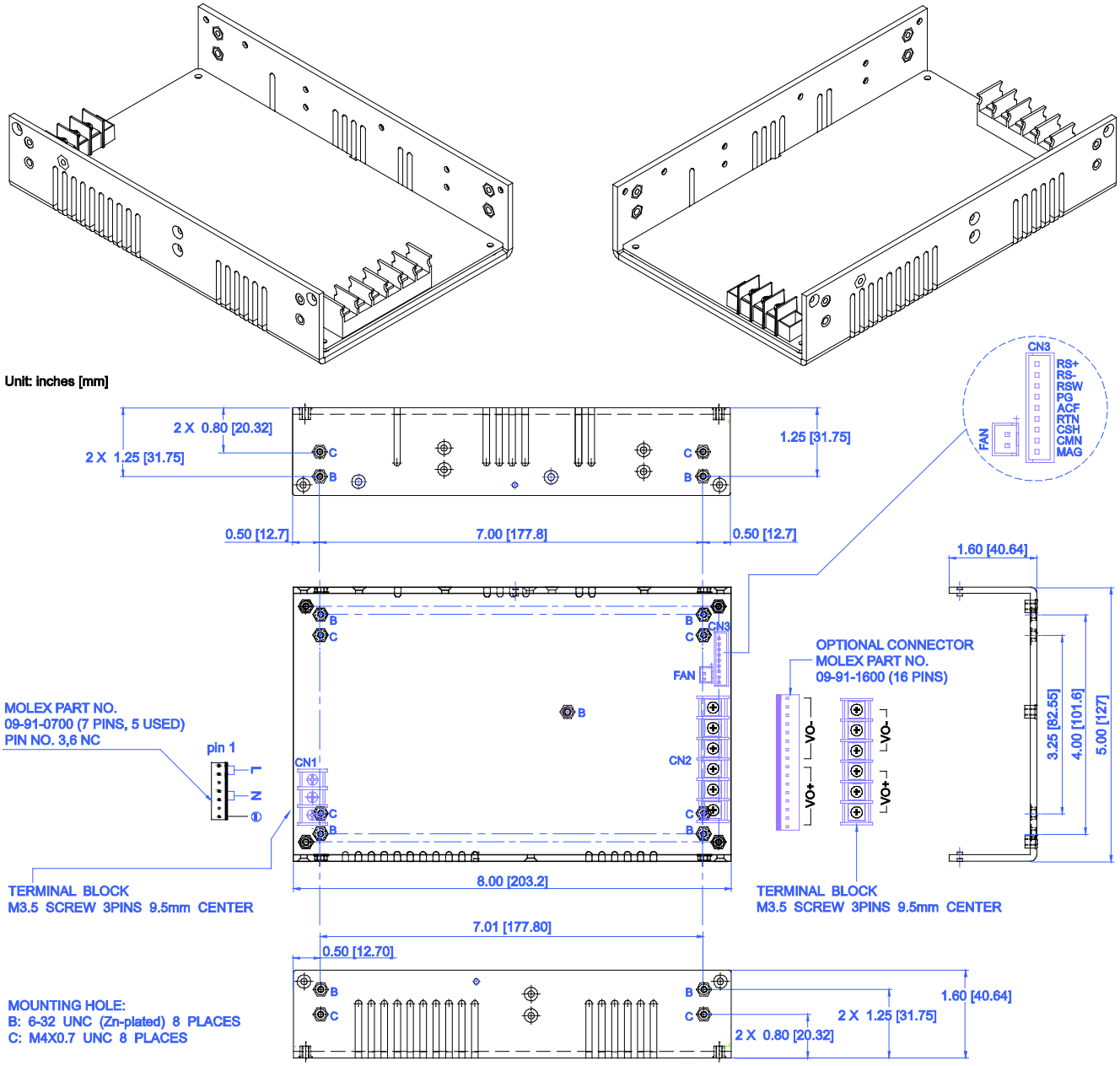
**Due to advances in technology, specifications subject to change without notice.*

DERATING CURVE



MECHANICAL DRAWING

U-Chassis Models (Type "U"): 8(L) x 5(W) x 1.6(H) inches; Weight: 2.87 lbs



I/O CONNECTOR PIN ASSIGNMENTS:

Input Connector (CN1):

PSRL0402MU (U-Chassis Type): Mating Molex Part No. 09-91-0700 (7pin, 5 used) or Howder Terminal block Part No. HD-121-3P
PSRL0402ME (Enclosed with Built-In Fan Type): IEC320 or equivalent Snap-In mounting type or DINKLE Terminal block Part No. DT-35-A02W-03 (3 pin)

Output Connector (CN2):

Mating Molex 16 pins (09-91-1600) or Howder (HD-121-6P) M3.5, 8 pins terminal block, 9.5 mm center

OUTPUT PIN ASSIGNMENT		
	Molex	Howder
VO+	Pins 1-8	Pins 1-3
VO-	Pins 9-16	Pins 4-6

Logic Signal Connectors (CN3):

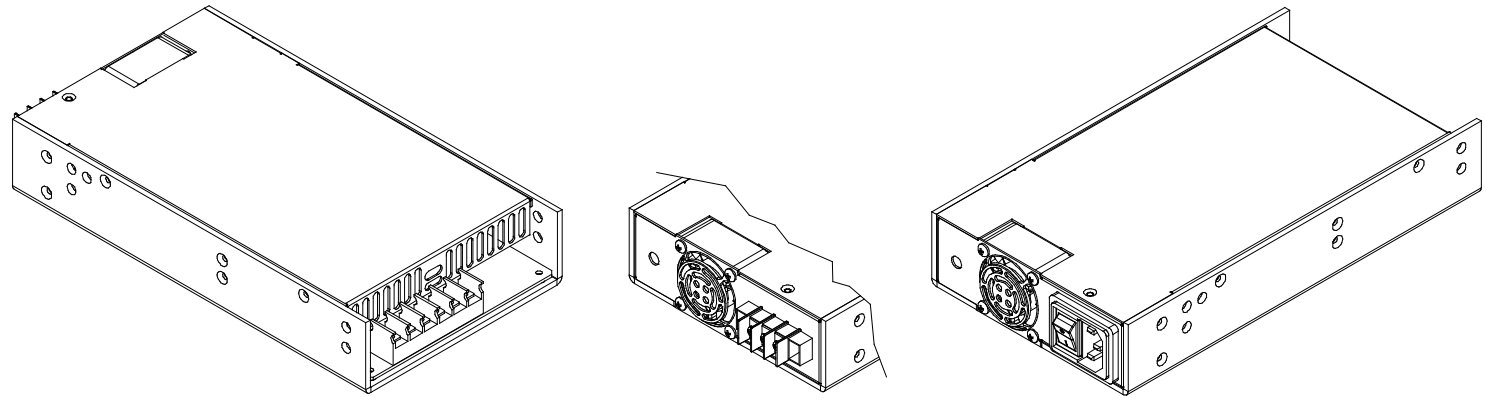
Mating JST XHP-9 or equivalent (CHYAO SHIUNN JS-2001-09) Mating Pins: JST SXH-002T-P0.6 for AWG 30 to 26

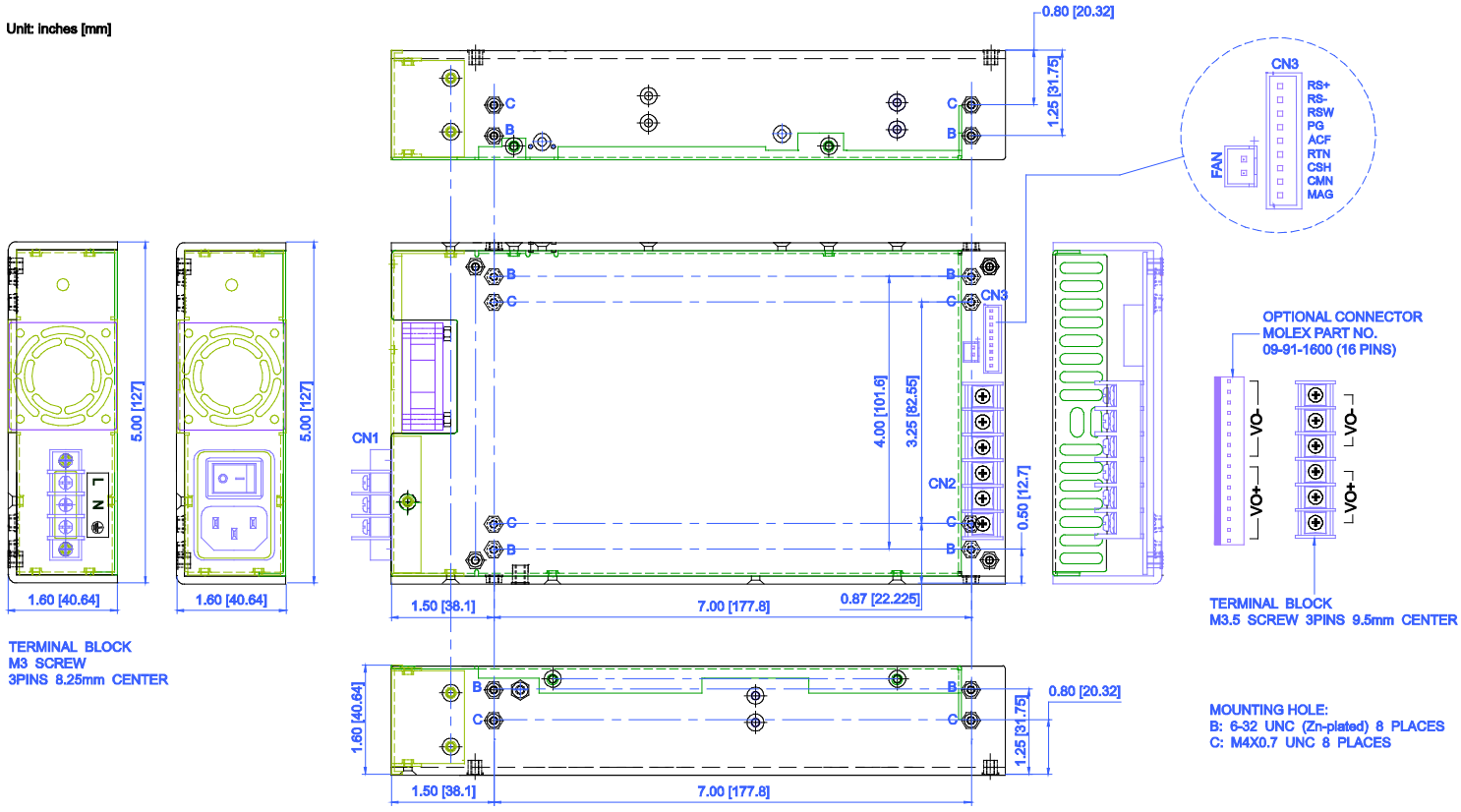
Mounting Inserts:

6-32, M4 4 places individually with maximum penetration 0.15" on bottom side and 0.25" on both sides

MECHANICAL DRAWING

Enclosed with Built-in Fan Models (Type "E"): 9(L) x 5(W) x 1.6(H) inches; Weight: 3.53 lbs





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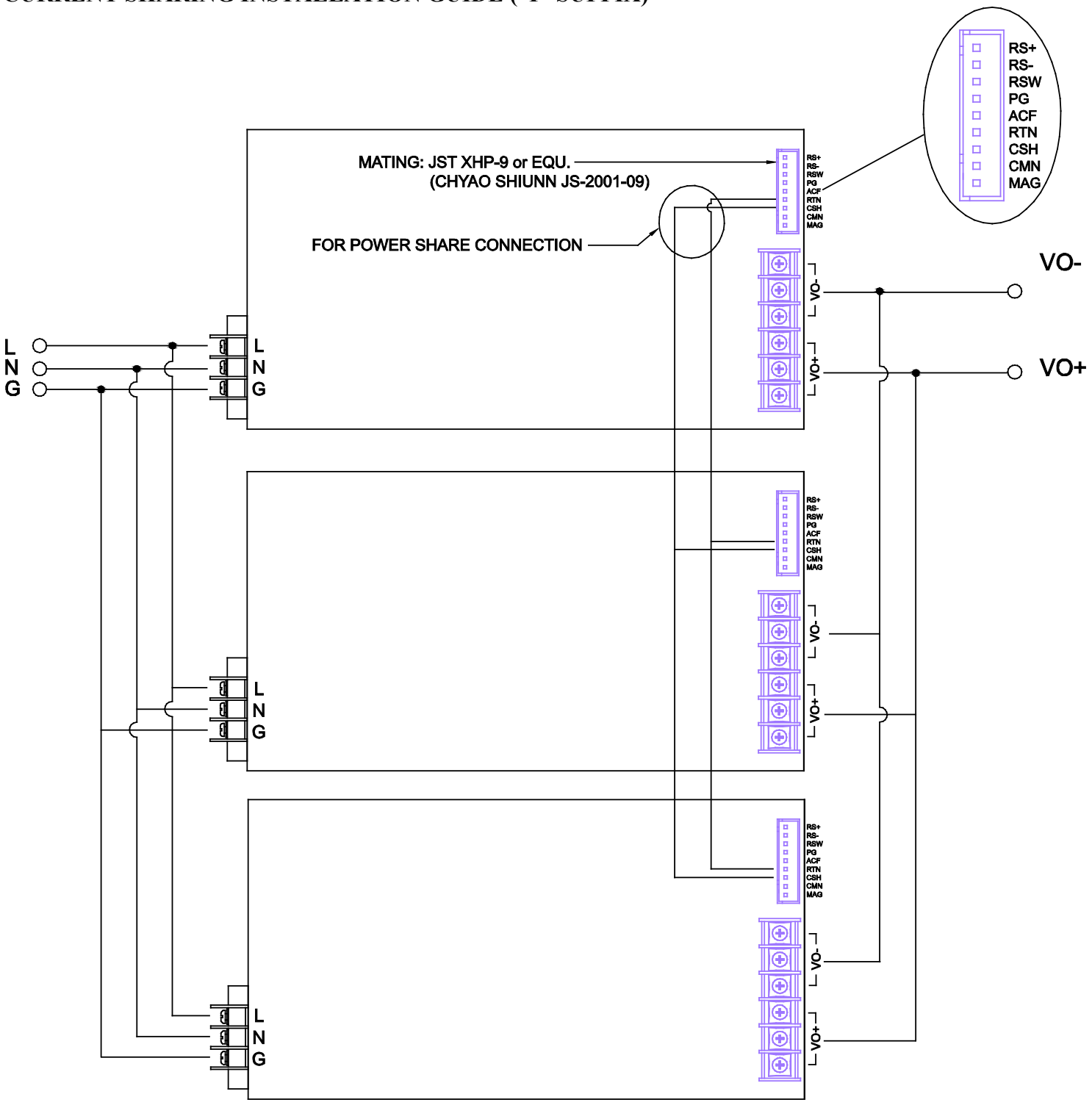
CURRENT SHARING INSTALLATION GUIDE ("I" SUFFIX)



COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001: 2015 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

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