

Wall Industries, Inc.

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 25°C, 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 <i>(See Note 2)</i>	See Table	
Output Adjustability	Output adjustable $\pm 5\%$ minimum	
Total Regulation	$\pm 1\%$	
Output Current	See Table	
Minimum Load	1% minimum load is required to maintain the ripple and regulation	
Ripple & Noise	$\pm 1\%$	
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 $80 \pm 5VAC$ 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 $\pm 5^\circ C$ for one hour at 230VAC with full load.	
Leakage Current	< 200 μA	
Grounding Test	Apply 40A from ground pin to the earthed connection point. Max allowable resistance is 0.1 Ω	
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 $\pm 7.35 m/(s \times s)$ 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 <i>(Not available for current sharing models)</i>	
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 <i>(E Type only)</i> . 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 $80 \pm 5VAC$ 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, EN60601-1, IEC60601-1 (3 rd 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

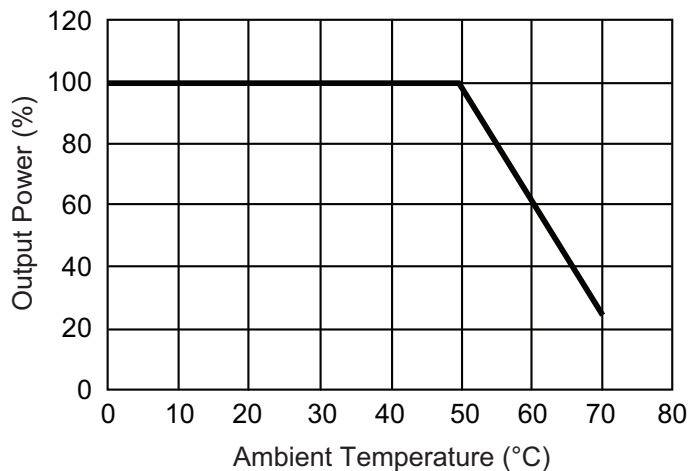
ENCLOSED WITH BUILT-IN FAN MODELS (TYPE “E”)

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

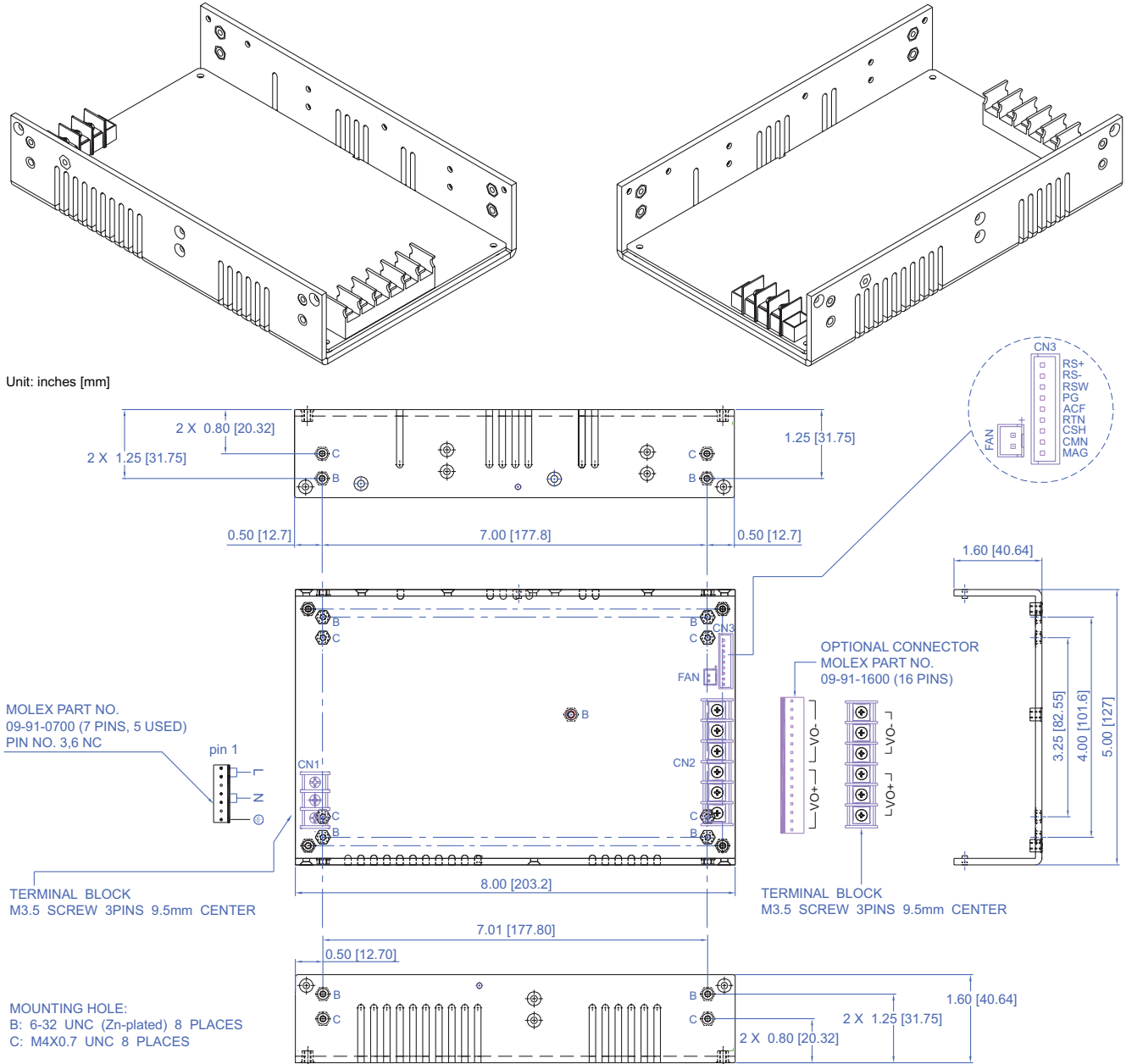
- The “I” suffix denotes forced current sharing option (OR-ring diode). See page 6 for installation guide. Optional top cover (Type “C”) is also available for U-Chassis Models. Please call factory for more details.
- PSRL0402MU Models** (U-Chassis): 400W max. with 23CFM forced airflow or 250W max with convection cooling.
PSRL0402ME Models (Enclosed with built-in fan): 400W max with built-in fan airflow.
- Provides peak power to 700W within 500µs for all models; for longer duty duration must contact manufacturer.
- 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.
- 1% minimum load is required to maintain the ripple and regulation specifications.
- Output is fully isolated.
- For dual output models see the PSRL0402MD series.

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

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

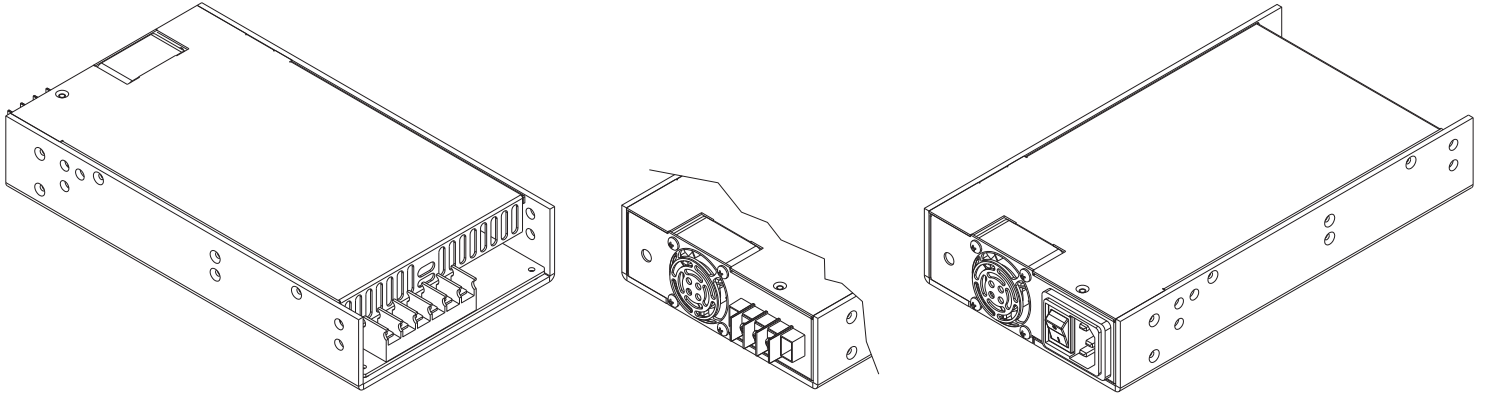
Mounting Inserts:

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

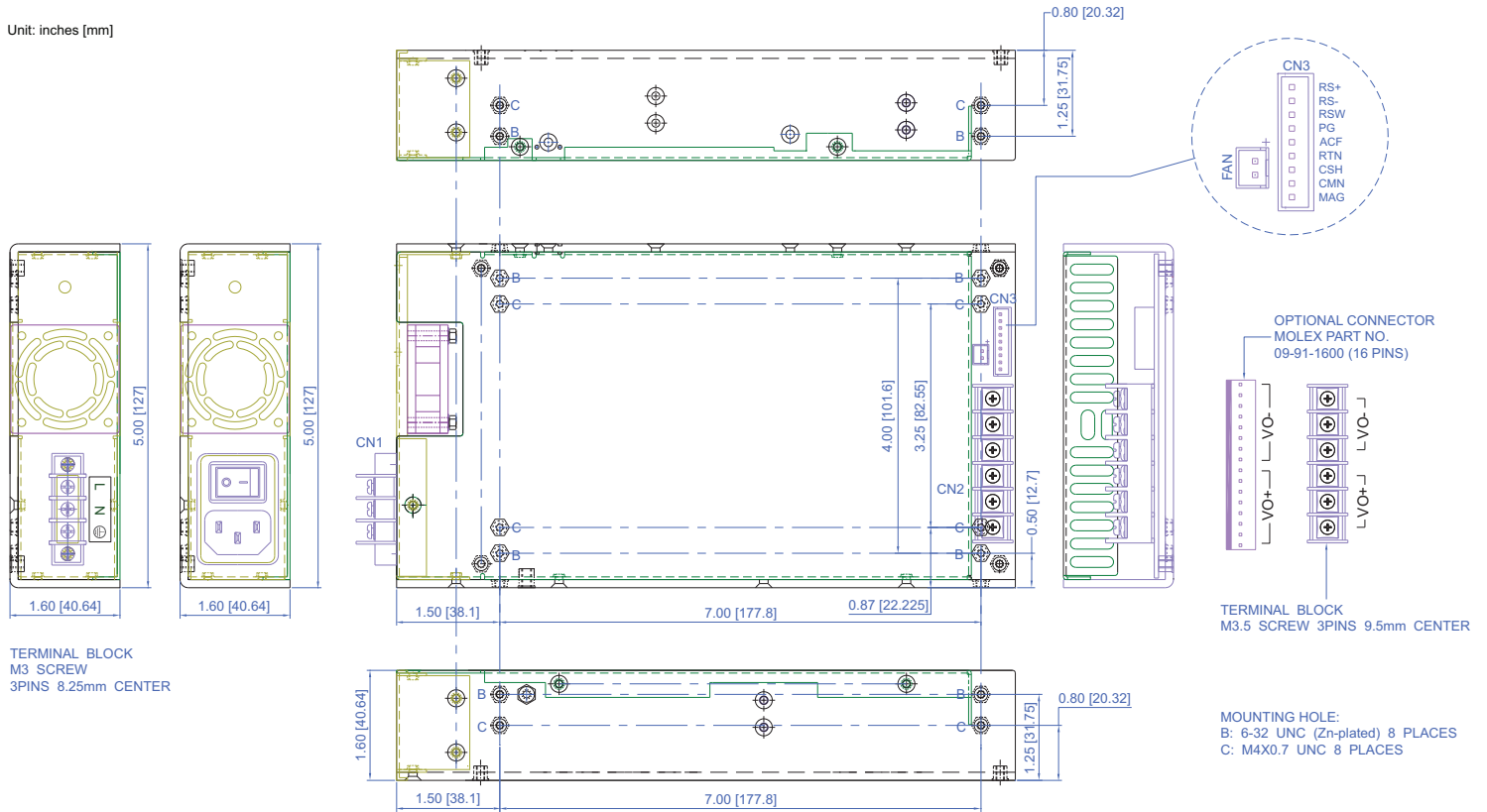
OUTPUT PIN ASSIGNMENT		
	Molex	Howder
VO+	Pins 1-8	Pins 1-3
VO-	Pins 9-16	Pins 4-6

MECHANICAL DRAWING

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



Unit: inches [mm]



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

Logic Signal Connectors (CN3):

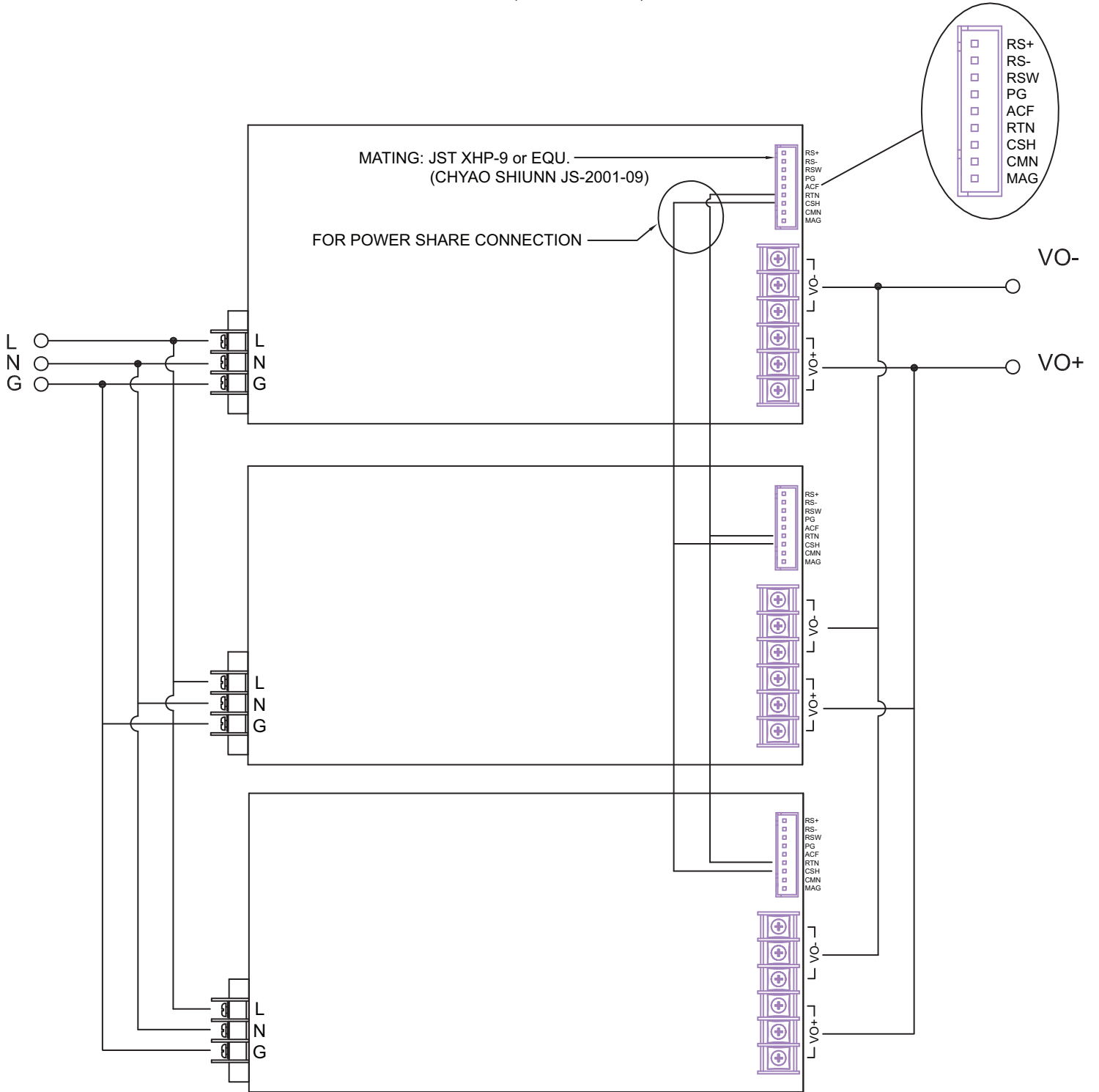
Mating JST XHP-9 or equivalent (CHYAO SHIUNN JS-2001-09) Mating Pins: JST SXH-002T-P0.6 for AWG 30 to 26

Mounting Inserts:

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

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

CURRENT SHARING INSTALLATION GUIDE (“T” 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 ISO9001-2008 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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