

Instruction Manual

RP0550-*-N**

RP0550-*-R**

RP0550-*-T**

RP0550-*-Z**

RP0550-*-F**

RP0530-*-N**

RP0530-*-R**

RP0530-*-T**

RP0530-*-Z**

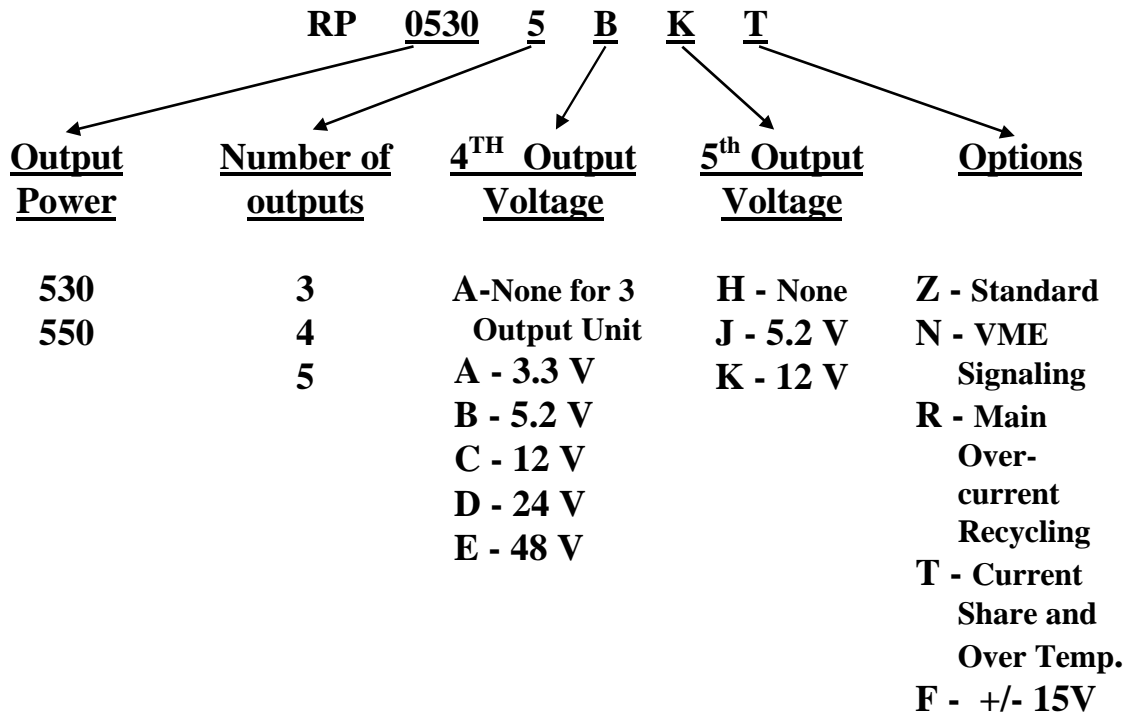
RP0530-*-F**

Multi-Output Power Supplies

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Part Number Build



NOTE: On RP0530 V01 Adjustable 3.0V to 4.5VDC
On RP0550 V01 Adjustable 4.75V to 5.75VDC

Option Summary

Z option (Standard)

Remote Sense for all outputs, Over Current Protection, Over Voltage Protection, Remote Turn off, DC Good signal, Hold-up time and Fan Fail signal is provided as standard.

Remote sense can be used to compensate for the voltage drop occurring in the load wires. This product is specified to compensate for 0.625 volts in the output line , and 0.125 volts in the return line. When using Remote Sense, it is recommended to run the + and - sense wires as a twisted pair or as tightly coupled traces on a PC board to minimize noise pickup on these lines. It is also recommended that the + and - load wires are run as a separate twisted pair or tightly twisted pair or tightly coupled traces in order to minimize inductance in the load wires. This minimization of inductance should take place at least until the load wires meet the remote sense lines. This implementation is required to optimize the dynamic load response when the remote sense feature is used.

Over-current protection is provided on all outputs . Each output can withstand over-current indefinitely, and each output provides a constant current response when over loaded. The standard will latch off the main output if over-current is applied for more than 1 second. Recycling the input power will be required to reset the power supply.

Over - Voltage protection is provided on all outputs to protect against broken sense wires or internal power supply failure. If any output experiences an over- voltage, all outputs will be latched off. Recycling the input power will be required to reset the power supply.

Remote turn off is referenced to the return of the main output. When this input is shorted to the return, all outputs will be shutoff . This input will source 30mA when held low, open circuit will allow the supply to operate.

DC Good is an uncommitted collector - emitter output which will conduct when the main output is above 2.5 volts. The user should limit the current in these lines to 5mA.

AC Good is an uncommitted collector - emitter output which will conduct when AC power is applied. The signal will provide at least 6mS of warning before outputs drop out of regulation. The user should limit the current in these lines to 5mA.

Hold-up Time. A minimum of 20mS hold-up time is provided on the main output of all models.

Fan Fail signal is an uncommitted collector - emitter output which will conduct if a fan rotor is blocked or if a fan ceases to operate. The signal may conduct during turn-on or turn-off until the fans reach their normal operating range. All outputs are internally disabled when a fan has failed.

N Option (VME Signaling)

This option provides ACFAIL*, SYSRESET*, and RESET signals consistent with ANSI/VITA 1-1994. When this option is provided, the AC Good, DC Good, and Remote Turn-off functions, described above, are not available.

R Option (Automatic Over-Current Recycling)

Specifying this option will allow the main output to recycle every ten seconds when in over-current until the over-current condition is removed.

T Option (Current Share and Over-Temperature)

Current share allows load sharing of the main output of paralleled power supplies. This option can be specified to increase the available output current, or to employ an N+1 redundancy technique.

Over-Temperature will shutdown all the outputs when the internal power supply temperature increases past the safe operating level. An uncommitted collector- emitter output is provided and will conduct when the unit is shutdown. After the unit is allowed to cool, normal operation will be automatically restored.

Set-up and Operating Instructions (All models, except where noted)

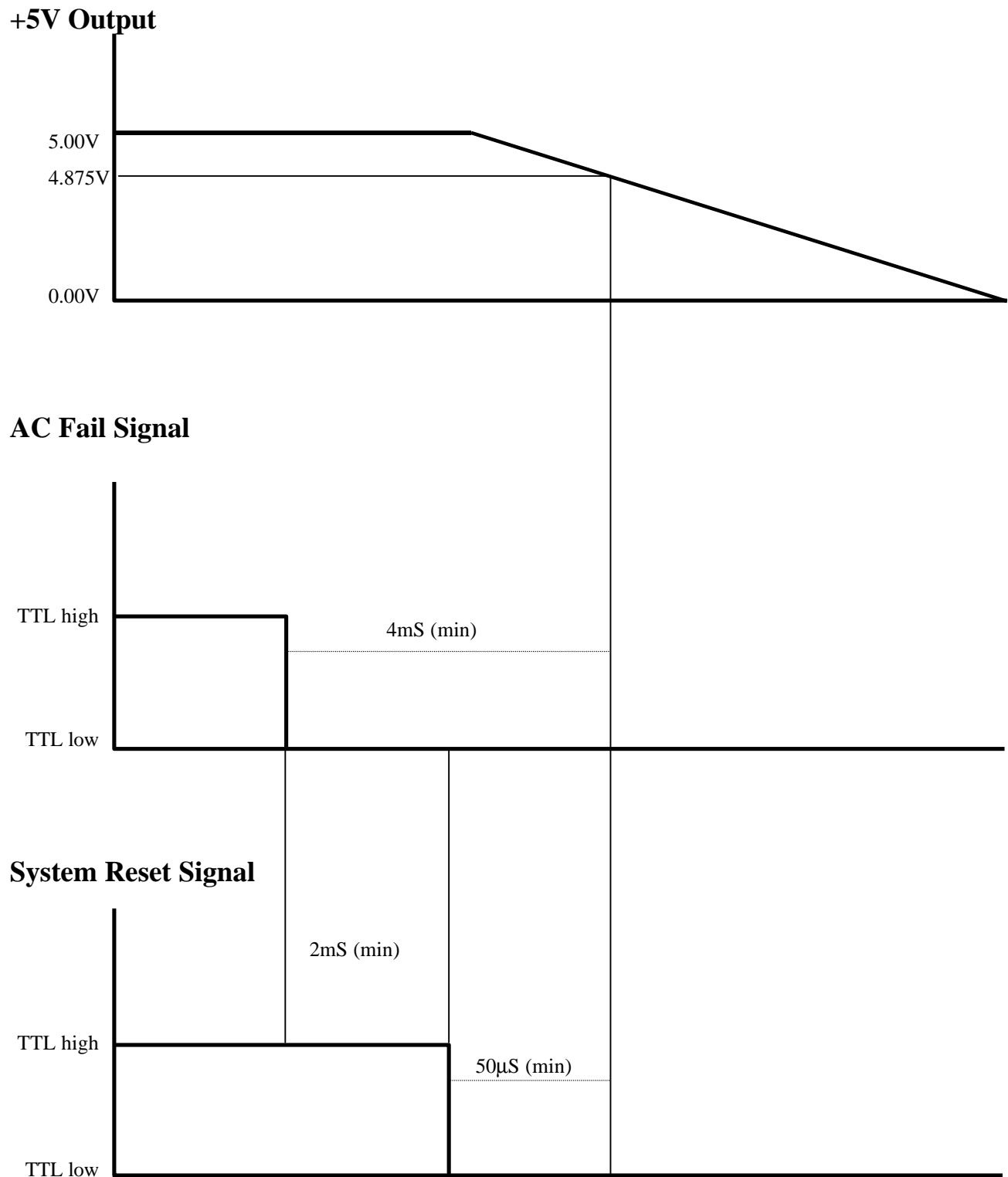
1. AC Input : Connect a line cord or equivalent wiring harness to the AC input terminal block observing proper polarity (i.e. black to line (L), white to neutral (N) and green to ground via the screw located above the terminal block). Insure that wiring is of an adequate gauge for power level. Refer to the *Connections* diagram on Page 12. **An external 250Vac, 10A fuse is required (Type “3AG” Littelfuse P/N 312010).** Note: When installed in a 2 phase system it is required to use a fuse on each line.
 2. DC Output: Connect load cables to outputs as required, again observing polarity where necessary and making sure that cables used are of sufficient current carrying capacity. Refer to various *Local / Remote Sense Connection* diagrams, page 15, and *Power Supply Performance Ratings*, Page 8.
 3. DC Sense : If local sense is to be used on a given output, install the supplied jumpers (if not already installed) on the appropriate sensing connector. If remote sense is to be used on an output, connect sense wires from appropriate connector to load. Refer to various *Local / Remote Sense Connection* diagrams, page 15.
 4. Power-up : When all wiring, sensing and monitoring features have been set up, simply apply AC power in accordance with input spec. on page 8 and verify that all outputs are operational. The main output V1 may be adjusted as necessary via a voltage adjust pot (R349) located to the left of it's output terminals (refer to page 12). Alternately, the power supply may be turned on with only sense jumpers and AC power cord in place to verify and adjust outputs prior to connecting loads.
- 5A. Auxiliary signals (For R, T, and Z options)
- Refer to the *Auxiliary Signals Connections* diagram on page 13.
- a. Line Fail: Connect a minimum 1000 Ω 1/2 watt resistor in series with AC Good terminals to use the conductance signal available at these terminals. Not available on VME option “N” units
 - b. DC Good: Connect a minimum 1000 Ω 1/2 watt resistor in series with DC Good terminals to use the conductance signal available at these terminals.
 - c. Fan Fail: Connect a minimum 1000 Ω 1/2 watt resistor in series with fan fail terminals to use the conductance signal available at these terminals.
 - d. Remote turn off: With pins 13 & 15 of connector J902 open, the power supply will remain on. When these pins are shorted together, the power supply will shut down.

5B. Auxiliary Signals (for N Option only)

Refer to figures 1 and 2 on pages 6 and 7

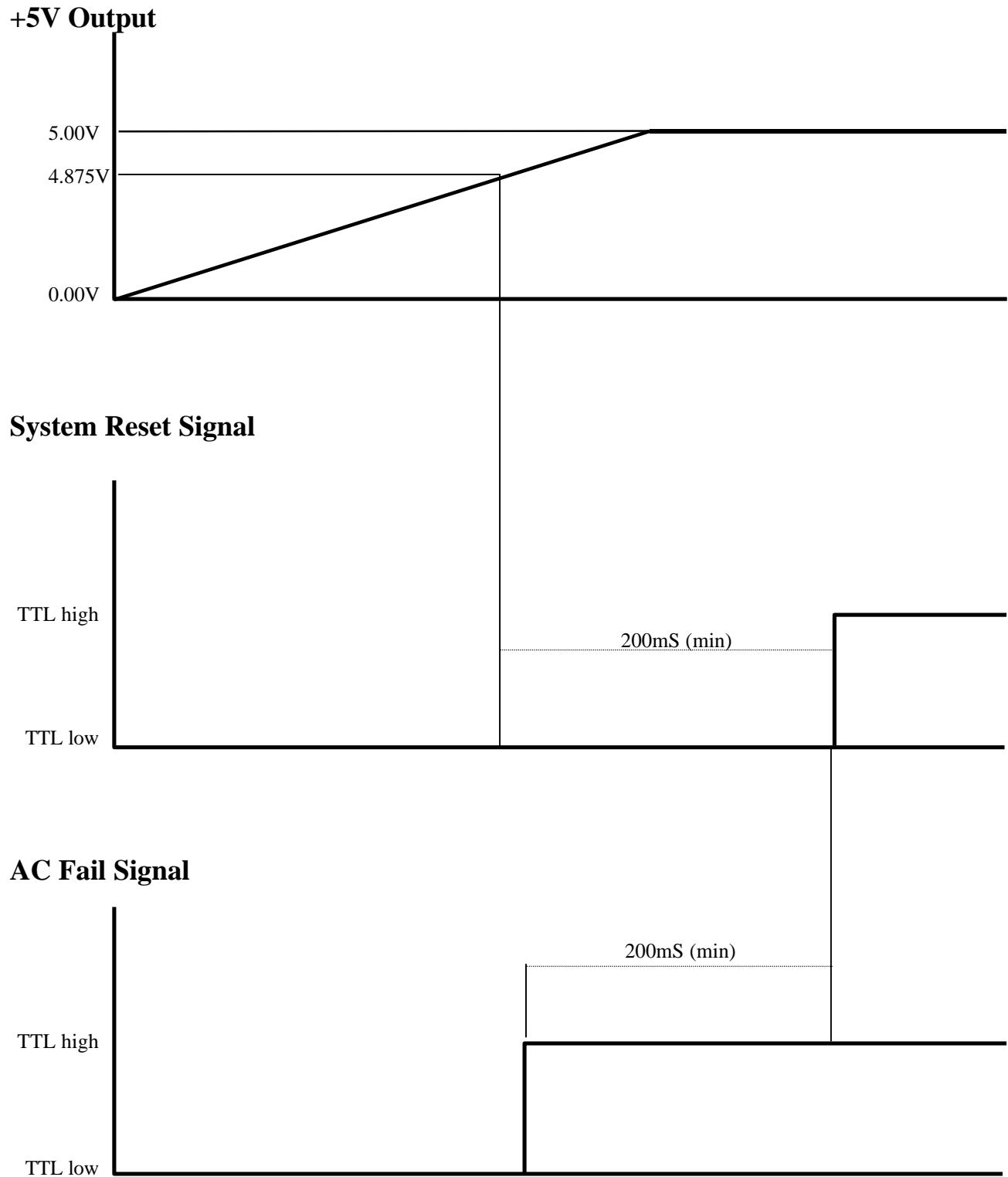
- a. VME Power: A 5V source must be applied across pin 10 of connector J902 and pins 4 of connector J802. V+ to pin 10 and V- to pin 4 . External source or output #1 can be used as the 5V source
- b. AC Fail Signal: A signal from the power supply that is used to indicate the status of the AC input voltage. When AC power is good, the output at this pin is a TTL (High, open collector). When AC power is removed or drops below the specified power supply operating voltage, the output from this pin changes to a TTL (Low). In the TTL (Low) position, the AC fail signal can sink 50mA of current through it. For timing sequence, refer to Figures 1 and 2 on the following pages.
- c. System Reset Signal: A signal from the power supply that is used to alert the system that AC input power has been lost. When AC power is good, the output at this pin is a TTL (open collector). When AC power is removed or drops below the specified power supply operating voltage, the output from this pin changes to a TTL (Low). In the TTL (Low) position, the System Reset Signal pin can sink 50mA of current through it. For timing sequence, refer to Figures 1 and 2 on the following pages.
- d. Reset Signal: An input to the power supply that is used to reset the entire system, without shutting the power supply off. The system reset is accomplished through an external switch closure. The reset signal is connected directly to the external system reset switch. One contact of the external switch can be referenced to output #1 return if the VME power common is connected to output #1 return. The other contact is connected directly to the Reset Signal. By closing the external switch you trigger the System Reset Signal, which in turn resets the entire system. When the reset signal is used, the timing diagrams as shown in figures 1 and 2 on the following pages *do not apply*.

Power Monitor: Power Failure Signal Timing - Figure 1 VME N Option



Power Monitor: System Reset Signal Timing - Figure 2

VME N Option



Ratings and Specifications

1. Maximum Ratings

		V1		V2		V3		V4					V5	
		3V	5V	12V	15V	-12V	-15V	3.3V	5.2V	12V	24V	48V	5.2V	12V
Output Voltage Range	V	Output #1, 3.0 to 4.5V for RP530, 4.5 to 5.75V for RP550. Output 2 and 3 +3% / -2% and output 4 and 5 +/-3% .												
Output current @ 50°C(500w)	A	75	75	12	9.6	4	3.2	20	20	10	7	3	5	2.5
Output Power @ 50°C(500w)	w	225	375	144	144	48	48	66	104	120	168	144	26	30
Output Current @ 60°C(375w)	A	56	56	9	7.2	3	2.4	15	7.5	7.5	4.5	2.2	3.5	1.85
Output Power @ 60°C(375w)	w	168	280	108	108	36	36	49.5	39	90	108	106	18.2	22.2
Output Current @ 70°C(250w)	A	37	37	6	4.8	2	1.6	10	5	5	3	1.5	2.5	1.25
Output Power @ 70°C(250w)	w	111	185	72	72	24	24	33	26	60	72	72	13	15
Operating Temperature	°c	Continuous duty from 0°C to 70°C.												

2. Input Specifications

	units	
Input Voltage Range	Vac V dc	85 - 265 Vac (0% tolerance for operating range), continuous operation, single phase 47 - 63 Hz. For continuous operation below 95Vac derate linearly to 85% max rating at 85 Vac input. Short term operation at full load below 95Vac will cause no damage. 125 VDC +/- 10% full load.
Input Current (rms, Maximum)	A	8.25A @ 85 Vac
Inrush Current (peak, at cold start)	A	50A @ 220 Vac
Input Current Harmonic Content		IEC-555-2 compliant
Turn-on Time		1.5 seconds max
Power Factor		0.98 minimum @ 110Vac, maximum power output 0.96 minimum @ 220 Vac, maximum power output
Input power (Maximum)	W	700W @ 85 Vac
Input Surge Protection		IEEE C62.41 Category A3, Category B3 with external MOV's IEC-801-2,-3,-4,-5 Class 3(IEC 801-5 Class 4 with external accessory MOV's)
Radiated Emissions		EN55022 Curve A, CISPR 22, group 1, (Class A)
Input EMI Conducted Emissions		EN55022, Class B, FCC20780 Class B, CISPR (Class B)

3. Output Performance Specifications

	units	V1	V2		V3		V4					V5	
			12V	15V	-12V	-15V	3.3V	5 V	12V	24V	48V	5.2V	12V
Voltage Line Regulation	%	0.2% from 85 to 265 Vac, all outputs											
Voltage Load Regulation	%	1.0% from No Load to Full load, all outputs											
Ripple & Noise, 20MHz BW, 25-70°C	mV p-p	100	120	150	120	150	100	100	120	240	480	100	120
Temperature Coefficient	% /°c	0.05% /°c											
Hold-up Time		20 ms on main output from 120 Vac, 60 Hz											
Overshoots		Overshoot will remain within load transient envelope on turn-on, turn-off, power failure or removal of short circuit											
Surge Current		Consult Factory.											
Preload		10% preload is required on output #1											

Features

1. DC Output Controls

Output Voltage Adjust	A single turn pot is provided for Outputs 1. All other outputs are non-adjustable.
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2. Remote Control Features

Remote Voltage Sensing	Standard Lambda - +0.626VDC +-0.125V GND RETURN
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3. Auxiliary Signals

Line (AC) Good (Standard)	A conducting signal indicates that the unit is functioning within its normal input voltage range. In the event of loss or insufficient input, this signal will stop conducting, indicating a shutdown (min. 6msec advance warning).
DC Good (Standard)	A conducting signal indicates that the voltage delivered by output # 1 differs from its programmed value by no more than 0.8 Volts.
Fan Fail (Standard)	A non-conducting signal indicates that the fans are functioning properly.
Remote ON/OFF Control (Standard)	Open circuit at connector J902 between pins 15 and ground allows the supply to function normally, short circuit will inhibit the outputs. Signal Current Draw-Less than 4mA for logic one input.
Signal Isolation	The remote monitoring signals are fully isolated. 500 Vac from each other and other outputs, 3000 Vac from the input.

4. Protection Features

	units	V1		V2		V3		V4					V5	
		3	5	12	15	-12	-15	3.3V	5.2V	12V	24V	48V	5.2V	12V
Overcurrent Protection	A	105 *	105*	16.8	13.4	5.6	4.5	28	28	14	9.8	4.2	7	3.5
Short Circuit Protection		All outputs can withstand a short circuit indefinitely; automatic recovery												
Overvoltage Protection (fixed)		Latching PWM shutdown for output 1 through 5. Recycle line voltage below 65 Vac to allow outputs to recover.												
trip point ---- Min	V	5.5	6.63	15.9	18.0	15.9	18.0	4.15	6.63	15.9	27.0	52.0	6.63	15.9
trip point ---- Max		6.5	7.1	18.0	21.0	18.0	21.0	4.8	7.1	18.0	33.0	60.0	7.1	18.0
Over temperature Protection **		PWM shutdown in the event of a fan blockage. Over Temperature and fan blockage shutdown is self resetting.												
Fusing		No internal fuse is provided. An external, 10A, 250V fuse in line with the hot AC line is required.												
Isolation Voltages		3000 Vrms input to output; 1500 Vrms input to chassis; 100 Vrms output to chassis; 100 Vrms output to output, and output to control signal interface												
Regulatory Agency Compliance		Designed to meet UL 1950, CSA 22.2 #234-M90, EN60950 (BS7002),EN41003(BABT,TELECOM)BS6301,SELV on all outputs, except 48V which is ELV.												

* Shutdown after 1 second, Self reset after 10 seconds (R option)

** T- Option

5. Mechanical Features

Size	2.50" x 5" x 12"
Weight	6 lbs. net, 7lbs. Shipping
Finish	Black, Fed. Std 595 No. 27038
Mounting	M4 mounting screws. One mounting surface; mounting positions are not restricted.

6. Input and Output Connections

Input	PC Board mounted 2 pin terminal connector
Chassis Ground	M4 metric stud
DC outputs	Heavy duty bus bars provided for high current capability on output 1. Outputs 2 through 5 use a two connection terminal block.
Sensing, monitor, control, and current share signals J802 and J902 (20 pin connectors)	PC Board mounted male connectors with jumpers.

7. Mating Connectors

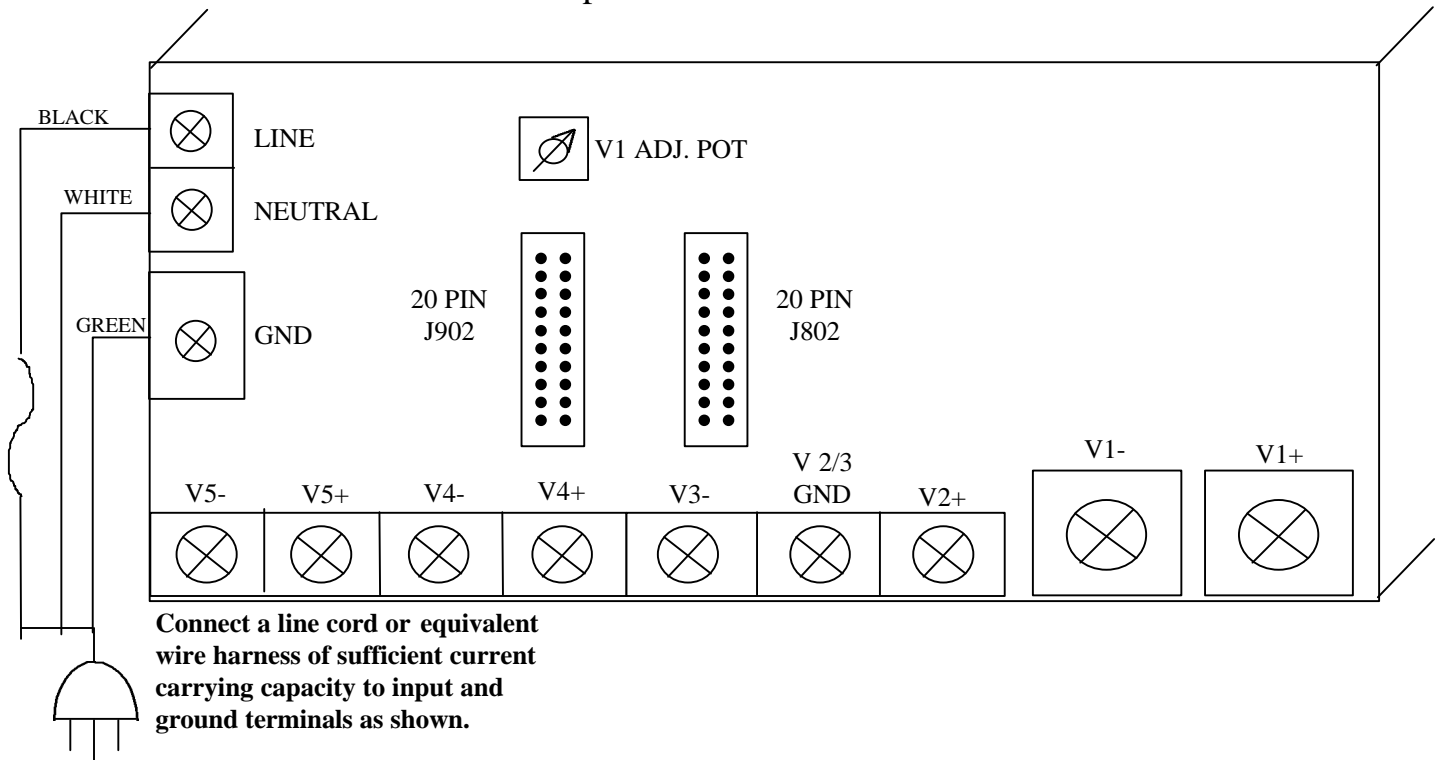
Sensing, monitor, control, and current share signals to connectors J802 & J902	Amp # 1-87631-5 & 102316-5
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8. Other Features

Storage Temperature	-40°C to +85°C
Cooling	Internal forced air cooling via fans
Warranty	1 Year
Fungus Inert	Unit is inherently fungus inert
Vibration & shock	Meet MIL-STD-810E transportation

Connections

Top of Unit



J902

1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20

Pin#

- 1 OT+
- 2 Not Used
- 3 Current Share
- 4 VME "SR"
- 5 DC Good -
- 6 VME "AC FAIL"
- 7 DC Good +
- 8 VME "RS"
- 9 AC Good -
- 10 VME "VCC"
- 11 AC Good +
- 12 Not Used
- 13 Remote Turn Off -
- 14 Not Used
- 15 Remote Turn Off +
- 16 Not Used
- 17 Fan Fail Return -
- 18 Not Used
- 19 Fan Fail +
- 20 OT -

J802

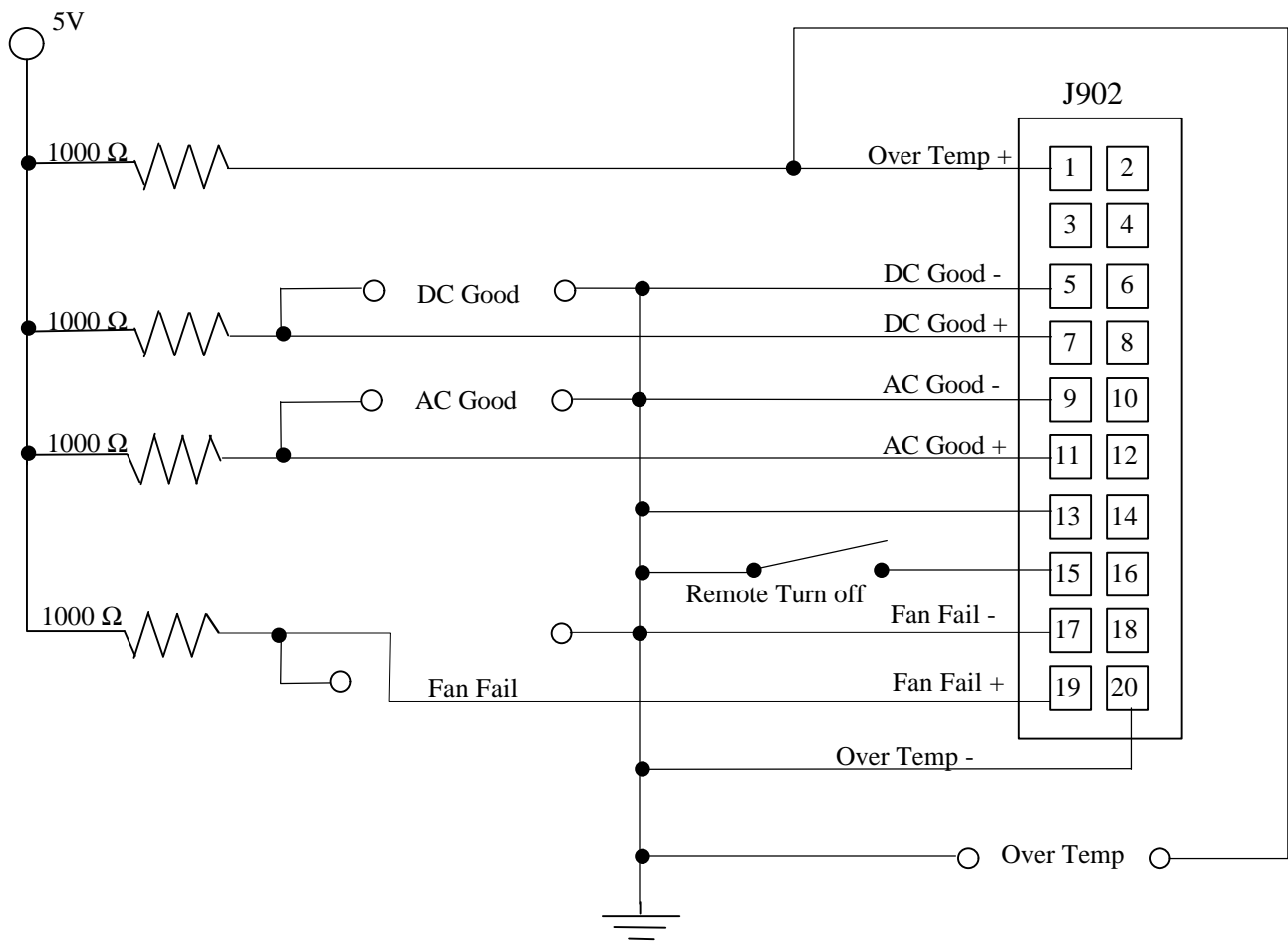
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20

Pin#

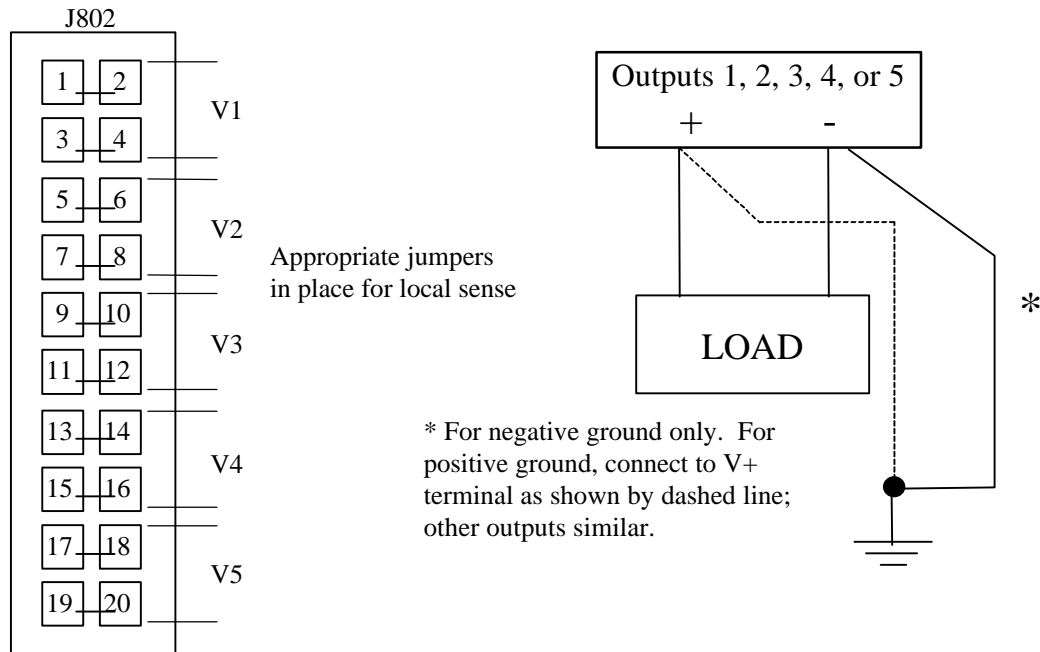
- 1 V1+
- 2 V1+S
- 3 V1-
- 4 V1-S
- 5 V2+
- 6 V2+S
- 7 V2 COMMON
- 8 V2 S COMMON
- 9 V3 COMMON
- 10 V3 S COMMON
- 11 V3-
- 12 V3- S
- 13 V4+
- 14 V4+ S
- 15 V4-
- 16 V4- S
- 17 V5+
- 18 V5+ S
- 19 V5-
- 20 V5- S

Short these pins
(jumpers in place)
when using local sense

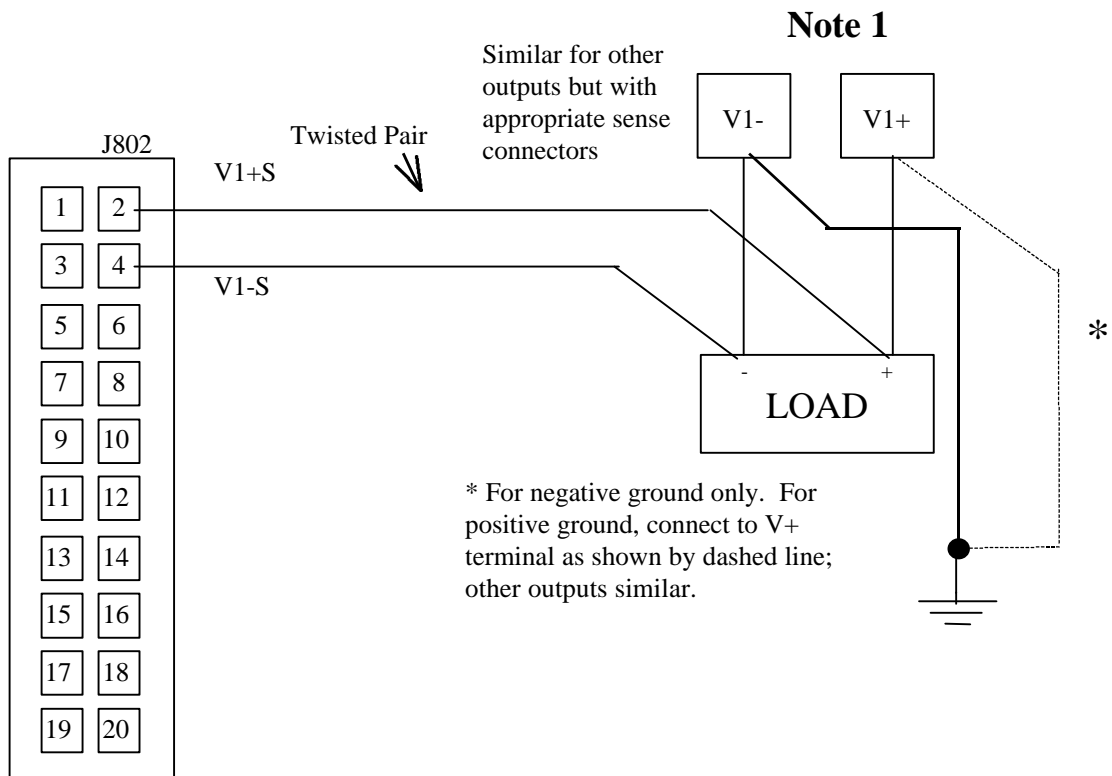
Auxiliary Signals Connections



Local Sense Connections

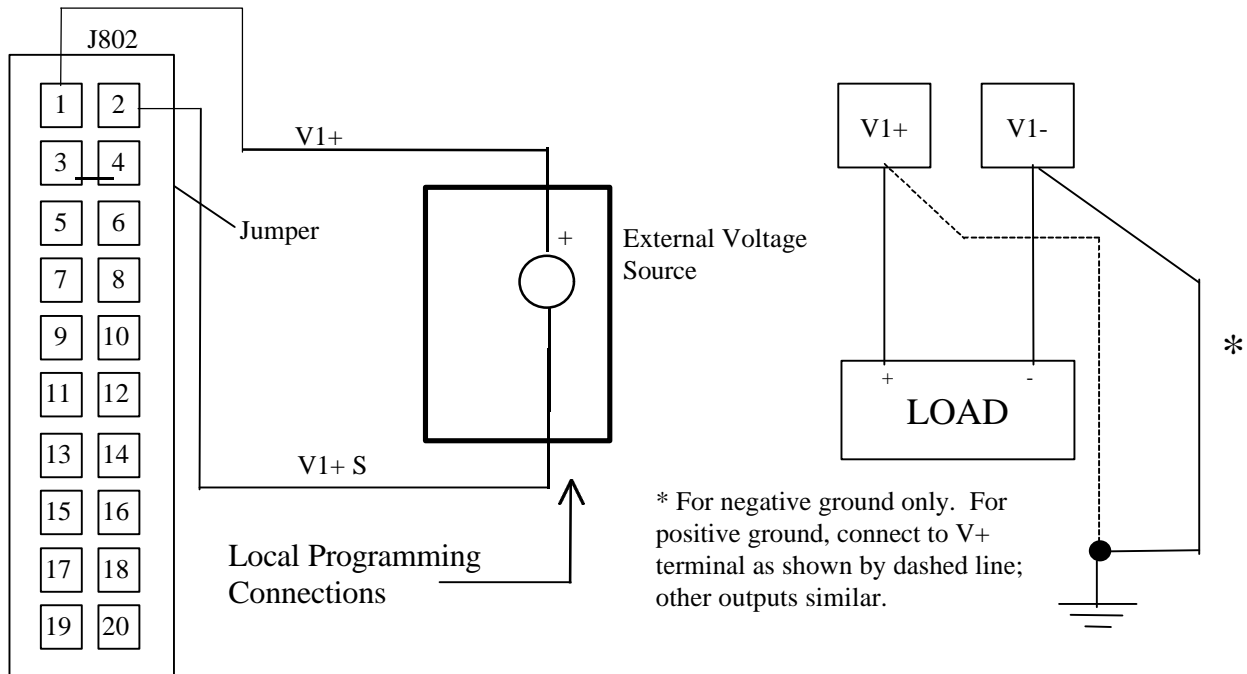


Remote Sense Connections

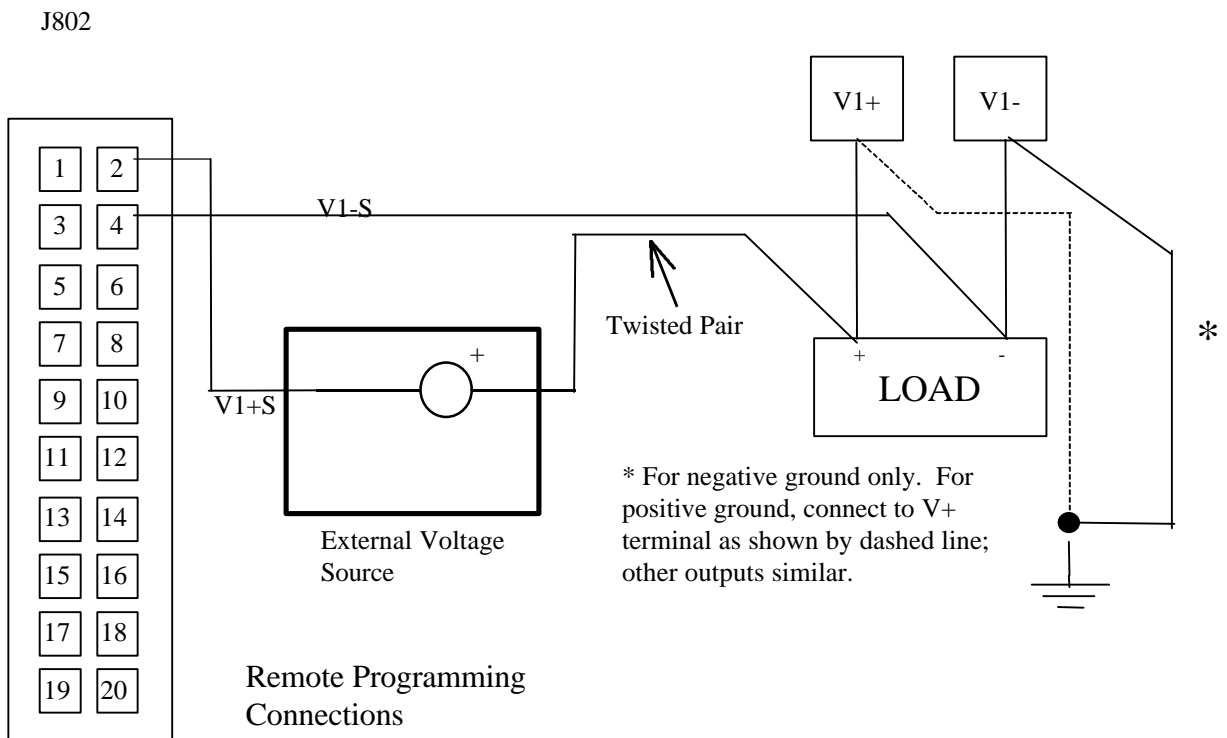


Note 1 - V1+ and V1- should be tightly coupled together. "Twisted Pair for best results."

Local Sense, Remote Programming



Remote Sense, Remote Programming

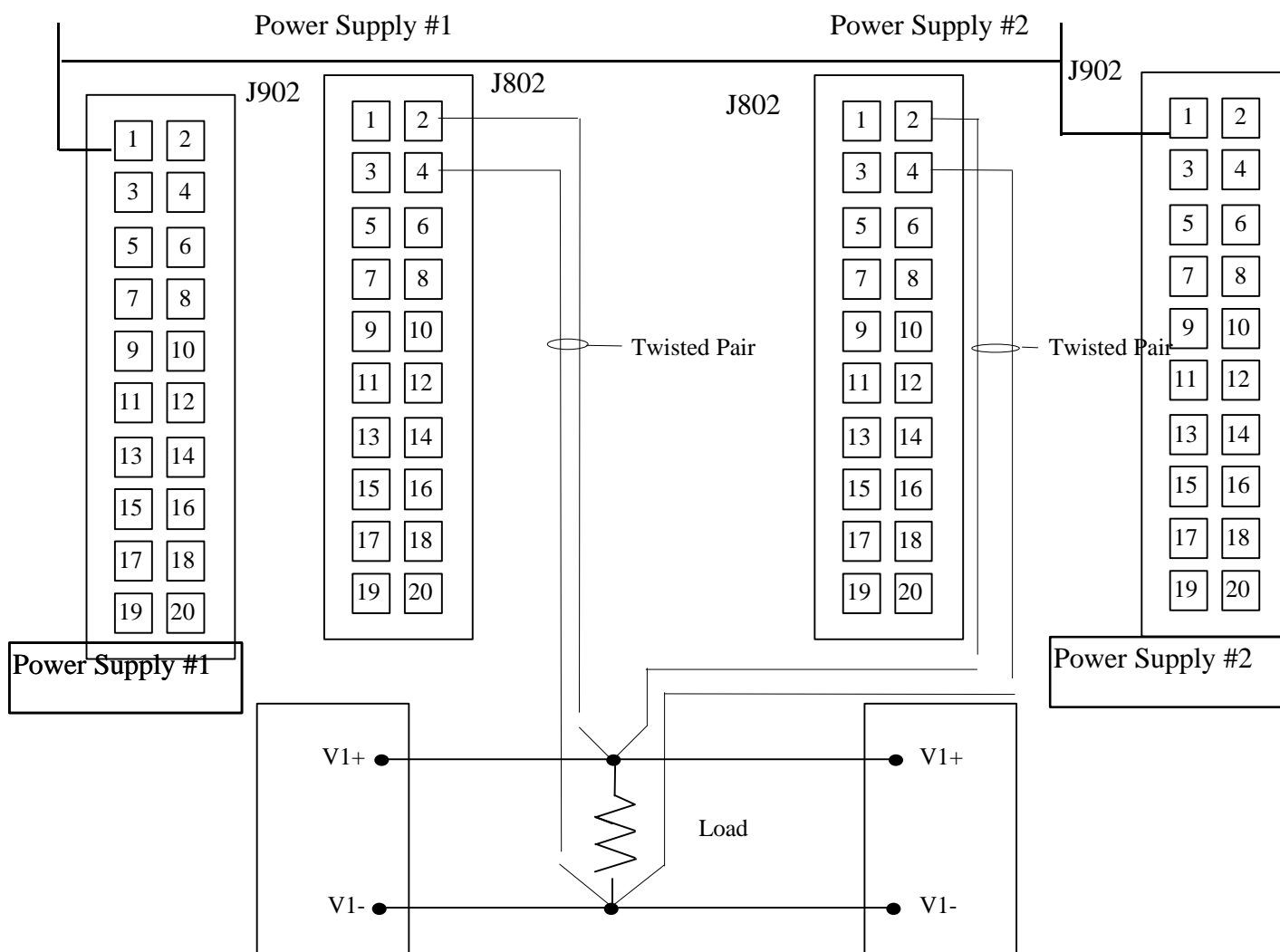


Current Sharing (for T option only)

With the current share option, the main output (V1) can operate in current share mode. When connecting RP power supplies for current sharing operation, refer to the figure and procedures below which show the required control signal connections. Note that the main output is the only output with active load sharing. The auxiliary outputs can be paralleled using a droop method. The main output of paralleled units will share load current within 10% of the nominal single unit full load current.

Procedures

1. Connect the current share control circuits of the units to be paralleled, using pin 3 of connector J902.
2. Using cabling of a gauge appropriate for the load current, connect the outputs of the units to the load as shown below. Note that a separate cable, of the same gauge, is required between the -V output terminals of the paralleled units. The cables running from each unit to the load should be of equal length.
3. If remote sensing is desired, the connections should be made for each output per the Instruction Manual.



Safety and Installation Instructions

To comply with published safety standards, the following instructions must be followed:

- a. The maximum ambient temperature of the operating environment must not be exceeded for the indicated output powers shown in the following table.

Model	Ambient Temperature		
	50°C	60°C	70°C
RP0500 Series	500W	375W	250W
RP0750 Series	750W	560W	375W
RP1000 Series	1000W	750W	500W

- b. For earth fault protection, the unit must be protected in the final installation by suitable overcurrent protection means. If protection relied upon building wiring, the end product should provide the necessary requirement.
- c. The power supply is intended for use as a component of other equipment. When installing the power supply, the relevant safety standards (i.e., EN 60950, IEC 950, VDE 0806, CSA 234-M90) must be complied with. In particular, creepage and clearance distances, and distances through insulation between primary and earth or primary and secondary must be maintained.
- e. On models RP0500-4EH-N/T/X/Z, RP0750-4EH-N/T/X/Z and RP1000-4EH-N/T/X/Z consideration to be taken at end product approval to ensure the outputs are non-operator accessible(ELV).

