

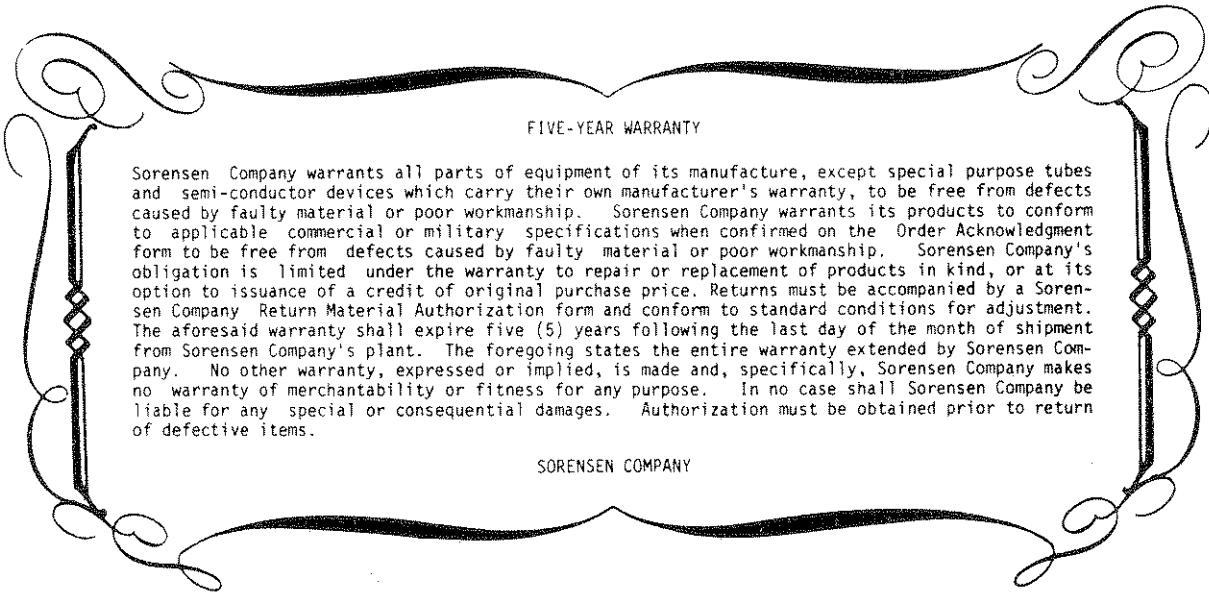
**instruction
manual
for PTM SERIES
NARROW RANGE
POWER SUPPLIES**

MODULE SIZE:	<u>I</u>	<u>II</u>	<u>III</u>	<u>IIIB</u>
MODELS:	3-4	3-7	3-11	3-16
	5-4	5-7	5-11	5-16
	12-2.7	12-4.4	12-6.5	12-10.5
	15-2.4	15-3.5	15-5.5	15-9.5
	24-1.6	24-2.3	24-4	24-6.8
	28-1.4	28-2	28-3.5	28-6

SORENSEN POWER SUPPLIES

Sorensen Company • 676 Island Pond Road, Manchester, NH 03103 USA • Tel 603-668-4500 • TWX 710-220-1339





FIVE-YEAR WARRANTY

Sorensen Company warrants all parts of equipment of its manufacture, except special purpose tubes and semi-conductor devices which carry their own manufacturer's warranty, to be free from defects caused by faulty material or poor workmanship. Sorensen Company warrants its products to conform to applicable commercial or military specifications when confirmed on the Order Acknowledgment form to be free from defects caused by faulty material or poor workmanship. Sorensen Company's obligation is limited under the warranty to repair or replacement of products in kind, or at its option to issuance of a credit of original purchase price. Returns must be accompanied by a Sorensen Company Return Material Authorization form and conform to standard conditions for adjustment. The aforesaid warranty shall expire five (5) years following the last day of the month of shipment from Sorensen Company's plant. The foregoing states the entire warranty extended by Sorensen Company. No other warranty, expressed or implied, is made and, specifically, Sorensen Company makes no warranty of merchantability or fitness for any purpose. In no case shall Sorensen Company be liable for any special or consequential damages. Authorization must be obtained prior to return of defective items.

SORENSEN COMPANY

SECTION I

INTRODUCTION AND DESCRIPTION

1.1 PURPOSE

This manual contains operating and maintenance instructions for the narrow-range PTM modular power-supply line, manufactured by the Sorensen Company, 676 Island Pond Road, Manchester, N. H. The line consists of 24 models, all similar in electrical design and physical appearance. The models are grouped into four module sizes: Modules I, II, III and IIIB, differing only in physical size and output current ratings (Table 1-1).

1.2 DESCRIPTION

1.2.1 General

Designed for operation from any of three separate single-phase inputs, the units provide a variety of highly regulated dc outputs. (Refer to Table 1-1 for unit specifications). PTM's also offer extremely fast recovery times as well as low output impedances.

The supplies are designed to be mounted in any one of three positions; end, bottom or side. Four tapped mounting holes are provided on each side.

Modules II, III and IIIB contain an extruded aluminum-finned heatsink (radiator) on the rear side to eliminate the need for an external heat-dissipation device. Heatsinking is not required in Module I.

Operational features of the PTM series power supplies include remote sensing, remote programming, overload and short-circuit protection by current limiting (foldback) and overvoltage protection (OVP) by an integral electronic crowbar circuit.

1.2.2 Remote Sensing

In applications where variations in the load-lead drops adversely affect load regulation, remote sensing may be used to extend the unit's regulating point from the output terminals to the load.

In the PTM series, remote sensing will compensate for 250mV of drop per load lead, maximum.

NOTE

The (+) sense and (-) sense leads should be a twisted pair to reduce stray pick-up.

1.2.3 Remote Programming

With the remote-programming feature, unit output voltage may be altered from a remote location by introducing a calculated resistance into the programming network. The programming ratio is approximately 500 ohms per volt.

1.2.4 Series Operation

The PTM series is not suitable for series connection. Series operation generally makes start-up difficult because of the foldback current-limiting feature. However, two supplies may be connected to form a plus and minus (dual-polarity) supply, provided that the bridging load across the two supplies does not exceed 25% of rated current of the lowest current-rated supply. (For these applications, Sorensen's PTM Dual Series is recommended).

1.2.5 Parallel Operation

Sorensen Company has prepared an application note, available on request, which outlines the method of connecting PTM's in parallel.

1.2.6 Overcurrent Protection

In the event of an overcurrent condition, such as a short circuit, a current-foldback circuit (preset at the factory to 125% of rated current at 40°C), operates to reduce both the unit output voltage and current.

1.2.7 Overvoltage Protection

In the event of an overvoltage condition at the output, such as a failure in the power supply or an externally induced condition, an overvoltage electronic crowbar is actuated by an integral OVP sensing circuit. The crowbar acts to quickly reduce the output voltage to zero.

1.3 OPTIONAL ACCESSORIES

Rack adapters (illustrated in Section 2) are offered as optional accessories to the PTM line, all designed for standard 19-inch (483mm) racks. There are six basic rack assemblies to mount various combinations of different power supplies. The rack assemblies include provisions for slide rails, and offer added versatility in that units may be mounted both at the front and rear of the adapter. Racks are supplied in $3\frac{1}{2}$ (89mm) - and $5\frac{1}{4}$ (133mm) - inch heights and in depths of 18 (457mm) and 20 (508mm) inches.

There are four filler panels available:

Metered

<i>PM300</i>	<i>3$\frac{1}{2}$" (89mm) height</i>	<i>PF300</i>	<i>3$\frac{1}{2}$" (89mm) height</i>
<i>PM500</i>	<i>5$\frac{1}{4}$" (133mm) height</i>	<i>PF500</i>	<i>5$\frac{1}{4}$" (133mm) height</i>

The metered panels (which can accommodate five meters), include a voltmeter, voltage selection knob, three meter lenses and three meter filler blocks. Consult your factory representative for complete system design.

1.4 INPUT OPTIONS

Standard PTM units are factory-wired for 115-volt operation. Units may be field-or factory-modified to accept inputs of 220 Vac (M1 option) or 230 Vac (M2 option). Refer to paragraph 2.3 on page 2-2 for input wiring changes.

Table 1-1 PTM Unit Specifications

Model No.	Module Package (1)	Adjustment Range (Vdc)		Current (Adc)				Output Adjust Resolution (mV typ.)
		Min.	Max.	@40°C	@50°C	@60°C	@71°C	
PTM 3-4	I	2.8	3.5	4.0	3.6	2.8	1.6	10
PTM 3-7	II	2.8	3.5	7.0	6.3	4.9	2.8	10
PTM 3-11	III	2.8	3.5	11.0	9.6	7.8	4.4	10
PTM 3-16	IIIB	2.8	3.5	16.0	14.0	11.0	6.5	10
PTM 5-4	I	4.8	5.5	4.0	3.6	2.8	1.6	10
PTM 5-7	II	4.8	5.5	7.0	6.3	4.9	2.8	10
PTM 5-11	III	4.8	5.5	11.0	9.6	7.8	4.4	10
PTM 5-16	IIIB	4.8	5.5	16.0	14.0	11.0	6.5	10
PTM 12-2.7	I	11.4	12.6	2.7	2.4	1.9	1.1	25
PTM 12-4.4	II	11.4	12.6	4.4	4.0	3.1	1.8	25
PTM 12-6.5	III	11.4	12.6	6.5	5.7	4.6	2.7	25
PTM 12-10.5	IIIB	11.4	12.6	10.5	9.5	7.0	4.0	25
PTM 15-2.4	I	14.25	15.75	2.4	2.1	1.7	0.95	25
PTM 15-3.5	II	14.25	15.75	3.5	3.1	2.5	1.6	25
PTM 15-5.5	III	14.25	15.75	5.5	4.9	3.9	2.5	25
PTM 15-9.5	IIIB	14.25	15.75	9.5	8.5	6.5	3.6	25
PTM 24-1.6	I	23	25	1.6	1.4	1.1	0.65	50
PTM 24-2.3	II	23	25	2.3	2.1	1.7	1.1	50
PTM 24-4	III	23	25	4.0	3.6	2.9	1.9	50
PTM 24-6.8	IIIB	23	25	6.8	6.0	4.5	2.7	50
PTM 28-1.4	I	27	29	1.4	1.2	1.0	0.55	50
PTM 28-2	II	27	29	2.0	1.8	1.5	1.0	50
PTM 28-3.5	III	27	29	3.5	3.1	2.6	1.8	50
PTM 28-6.0	IIIB	27	29	6.0	5.5	4.0	2.4	50

Table 1-1 Unit Specifications (Cont'd)

Input current (Amperes Max)

Module	105 - 125 Vac	200 - 240 Vac	210 - 250 V
I	0.8	0.42	0.4
II	1.3	0.68	0.65
III	2.4	1.3	1.2
III B	3.0	1.6	1.5

Case Size

Module	Dimensions in. (mm)						Weight	
	Height	Width		Length		lb.	(kg)	
I	3.31 (84)	3.88 (98)	6.5 (165)	5.5 (2.5)				
II	3.31 (84)	5.13 (130)	6.5 (165)	7.5 (3.4)				
III	3.31 (84)	5.13 (130)	9.5 (241)	11.0 (5.0)				
III B	5.13 (130)	5.13 (130)	9.5 (241)	13.5 (6.1)				

PTM Series Specifications

Input

Voltage:

105 - 125 Vac single phase
 200 - 240 Vac single phase
 or 210 - 250 Vac selectable by
 internal tap changes on power
 transformer.

Frequency:

50 - 440 Hz operation without de-
 rating.

Output

Regulation:

Single output.
 Line 0.02% + 1mV.
 Load 0.03% + 4mV.
 Dual output.
 Line 0.01% + 1mV.
 Load 0.01% + 1mV.

Ripple:

1mVrms, 5mV pk-pk maximum.

Temperature coefficient:

0.01% maximum per °C or 1mV per
 °C, whichever is greater.

Stability:

0.1% for 24 hours after 30 min.
 warm-up time.

Transient response time:

Output voltage returns to within ±
 20mV band in less than 50µs follow-
 ing a step-load change from either
 10% to 100% or 100% to 10% of full
 load.

Overshoot:

No overshoot at turn-on, turn-off or
 power failure.

Overvoltage protection:

Automatic, adjustable crowbar
 action. Factory set to 120% of full
 load current.

Current limiting:

Automatic fold-back type, internally
 adjustable 50% to 130% of rated cur-
 rent at 40°C. Factory set to 125%.

Operating data

Remote sensing:

250 mV maximum drop per load
 lead.

Remote programming:

Resistance programming; 500Ω/V
 Voltage programming; Volt/Volt.

Series operation:

200V dc maximum output.

Parallel operation:

May be directly paralleled without de-
 rating.

Isolation (breakdown test):

1.3 kV dc input to chassis
 300 V dc output to chassis.

Ambient operating temperatures:

0 to +70°C.

Storage temperature:

-40° to +85°C.

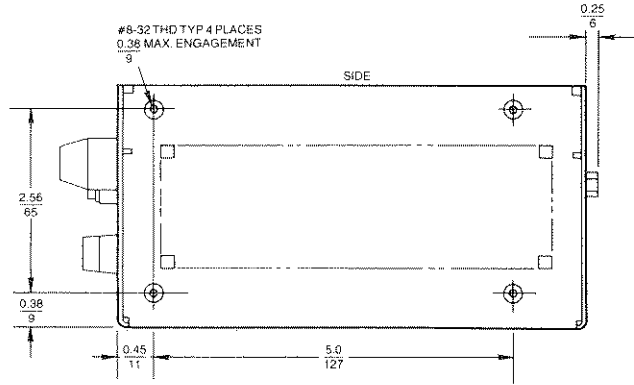
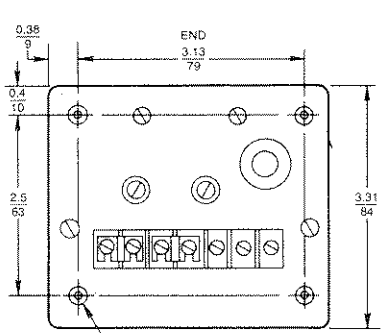
Cooling:

Convection cooled.

Finish:

Textured blue thermal paint.

Module I



NOTE 1: #8-32 THD TYP 4 PLACES
0.38 MAX. ENGAGEMENT
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NOTES: ALL DIMENSIONS ARE IN INCHES
MM

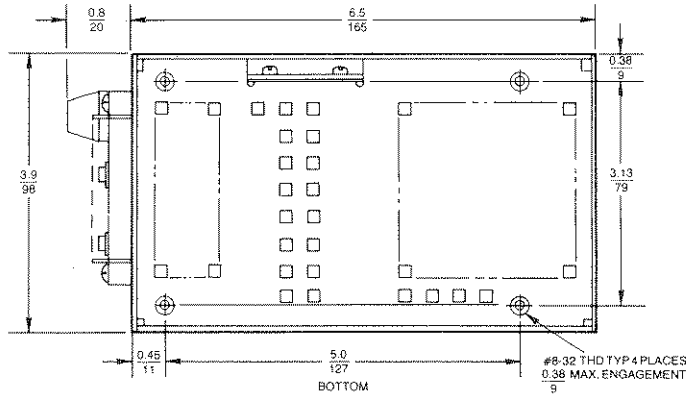
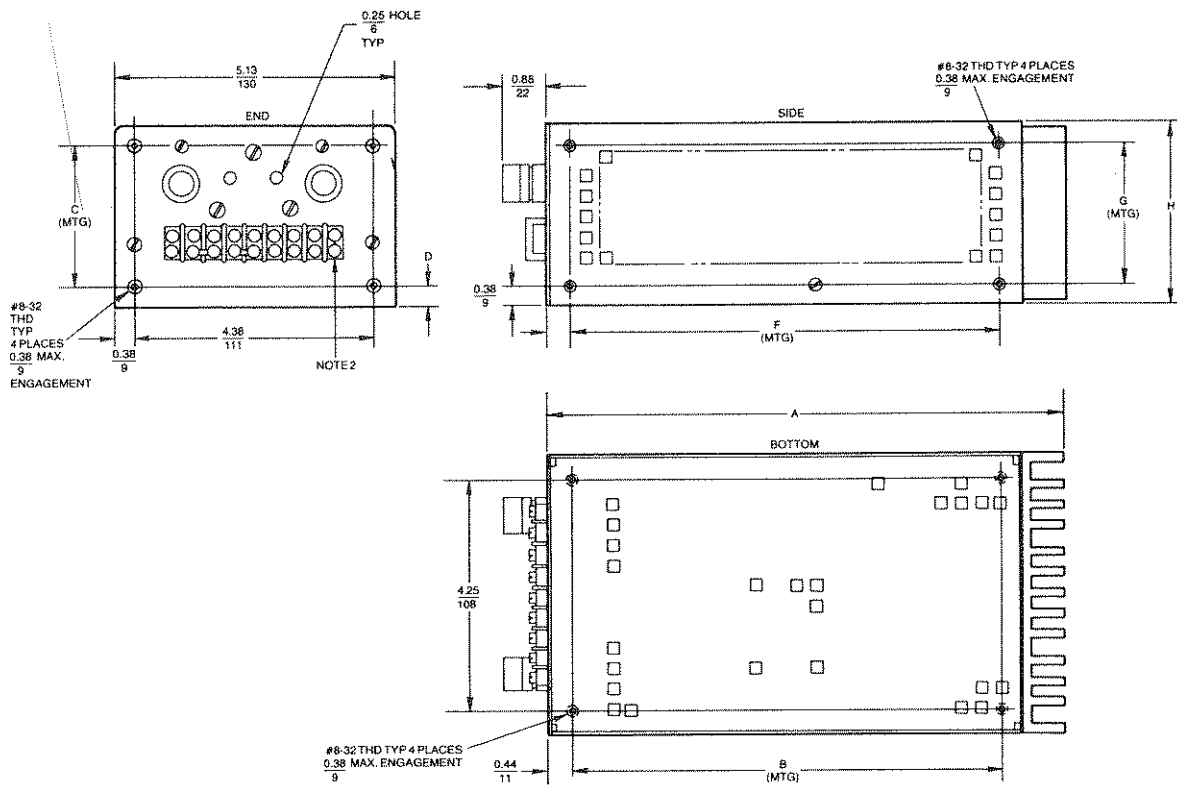


Figure 1-1 PTM Outline Drawing (Module I)

Modules II, III and IIIB



Case	Dimensions							
	A	B	C	D	E	F	G	H
II	6.5	5.0	2.5	0.46	0.45	5.0	2.56	3.3
	165	128	63	11	11	128	65	84
III	9.5	7.88	2.5	0.46	0.44	7.88	2.56	3.3
	241	200	63	11	11	200	65	84
IIIB	9.5	7.88	4.38	0.38	0.44	7.88	4.38	5.13
	241	200	111	9	11	200	111	130

NOTES: ALL DIMENSIONS ARE IN INCHES.
MM

NOTE 1: SCREW SIZE #6-32 (EXCEPT FOR PTM DUAL, AC INPUT #5-40).
NOTE 2: CASE II & III SCREW SIZE #5-40, CASE IIIB & DUALS #6-32).

Figure 1-2 PTM Outline Drawing (Modules II, III, IIIB)

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SECTION II

PREPARATION FOR USE

2.1 GENERAL

Following unpacking, general inspection and preliminary check-out procedures should be performed to assure that the unit is in proper working order. These consist of visually inspecting for physical damage and performing an electrical check. If it is determined that the unit is damaged, the carrier should be notified immediately. The carrier's claim agent will prepare a report of damage, which should be sent to the Service Department, Sorensen Company, 676 Island Pond Road, Manchester, N. H. 03103. Sorensen will advise the user as to the action required to repair or replace the supply. Written approval from Sorensen Company must be obtained before unit is returned for service.

2.2 INSPECTION

Check for damage incurred during shipment as follows:

1. Inspect enclosures for dents, chips and other signs of obvious damage.
2. Check condition of external terminal block. Make certain that all terminal screws are in place and that links are fitted over the barrier strip between terminals 1 and 2, and between 3 and 4.
3. Inspect fuse holders for evidence of damage.
4. If internal damage is suspected;
 - a. Remove the (4) flat-head screws on front panel.
 - b. (Groups III & IIIB only) remove the (2) flat-head screws, one on each side.
 - c. Remove the (6) round-head screws on rear heat-sink, top edge and end side.
 - d. Loosen the (2) round-head screws on the lower edge of the heatsink.

e. Inspect printed-circuit board (PCB), transformer, capacitors, and potentiometers.

5. The PCB assembly can be detached by removing the two round-head retaining screws on the front panel.

6. The heatsink assembly at the rear can be detached by removing the two lower rear round-head screws. Check that the power transistors are firmly plugged into their sockets. These may be readily removed for unit servicing.

2.3 INPUT CONNECTIONS

If either of the two alternatives to a nominal 115-Vac input is to be used, (options M1, 220V, or M2, 230V) transformer T1 primary tap wiring should be changed as indicated in Figure 2-1. The factory-wired 115-Vac configuration is included for reference. Mount enclosures following inspection or tap changing.

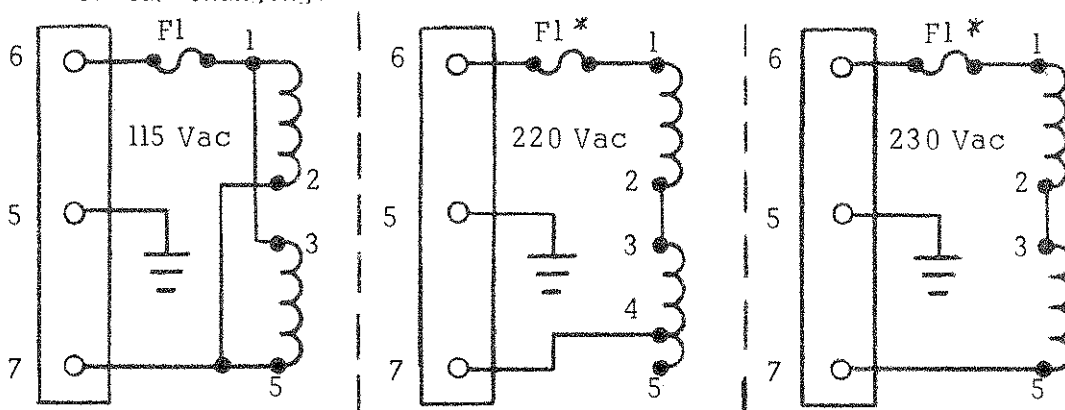


Figure 2-1 Input Connections

*Recommended fuses for 220/230 Vac:

PTM Module	Fuse Rating	Sorensen Part No.	Mfr., Type
I	0.5A, 250V	226-7176P36	Buss., AGC
II	0.8A, 250V (SB)	226-7177P46	Buss., MDL
III	1.5A, 250V (SB)	226-7177P26	Buss., MDX
IIIB	2.0A, 250V (SB)	226-7177P28	Buss., MDX

2.4 ELECTRICAL CHECK

1. Place unit in an area where the passage of air is unrestricted. Connect input leads to terminals 6 and 7 (IN) on unit terminal block. Use terminal 5 (GRD) for input system ground.
2. Connect a dc voltmeter across terminals 1 and 4 (OUT). Select a voltage range compatible with rated output.
3. Apply nominal rated input power.
4. Rotate output adjust sufficiently to swing the dc voltmeter from minimum to maximum rated voltage (per Table 1-1). Do not exceed the maximum ratings.
5. Set output voltage to its nominal value. Remove input power.

2.5 MOUNTING

These units may be mounted in a variety of positions and locations, including rack installation.

CAUTION

Mounting screws should not penetrate more than 1/4" into the case, to avoid possibility of shorting internal components.

1. For cantilever-type mounting from a vertical panel or wall (where vertical airflow is unrestricted):

End Mounting - Use knockout per Figures 2-2 through 2-5. This clears the terminal block and fuses.

Side or Bottom Mounting - No knockout is needed. Use the four mounting holes shown in the figures.

2. For flat mounting from a horizontal surface (where vertical airflow is not available):

End Mounting - Not recommended.

Side Mounting - Use knockout per the figures. Note that dotted area is suggested for additional heatsink cooling but is optional.

Bottom Mounting - Use knockout per the figures.

NOTE

Vertical panel mounting per paragraph 1 preceding is preferred since maximum airflow is assured. Horizontal surface mounting, using bottom mounting with proper knockout is the second preference.

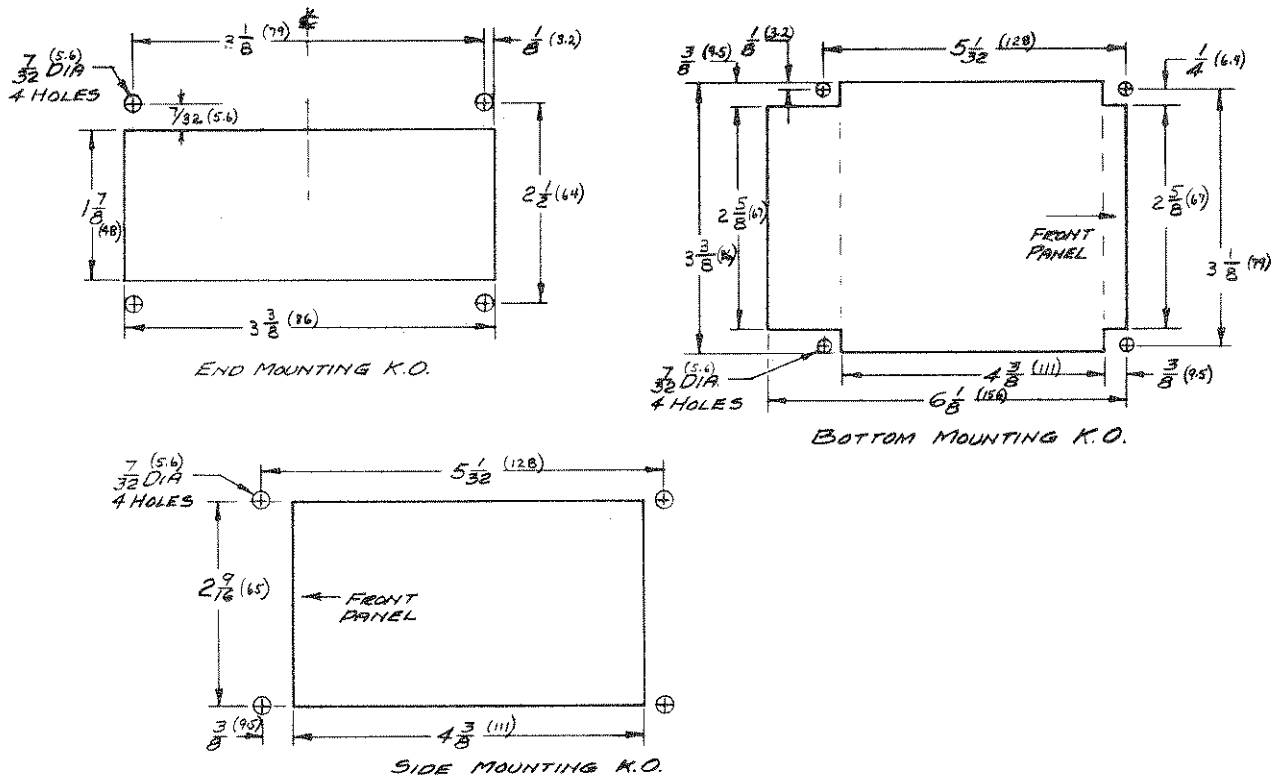


Figure 2-2 Knockout Dimensions Module I

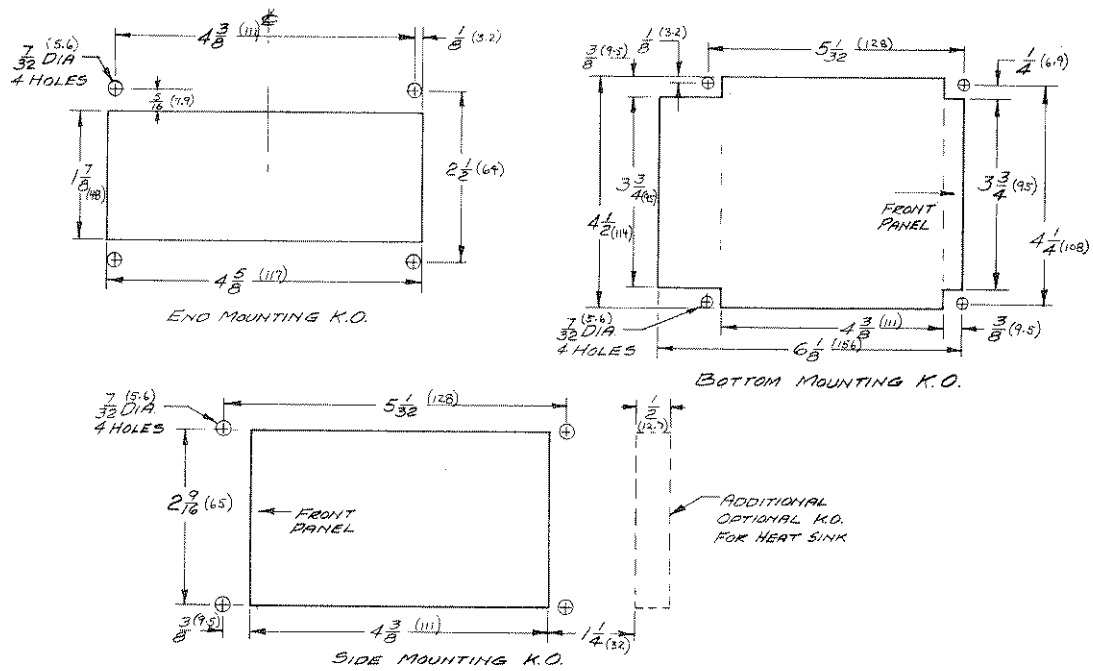


Figure 2-3 Knockout Dimensions Module II

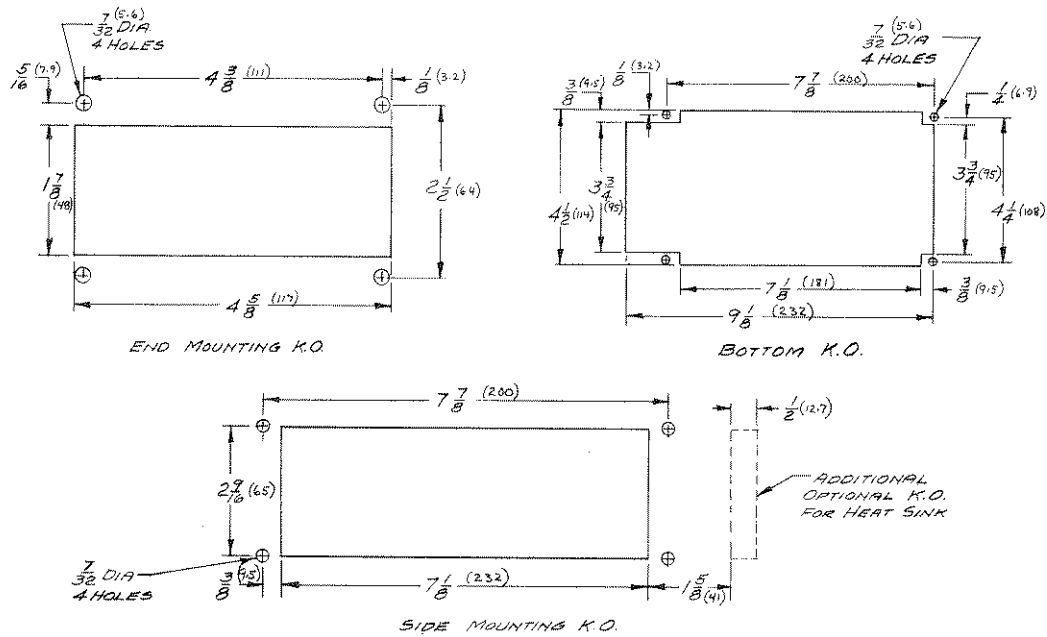


Figure 2-4 Knockout Dimensions Module III

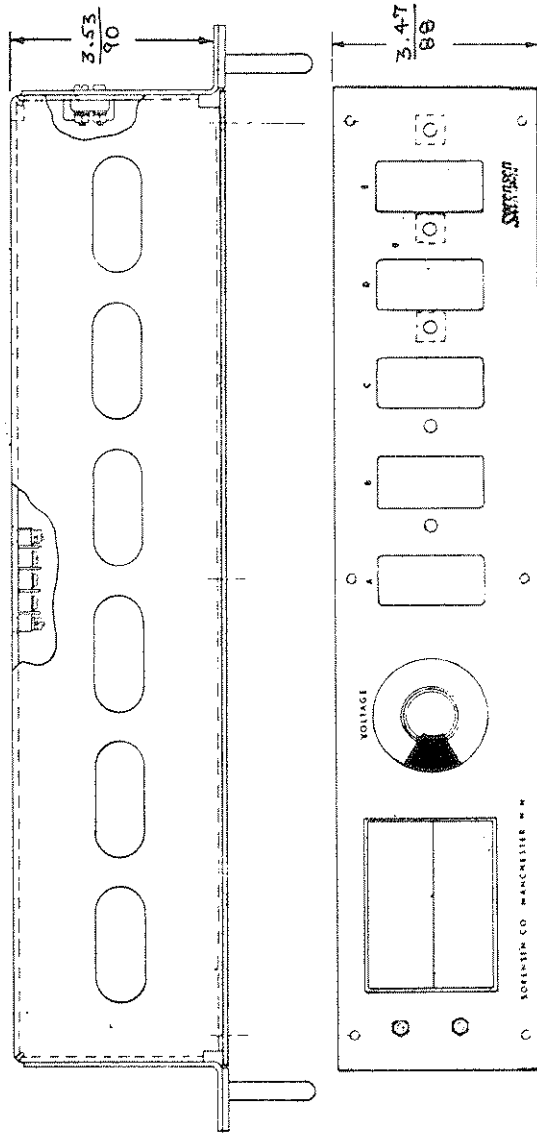


Figure 2-6 AC300 Rack Adapter (shown with metered panel)

NOTE

AC300 can accommodate three Module II or Module III units, or four Module I units.

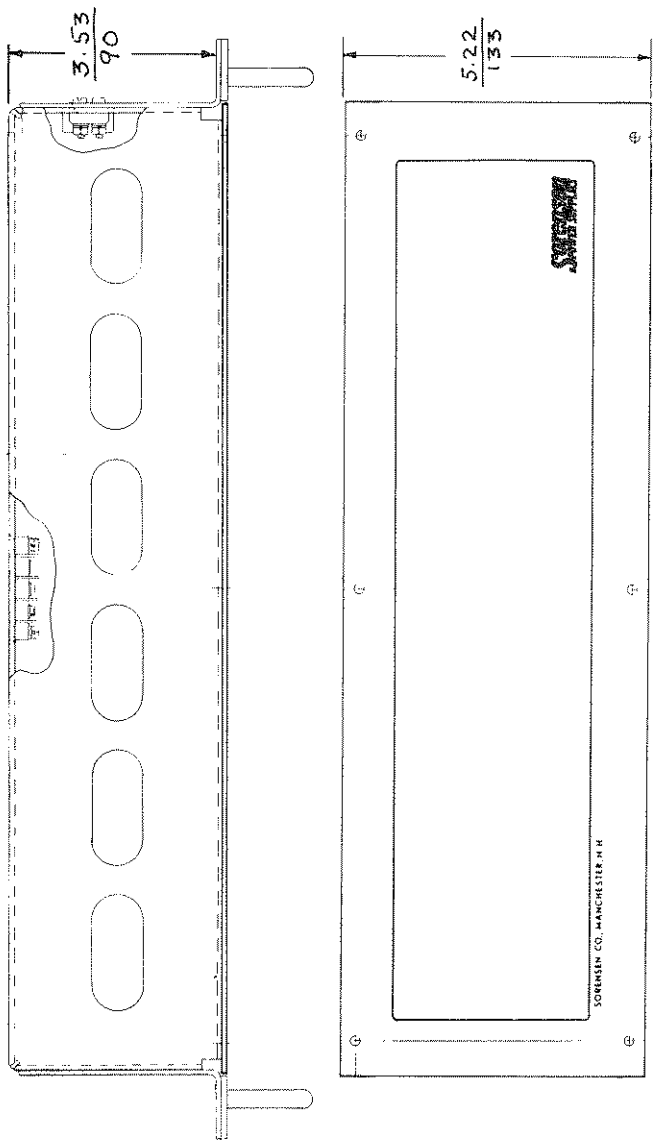
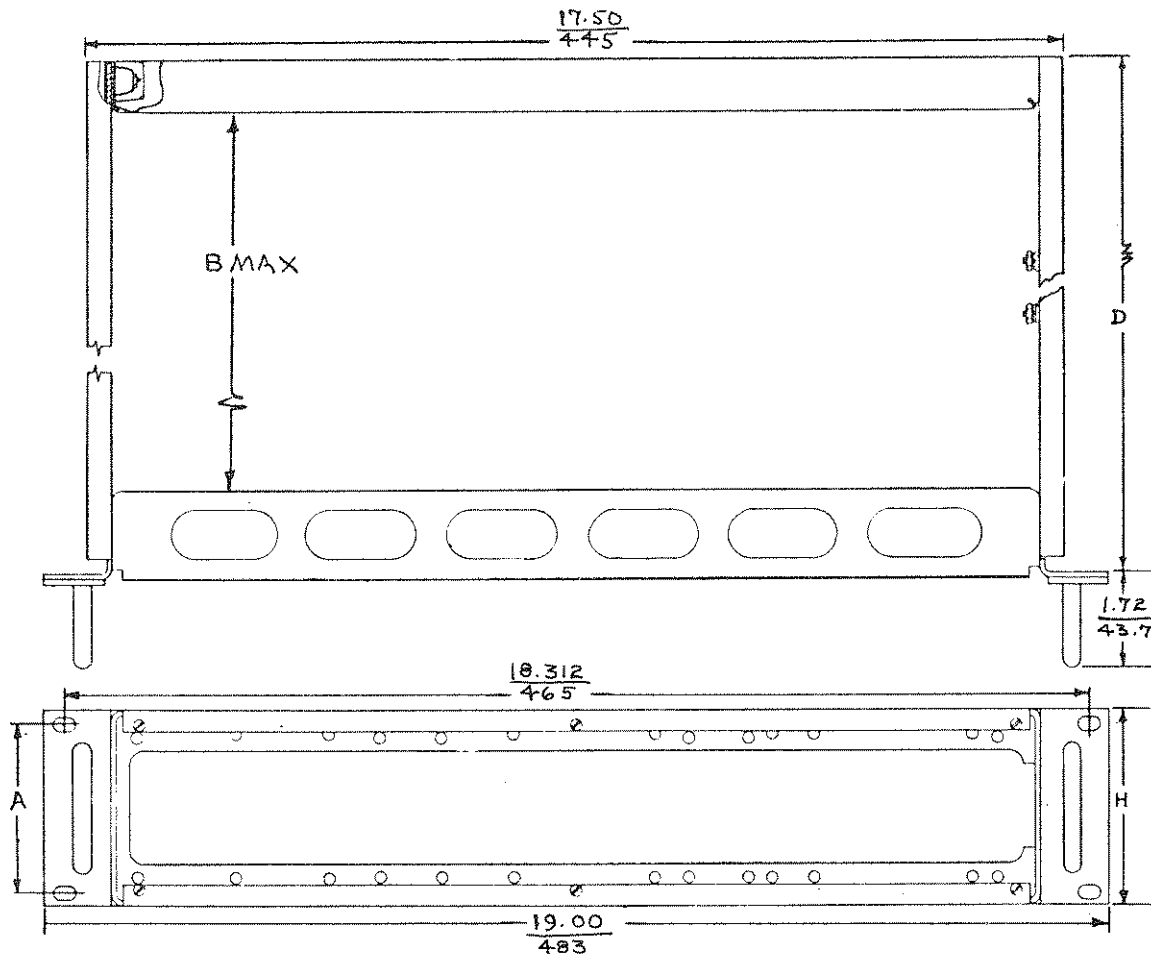


Figure 2-7 AC500 Rack Adapter (shown with unmetered panel)

NOTE
AC500 can accommodate four PIM Modules.



DIMENSIONS IN $\frac{\text{IN.}}{\text{MM}}$

<u>MODEL</u>	<u>A</u>	<u>D</u>	<u>H</u>	<u>B MAX</u>
AC318	$\frac{3}{75}$	$\frac{17.5}{445}$	$\frac{3.44}{87}$	$\frac{15.06}{383}$
AC320	$\frac{3}{75}$	$\frac{20}{508}$	$\frac{3.44}{87}$	$\frac{17.56}{439}$
AC518	$\frac{2.25}{57}$	$\frac{17.5}{445}$	$\frac{5.19}{132}$	$\frac{15.06}{383}$
AC520	$\frac{2.25}{57}$	$\frac{20}{508}$	$\frac{5.19}{132}$	$\frac{17.56}{439}$

Figure 2-8 AC318, AC320, AC518, AC520 Rack Adapter

NOTE:

These adapters will accommodate up to 8 units.

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SECTION III

OPERATING INSTRUCTIONS

3.1 GENERAL

This section contains instructions on how to adapt the unit to, and operate it in, a number of varied applications. These include remote sensing, remote programming, and series operation.



The sensing and power circuits form a closed loop. Opening this loop, either by removing a terminal-board link or disconnecting a sensing or programming lead will result in a high unit output and will cause the OVP crowbar to operate.

3.2 CONTROLS

PTM units are equipped with two panel controls; the output adjust and the OVP adjust potentiometers. The output adjust control is used to vary the output voltage while the OVP adjust control is used to vary the OVP trip point. Both are factory-set to nominal values (see paragraph 3.3.3).

3.3 PRE-OPERATION CONSIDERATIONS

3.3.1 Current-Foldback Setting

The current foldback point is factory set to approximately 125% of rated 40°C current. If the unit is to be operated in other ambients, the rated output current is derated per specifications. For ambient temperatures above 40°C, the foldback should be reset to approximately 125% of the derated output current.

3.3.2 Current-Foldback Reset

To reset the current foldback, proceed as follows:

1. Remove top cover per paragraph 2.2.4 to expose component printed-circuit board (PCB).
2. Rotate foldback-adjust control (R4) fully clockwise.
3. Connect a voltmeter across the output terminals. Apply nominal input power, and adjust output voltage to the unit's rated nominal value.
4. Remove input power, and connect an ammeter and variable load resistor in series across the output terminals.
5. Reapply input power and adjust load so that the test ammeter indicates current foldback calculated in paragraph 3.3.1.
6. Rotate R4 slowly counterclockwise until both output voltage and current begin to drop. Current foldback is then properly set.
7. Remove input power, disconnect test instruments and load. Reassemble top cover.

3.3.3 Overvoltage Trip Point

The OVP trip point is factory-set to 1V or 10% (whichever is greater) higher than the rated nominal output voltage. However, if the output voltage will be operated near its maximum rating, it may be desired to raise the trip point. For nuisance-free OVP, the trip point should be maintained at least 1V or 10% (whichever is greater) above the operating voltage. For example, a 5-V model operating at 5.5 V should use a 6.5-V trip setting.

3.3.4 OVP Trip Point Reset

To reset the OVP, proceed as follows:

1. Rotate OVP control (R14) on panel fully clockwise.

2. Rotate output control (R10) on panel until the output voltage is equal to the desired trip point.
3. Rotate OVP control R14 slowly counterclockwise until the output voltage suddenly drops to zero. This indicates OVP has triggered the crowbar.
4. Remove input power. Rotate output control fully counterclockwise (minimum voltage).
5. Apply input power. Slowly adjust output control until desired operating voltage is obtained.

NOTE

The OVP circuit includes a time delay such that the overvoltage condition must exist for approximately 100 microseconds before the OVP fires. This delay prevents short-duration OV pulses from triggering the crowbar.

3.3.5 Reset after OVP Fires

If the OVP fires, proceed to reset the circuit to restore normal output as follows:

1. Remove input power and disconnect load (in the event that the OV condition is externally induced).
2. Rotate output adjust potentiometer fully counterclockwise (minimum voltage).
3. Apply input power and increase output voltage to desired value.

NOTE

If crowbar again fires (reducing output to zero), internal failure is indicated, or the output is set too close to the operating voltage (see paragraph 3.3.4 preceding).

3.4 LOCAL SENSING

The unit is shipped ready for use in the local-sensing mode. In this mode, regulation is at the output terminals, not at the load. If variations in load-line voltage drops are expected to be prohibitive, refer to paragraph 3.5.

To operate the unit, proceed as follows:

1. Connect a voltmeter across output terminals 1 and 4.
2. Attach the input leads to terminals 6 and 7. Use terminal 5 (GRD) to ground input system.
3. Apply nominal input power.
4. Rotate output adjust until desired output voltage is indicated on voltmeter.
5. Remove input power, disconnect voltmeter and connect load leads to terminals 1 and 4. Do not remove or loosen any of the interconnecting links. Apply nominal input. Unit supplies highly regulated power to load.

CAUTION

Do not touch enclosure while unit is operating under load, as surface temperature is comparatively high. If unit must be handled immediately after operation, wear heat-resistant gloves.

3.5 REMOTE SENSING

If it is desirable to sense (regulate) unit output at the load rather than at output terminals, remove the links between terminals 1 and 2, and 3 and 4. Run a sensing lead from terminal 2 to the positive side of load and connect the other lead from terminal 3 to the negative side of load (see Figure 3-1). Sensing leads should be fabricated using a shielded and twisted pair of wires. Put unit into operation per paragraph 3.4. With remote sensing, unit transient response degenerates slightly. If this is undesirable the response characteristic may be maintained by disconnecting output capacitor C5 and connecting it, or an identical capacitor, locally across the load. Rating of C5 may be determined from parts list in section 6. The load-carrying leads (1 and 4) should be selected to limit the voltage drop to 250 millivolts per lead.

3.6 REMOTE PROGRAMMING

The unit may be programmed to supply pre-determined output voltages by inserting a calculated resistance into the voltage-sensing circuit. Programming sensitivity is approximately 500 ohms per volt, that is 500 ohms are required for each volt difference between the desired output and the minimum value of the unit's specified range. The program resistor should be a 1/8 watt (or larger) precision film resistor with a 25 PPM/°C coefficient (equal to MIL style RN55E). The programming current is approximately 2 milliamperes.

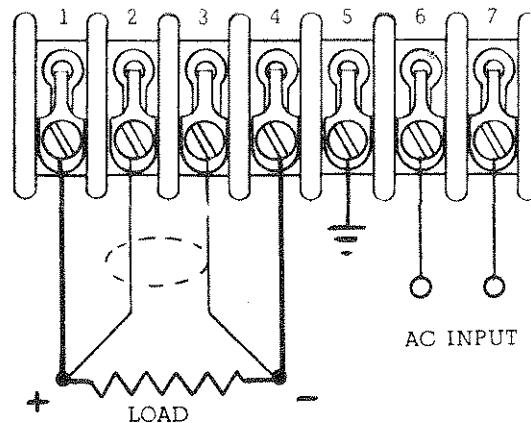


Figure 3-1 Remote-Sensing Configuration

To adapt the unit for remote programming, proceed as follows:

1. With normal local sensing (paragraph 3.4), apply input power and adjust output control to specified rated minimum output voltage (per specifications). For example, for a 12-V module, set the output to 11.4 volts.

2. At this point, any value within rated output range can be obtained by inserting 500 ohms-per-volt difference between the desired voltage and the minimum voltage. For example, to obtain 12.0-volt output the difference is $12.0 - 11.4$ or 0.6 volt. The program resistor should be 0.6×500 or 300 ohms.

3. Remove input power. Connect programming resistor per Figure 3-2. Note that either local or remote sense can be used.

4. Apply input power and verify load voltage across terminals 1 and 4 as the desired value (using local sense).

3.6.1 Fixed Output Voltage Setting

For the optimum long-term stability of the output voltage, the remote-program feature can be used to eliminate the possible drift of the output-adjust control. In this mode, the output control is disabled. Proceed as follows:

1. Remove top cover per paragraph 2.2.4. Remove the two screws securing PCB to front panel.

2. Short out potentiometer R10 by soldering a wire from PCB terminal 9 to 10.

3. Reassemble PCB and cover.

4. Connect a precision variable potentiometer or decade box for the programming resistor per Figure 3-2.

5. Set variable resistor to zero and apply input power.

6. Vary resistance until desired output voltage is obtained.
7. Remove input power, measure resistance and replace it by a fixed precision resistor (See paragraph 3.6 preceding for type).
8. Apply input power and verify that the output voltage is desired value.

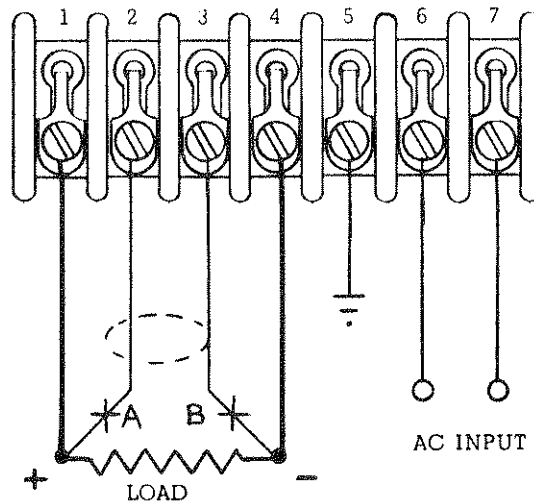


Figure 3-2 Resistance Programming Connections

NOTES

A. 3-V and 5-V Models:

- 1) Local Sense: Open link 1-2 and insert programming resistor.
- 2) Remote Sense: Insert programming resistor in (+) sense lead (at point "A").

B. 12-, 15-, 24-, and 28-V Models:

- 1) Local Sense: Open link 3-4 and insert programming resistor.
- 2) Remote Sense: Insert programming resistor in (-) sense lead (at point "B").

3.7 SERIES OPERATION

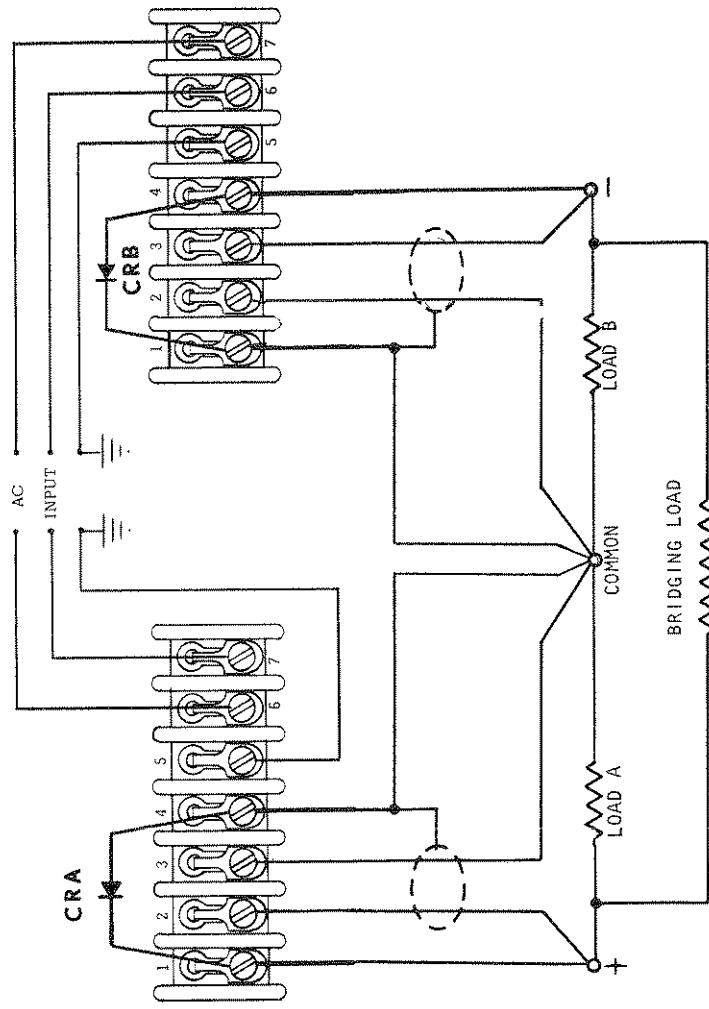
Series operation is not recommended for the PTM series. However, two supplies may be connected in series to form a dual-polarity (+) and (-) output system such as (+) 12V and (-) 12V with a common return. Such systems often include a small amount of bridging load (as 24-volt load in the above example). To insure starting of both supplies, the current rating of this load should not exceed 25% of the rating of the lowest current-rated supply.

To series-connect two units, proceed as follows:

1. Remove input power and connect two units per Figure 3-3. Use shielded twisted pair for each pair of sense leads.
2. Connect a suitable rectifier across each output as shown. See Figure 3-3 notes for rectifier type.
3. Check that load does not include more than 25% bridging load. (See explanation preceding.)
4. Apply input power.

3.8 PARALLEL OPERATION

Parallel-connecting PTM units requires special considerations, outlined in Sorensen Application Note PTM-1. This publication is available free of charge through your Sorensen Representative.



CRA & B shall be 3A 100V diode 1N5401 on all models rated 3A or less. Use 12A, 100V diode 1N3890 on all higher-current models (mount 12A diodes on 6" X 6" heatsink).

Figure 3-3 Dual-Polarity Operation

F
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m
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n
t