



PPS/PPX/SPS

Process Power Supplies
USER'S MANUAL

August 1990

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PPS/PPX/SPS

Introduction

Moore Industries' family of Process Power Supplies (PPS) includes the models PPS, PPX, and SPS. The PPS product line offers a wide range of output voltages, a selection of international ac input ratings, and a variety of housing and mounting configurations.

This manual provides descriptions, specifications, calibration information, and installation procedures for the models PPS, PPX, and SPS.

Description

The standard process power supply, the PPS, is available with either of two dedicated output ratings; 24 or 42 Vdc at 200 mA. It offers short circuit and overload protection, convection cooling, and current-limiting for added safety.

The PPX provides a 32 or 24 Vdc at 65 mA output. It is enclosed in an explosion-proof housing for use in hazardous area environments.

The SPS is an adjustable power supply that provides an output ranging from 5 to 10 Vdc at 100 mA. The unit features precision regulation to within 0.005% for a 1% line voltage change, and ripple of less than 50 mV, peak-to-peak.

Each of these power supplies is factory-configured for operation at 117, 220, or 240 Vac, 60/50 Hz, according to customer specification.

A "CT" option, available with PPS/24 Vdc units only, allows the user to mount the power supply directly onto a printed circuit board. This provides convenient input and output terminals for bench testing purposes.

For information on other housing types and mounting configurations available with units in the PPS family, contact Moore Industries, or your local sales representative.

Table 1 contains the equipment specifications for Moore Industries' family of PPS-type power supplies.

Serial Number. A complete, serial-number-dependent history is kept on every unit that Moore Industries sells and services. For service information, it is necessary to provide the factory with the serial number of the unit that requires attention.

The number is stamped on a stainless steel tag, and affixed to the upper end of the terminal block on standard PPS and SPS units. It is located on the face of the unit housing on PPX units. The serial tag on standard units in NEMA box enclosures may be found by opening the door and removing the safety cover.

Model Number. Moore Industries' model numbers identify the type of instrument, functional characteristics, any options ordered, and the housing type. The model number reflects the way the unit was configured when it originally left the factory. It is all that is needed to identify the operational characteristics of the power supply. The number is stamped on the same tag as the serial number.

The example on the next page outlines the significance of each field in a typical power supply model number.

PPS/PPX/SPS

EXAMPLE

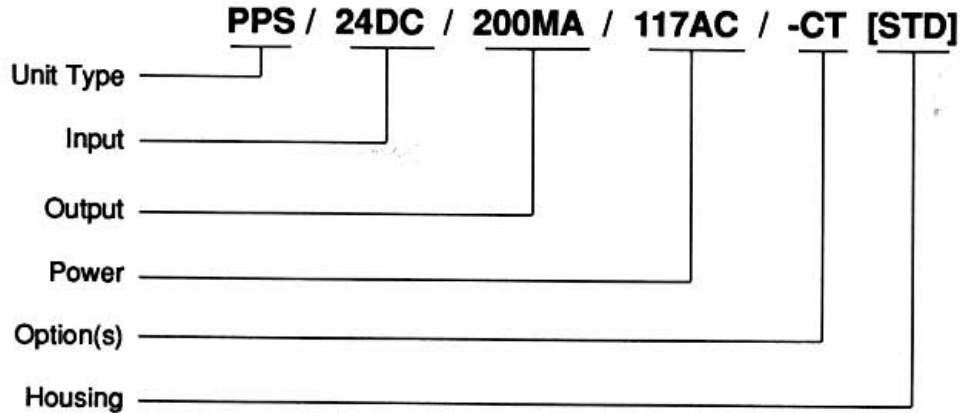


Table 1. PPS, PPX, & SPS Equipment Specifications

Characteristics	Specifications
Input Power	117, 220, or 240 Vac, $\pm 10\%$, 50/60 Hz of nominal power (factory-configured to customer specification)
Input Frequency	48 to 62 Hz
Output	PPS: 24 or 42 Vdc, 200 mA PPX: 24 or 32 Vdc, 65 mA, nominal SPS: 5 to 10 Vdc, 100 mA (front panel adjustable)
Performance	Output Regulation for the PPS and SPS: $\pm 0.005\%$ per 1% line change For the PPX: $\pm 0.15\%$ per 1% line change Ripple: 50 mV peak-to-peak, maximum Isolation: Input/Output/Power Supply to 500 Vac
Environmental Conditions	Ambient Temperature Operating Range: 0 to +70 °C (+32 to +158 °F) Effect on Power Supply: $\pm 0.03\%$ per °C over the range specified above
Weight	PPS and SPS: 936 grams (approximately 2 pounds, 1 ounce) PPX: 1276 grams (approximately 2 pounds, 13 ounces)
NOTE: Refer to Installation Section for physical dimensions.	

Calibration

Each power supply is calibrated to customer specification and checked at the factory to ensure proper performance before shipping. However, output values for each unit should be re-checked by the user on-site before the equipment is placed into service.

Adjustments

The SPS has a single, multi-turn potentiometer on the front panel. Labeled "EXCITATION ADJUST", this enables the user to set the output voltage as required (within the range specified in table 1).

Calibration Equipment

The equipment required to calibrate Moore Industries' process power supplies is listed in table 2. This equipment must be provided by the user.

Calibration Setup

Calibration should be performed in a laboratory setting. This will allow the user to control input variables, and to monitor changes in the output more easily.

Figure 1 depicts the correct calibration setup for all power supplies in the Moore Industries PPS family. Table 3 lists the observable outputs according to load.

Table 2. Calibration Equipment

Equipment	Description
Adjustable, ac Power Source	Variac, or equivalent; capable of 105-264 Vac output
Voltmeter	Accurate to 0.01 millivolt
Milliammeter	Accurate to 1 milliamp
Variable Power Resistor, or Equivalent Load	Powerstat, or equivalent; capable of output load of 120 Ω
Screwdriver, blade-type	Head measuring less than 2.54 mm (0.1 inch) in width

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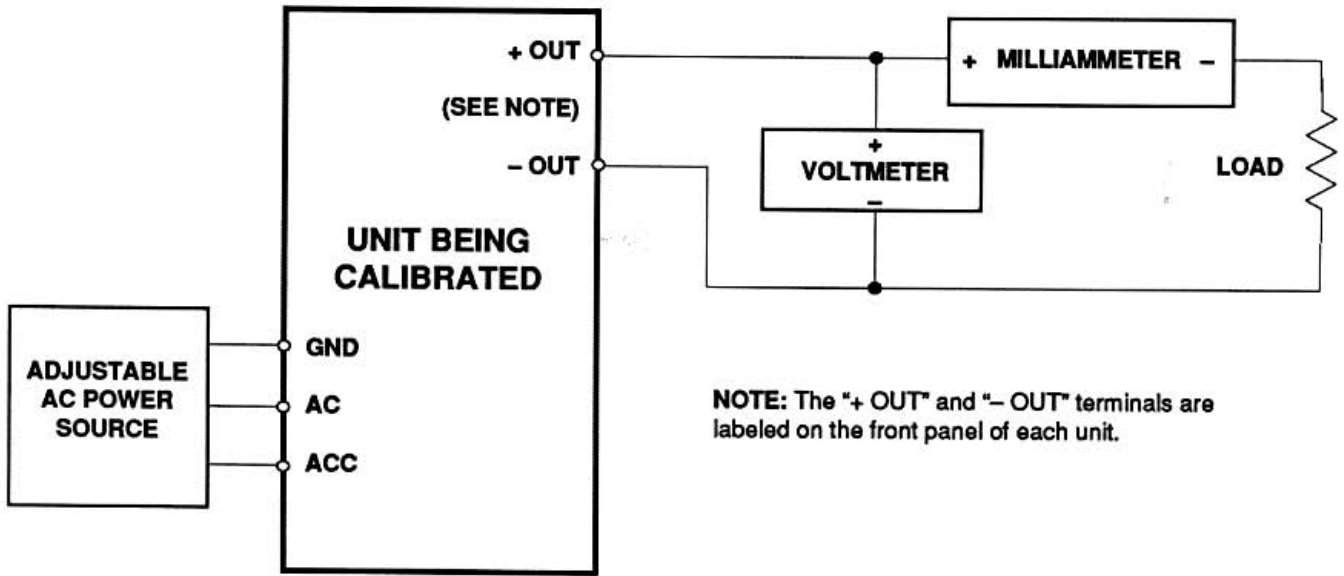


Figure 1. Calibration Setup

Table 3. Observable Outputs

Voltage	Current	Load
42 Vdc	240 mA	175 Ω (10 watts)
42 Vdc	200 mA	210 Ω (10 watts)
24 Vdc	240 mA	100 Ω (6 watts)
24 Vdc	200 mA	120 Ω (5 watts)
32 Vdc	65 mA	490 Ω (2 watts)
10 Vdc	100 mA	100 Ω (2 watts)

Calibration Procedure for PPS and PPX Units

Since PPS and PPX units have no adjustments, the operational check consists of connecting the unit to the primary power source, and checking for the correct output voltage.

Refer to the specifications in table 1 for minimum and maximum inputs and outputs.

Calibration Procedure for SPS Units

To calibrate the SPS:

1. Connect the unit to an adjustable ac power source, as shown in figure 1.
2. Turn the EXCITATION ADJUST potentiometer on the front panel fully clockwise.
3. Observe and note the output voltage (+DC OUT), and the output current.
4. Vary the power input voltage $\pm 10\%$
5. Verify that the output voltage (+DC OUT) does not change more than $\pm 0.05\%$ of the voltage noted in step 3.
6. Verify that the current remains within the range as described in table 1.
7. Turn the EXCITATION ADJUST screw fully counterclockwise. Repeat steps 3 through 6.
8. Verify that the output voltage stays within the output range as described in table 1.
9. Remove the load from the setup.
10. Verify that the output voltage does not change more than $\pm 0.1\%$ of the value noted in step 3.
11. Use the EXCITATION ADJUST screw to set the output voltage as desired.

Installation

Installing PPS-type units consists of physically mounting each device, and completing the necessary electrical connections.

Mounting

There is a variety of housings and mounting bracket combinations available for several models in the PPS family of power supplies. The technique used in mounting a particular model of power supply will depend upon the type of unit housing to be used.

PPS and SPS units in standard, aluminum cases can be mounted using a variety of hardware types. These include angle brackets and angle brackets with conduit plates, Bailey-type brackets, special conduit plate/caution cover combinations (meets Division 2 requirements in class 1, groups A, B, C, and D), and U-back mountings.

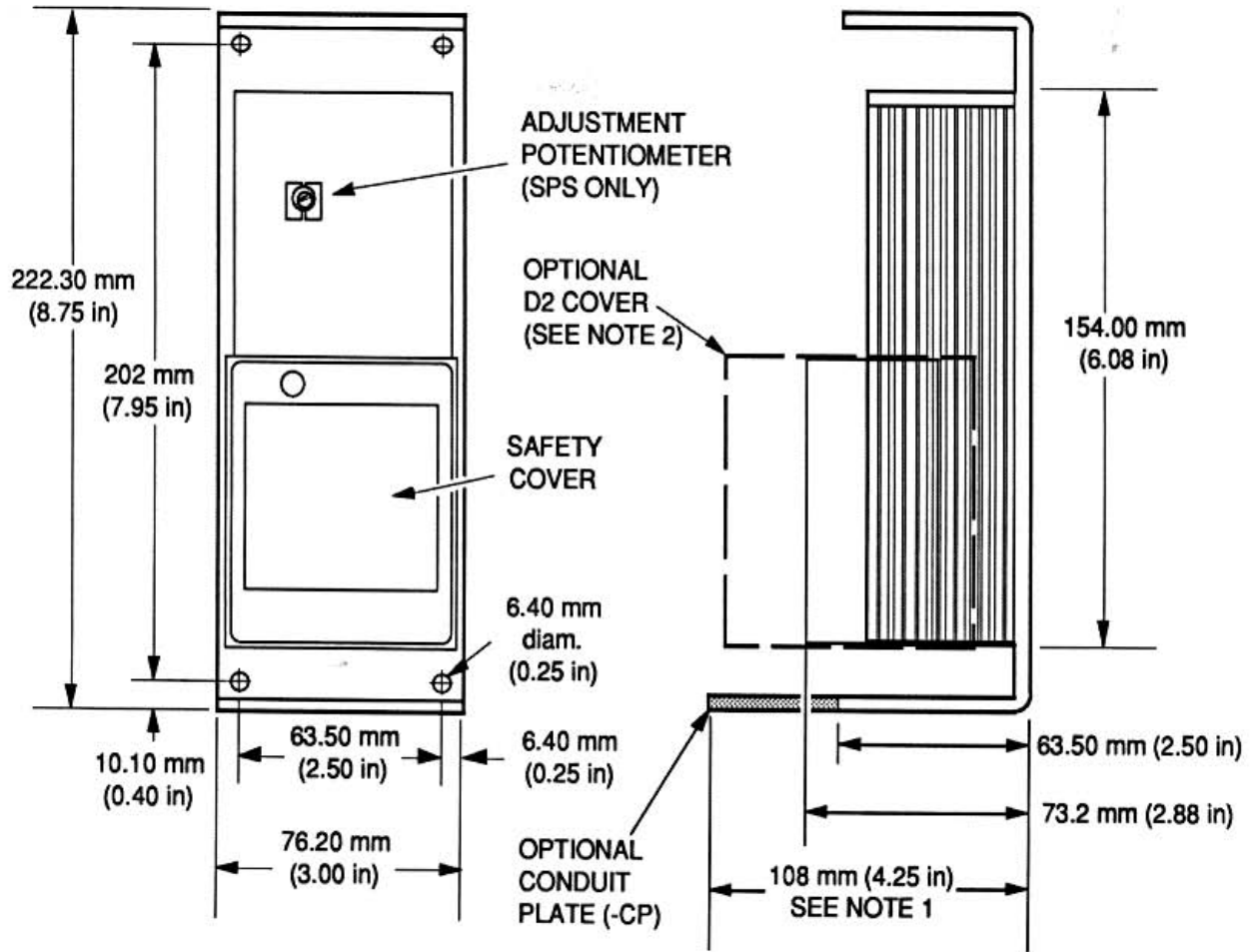
The PPS and SPS units are also available in three types of NEMA housing configurations. These are the general purpose (NEMA 1), water-tight (NEMA 4), and oil-tight (NEMA 12) housings.

The PPX is only available mounted in an explosion-proof housing. There are 2 and 3-hub housings, available with high or low covers. Either design can be equipped, if desired, with a glass cover. Each housing is available with a 2-inch pipe mounting bracket as well.

Although all the units are designed to employ convection cooling, it is advised to mount each unit on a surface made of material that can serve as a heat sink. The unit should also be located in an area that is protected from dust, moisture, and corrosive atmospheres.

Figures 2, and 3 show the outline dimensions of the various PPS-type units available.

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- NOTES:** 1. Dimensions are for optional conduit plate only. Disregard for standard mounting.
 2. Meets Class 1, Group d, Division 2 with optional D2 cover and CP bracket.

Figure 2. Outline Dimensions for the PPS and SPS

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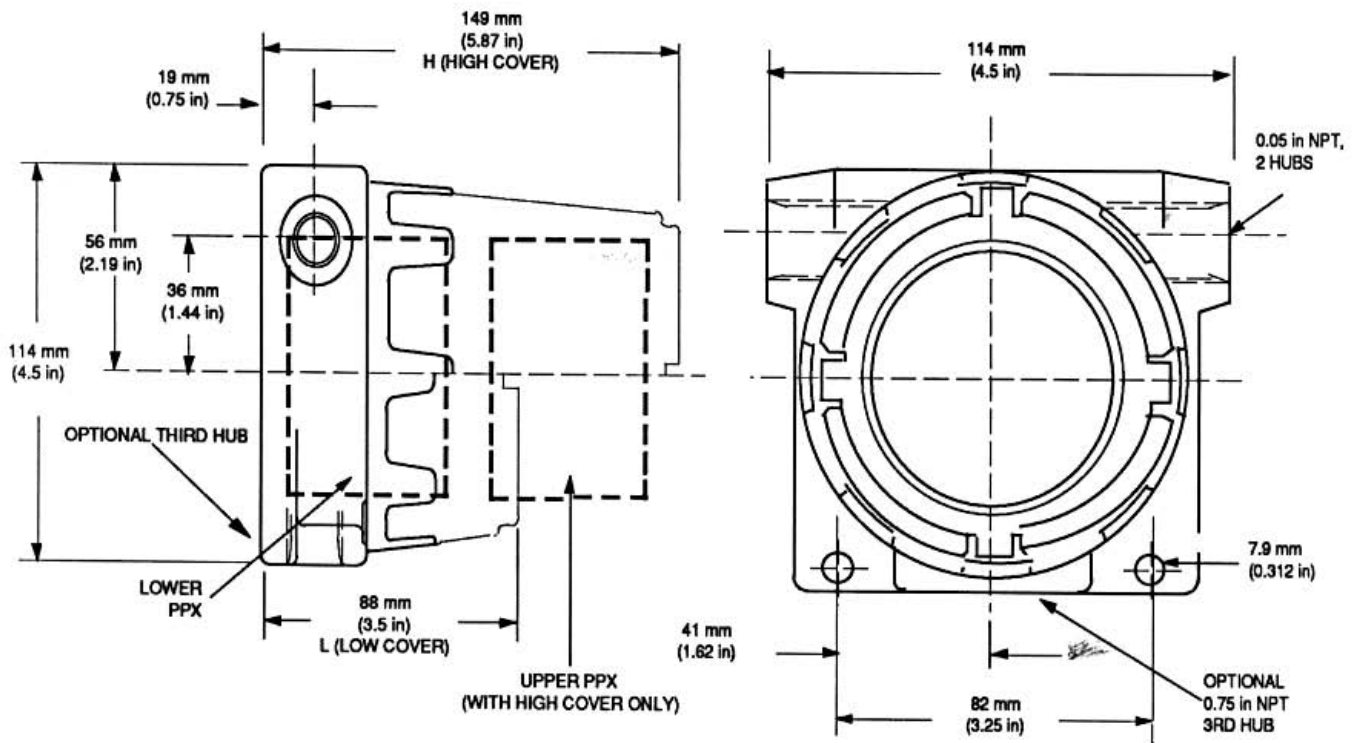


Figure 3. Outline Dimensions for the PPX Enclosure

Electrical Connections

Figure 4 is a block diagram showing a typical PPS-type power supply hook-up. The unit shown is connected to a Pressure-to-Current Transmitter (Moore Industries model PIT-DIN). For information on other Moore Industries products that operate with PPS units, contact your sales representative, or Moore Industries.

All electrical connections for the power supplies are clearly labeled. The ac input terminals are "AC", "ACC", and "GND". Output terminals are labeled "+ DC OUT", "(+)OUT", or "+ OUT", and "- DC OUT", "(-)OUT", or "- OUT".

Special wire or cabling is not required for signal connections to standard units. To avoid transients and stray pick-ups, it is recommended that twisted conductors be used when running close to other services.

Spade-lug connectors are recommended for all wire terminations. Standard units with terminal strips or blocks have terminals supplied with #6-32 screws, which are long enough to accommodate up to three spade-lug connectors.

Standard units with snap-off plastic covers have an opening in the bottom of the cover. Route all wiring to and from the terminals through this opening.

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Wiring Considerations for Units in NEMA Enclosures

Oil-tight and water-tight NEMA enclosures do not have conduit hole fittings or knockouts. Conduit access must incorporate water-tight or oil-tight fittings such as Myer Scru-Tite, or an equivalent type.

General purpose NEMA enclosures have knockouts for conduits from 1/2-inch to 1-inch.

Operation

PPS units operate from an ac source of 117 Vac $\pm 10\%$, 60 Hz (220/240 Vac is also available). Once calibrated, installed, and supplied with current, PPS units operate unattended, and are maintenance-free.

Any units found to be performing below specifications should be immediately returned to the factory for service. Instructions for return of the equipment are on the back cover of this manual. Customers may also contact Moore Industries' Customer Service Department at 1-800-999-2900 for assistance.

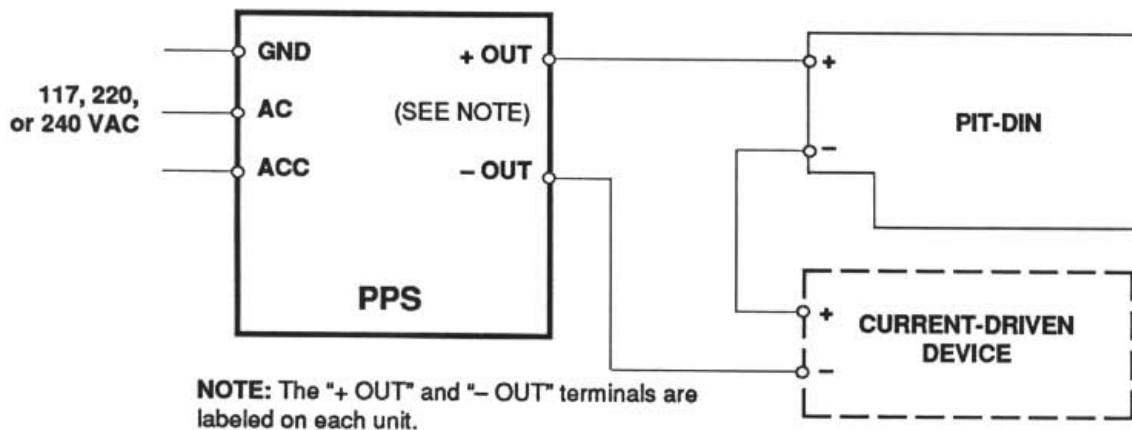


Figure 4. Typical Installation Hook-up

RETURN PROCEDURES

To return equipment to Moore Industries for repair, follow these four steps:

1. Call Moore Industries and request a Returned Material Authorization (RMA) number.

Warranty Repair –

If you are unsure if your unit is still under warranty, we can use the unit's serial number to verify the warranty status for you over the phone. Be sure to include the RMA number on all documentation.

Non-Warranty Repair –

If your unit is out of warranty, be prepared to give us a Purchase Order number when you call. In most cases, we will be able to quote you the repair costs at that time. The repair price you are quoted will be a "Not To Exceed" price, which means that the actual repair costs may be less than the quote. Be sure to include the RMA number on all documentation.

2. Provide us with the following documentation:
 - a) A note listing the symptoms that indicate the unit needs repair
 - b) Complete shipping information for return of the equipment after repair
 - c) The name and phone number of the person to contact if questions arise at the factory
3. Use sufficient packing material and carefully pack the equipment in a sturdy shipping container.
4. Ship the equipment to the Moore Industries location nearest you.

The returned equipment will be inspected and tested at the factory. A Moore Industries representative will contact the person designated on your documentation if more information is needed. The repaired equipment, or its replacement, will be returned to you in accordance with the shipping instructions furnished in your documentation.

WARRANTY DISCLAIMER

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RETURN POLICY

For a period of thirty-six (36) months from the date of shipment, and under normal conditions of use and service, Moore Industries ("The Company") will at its option replace, repair or refund the purchase price for any of its manufactured products found, upon return to the Company (transportation charges prepaid and otherwise in accordance with the return procedures established by The Company), to be defective in material or workmanship. This policy extends to the original Buyer only and not to Buyer's customers or the users of Buyer's products, unless Buyer is an engineering contractor in which case the policy shall extend to Buyer's immediate customer only. This policy shall not apply if the product has been subject to alteration, misuse, accident, neglect or improper application, installation, or operation. THE COMPANY SHALL IN NO EVENT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.



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