

HASTINGS

INSTRUCTION MANUAL

MODEL HPS-10 POWER SUPPLY



 **ISO 9001**
KEMA CERT 10192.01

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 **TELEDYNE**
HASTINGS INSTRUMENTS
A Teledyne Technologies Company

Manual Print History

The print history shown below lists the printing dates of all revisions and addenda created for this manual. The revision level letter increases alphabetically as the manual undergoes subsequent updates. Addenda, which are released between revisions, contain important change information that the user should incorporate immediately into the manual. Addenda are numbered sequentially. When a new revision is created, all addenda associated with the previous revision of the manual are incorporated into the new revision of the manual. Each new revision includes a revised copy of this print history page.

Revision A (Document Number 154-032000) March 2000

Hastings Instruments reserves the right to change or modify the design of its equipment without any obligation to provide notification of change or intent to change.

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Introduction

The Hastings Power Supply (HPS-10) supplies stable $\pm 15\text{VDC}$ specifically for Hastings mass flowmeters (HFM-200 and HFM-300 series). The flowmeter returns a 0-5VDC output that is proportional to flow that is digitally displayed.

Specifications

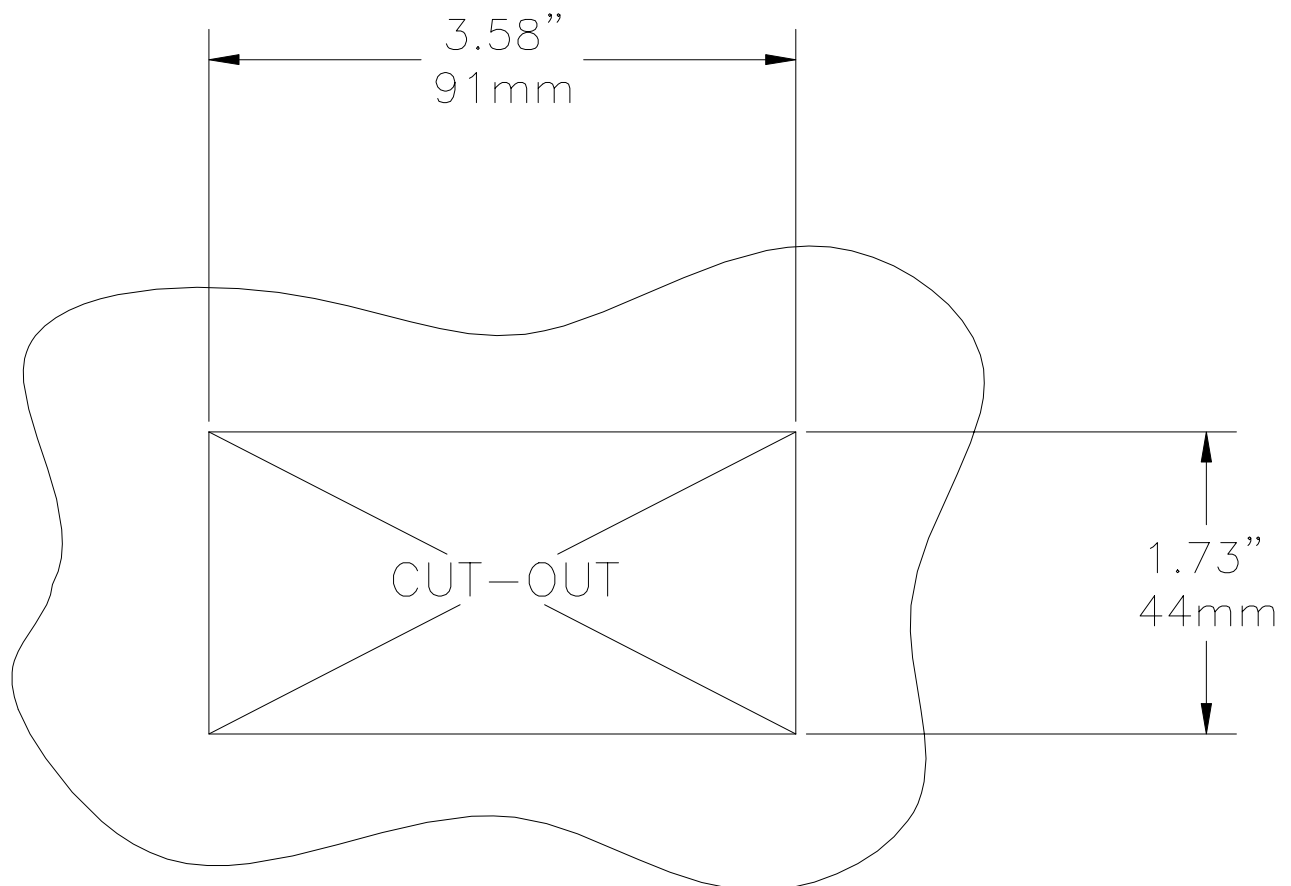
Output voltage	$\pm 15\text{VDC} \pm 2.5\%$
Power input	115VAC $\pm 10\%$, 50/60 Hz
Signal input	0 - 5VDC
Display	3½ digit
Analog output voltage	0 - 5VDC
Min. load impedance	10 kW
Display type	0.52" (13.2mm) red LEDs
Warm up time	15 min
Operating temperature	0 - 50°C
Load regulation	$\pm 1\%$ (10 mA-30 mA)

Receiving Inspection

Carefully unpack the HPS-10. Inspect all items received at this time for any obvious damage that may have occurred during shipment. Immediately advise the shipping agent if there is any damage to items in your shipment. Identify each item and the quantity received with those listed on the packing list.

Mounting

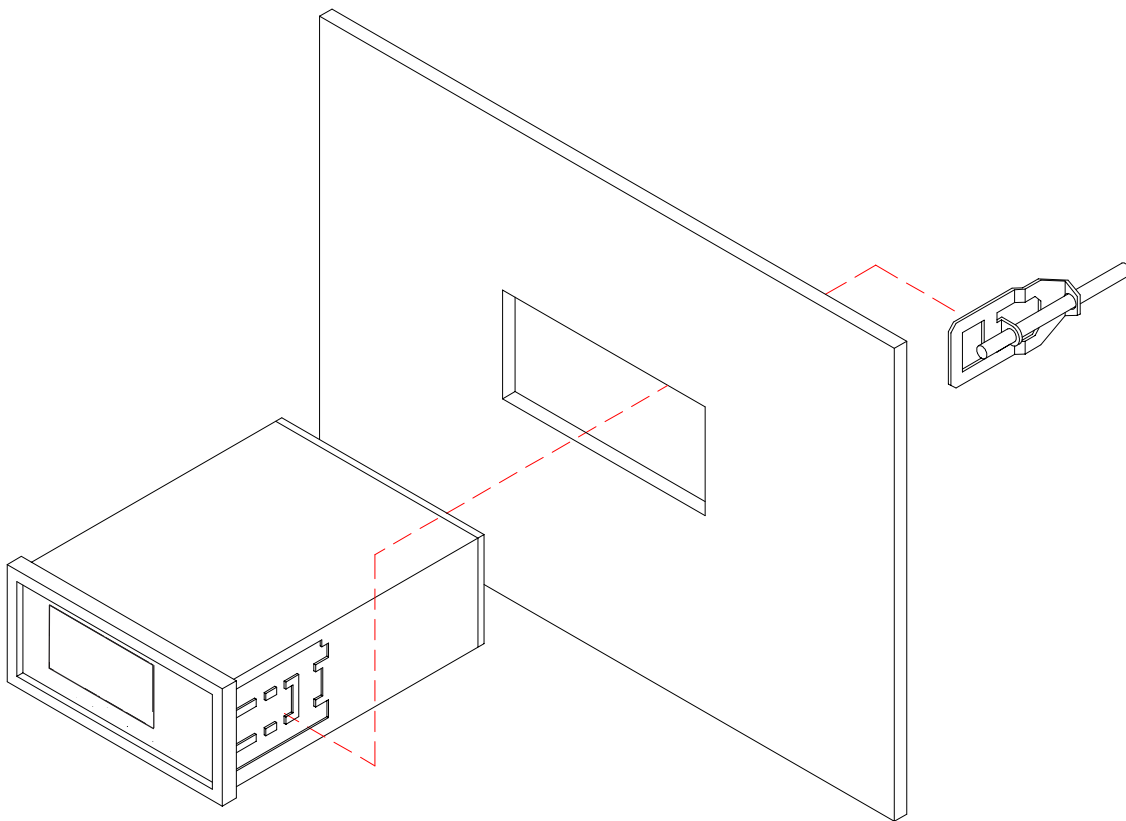
Cut out panel as shown in the diagram below.



To panel mount the HPS-10:

- 1) Slide power supply into panel from the front.
- 2) Attach brackets to the side of the power supply.
- 3) Tighten screws against panel.

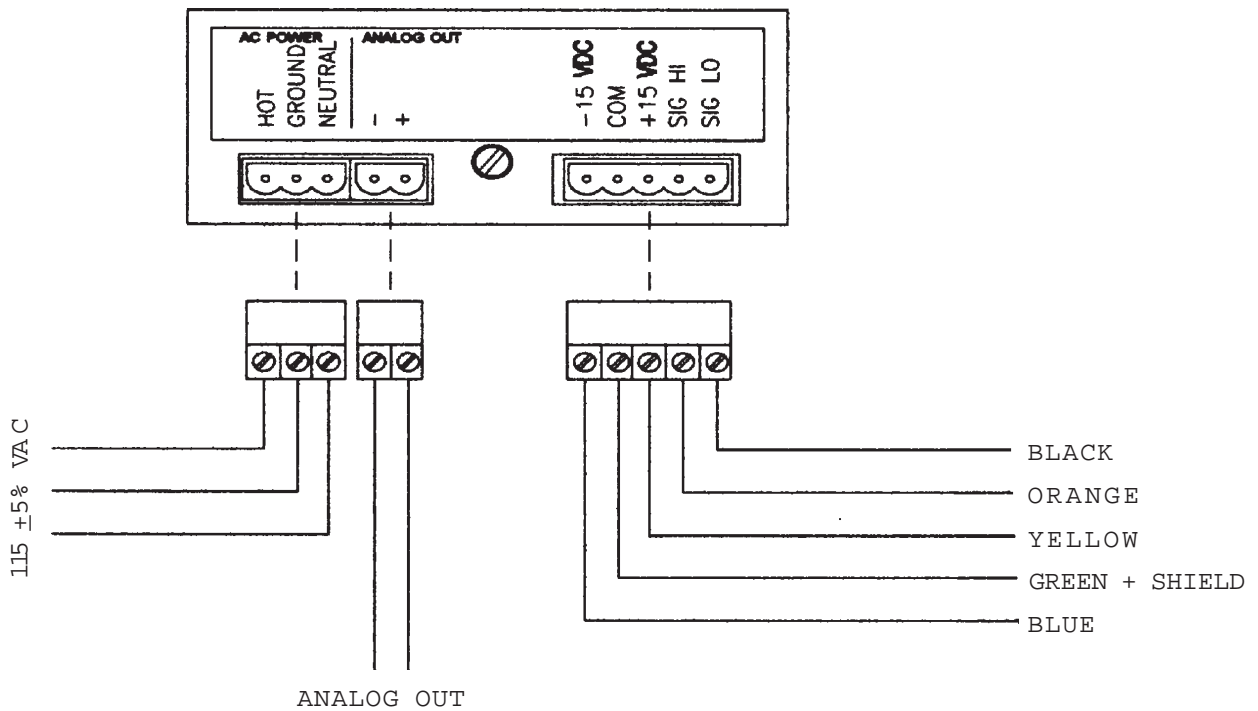
See Figure below:



Hastings HPS-10 Power Supply Cable Connections

The HPS-10 is supplied with a power cable. The 3-wire cable plugs into the back of the instrument in the socket marked "AC POWER".

A 5-wire shielded cable connects the instrument to the flowmeter. The diagram below shows the proper connections.



Normal Start-up

- 1) Connect the interface cable from the HPS-10 to the flowmeter. (See figure on page 2-4 of this manual)
- 2) Verify that the AC power to be applied to the HPS-10 is correct (115 VAC).
- 3) Apply AC power to the HPS-10.
- 4) The HFM instrument has a local zero adjustment. Follow the zero adjustment procedure described in the HFM-200 or HFM-300 series manual.

Caution

Before applying power to the instrument, ensure that the line voltage being applied is correct. Failure to do so may result in damage to the instrument not covered by the warranty.

Analog Output

The HPS-10 generates an analog signal which is directly proportional to the displayed pressure. The analog output signal is given by:

$$V_{\text{OUT}} = 5 * \frac{\text{DISPLAY GAS FLOW}}{\text{FLOWMETER RANGE}}$$

The output signal is a DC voltage with a full scale reading for a given flowmeter corresponding to +5VDC. For example, if one has a 100 sccm flowmeter with a displayed flow of 35 sccm, then the output voltage will be:

$$V_{\text{OUT}} = 5 * \frac{35 \text{ sccm}}{100 \text{ sccm}} = 1.75 \text{ Volts}$$

Conversely, if the analog output voltage is measured, then the gas flow reading is given by:

$$\text{GAS FLOW} = \frac{V_{\text{OUT}} (\text{V}) * \text{FLOWMETER RANGE}}{5}$$

Internal Adjustments

The internal adjustments are factory set and should not be changed. However, if the need arises and suitable standards are available the following adjustments can be made. (see figure on page 3-4)

Full Scale

The full scale potentiometer changes the display by changing the sensitivity of the instrument. Apply a calibrated +5 VDC signal to the **Sig Hi** and **Sig Lo** pins on the back of the power supply. The display of the instrument should read “100.0”, “10.00” or “1.000” depending upon the configuration. Adjust the full scale potentiometer (R11) if needed.

Analog Output

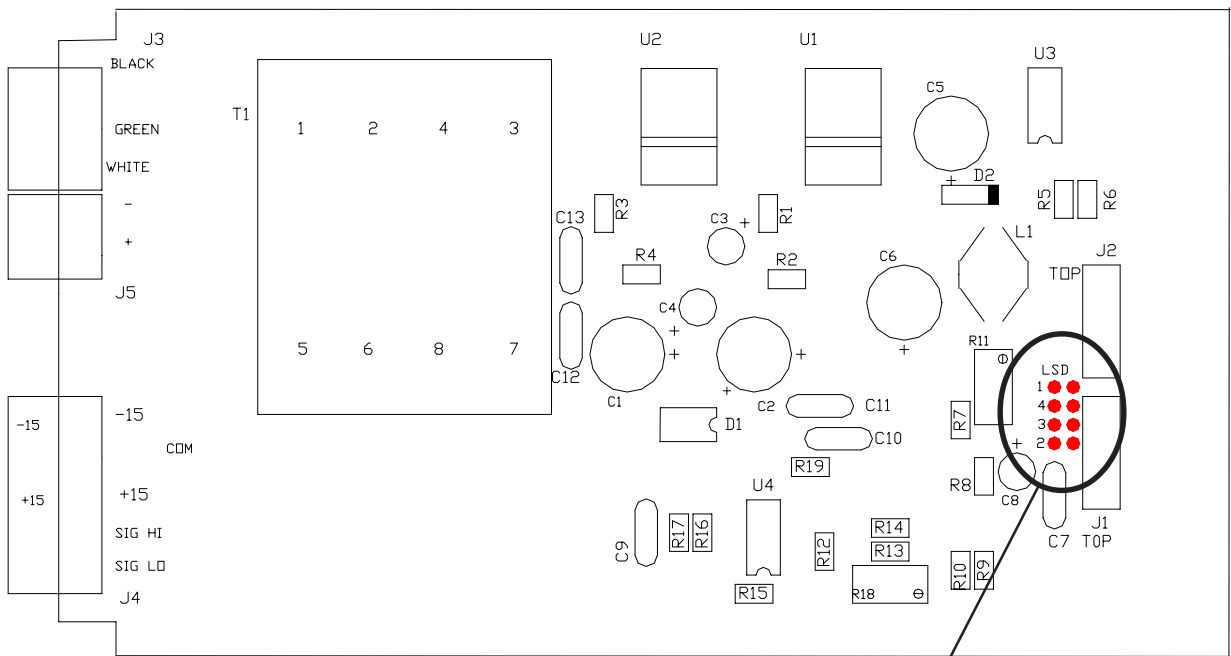
The analog output potentiometer changes the analog output voltage by changing the gain on the output buffer amplifier. Apply a calibrated pressure standard to the transducer and refer to equation (1). Adjust the potentiometer (R18) as needed.

Notes on internal adjustments:

- * Both the full scale reading and the analog output voltage can change by only $\pm 10\%$.
- ** Zero adjustment can only be performed on the flowmeter itself. Consult your flowmeters manual for making these adjustments.

Display Configuration

The jumper position on the power supply circuit board determines the location of the decimal on the display. The jumper is factory set to match the configuration specified by the customer. Should the need arise to change the display configuration, this jumper can be easily moved (see figure on page 13).



configuration jumpers

Jumper Location	Display Configuration
1	100.0
4	not used
3	1.000
2	10.00

Warranty and Repair

Warranty Policy

Hastings Instruments warrants this product for a period of one year from the date of shipment to be free from defects in material and workmanship. This warranty does not apply to defects or failures resulting from unauthorized modification, misuse or mishandling of the product. This warranty does not apply to batteries or other expendable parts, nor to damage caused by leaking batteries or any similar occurrence. This warranty does not apply to any instrument which has had a tamper seal removed or broken.

This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty as to fitness for a particular use. Hastings Instruments shall not be liable for any indirect or consequential damages.

Hastings Instruments will, at its option, repair, replace or refund the selling price of the product if Hastings Instruments determines, in good faith, that it is defective in materials or workmanship during the warranty period. Defective instruments should be returned to Hastings Instruments together with a written statement of the problem and a Return Material Authorization (RMA) number. Please consult the factory for your RMA number before returning any product for repair.

Non-Warranty Repair Policy

Any product returned for a non-warranty repair must be accompanied by a purchase order, RMA form and a written description of the problem with the instrument. If the repair cost is higher, you will be contacted for authorization before we proceed with any repairs. If you then choose not to have the product repaired, a minimum will be charged to cover the processing and inspection. Please consult the factory for your RMA number before returning any product for repair.

TELEDYNE HASTINGS
804 NEWCOMBE AVENUE
HAMPTON, VIRGINIA 23669 U.S.A.
ATTENTION: REPAIR DEPARTMENT

TELEPHONE (757) 723-6531
1-800-950-2468
FAX (757) 723-3925

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