



CS-7200 SERIES CONTROL STATIONS

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Due to wide variations in the terminal numbering of actuator products, actual wiring of this device should follow the wiring drawing supplied with the unit.

I. Description

The CS-7200 series Control Stations are designed for position indication and control of Jordan Controls actuators and servo-amplifiers, or other final control elements. They may be used as a local control station with or without a separate, remotely located process controller or servo-amplifier.

The CS-7210 and CS-7230 control stations are used for manually setting the command ("local setpoint") signal in a closed loop servo or process control system. The CS-7230, in addition, has a selector switch to display either the local setpoint value or feedback signal.

Models CS-7220 and CS-7240 are used with a separate process controller or servo-amplifier to provide local or remote control of the 4 to 20 mA output signal and displays either the local or remote signal. The CS-7240 also has a selector switch to display the command (local setpoint or remote) or the process feedback signal.

The CS-7250 control station is used to manually control an actuator or motor via pushbuttons, and display a feedback signal. The CS-7250 can control single phase ac actuators produced by Jordan Controls, or three phase contactors driving three phase motors or actuators.

All Control Stations are housed in a DIN size enclosure (92 x 144 mm). Options include: an on/off power switch on front panel, 120 Vac or 240 Vac input power, and a Security door.

II. Specifications

A. Electrical

1. Input Power(Terminals 1 & 2)
120 V ac $\pm 10\%$, 50/60 Hz or
240 V ac $\pm 10\%$, 50/60 Hz; 3 VA
Fused, 7 A, slow blow. Replace with
Littlefuse 275007 or equiv.

2. 24 V Supply(Customer use)
24 V dc ± 1 V, 60 mA maximum
Terminals 8(+),7(-)
Fused, .06 A slow blow
(Littlefuse 275.062 or Equiv.)
3. Pushbutton Contact Ratings
15 A @ 120 V ac,10 A @ 250 V ac
(MODEL CS-7250)
Terminals 4(COM),5(INC),6(DEC)
3/4 HP @ 250 V ac
4. Input Signals: Command 10(+),9(-);
Feedback 12(+).11(-)
NOTE: Requires configuration by dip switches
 - a. Potentiometer
1K to 10K ohm, powered by 24 V dc
supply; 2 Watt minimum
200K ohm input impedance
 - b. dc Voltage
Minimum span: 4 V
Maximum span: 24 V
Range limits: 0 V to 24 V
100K ohm minimum input impedance
 - c. 4 to 20 mA
Minimum span: 15 mA
Maximum span: 17 mA
Range limits: 3 mA to 25 mA
Shunt resistor value: 249 ohms $\pm 1\%$
5. Output Signal
Type: Floating current source
Range: 4 to 20 mA $\pm 1\%$

Terminals 14(+), 13(-)
Drive load: 600 ohms maximum
Conformity: within .5% of input span
6. Display
Type: 3° digit LCD, .35 inch
character height
Range: 00.0 to 100.0
Accuracy: within .2% of span, ± 1 digit
over full temperature range

B. Mechanical

1. Size 72mm x 144mm x 195mm
(2.8 in x 5.7 in x 7.7 in)
add 30mm(1.2 in) for Security door
2. Panel Cutout 68.4mm x 138.5mm
(2.685 in x 5.45 in)
3. Weight 1.0Kg (2.2lb)
4. Minimum Spacing Between Adjacent Stations
25mm (1.0 in)

C. Environmental

1. Temperature Range
Operating: 0 to 50°C (32 to 122° F)
Storage: -10 to 60° C (14 to 140° F)
2. Humidity To 90%, non-condensing

III. Theory of Operation

The CS-7200 series Control Stations consist of one or more of the following circuit blocks: Power Supply, Output Signal Conditioning, and Display block. Except for the CS-7250, a Local Set Point is also used. The CS-7250 has a set of manual pushbuttons to directly control ac power to the load.

Refer to pages 9 to 12 for block diagrams of the specific Control Stations.

A. Power Supply Block

The Power Supply Block powers all the electronics, display, and external power for customer supplies signals (Terminals 7 and 8). The 24 V dc supply is internally fused for protection against shorting.

B. Input Signal Conditioning Block

The Input Signal Conditioning Block is used to set various input signals to a signal for the Output Conditioning Block. Two dip switches and two trim potentiometers are used in this block. For Control Stations that input a remote command and feedback signals, all four dip switches and two sets of trim potentiometers are used.

C. Output Conditioning Block

This block is used to convert the incoming signals to a 4 to 20 mA output (terminals 13 and 14). The 4 to 20 mA output is a floating type current source and can not be referenced to any other input signal (i.e., can not share common grounds). Use a loop isolator if any doubt exists. The output block can drive up to a 600 ohm load.

The Output Conditioning Block is monitored by the Display Block (except for feedback inputs) and the output signal must return to the control station. If this output is not used, a jumper should be installed between terminals 13 and 14.

D. Display Block

The Display Block consists of a self-contained meter and circuitry, connector harness, and an offset circuit. The Display Block monitors the Output Conditioning Block signal (4 to 20 mA) and displays 0.0 to 100.0 percent full range. If a command/feedback switch is present, it also monitors the Feedback Input Conditioning Block.

E. Local Set Point Block

Except for the CS-7250, all the Control Stations have a Local Set Point Block. This block consists of the front panel potentiometer with thumbwheel, and high and low trim potentiometers. This block's signal goes to the Output Conditioning Block for 4 to 20 mA output.

F. Motor Control Block

The CS-7250 is the only Control Station to have a Motor Control Block. This block consists of the two pushbutton switches located on the front panel. These pushbuttons are mechanically interlocked, and when pushed, supplies ac line power to terminals 5 and 6 (terminal 4, power common or neutral). The switched power is protected by an internal fuse against any short circuit.

IV. Storage

If the actuator will not be installed immediately, it should be stored in a clean, dry area where the ambient temperature is no less than -20° F. The actuator should not be stored in a corrosive environment.

V. Calibration and Set up Procedure

Units are preset at the factory and calibration is not necessary. However, calibration may be necessary if your input signal requirements change. All trim pots and dip switches are accessible through the side of enclosure. Equipment needed: 3° digit voltmeter(minimum), 0 to 20 V dc scale

NOTE: Check dip switch settings and calibrate input signals before proceeding. Make sure jumper across terminals 13 & 14 is in place before starting (if not using the 4 to 20 mA output).

A. CS-7210

1. Adjust Local Set Point adjustment pots, "High" & "Low", fully CW.
2. Set "Local Set Point" pot to minimum(decrease direction).
3. Adjust "Zero" pot to get 2.50 V dc output at terminals 13(+) & 7(-).
4. Adjust "Meter Offset" pot for 00.0 on display.
5. Set "Local Set Point" pot to maximum.
6. Adjust "Span" pot to get 12.50 V dc at terminals 13 & 7.
7. Repeat steps b through f until interaction no longer occurs.

B. CS-7220

1. Set "Local/Remote" switch to "Remote".
2. With minimum command input signal on terminals 9(-) & 10(+), adjust "Zero" pot for 2.50 V dc at terminals 13(+)% 7(-).
3. Adjust "Meter Offset" pot for display reading of 00.0 .
4. With maximum command input, adjust "Span" pot for 12.50 V dc at terminals 13 & 7.
5. Repeat steps b & d until interaction no longer occurs.
6. Set "Local/Remote" switch to "Local".

7. With "Local Set Point" pot at minimum, adjust "Low" trim pot for 00.0 on display.
8. With "Local Set Point" pot at maximum, adjust "High" trim pot for 100.0 on display.
9. Repeat steps g & h until interaction no longer occurs.

C. CS-7230

1. Set "Command/Feedback" switch to "Command".
2. Refer to CS-7210 calibration procedure for setting "Local Set Point" pot, 4 to 20 mA output, and display sections.
3. Set "Command/Feedback" switch to "Feedback".
4. With minimum feedback input signal, adjust "Offset" pot to get 00.0 on display.
5. With maximum feedback input signal, adjust "Gain" pot to get 100.0 on display.
6. Repeat steps d & e until interaction no longer occurs.

D. CS-7240

1. Set "Command/Feedback" switch to "Command".
2. "Remote/Local" calibration: Refer to CS-7220 calibration procedure.
3. Set "Command/Feedback" switch to "Feedback".
4. With minimum Feedback signal on terminals 11(-) & 12(+), adjust "Offset" trim pot for 00.0 on display.
5. With maximum feedback signal, adjust "Gain" trim pot for 100.0 on display.
6. Repeat steps d & e until interaction no longer occurs.

E. CS-7250

1. With minimum feedback signal in terminals 9(-) & 10(+), adjust "Zero" trim pot to get 2.50 V dc at terminals 13(+) & 7(-).
2. Adjust "Meter Offset" for 00.0 on display.
3. With maximum feedback signal, adjust "Span" pot for 100.0 on display.
4. Repeat steps a & c until interaction no longer occurs.

VI. Actuator Compatibility for CS-7250 Manual Control Station

Caution: Actuator and control station **MUST** be of the same line voltage potential. Otherwise, damage will result to one or both pieces of equipment.

Single phase (120 or 240 V)AC models of following actuator series:

- SM, LA, VA, CVA, MV, MC-1100 SERIES
- SM, LA, VA, CVA, MV-1500 SERIES
- SM-1630
- SM-1700 SERIES
- LA-2400 SERIES
- LA-2820
- SM, LA-5100 SERIES
- SM, LA-5220

3 Phase reversing contactor controlling 3 phase motor or actuator.

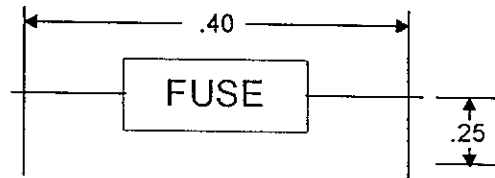
VII. Fuse Replacement Procedure

To replace any of the two fuses, use the following procedure.

NOTE: Find out why the fuse blew in the first place!

- a. Remove all power from the control station.
- b. Remove the four screws from the back panel.
- c. Slide out the circuit board as far as it will go.
- d. Remove fuse. F1(7 A) is near the bottom of board, and F2(.062 A) is in the middle of board to the left of transformer.
- e. Cut and bend leads of new fuse as shown in Fig. 2 and insert into sockets on board.
- f. Slide board back in and tighten back panel.
- g. Connect all wiring to terminal strip.

Figure 2



VIII. Switch Settings

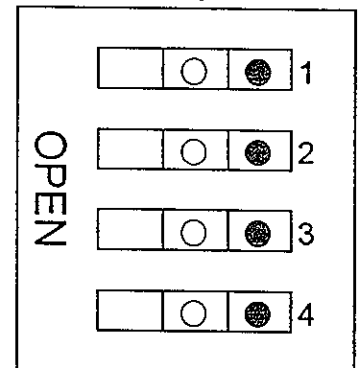
The dip switches are used to set up the input circuitry for use with different ranges of input signals. The dip switches are accessible through the enclosure and are labeled 1 through 4, with switch 1 closest to the top.

For inputs to terminals 9 & 10, sw 3 & 4 are used.
For inputs to terminals 11 & 12, sw 1 & 2 are used.

Input Signal Terminals 9 & 10	Switch Settings	Input Signal Terminals 11 & 12	Switch Settings
4-20 mA	sw 3 & 4 closed	4-20 mA	sw 1 & 2 closed
0 to 5 V 1 to 5 V 0 to 10 V 2 to 10 V	sw 3 open sw 4 closed	0 to 5 V 1 to 5 V 0 to 10 V 2 to 10 V	sw 1 closed sw 2 open
0 to 15 V 0 to 24 V pot. (min. 60% travel)	sw 3 & 4 open	0 to 15 V 0 to 24 V pot. (min. 60% travel)	sw 1 & 2 open

For different input signals, consult factory for correct dip switch settings.

FIGURE 1 - sw 1-4 shown in closed position

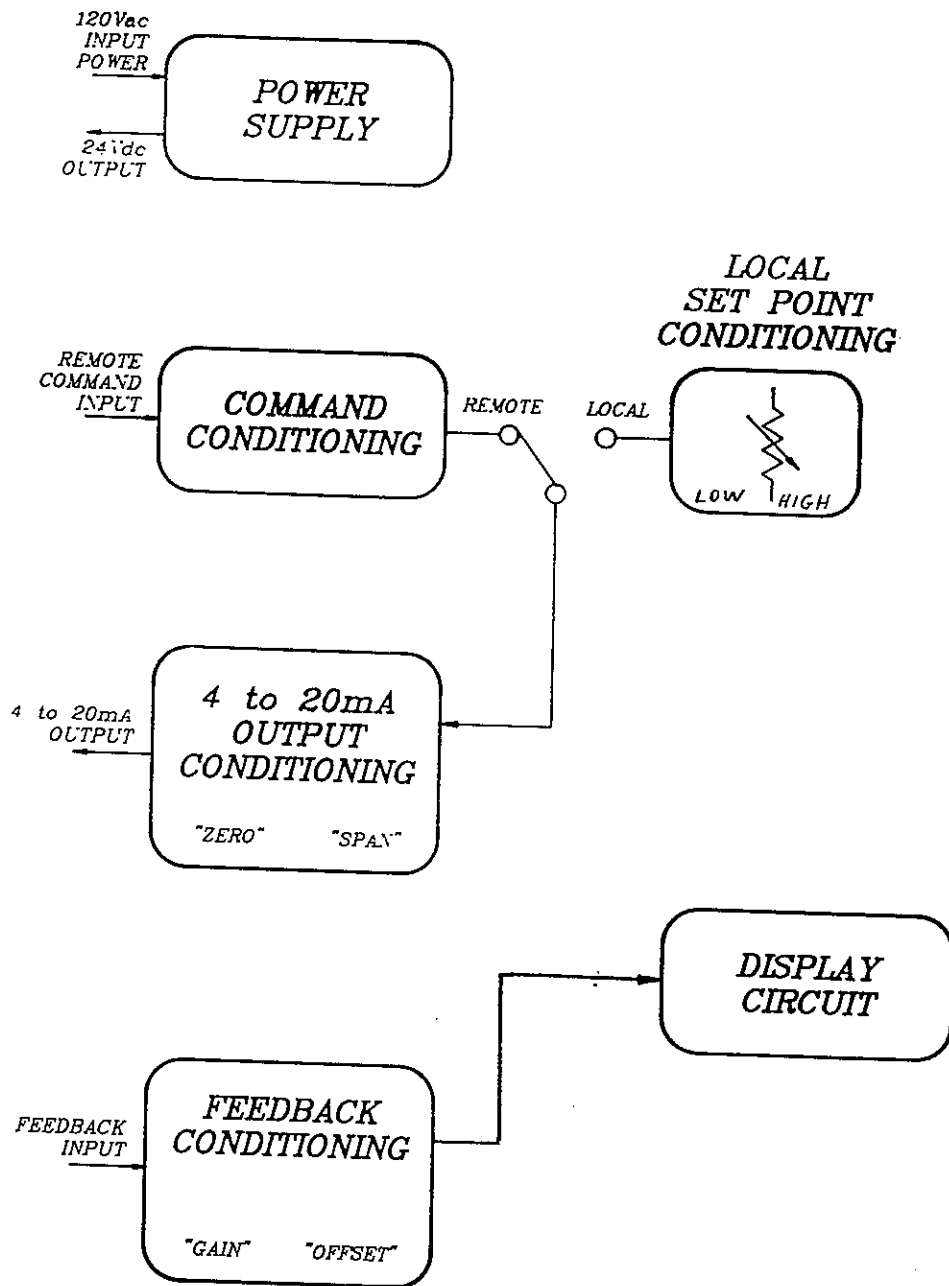


IX. Troubleshooting Guide

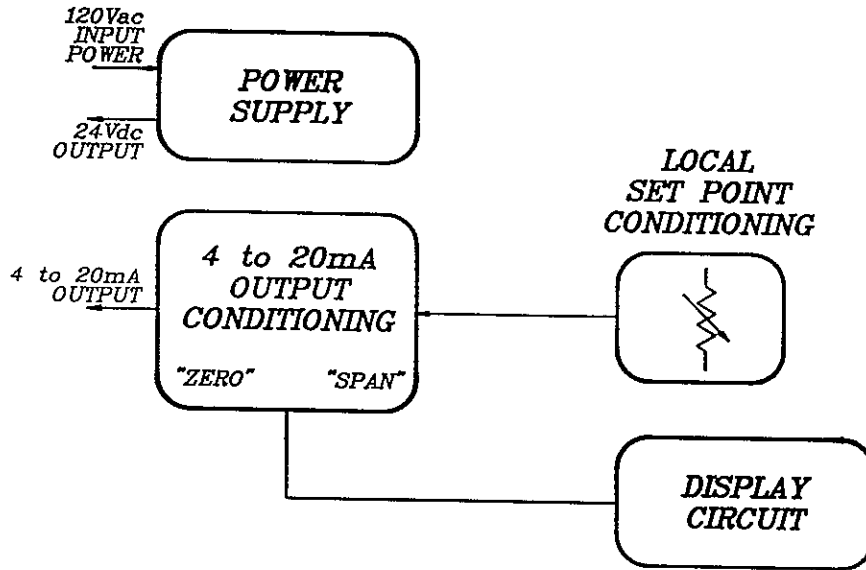
Below are some troubleshooting hints to use before calling Jordan Controls Service Department with any problems.

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. No Display	<ol style="list-style-type: none"> 1. No line power. 2. 24 V fuse blown (F2) 3. Connector off meter 4. Optional on/off switch in off position 5. Line fuse blown (F1) 	<ol style="list-style-type: none"> 1. Check for power at terminals 1 & 2 2. Replace with Little fuse #275.250 or equivalent (Jordan Controls 37A-025263-006) 3. Remove front panel and reconnect 4. Turn Switch on 5. Replace internal fuse with Little fuse #275007 or equivalent (Jordan Controls 37A-025263-015)
2. Display reads approx. - 24.8	<ol style="list-style-type: none"> 1. 4 to 20 mA output (terminals 13 & 14) open 	NOTE: If not using, jumper across terminals. If output is being used, find faulty external wiring.
3. Can not adjust output for input range		<ol style="list-style-type: none"> 1. Check dip switch settings
4. Display range not correct (0.00 to 100.0)		<ol style="list-style-type: none"> 1. Check dip switch settings
5. Display reads 00.0	<ol style="list-style-type: none"> 1. Output signal grounded to control station signal common 	<ol style="list-style-type: none"> 1. Remove ground and/or add a loop isolator 2. Use a parallel, but isolated feedback (or command) signal

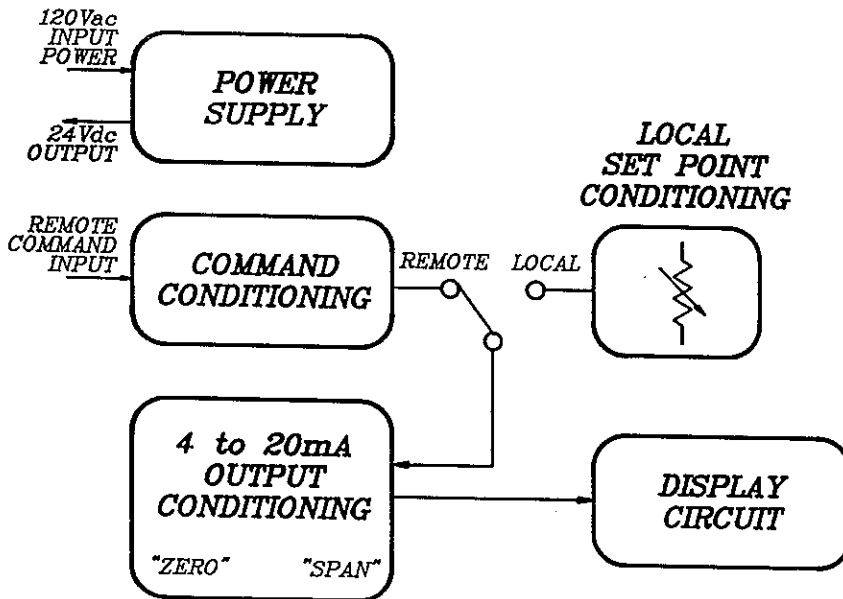
CS-7200-1001 BLOCK DIAGRAM



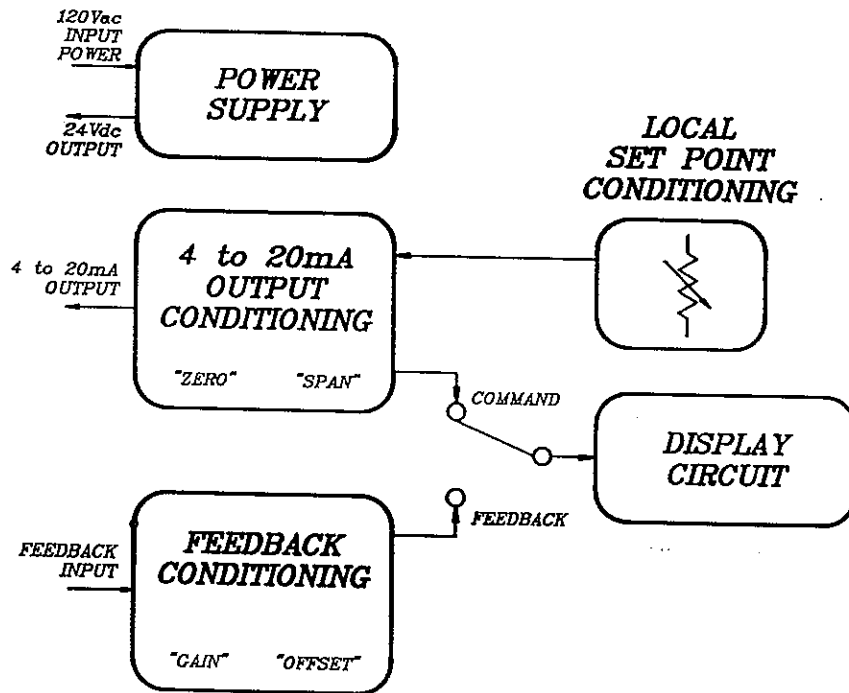
CS-7210 BLOCK DIAGRAM



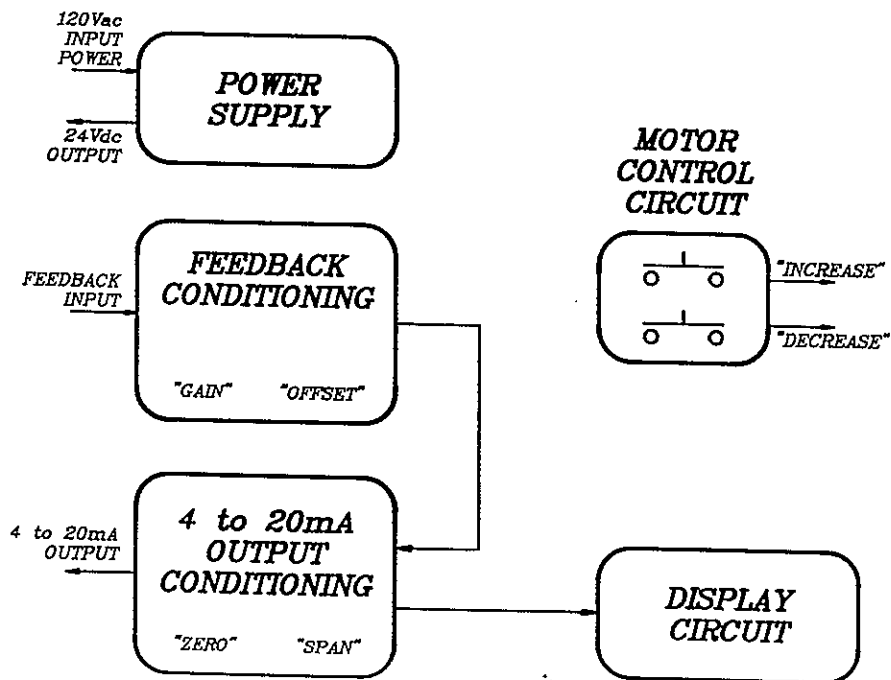
CS-7220 BLOCK DIAGRAM



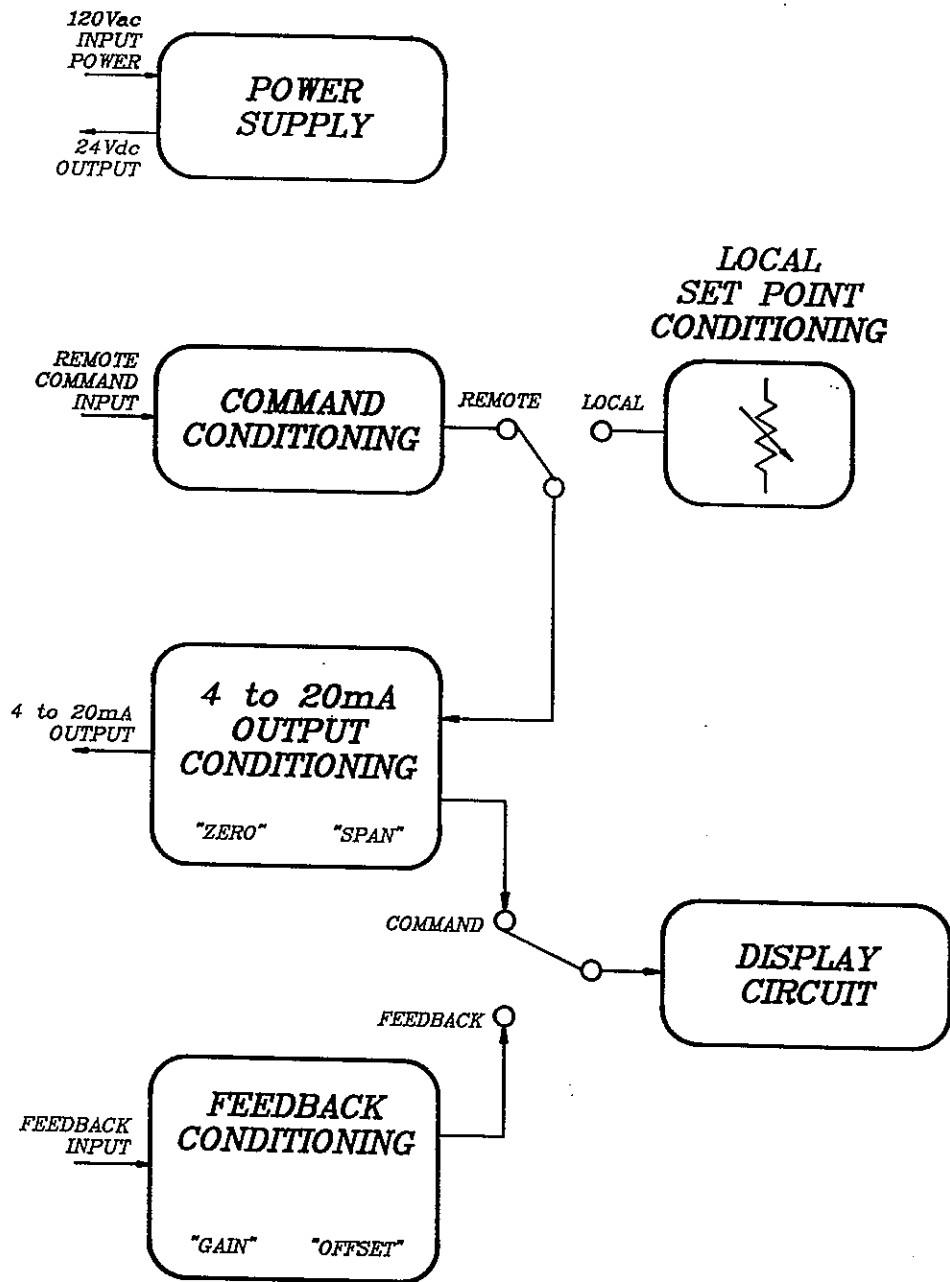
CS-7230 BLOCK DIAGRAM

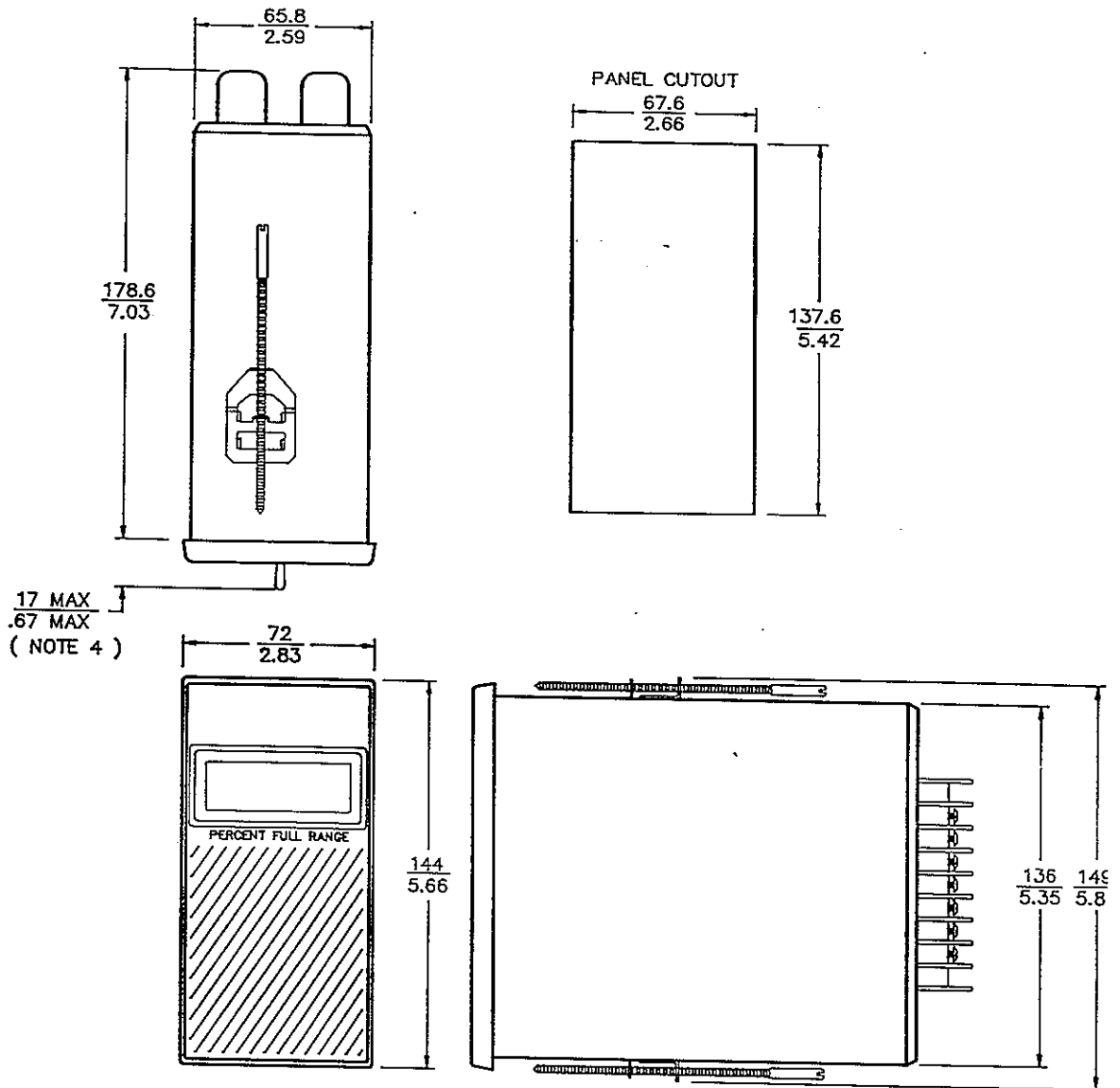


CS-7250 BLOCK DIAGRAM



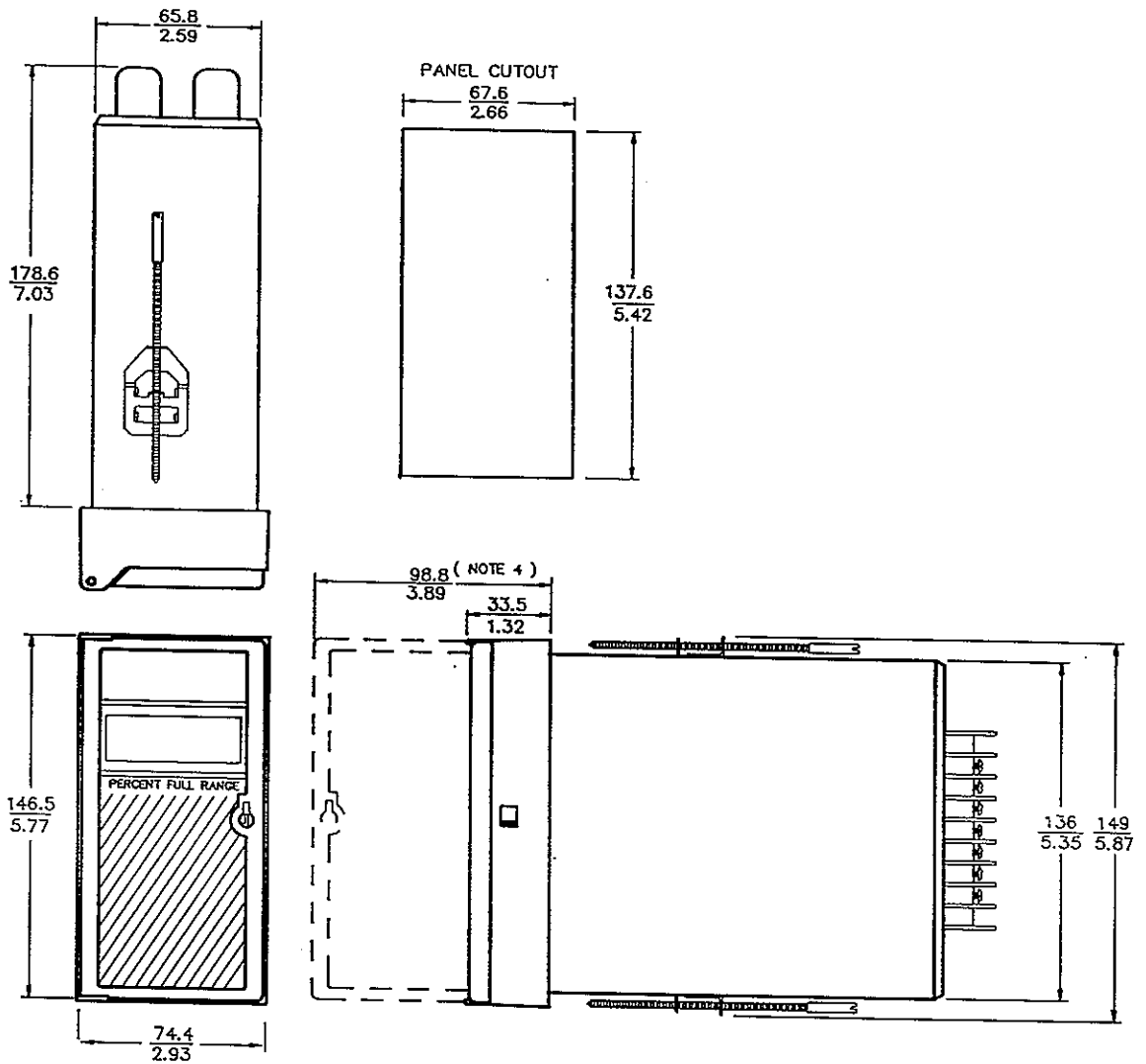
CS-7240 BLOCK DIAGRAM





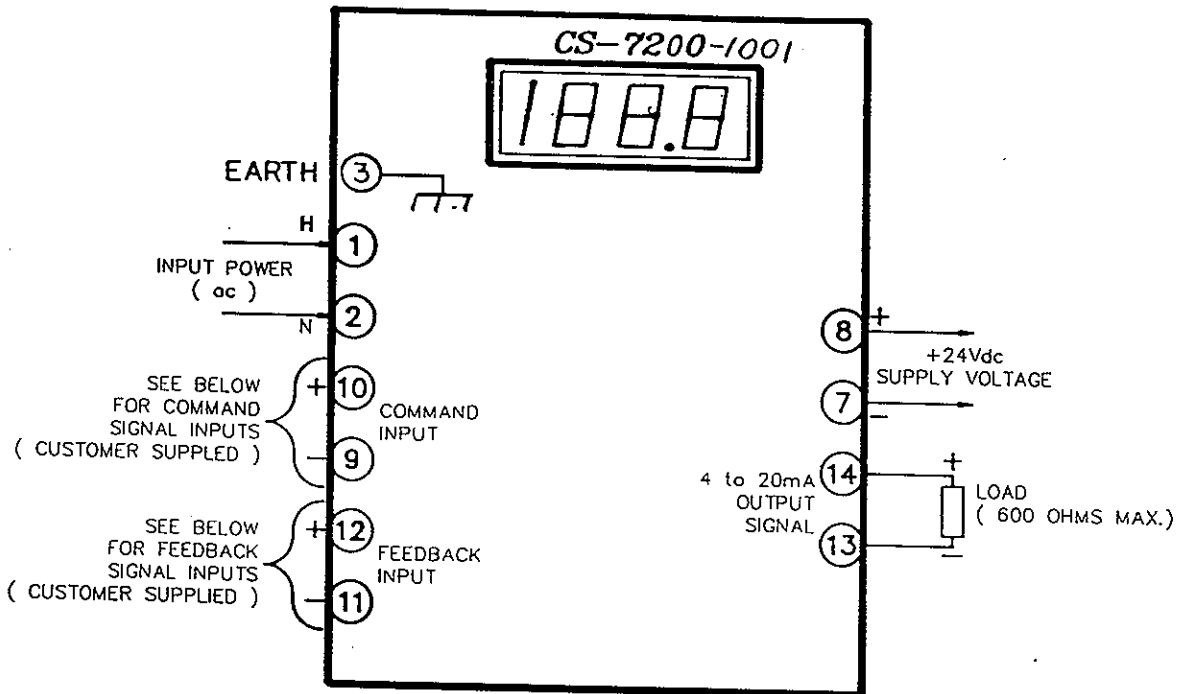
NOTES

- 1) REMOVE MOUNTING BRACKETS BEFORE INSERTING INTO PANEL CUTOUT.
- 2) FOR MULTIPLE METER MOUNTINGS, ALLOW AT LEAST 25.5mm (1") SPACING BETWEEN ANY ADJACENT PANEL CUTOUT AREA.
- 3) DIMENSIONS ARE IN $\frac{\text{mm}}{\text{INCHES}}$
- 4) DIMENSION SHOWS MAXIMUM DISTANCE (FOR MODELS WITH SWITCHES).

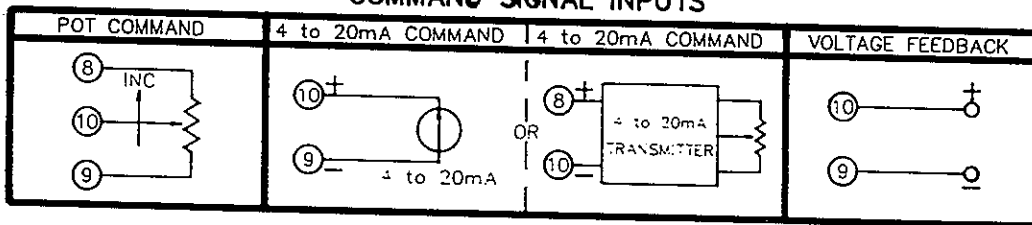


NOTES

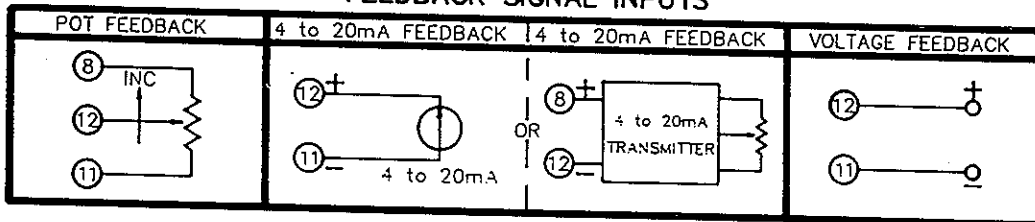
- 1) REMOVE MOUNTING BRACKETS BEFORE INSERTING INTO PANEL CUTOUT.
- 2) FOR MULTIPLE METER MOUNTINGS, ALLOW AT LEAST 25.5mm (1") SPACING BETWEEN ANY ADJACENT PANEL CUTOUT AREA.
- 3) DIMENSIONS ARE IN $\frac{\text{mm}}{\text{INCHES}}$.
- 4) DIMENSION SHOWS CLEARANCE REQUIRED TO OPEN DOOR.



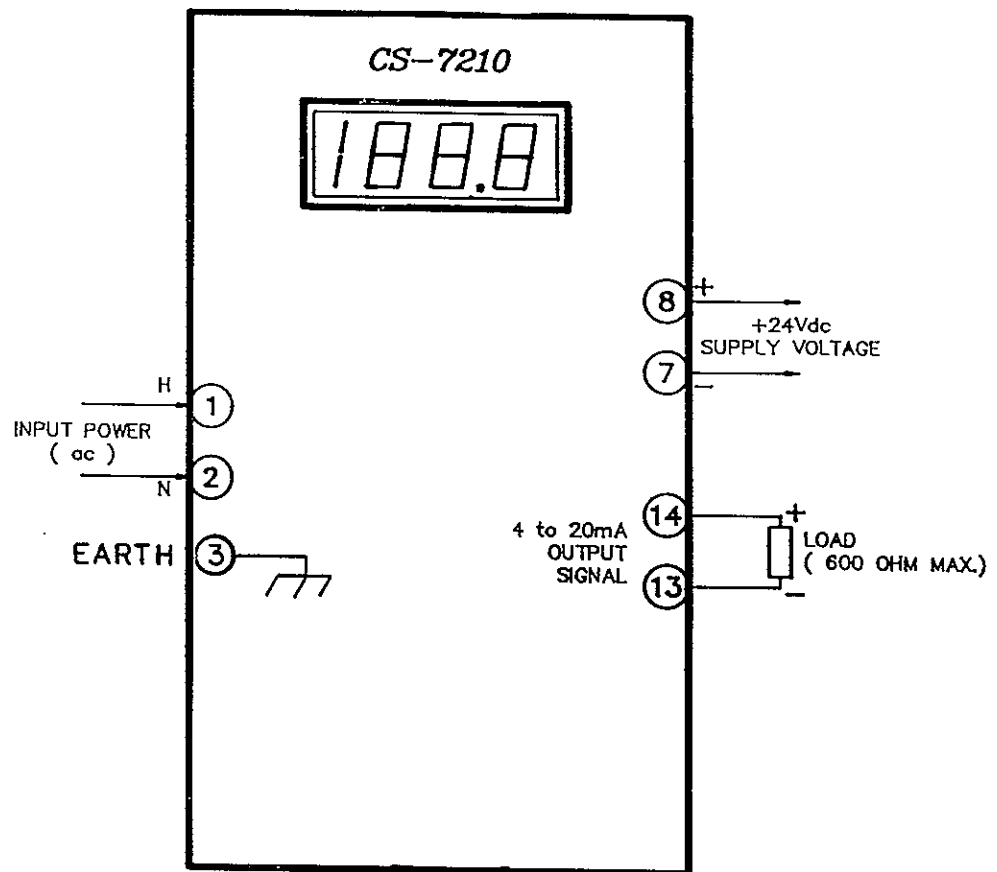
COMMAND SIGNAL INPUTS



FEEDBACK SIGNAL INPUTS

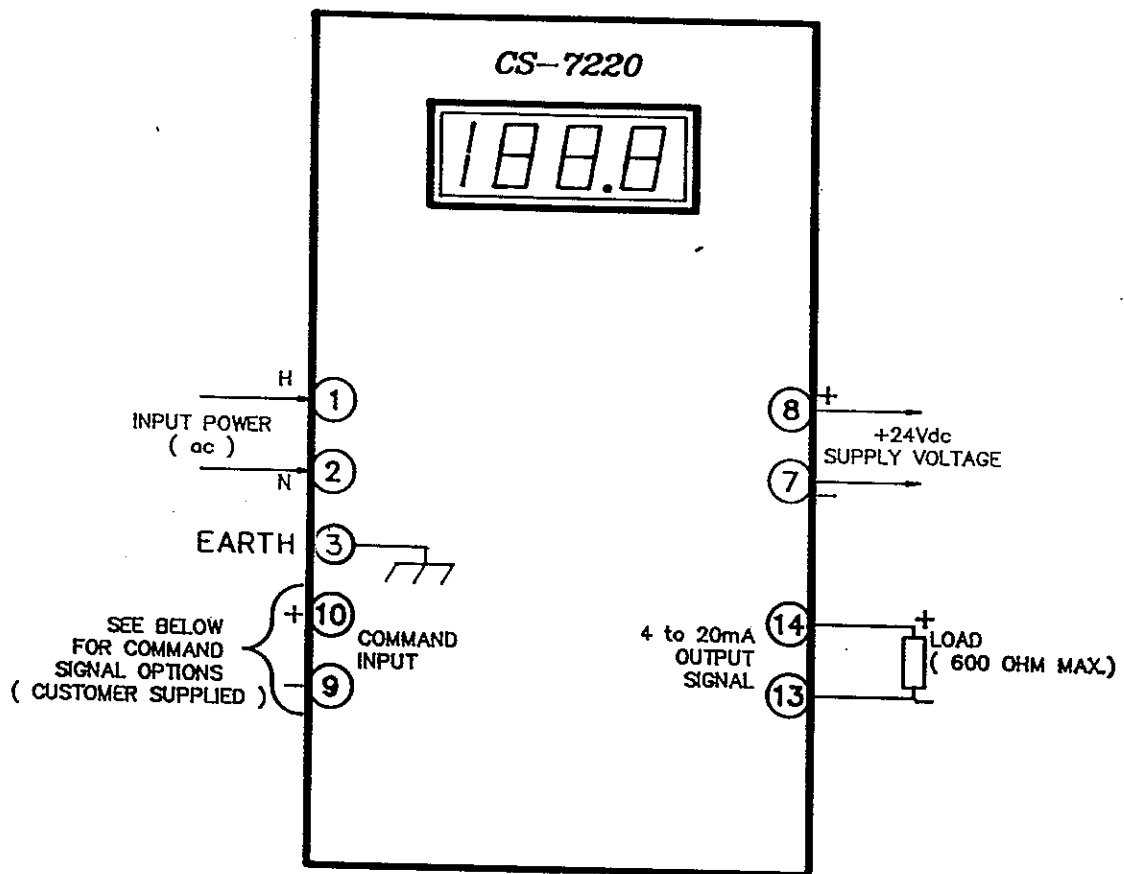


- NOTES**
- 1) FOR PROPER ac INPUT POWER, REFER TO LABEL ON SIDE OF ENCLOSURE.
 - 2) WITH THE "LOCAL-REMOTE" SWITCH IN THE "LOCAL" POSITION, TURNING THE "LOCAL SET POINT" POT ON THE FRONT PANEL TOWARDS INCREASE WILL RESULT IN AN INCREASING 4 to 20mA OUTPUT SIGNAL AT TERMINALS 13 AND 14.
 - 3) WITH THE "LOCAL-REMOTE" SWITCH IN THE "REMOTE" POSITION, AN INCREASING COMMAND SIGNAL AT TERMINALS 9 AND 10 WILL RESULT IN AN INCREASING 4 to 20mA OUTPUT SIGNAL AT TERMINALS 13 AND 14.
 - 4) MONITOR CUSTOMER SUPPLIED FEEDBACK SIGNAL. AN INCREASING FEEDBACK SIGNAL WILL RESULT IN AN INCREASING METER READING.



NOTES

- 1) FOR PROPER ac INPUT POWER, REFER TO LABEL ON SIDE OF ENCLOSURE.
- 2) TURNING THE "LOCAL SET POINT" POT ON THE FRONT PANEL TOWARDS INCREASE WILL RESULT IN AN INCREASING 4 to 20mA OUTPUT SIGNAL AT TERMINALS 13 AND 14. THIS SHOULD ALSO RESULT IN AN INCREASING METER READING.

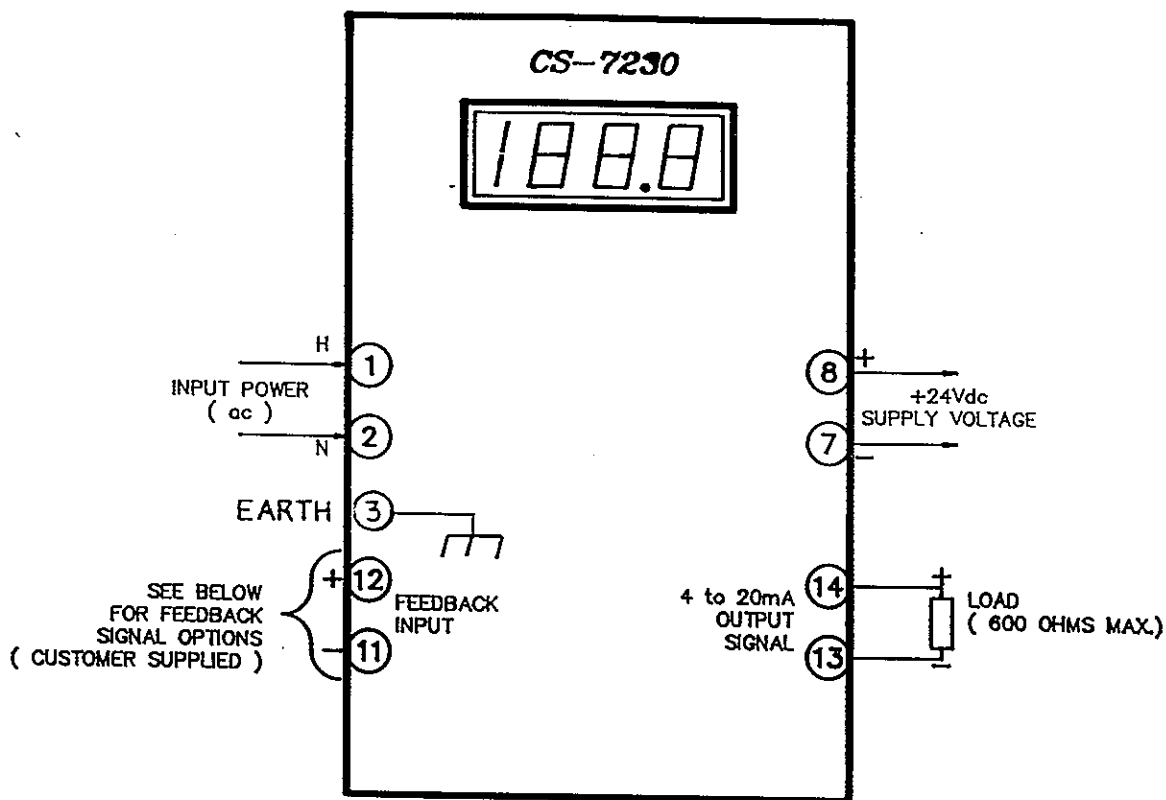


COMMAND SIGNAL INPUTS

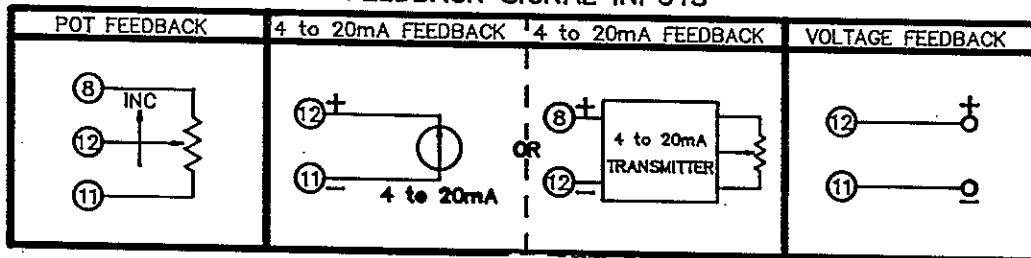
POT COMMAND	4 to 20mA COMMAND	4 to 20mA COMMAND	VOLTAGE COMMAND
		<p>OR</p>	

NOTES

- 1) FOR PROPER ac INPUT POWER, REFER TO LABEL ON SIDE OF ENCLOSURE.
- 2) WITH THE "LOCAL-REMOTE" SWITCH IN THE "LOCAL" POSITION, TURNING THE "LOCAL SET POINT" POT ON THE FRONT PANEL TOWARDS INCREASE WILL RESULT IN AN INCREASING 4 to 20mA OUTPUT SIGNAL AT TERMINALS 13 AND 14. THIS SHOULD ALSO RESULT IN AN INCREASING METER READING.
- 3) WITH THE "LOCAL-REMOTE" SWITCH IN THE "REMOTE" POSITION, AN INCREASING COMMAND SIGNAL AT TERMINALS 9 AND 10 WILL RESULT IN AN INCREASING 4 to 20mA OUTPUT SIGNAL AT TERMINALS 13 AND 14. THIS SHOULD ALSO RESULT IN AN INCREASING METER READING.

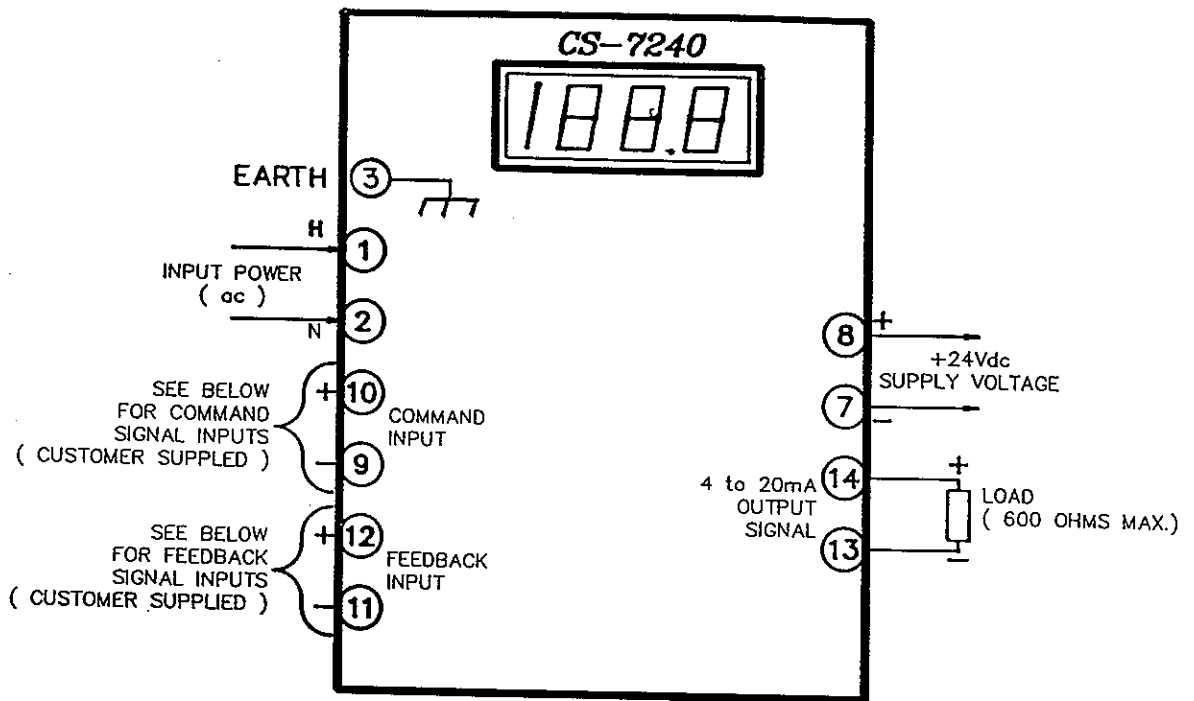


FEEDBACK SIGNAL INPUTS

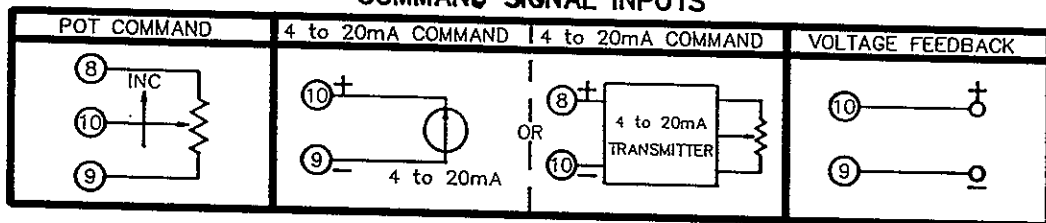


NOTES

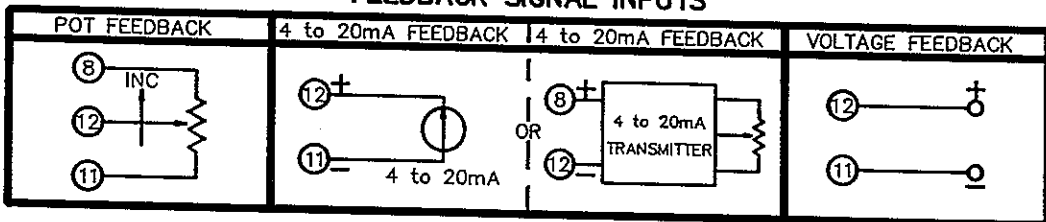
- 1) FOR PROPER ac INPUT POWER, REFER TO LABEL ON SIDE OF ENCLOSURE.
- 2) TURNING THE "LOCAL SET POINT" POT TOWARDS "INCREASE" WILL RESULT IN AN INCREASING 4 to 20mA OUTPUT SIGNAL AT TERMINALS 13 AND 14.
- 3) WITH THE "FEEDBACK-COMMAND" SWITCH IN THE "COMMAND" POSITION TURNING THE "LOCAL SET POINT" POT TOWARDS INCREASE WILL RESULT IN AN INCREASING METER SIGNAL.
- 4) WITH THE "FEEDBACK-COMMAND" SWITCH IN THE "FEEDBACK" POSITION AN INCREASE IN THE FEEDBACK INPUT SIGNAL TO TERMINALS 11 AND 12 (CUSTOMER SUPPLIED) WILL RESULT IN AN INCREASING METER READING.



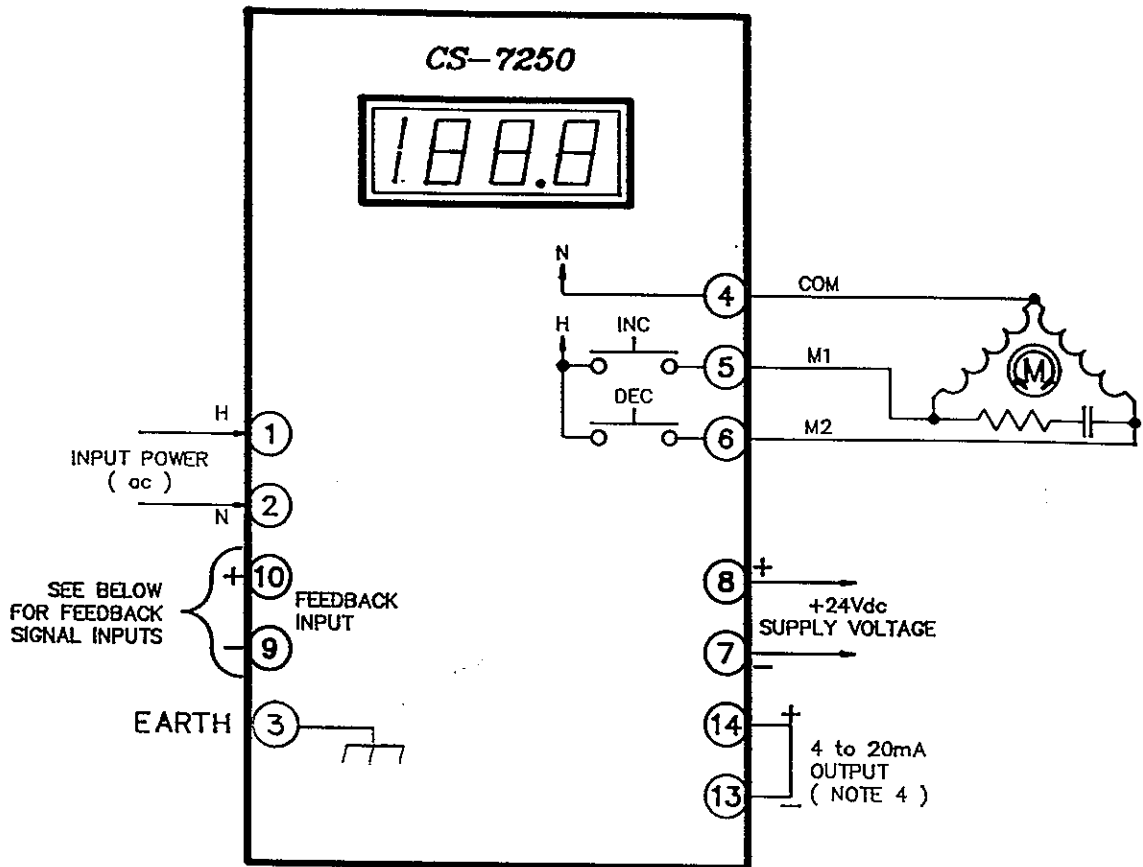
COMMAND SIGNAL INPUTS



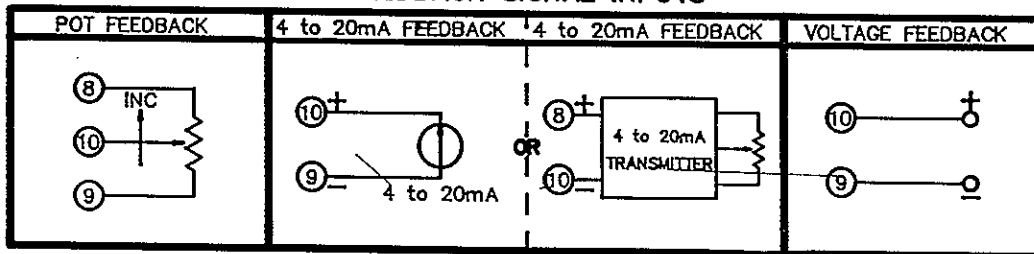
FEEDBACK SIGNAL INPUTS



- NOTES**
- 1) FOR PROPER ac INPUT POWER, REFER TO LABEL ON SIDE OF ENCLOSURE.
 - 2) WITH THE "LOCAL-REMOTE" SWITCH IN THE "LOCAL" POSITION, TURNING THE "LOCAL SET POINT" POT ON THE FRONT PANEL TOWARDS INCREASE WILL RESULT IN AN INCREASING 4 to 20mA OUTPUT SIGNAL AT TERMINALS 13 AND 14.
 - 3) WITH THE "LOCAL-REMOTE" SWITCH IN THE "REMOTE" POSITION, AN INCREASING COMMAND SIGNAL AT TERMINALS 9 AND 10 WILL RESULT IN AN INCREASING 4 to 20mA OUTPUT SIGNAL AT TERMINALS 13 AND 14.
 - 4) PLACE THE "FEEDBACK-COMMAND" SWITCH IN THE "COMMAND" POSITION TO MONITOR EITHER THE "LOCAL" OR "REMOTE" COMMAND SIGNALS. AN INCREASING SIGNAL WILL RESULT IN AN INCREASING METER READING.
 - 5) PLACE THE "FEEDBACK-COMMAND" SWITCH IN THE "FEEDBACK" POSITION TO MONITOR CUSTOMER SUPPLIED FEEDBACK SIGNAL. AN INCREASING FEEDBACK SIGNAL WILL RESULT IN AN INCREASING METER READING.



FEEDBACK SIGNAL INPUTS



NOTES

- 1) FOR PROPER ac INPUT POWER, REFER TO LABEL ON SIDE OF ENCLOSURE.
- 2) DEPRESSING THE "INCREASE" PUSHBUTTON SWITCH WILL RESULT IN ac POWER AT TERMINALS 4 AND 5. THIS SHOULD RESULT IN AN INCREASING METER READING, AND AN INCREASING 4 to 20mA OUTPUT SIGNAL (TERMINALS 13 AND 14).
- 3) DEPRESSING THE "DECREASE" PUSHBUTTON SWITCH WILL RESULT IN POWER AT TERMINALS 4 AND 5. THIS SHOULD RESULT IN A DECREASING METER READING, AND A DECREASING 4 to 20mA OUTPUT SIGNAL (TERMINALS 13 AND 14).
- 4) IF THE 4 to 20mA OUTPUT SIGNAL IS TO BE USED, REMOVE JUMPER FROM TERMINALS 13 AND 14, AND INSTALL LOAD (600 OHMS MAXIMUM).