Dynisco®

38 Forge Parkway
Franklin, MA 02038

Installation and Operation Manual
µPR690 Microprocessor-Based Pressure Indicator

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1-0 INTRODUCTION

µPR690 is a flexible, programmable indicator designed for 350 Ohm strain gage based sensors such as pressure transducers and load cells. µPR690 incorporates both digital display and an analog bar graph display. The five digit 0.56" LED display provides a precise, readable indication of the measured value while the analog LED bar graph shows process trend information and its relationship to alarm set points and sensor full scale range.

µPR690 can be programmed by the user to display engineering units up to 99,900 with resolution approaching 0.05%. The span value, alarm set points and other constants are stored indefinitely in non-volatile memory, eliminating a battery backup. Easy to remember pushbutton sequences simplify transducer calibration routines.

Two independent SPDT alarm relays are another standard feature of the µPR690. The dual high or low set points can be easily programmed from the front keyboard and displayed on the digital display. The low alarms can be programmed as low alarm suppressed to inhibit alarm action during start-up. The LED bar graph then shows the alarm setpoint values in relation to the full scale range and present input value. Relay contacts are provided to be used to activate an annunciator or to initiate automatic shutdown if operating conditions exceed preset limits. As an option, a third SPST alarm relay is available.

A programmable voltage or current retransmission output is also standard. The voltage output of 0-10 VDC or current outputs of 4-20 or 0-20 mA can be selected by the user for use as inputs to recorders or data acquisition equipment.

Model µPR690 is also available with serial communications formats RS232C, RS422, and RS485. Communication is bidirectional, half duplex. All formats are optically isolated and baud rate is adjustable between 150 and 19200 baud.

A peak reading display (high or low) can be selected from the front panel keyboard as well as a display averaging function filter to reduce the effects of input variations on the digital display. The µPR690 also features input interrupt sensing to detect when a transducer or any one of the leads has been disconnected. A program lockout feature disables the front keyboard to prevent unqualified erroneous changes. The digital display provides operator prompts with messages to show present operating conditions or errors. The µPR690 is packaged in a compact 96mm by 96mm 1/4 DIN enclosure and projects only 6.30" (160 mm) behind the panel.

2-0 SPECIFICATIONS

Power:	120/240 VAC ±10%, 50/60 Hz, rear terminal selectable
Regulation:	0.1%FS max. indication change for 10% line voltage variation.
Operating Temperature:	Range of 32 to 120°F (0/50°C)

INPUT

Type:	350 Ohm strain gage bridge, 2 to 4 mV/V sensitivity
Bridge Excitation:	10 VDC ±7%
Input signal range:	-25% +125% of full scale (approximately -10 to 50 mV)
Calibration:	a) without shunt resistor (100%) b) with shunt resistor (value programmable from 40.0 to 100%)
Zero Adjust:	±25% of full scale (±10 mV)
Input Wire Interrupt Detection:	On every wire, display shows "OPEN" and output is driven selectively low/high (-25%/+125% FSV)

DISPLAY

Type:	5 digit LED, 13 mm (0.56")
Ranges:	User programmable up to 99900
Resolution:	1 digit up to 1999, 10 digit up to 19990, 100 digit up to 99900
Display Update:	Every 400 ms. (If filter function is enabled the time constant applied is approximately 3 seconds)
LED Indication:	3 LED's for alarm condition indication One LED for local/remote indication
Peak Hold:	Selectable (max./min.) via keyboard during configuration
Peak Viewing:	Requested from keyboard in RUN mode, indicated by the lighted L.S.D. decimal point
Peak Reset:	From keyboard or rear terminal

ANALOG DISPLAY

Type:	28 segment bar graph display Displays continuous bar graph of pressure 0-100% full scale Alarm setpoint values displayed on the bar graph First bar graph segment blinks for pressure (0%); Last segment blinks for pressure (100%)

AUXILIARY OUTPUT

Selection:	One, user programmed 0-20 mA, 4-20 mA, or 0-10 . 1K Ohm maximum load for 0-20 mA and 4-20 mA output The mA output can drive floating or grounded load 5K Ohm minimum load on voltage output
Linearity:	0.1% full scale ±1 digit
Response Time:	100 ms typical
Output Noise:	0.1% full scale RMS
Scaleable:	From 0-100% of full scale value (minimum span 25% of full scale)

ALARMS

Type:	2 SPDT alarm relays standard (Alarm 1 and Alarm 2) 1 optional alarm relay (Alarm 3) with SPST output contact
Alarm Setpoint Adjustment:	0-100% full scale, settable according to display resolution
Modes:	Selectable high or low and low alarm suppressed. The low alarm suppression inhibits low alarm action during start up. Alarms can be programmed for automatic or manual (latching) reset.
Hysteresis:	1.5% of full scale. Alarm triggers within 1 digit of setpoint and resets 1.5% lower (high alarm) or 1.5% higher (low alarm)
Response Time:	100 ms typical
Indication:	3 LEDs on instrument front, lit to indicate alarm condition
Relay Contact Rating:	2 A at 115/230 VAC Resistive load, 0.5 A at 24 VDC Resistive load R/C snubber network on relay contacts is provided Relays operate in fail safe mode and are energized in no alarm condition

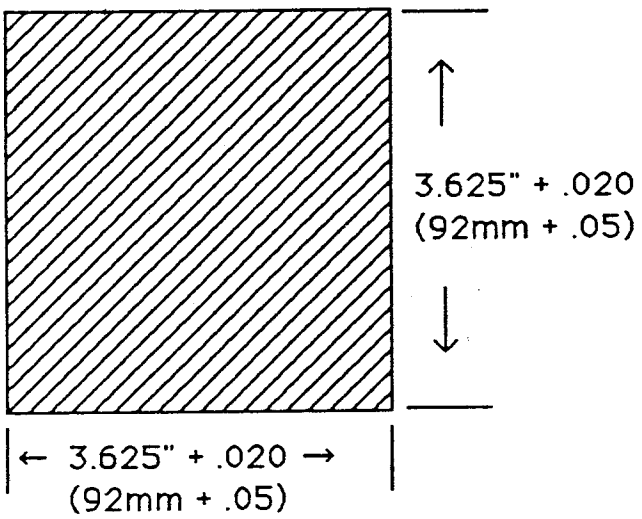
3-0 INSTALLATION AND SETUP

Remove the instrument from the shipping container and visually inspect for any physical damage caused in shipment. Should physical damage be apparent, immediately notify the freight carrier. Please note the wiring terminations are achieved via Fast-On type connectors. A supply of these connectors is provided in the shipping carton.

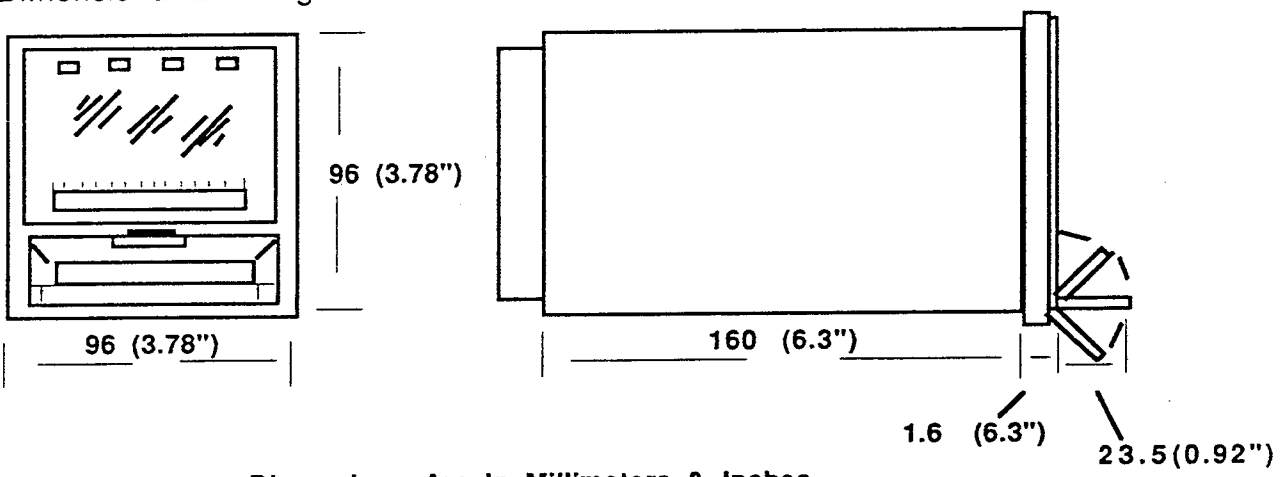
3-1 PANEL CUTOUT / INSTRUMENT DIMENSIONS

Prepare a panel cutout per the dimensions detailed in the diagrams below.

Panel Cutout



Dimensional Drawings



Dimensions Are In Millimeters & Inches

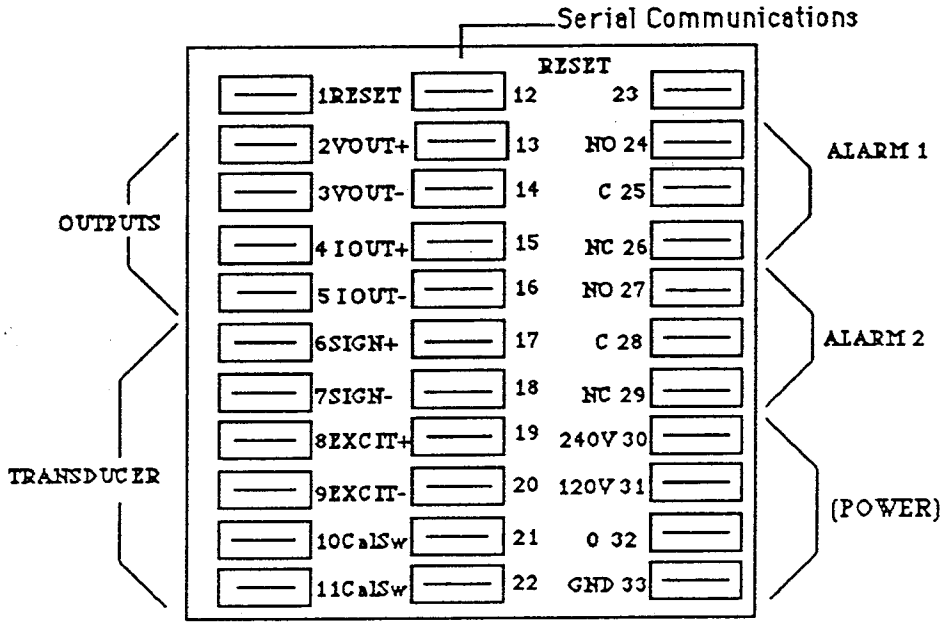
3-2 MOUNTING

µPR690 has a unique no tools necessary mounting bracket system. To install the unit in the panel remove the red mounting brackets by squeezing the ends together and pulling towards the rear of the unit. Insert the unit into the panel. Slide the mounting brackets as far forward as their ratchet mechanism will allow. The unit is now secured in the panel.

3-3 WIRING INSTRUCTIONS

The rear terminal board is shown below with the rear terminals having the following functions:

(Figure 1)



Note: (1) Alarm wiring designations are for fail-safe operation. Designations apply to de-energized relays (alarm condition) or when power is removed from the instrument. (2) When using manual reset alarm mode, alarm relays may be reset externally using terminals 1 and 23.
(3) Alarms will also activate if one of the transducer leads (6 through 9) becomes disconnected.

Terminal Number	Function
1	Reset
2	Voltage Output (+)
3	Voltage Output (-)
4	Current Output (+)
5	Current Output (-)
6	Transducer Signal (+) Red Lead
7	Transducer Signal (-) Black Lead
8	Transducer Excitation (+) White Lead
9	Transducer Excitation (-) Green Lead
10	Calibration Switch Blue Lead
11	Calibration Switch Orange Lead
12-20	Serial Communications
21	OPTIONAL Alarm 3 Normally Closed
22	OPTIONAL Alarm 3 Common
23	Reset Common
24	Alarm One Normally Open (NO)
25	Alarm One Common (C)
26	Alarm One Normally Closed (NC)
27	Alarm Two Normally Open (NO)
28	Alarm Two Common (C)
29	Alarm Two Normally Closed (NC)
30	240 VAC
31	120 VAC
32	Common
33	Ground

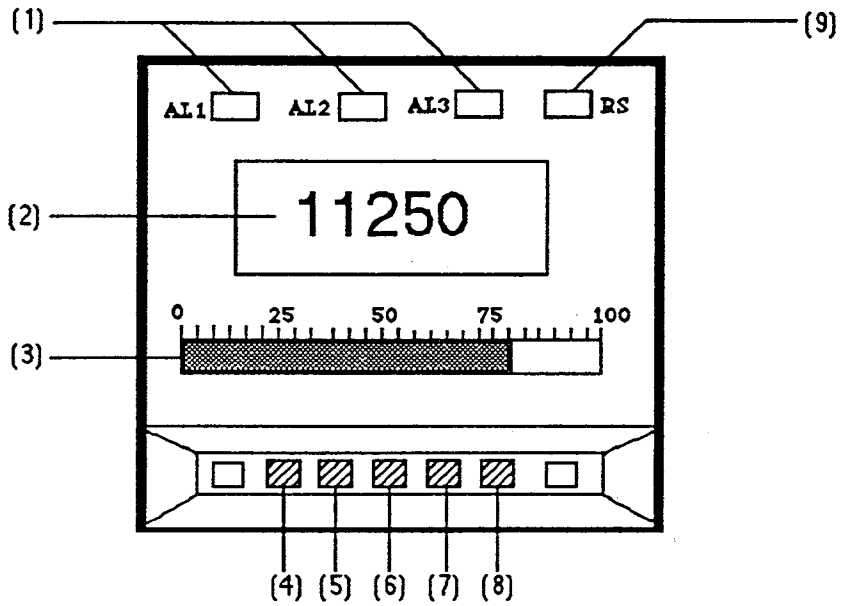
Please note that the µPR690 is designed for 350 Ohm strain gage inputs. Also be certain that the AC voltage is correctly wired or damage to the instrument can result.

3-4 SERIAL COMMUNICATIONS WIRING

RS232C	RS422	RS485
18 COM	14 ARX	16 A
19 TX	15 BRX	17 B
20 RX	16 ATX	18 COM
	17 BTX	
	18 COM	

4-0 OPERATOR INTERFACE

The operator interface (analog and digital display and membrane keypad) are shown below. Note that many of the keys have dual functions.



(Figure 2)

(1) ALARM INDICATION LED
On when the process is in a defined alarm condition.

(2) DIGITAL PROCESS INDICATION
Bright 5 digit LED display of operating pressure, alarm set points and set up prompts.

(3) ANALOG BAR GRAPH DISPLAY
Displays process value and alarm set points. Shows relation in percent of operating pressure to full scale range and set points.

(4) RESET KEY
Used to reset alarms and peak hold value.

(5)(6) UP/DOWN KEYS
Used to raise/lower alarm set points and modify parameters in the configuration mode.

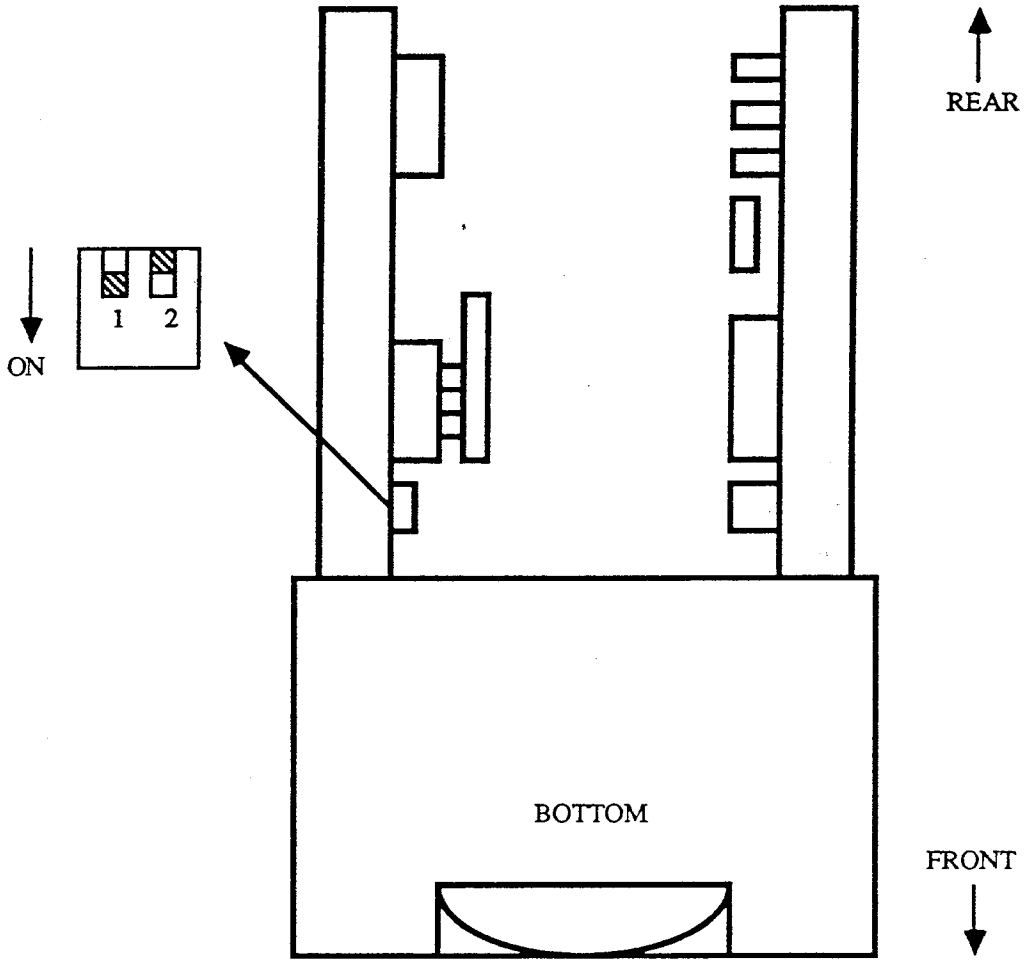
(7) FUNCTION KEY
Pushbutton used to scroll and store parameters when in the configure mode and to calibrate the transducer.

(8) CAL
Pushbutton used for transducer calibration

(9) RS
LED for local/remote control indication
OFF = local control via keyboard
ON = remote control via serial communication

5-0 INSTRUMENT CONFIGURATION

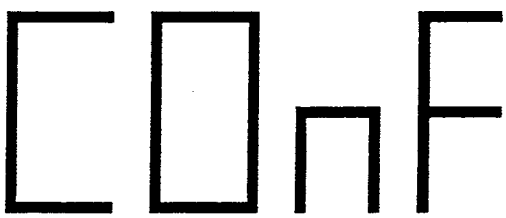
To enter this operating mode it is necessary to position the internal dip switch (Figure 3), located on the lower front portion of the analog/CPU board, to 1 = "ON" and 2 = "OFF". The configuration parameters cannot be modified via serial link and during configuration, the serial link is disabled.



(Figure 3)

Conf(iguration)

The following configuration parameters are shown in the sequence in which they appear (the displayed value is the present choice). Using the ▲ ▼ keys enables you to modify the parameter and the "FUNC" key stores the selection and advances to the next parameter.
When set as explained above, the display shows the following:

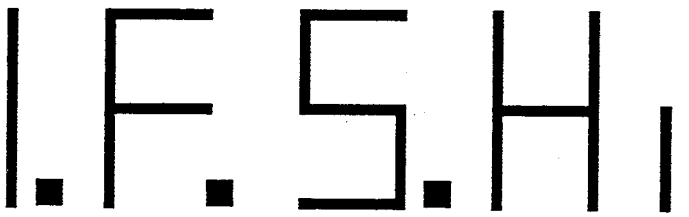


This indicates you are in the configuration mode and you may begin scrolling the parameters *(A)* through *(P)* by depressing "FUNC". **NOTE:** You must press FUNC to advance to the next parameter.

(A) **L(ine), F(requency)** The display shows:

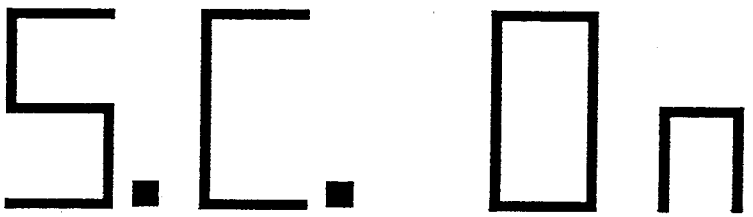
Use ▲ ▼ to select line frequency of 50 or 60 Hz. The default choice is "60".

(B) **I(nput), F(ail) S(afe)** The display shows:



Use ▲ ▼ to select up scale (Hi) or down scale (Lo) warning in the event of a transducer disconnect or interrupt. The default choice is "Hi".

(C) **S(hunt) C(alibration)** The display shows:

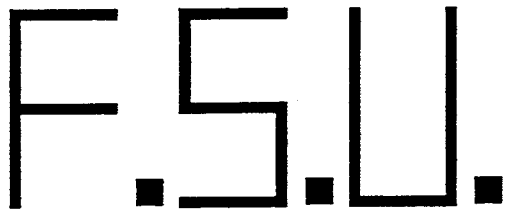


Use ▲ ▼ to select enable (on) or disable (off) shunt calibration. Dynisco pressure transducers utilize an internal shunt resistor; therefore, when using such a transducer this parameter should be selected to "on". The default choice is "ON". With the shunt calibration "OFF", the calibration value is 100%.

(D) **Shunt (calibration value)** The display alternately shows the following as well as the actual shunt value:

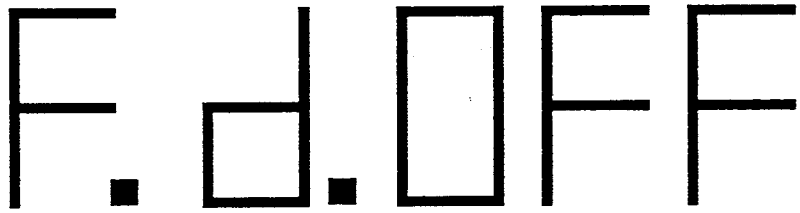
Use ▲ ▼ to set the value from 40.0% to 100.0% (during modification the display shows only the numerical value). The Dynisco transducer utilizes 80.0% as a standard shunt percentage. The default value is 80.0%. *Note:* this step is skipped if shunt calibration selected in part c is disabled (OFF).

(E) **F(ull) S(cale) V(alue)** The display alternately shows the following as well as actual full scale value:



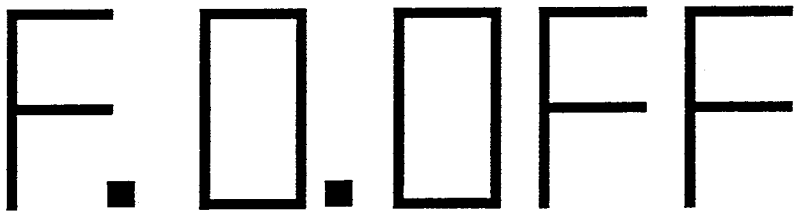
Use ▲ ▼ to set the full scale value equal to the transducer's full scale value from 10 to 99900 (during value modification the display shows only the numerical value). The default value is 10,000. Depress "FUNC" and use ▲ ▼ to set the decimal point position.

(F) **F(ilter) d(isplay)** The display shows:



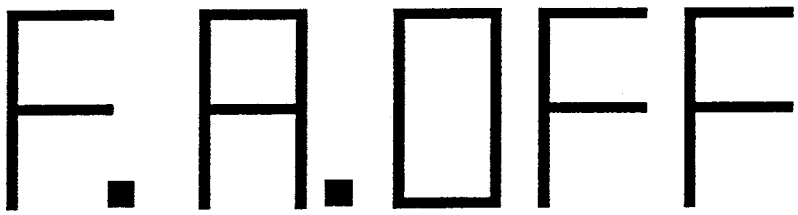
Use ▲ ▼ to enable (on) or disable (off) display filter. The default choice is "OFF".
Note: the filter only changes the display response not the alarm or retransmission output.

(G) **F(ilter) O(utput)** The display shows:



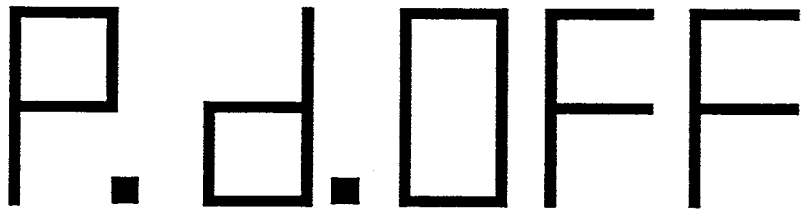
Use ▲ ▼ to enable (ON) or disable (OFF). The default choice is "OFF". This filter function slows the response time of the mA/VDC output.

(H) **F(ilter) A(larm)** The display shows:



Use ▲ ▼ to enable (ON) or disable (OFF) the alarm filter. This feature activates a 3 second delay in the alarm response. The default choice is "OFF".

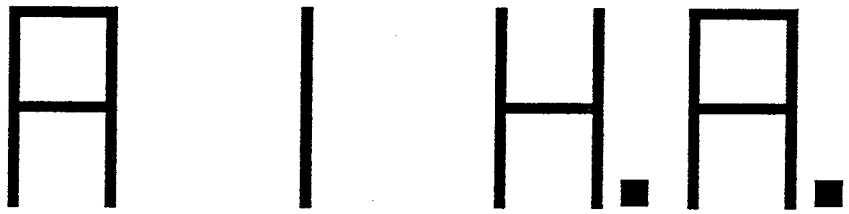
(I) **P(eak) d(etection)** The display shows:



Use ▲ ▼ to select the operating mode following the sequence shown below:
1) OFF *Peak detector disabled*
2) LO *display "holds" lowest reading*
3) HI *display "holds" highest reading*

NOTE: The peak value is viewed by pressing the ▲ key (see section 9-0).
The default choice is "OFF"

(J) **A(larm) (operating mode)** The display shows:



Use ▲ ▼ to select the operating mode following the sequence shown below:
1) OFF *Alarm disabled*
2) HA *high alarm with auto reset*
3) LA *low alarm with auto reset*
4) Hn *high alarm with manual reset*
5) Ln *low alarm with manual reset*
6) SA *low alarm suppressed with auto reset*
7) Sn *low alarm suppressed with manual reset*

The default choice is "HA"

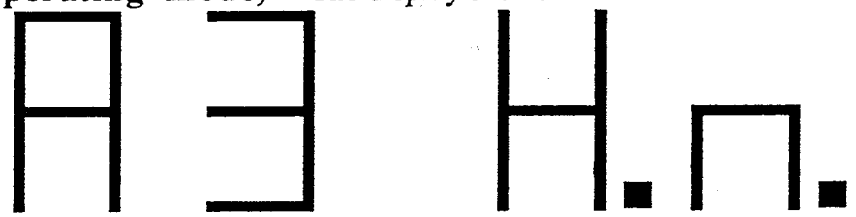
NOTE: Manual alarm reset is accomplished via front keyboard "Reset" key or rear terminals 1 and 23.

(K) **A(larm) 2 (operating mode)** The display shows:

Use ▲ ▼ to select the operating mode following the sequence shown below:
1) OFF *Alarm disabled*
2) HA *high alarm with auto reset*
3) LA *low alarm with auto reset*
4) Hn *high alarm with manual reset*
5) Ln *low alarm with manual reset*
6) SA *low alarm suppressed with auto reset*
7) Sn *low alarm suppressed with manual reset*

The default choice is "HA"

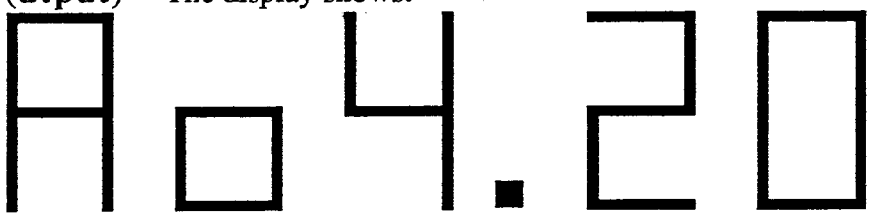
(L) **A(larm) 3 (operating mode)** The display shows:



Use ▲ ▼ to select the operating mode following the sequence shown below:
1) OFF Alarm disabled
2) HA high alarm with auto reset
3) LA low alarm with auto reset
4) Hn high alarm with manual reset
5) Ln low alarm with manual reset
6) SA *low alarm suppressed with auto reset*
7) Sn *low alarm suppressed with manual reset*

The default choice is "Hn"

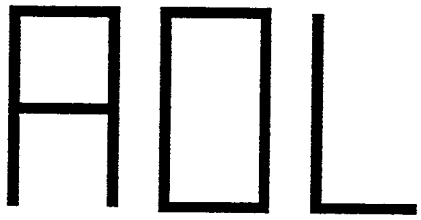
(M) **A(uxiliary) O(utput)** The display shows:



Use ▲ ▼ to select the proper output following the sequence shown below:
1) 0.10 for 0-10 V
2) 0.20 for 0-20 mA
3) 4.20 for 4-20 mA

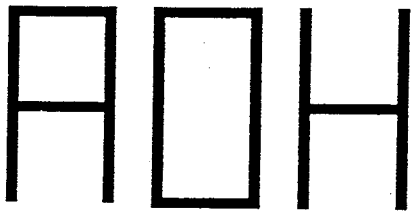
The default choice is "4.20". See section 3-3 for proper wiring.

(N) **A(uxiliary) O(utput) L(ow)** The display shows:



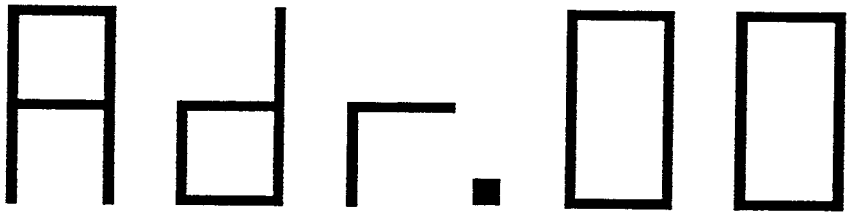
Use ▲ ▼ to select the low limit for the analog auxiliary scaling. The range is from 0-75% of full scale. The default value is "0".

(O) **A(uxiliary) O(utput) H(igh)** The display shows:



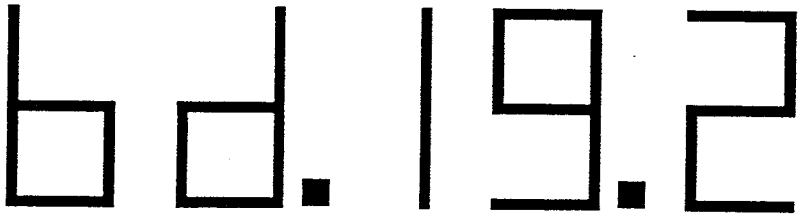
use ▲ ▼ to select the high limit for the analog auxiliary scaling. The range is from 25% - 100% of full scale. The default value will be the programmed full scale value in step (e).

(P) **Ad(d)r(ess)** The display shows:



Use ▲ ▼ to set the address value from 0 to 31 (address 00 means serial link disabled). The default value is "00". If address is set to "00", steps (o) and (p) will be skipped.

(Q) **b(au)d (rate)** The display shows:



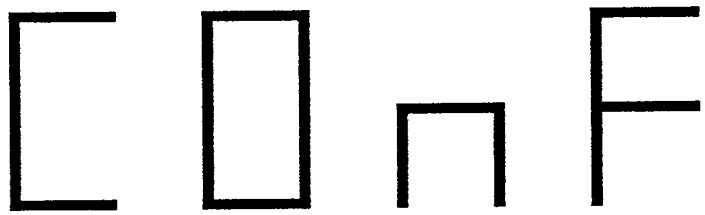
Use ▲ ▼ to set the baud rate value from 150 to 19200 (the values shown with decimal are in K baud). **NOTE:** This step is skipped if serial communication address is "00". The default value is "19.2".

(R) **b(yte) F(ormat)** The display shows:

Use ▲ ▼ to select the desired format following the sequence shown below:
1) 7E for 7 bit length and even parity
2) 7o for 7 bit length and odd parity
3) 8 for 8 bit length parity disable
4) 8E for 8 bit length and even parity
5) 8o for 8 bit length and odd parity

Note: this step is step is skipped if serial communication address is "00". The default value is "7E".

After this step, *(P)*, (or after Adr.00, step *(N)*), the configuration is completed and the instrument returns to display:



It is possible to reconfigure the instrument by continuing to press FUNC or to proceed to another operating mode.

6-0 RUNNING MODE

To enter this operating mode, it is necessary to position the internal dip switch to 1 = "OFF" and 2 = "OFF". (Refer to Figure 3)

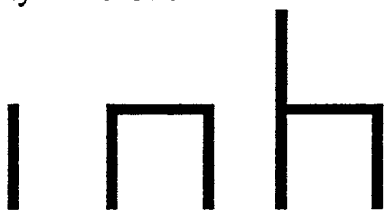
This mode is the normal operating mode of the instrument during which all functions are active, i.e. alarms, etc.

In the RUNNING MODE it is also possible to perform the transducer calibration and ALARM SETPOINT programming.

6-1 TRANSDUCER CALIBRATION

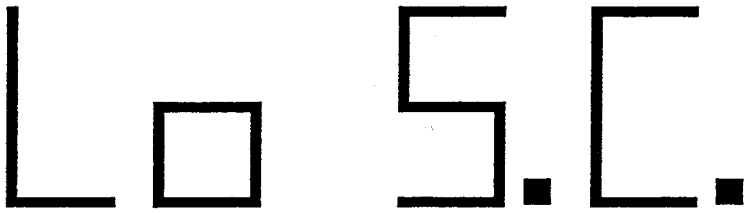
The calibration procedure should be done with the sensor in place and at operating temperature and MUST be performed at no load, i.e. zero PSI.

Transducer calibration is possible only if the keyboard is unlocked (refer to Section 7-0 to unlock keyboard). If the keyboard is locked the display will show:



Lo(w) S(cale) C(alibration)

To start the calibration, press and hold "CAL". With the "CAL" key depressed, press the "FUNC" key once and then release both keys. The display alternately shows the actual zero value and:

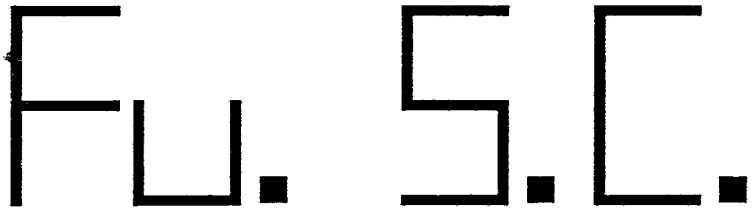


Push "CAL" to start calibration. Calibration time is approximately 4 seconds, during which the display is blanked with the exception of a decimal point. Upon completion, the input value will be stored as "zero".

NOTE: You may push "FUNC" to skip the above calibration step and go directly to full scale calibration.

Fu(ll) S(cale) C(alibration)

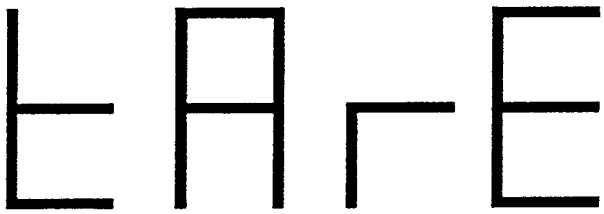
Immediately after zero calibration the display alternately shows the actual full scale value(set during configuration) and:



Push "CAL" to start full scale calibration; upon completion the input value will be stored as "span". Calibration time is approximately 4 seconds, during which the display is blanked with the exception of a decimal point.

tArE (Calibration)

Immediately after the full scale calibration the display alternately shows the actual tare value and:



After the tare weight has been applied, push "CAL" to start calibration; upon completion the input value will be stored as "tare". You may push "FUNC" to skip the above calibration step if a tare weight is not used.

After the above step (or if no key has been depressed for at least 5 seconds) the instrument will return automatically to normal display.

6-2 ALARM SETPOINT PROGRAMMING

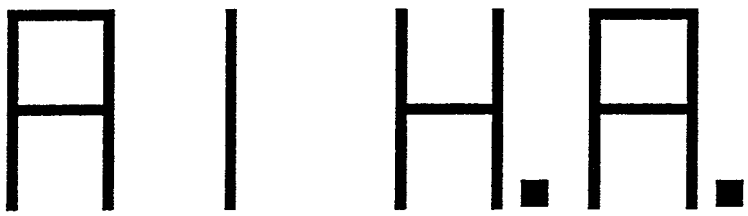
Push "FUNC" to enter in this mode. Use ▲ ▼ to modify the setpoint and "FUNC" to store it and display the Alarm 2 setpoint.

The alarm value adjustment is possible only if the keyboard is unlocked. If the keyboard is locked, the display will show:

(Refer to section 7-0 to unlock keyboard).

A(larm) 1 (set point value)

After pressing the FUNC key once the display alternately shows the actual setpoint value, as well as "**A 1**" and the alarm option selected in the configuration mode. For example:



Use ▲ ▼ to set the value from 0 to FULL SCALE value (during modification the display shows only numerical value). The default value is 40.0% of FULL SCALE (this step is skipped if Alarm 1 is disabled).
Press FUNC once again to advance to Alarm 2.

A(larm) 2 (set point value)

The display alternately shows the actual setpoint value, as well as "**A2**" and the alarm option selected in the configuration mode. For example:

Use ▲ ▼ to set the value from 0 to FULL SCALE value (during modification the display shows only numerical value). The default value is 60.0% of FULL SCALE (this step is skipped if Alarm 2 is disabled).
Press FUNC once again to advance to Alarm 3.

A(larm) 3 (set point value)

The display alternately shows the actual setpoint value, as well as "**A3**" and the alarm option selected in the configuration mode. For example:

Use ▲ ▼ to set the value from 0 to FULL SCALE value (during modification the display shows only numerical value). The default value is 80.0% of FULL SCALE (this step is skipped if Alarm 3 is disabled).

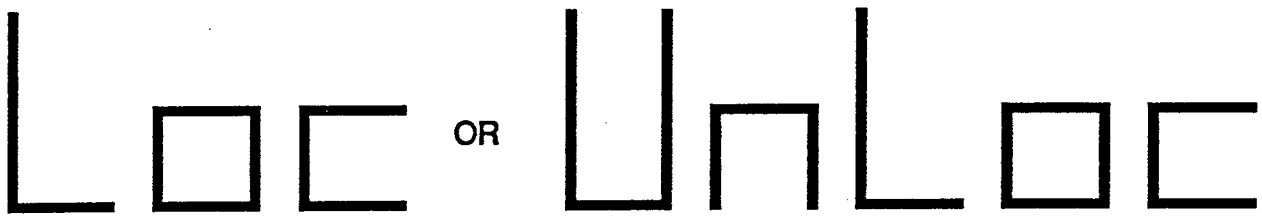
After the above step (or if no key has been depressed for at least 5 seconds) the instrument will return automatically to normal display.

7-0 KEYBOARD LOCK/UNLOCK PROCEDURE

The keyboard LOCK/UNLOCK function is activated only in run mode. The LOCK function inhibits the following procedures set from instrument front as well as from serial link:

1) calibration of zero value, span value and tare value
2) changing of alarm set points
3) loading of default data

To change the keyboard status, implement the following sequence (IN THIS EXACT ORDER): press and hold the ▼ key; while still pressing this key, press and hold "RESET"; and lastly, depress "CAL" (you now have all three keys pressed simultaneously) until the display shows:



Repeat the above sequence to toggle the desired mode (LOCK or UNLOCK). The function selected will be stored in EEprom and the display returns to previous condition automatically after 5 seconds.

8-0 RESET FUNCTION

The RESET key (or EXT. RESET via rear terminals 1 and 23) allows the manual reset of the alarms (when the instrument is programmed and is in non-alarm condition) and also the reset of the peak value stored. This function is not disabled from LOCK function.

9-0 PEAK HOLD

Normally the display shows the measured value; however, by depressing ▲ it is possible to display the stored peak value when programmed in step (i) of the configuration. The indication of this peak display mode is given by the decimal point at the right of the last significant digit lit. Depress ▲ to return to normal display mode. In this case no timeout is applied and the display will continue to show the peak value until a return to normal mode is performed.

10-0 AUXILIARY OUTPUT CALIBRATION

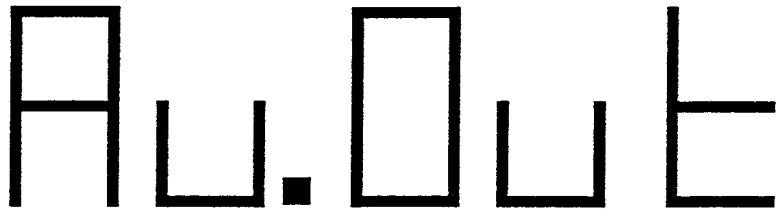
To enter this operating mode it is necessary to position the internal dip switch to 1 = "OFF" and 2 = "ON" (see figure 3)

NOTE: The instrument is shipped with all auxiliary outputs fully calibrated. A new recalibration is required when parts of output circuitry are replaced. During this operating mode the serial link is disabled.

The calibration steps are in the sequence shown below (the displayed value is the present choice).
Use ▲ ▼ to modify parameter and "FUNC" to store it display the next one. In this mode the keyboard lock/unlock feature has no effect.

Au(xiliary) Out(put)

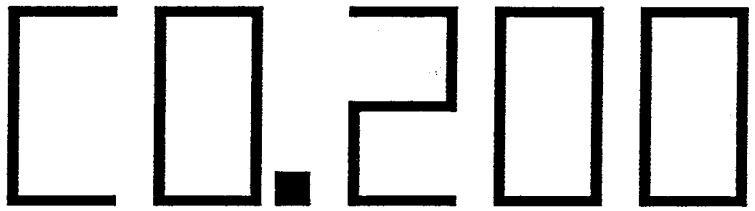
When turned on in above mode the display shows:



Depress "FUNC" to display and/or modify calibration values.

a) C0
(output current calibration)
(zero)

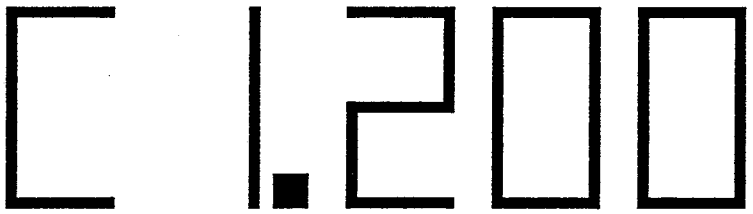
The display shows:



Use ▲ ▼ to change value until the output current, read from rear terminals 4 and 5, is 50 ±5 microampere. The offset value shown can vary from 0 to 400 units. The default value is 200.

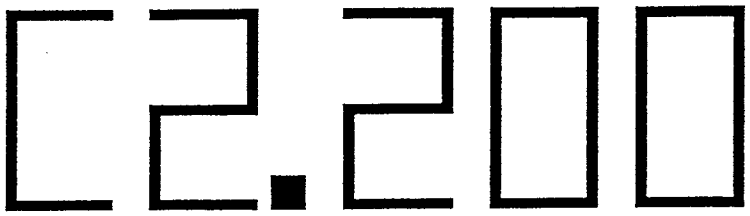
b) C1
(output current calibration)
(full scale)

The display shows:



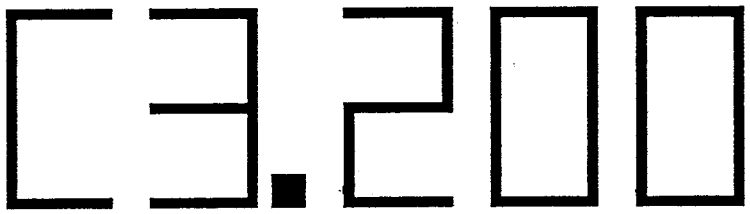
Use ▲ ▼ to change value until the output current, read from rear terminals 4 and 5, is 25 ±0.005 milliamperes. The offset value shown can vary from 0 to 400 units. The default value is 200.

c) C2 The display shows:
(output voltage calibration)
(zero)



Use ▲ , ▼ to change value until the output voltage, read from rear terminals 2 and 3, is -2.5 ±0.0025 volt. The offset value shown can vary from 0 to 400 units. The default value is 200.

d) C3 The display shows:
(output voltage calibration)
(full scale)



Use ▲ ▼ to change value until the output voltage, read from rear terminals 2 and 3, is 10 ±0.0025 volt. The offset value shown can vary from 0 to 400 units. The default value is 200.

After this step the auxiliary output calibration is terminated and the display shows the input variable expressed in bits (typical 546 bit/mV).

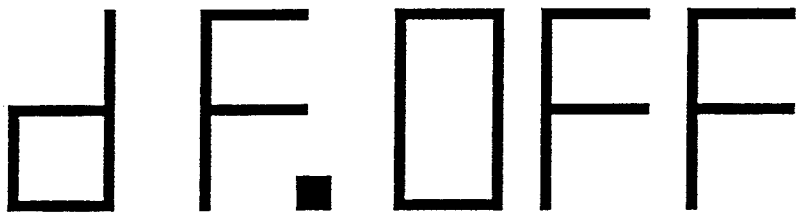
11-0 PROCEDURE TO LOAD DEFAULT DATA

In every one of the three operating modes is possible to load default data using the procedure described below. The loading of one group of data does not affect the other two groups (i.e., loading default in the configuration mode will not affect alarm values in the running mode.) The procedure of default data loading is possible only if instrument is in local condition (serial communications only) and the keyboard is unlocked.

D(e)f(ault) Off

1) To start this procedure keep continuously depressed ▼ and depress once ▲

The display shows:



D(e)f(ault) On

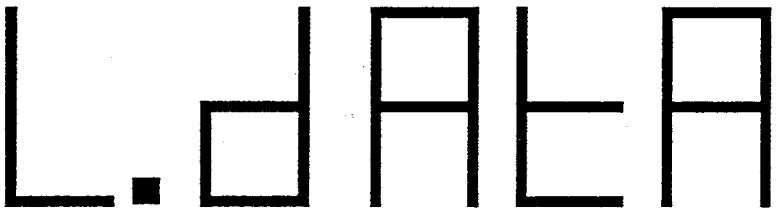
In order to enable the default data loading procedure, depress the ▲ key.

With loading procedure enabled the display shows:

Depress "FUNC" to start loading operation.

L(oad) Data

During data loading (about 5 seconds) the display shows:



and then returns to proceeding condition.

DEFAULT DATA FOR CONFIGURATION PARAMETERS

1)	Line frequency	60 Hz	
2)	Input failsafe	Full scale	(Hi)
3)	Shunt calibration	Enable	(ON)
4)	Shunt calibration value	80.0%	
5)	Full scale value	10000	
6)	Filter display	disable	(OFF)
7)	Filter output	disable	(OFF)
8)	Filter alarm	disable	(OFF)
9)	Peak detector	disable	(OFF)
10)	Alarm 1 operating mode	high with automatic reset	(HA)
11)	Alarm 2 operating mode	high with automatic reset	(HA)
12)	Alarm 3 operating mode	high with manual reset	(Hn)
13)	Auxiliary output	4 - 20 mA	(4.20)
14)	Serial communication address	Disable	(00)
15)	Serial communication baud rate	19200 baud	(19.2)
16)	Serial communication format	7 bit, parity even	(7E)

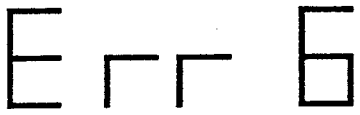
DEFAULT DATA FOR TRANSDUCER CALIBRATION AND ALARM SET POINTS

1)	Low scale calibration	0 mV
2)	Full scale calibration	33.3 mV
3)	Tare calibration	0 mV
4)	Alarm 1 setpoint	40.0% of full scale value
5)	Alarm 2 setpoint	60.0% of full scale value
6)	Alarm 3 setpoint	80.0% of full scale value
7)	Keyboard status	LOCK (programming disable)

DEFAULT FOR AUXILIARY OUTPUT CALIBRATION

1)	Low scale current offset	200
2)	Full scale current offset	200
3)	Low scale voltage offset	200
4)	Full scale voltage offset	200

12-0 ERROR MESSAGES



(Error 6)

Calibration error
The "zero" or "tare" value is greater than ±25% of span (about ±10 mV)

(Error 7)

Calibration error
The "full scale" value is negative or span less than 7% of the input range (about 3 mV)

(Error 8a)

Startup error
At power up the instrument has found one or more configuration data corrupted. Put instrument in configuration mode and reload data.

(Error 8b)

Startup error
At power up the instrument has found one or more auxiliary output calibration data corrupted. Put instrument in auxiliary output calibration mode and recalibrate.

(Error 8c)

At power up the instrument has found one or more transducer calibration data or alarm setpoint value corrupted. Load "DEFAULT DATA" and then perform a new transducer calibration and/or alarm setpoint manipulation.

AUTO DIAGNOSTIC ERROR

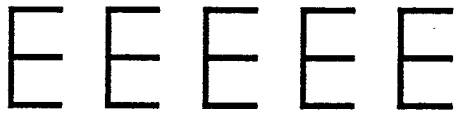
(Over range) The input signal is greater than +125% of span or greater than display capability (99900)

(Under range) The input signal is lower than -25% of span or lower than display capability (-19900)

(Input open) One or more wires of the transducer are disconnected

(Inhibit) Programming error
The user attempts to modify data while the keyboard is locked (the indication disappears automatically after 5 seconds). Refer to section 7-0.

(A/D error) Internal analog to digital measurement is faulty. Return the instrument to factory for repair.



(EEprom error) The internal EEprom for data back-up is faulty. Return the instrument to factory for repair.

(Data failed) Data to display is not within limits. Reload all default data and re-calibrate the transducer and the auxiliary output.

13-0 WARRANTY AND SERVICE

This equipment is sold subject to the mutual agreement that it is warranted by us to be free from defects of material and construction but our liability in connection with it shall be limited to repairing or replacing without charge at our factory any material or construction defects which become apparent within one year from the date on which the equipment is shipped, that we have no liability for damages of any kind arising from the installation and or use of the apparatus by anyone and that the purchaser by the acceptance of this equipment will assume all liability for any damages which may result from its use or misuse by the purchaser, his or its employees or by others. There is no guarantee or warranty or liability except as here stated.

Should the equipment require service or repair, return it freight prepaid to:

Dynisco, Inc.
38 Forge Parkway,
Franklin MA 02038
Attention: Service Department

NOTE: Before returning any product for repair, please call the Dynisco Service Department at 800-332-2245 or **508-541-9400** for a return authorization number.

FOR TECHNICAL ASSISTANCE, CALL 1-800-221-2201