Gentran

Analog
Melt Pressure Indicator

GT-409

OWNER'S MANUAL

CE

ISE, Inc. · 10100 Royalton Rd., Cleveland, OH 44133 · Tel: (440) 237-3200 Fax: (440) 237-1744·
http://iseinc.com

GT-409
ANALOG MELT PRESSURE INDICATOR

OWNER'S MANUAL

Table of Contents

GT-409 ANALOG MELT PRESSURE INDICATOR OWNER'S MANUAL

1.0 DESCRIPTION

The Gentran GT-409 analog melt pressure indicator is a combination transducer power supply, indicator and signal conditioner. The GT-409's 1/4 DIN standard size case of extruded aluminum protects against EMI and RFI noise, heat dispersion and physical damage. The 6 inch, 240 degree meter is styled for ease of reading and incorporates an international face.

The GT-409 is designed for use with a Gentran pressure transducer or any 4 leg, 350 ohm wheatstone bridge strain gage transducer. A calibration pushbutton allows for span adjustment while you adjust zero at zero pressure. The complete electronic assembly can be removed and/or replaced from the front panel for convenient service and option selection. Options include dual setpoints and auxiliary outputs for recorders, remote indicators or a computer interface. The dual setpoint option, designated by the letter "D" (GT-409D), can be used to give a warning before an actual shutdown sequence is initiated, thereby reducing or avoiding downtime. To prevent accidental shutdown, the act of setting of the setpoint or calibration will not actuate the alarm relays.

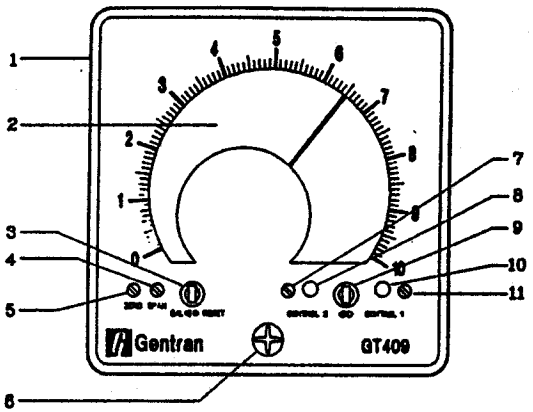
2.0 SPECIFICATIONS

Power:	106-125 VAC or 200-250 VAC, 50/60 Hz, 1/8 Amp Max.
Operating Temperature Range:	0 to 140°F (0 to 60°C)
Display:	6" long scale, 240 degree angle
Accuracy:	Within ±2.0% full scale
Transducer Power Supply:	8.2 VDC ±5%
Transducer Bridge Circuit:	4 leg, 350 ohm nominal resistance
Shunt Calibration Resistor:	Selectable 30.1 Kohm, 54.9 Kohm, 200 Kohm or Dynisco compatible
Input Sensitivities:	0-1 to 0-2.5 mV/V and 0-2.5 to 0-5 mV/V dip-switch selectable
Zero Balance:	±35% adjustable with the front panel potentiometer
Response Time:	1/3 second or 5 seconds selectable
Recorder Outputs:	0-1VDC, 0-2VDC, 0-5VDC, 0-10VDC dip-switch selectable, min. load 5000 ohms
	-6 option -- 0-20mA or 4-20mA factory set, min. load 15 ohms, max. load 600 ohms
Recorder Output Accuracy:	±0.1% full scale ±1 digit
Recorder Output Repeatability:	Within ±0.1% full scale
Recorder Output Linearity:	Within ±0.1% full scale
Recorder Output Stability:	Within ±0.1% full scale

<u>GT-409D CONTROL SPECIFICATIONS</u>

Relays:	2 SPDT (single pole double throw)
Relay Rating:	8 amps at 125/250 VAC or 5 amps at 30 VDC
Setpoint Range:	1-100% of full scale
Accuracy:	Within ±0.3% of full scale
Hysteresis:	Within ±0.5% of full scale
Indication:	Front panel LED's
Mode:	Above or below setpoint switch selectable
Reset:	Automatic or manual switch selectable
Peak Hold:	Available, order option"F"

2.1 FRONT PANEL FEATURES



1. 1/4 DIN Enclosure.

2. Large Analog Display with 240° Dial Indication. Indicates operating pressure and control alarm setpoints. Shows relation of operating pressure to full-scale range.

3. Calibration Selector/Reset Toggle Switch. Used to display and adjust span for calibration pressure of transducer and to reset control alarms when configured for manual reset.

4. Span Potentiometer. Used to raise/lower calibration pressure in conjuction with calibration/reset switch.

5. Zero Potentiometer. Used to raise/lower zero calibration point on display.

6. Access Screw. Unscrew to remove indicator from enclosure to gain access to internal dip switches.

7. Control 2 Potentiometer. Used to raise/lower Control 2 alarm setpoint.

8. Control 2 Alarm Indication LED. Lights when Control 2 setpoint is reached.

9. Control 1/Control 2 Selector Toggle Switch. Used to display and adjust Control 1 and Control 2 setpoints.

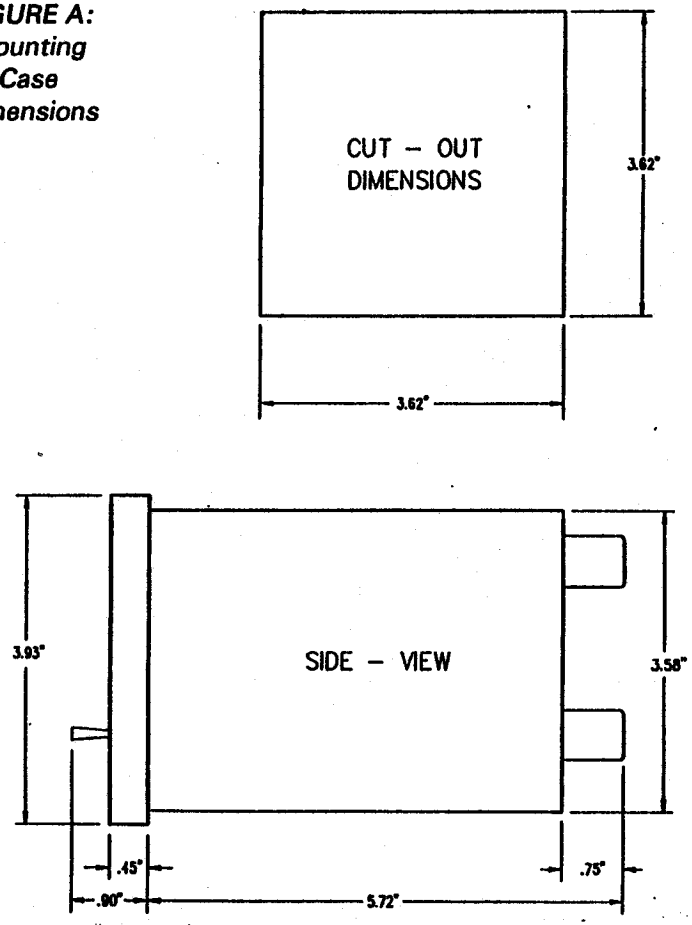
10. Control 1 Alarm Indication LED. Lights when Control 1 setpoint is reached.

11. Control 1 Potentiometer. Used to raise/lower Control 1 alarm setpoint.

3.0 INSTALLATION

The GT-409 would normally be mounted on a control panel or other sheet metal structure. High heat or humid locations should be avoided. The outer case is designed for a 1/4 DIN panel cutout (See figure A). To mount, slide the unit through the opening until it is flush against the front panel. Slide the two bars through the slots on the side of the unit until they are tight against the back of the panel. Secure bars with the two screws provided.

FIGURE A: Mounting Case Dimensions



3.1 INSTALLATION WIRING

Compliance with local and national codes is recommended. Wiring should be double checked before applying power. Power and signal leads should be run separately, if possible, to prevent electrical interference. The recorder output, except for the –6 (4-20mA output) option, is connected to the "+" and "–" Recorder Output Terminals. The –6 (4-20mA output) option is wired to the "+" and "–" terminals marked "4-20 OUT".

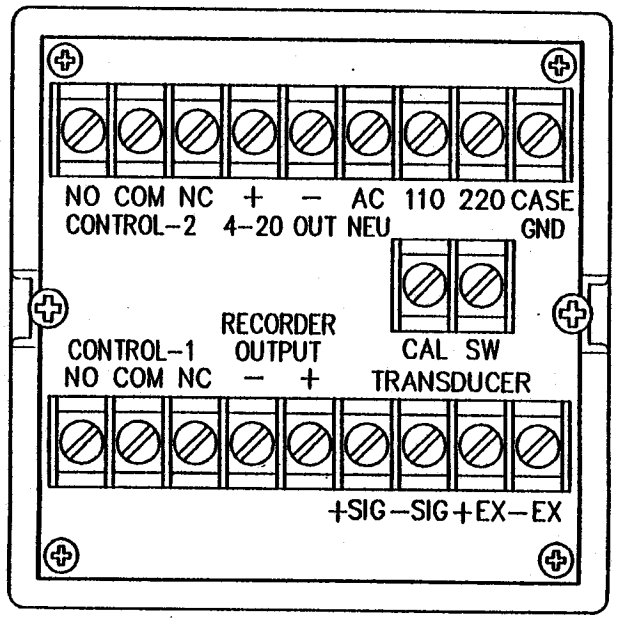


FIGURE B: Rear Terminal Assembly

UPPER TERMINALS

1. Control 2 Relay -- normally open
2. Control 2 Relay -- common
3. Control 2 Relay -- normally closed
4. 4-20mA Recorder Output -- positive (+) signal
5. 4-20mA Recorder Output -- negative (–) signal
6. Power Supply -- AC neutral
7. Power Supply -- 110 volt AC input
8. Power Supply -- 220 volt AC input
9. Case Ground

MIDDLE TERMINALS

10. Calibration Switch -- for use with internal shunt transducers
11. Calibration Switch -- for use with internal shunt transducers

LOWER TERMINALS

12. Control 1 Relay -- normally open
13. Control 1 Relay -- common
14. Control 1 Relay -- normally closed
15. Voltage Recorder Output -- negative (–) signal
16. Voltage Recorder Output -- positive (+) signal
17. Transducer -- positive (+) signal connection (green)
18. Transducer -- negative (–) signal connection (white)
19. Transducer -- positive (+) excitation (red)
20. Transducer -- negative (–) excitation (black)

4.0 ADJUSTMENTS -- ZERO AND SPAN

All wheatstone bridge type strain gages have some zero imbalance. This small error can be virtually eliminated by using the zero adjustment potentiometer on the front panel. The zero should only be reset when zero pressure is being applied to the transducer. The zero adjustment changes the offset or starting point for the indicator to correspond to zero pressure on the transducer. The span adjustment changes the gain or slope of the amplifier to match the output curve of the transducer. A pressure standard or dead-weight tester can be used to check calibration. The span would then be adjusted to give the desired output at a particular pressure. Most transducers are calibrated against an external shunt resistor. This shunt resistor simulates an actual pressure input value. The value is normally marked on the transducer itself. It would look like this: 30.1 Kohms, 8123 psig. This means that if an external resistor of 30.1 Kohms resistance were placed between the excitation positive (+) wire and the signal positive (+) wire an input signal equivalent to 8123 psig will be simulated between the signal positive (+) and the signal negative (–) wires. The following is typical of an adjustment procedure:

ALL CALIBRATION ADJUSTMENTS SHOULD BE PERFORMED WITH THE TRANSDUCERS UNDER NO LOAD AND AT OPERATING TEMPERATURE.

1. Power the instrument.
2. With zero pressure on the transducer, adjust the zero potentiometer to obtain a zero reading.
3. Push and hold the calibration selector switch to the left while adjusting the span potentiometer until the correct calibration pressure is obtained.
4. Release the calibration switch and recheck the zero reading. If incorrect, repeat steps 3 and 4.
5. The electrical zero may be checked any time the transducer is at zero pressure. This may be necessary after heat-up to correct any thermal zero shift of the transducer.

NOTE: DO NOT CHANGE THE SPAN CALIBRATION WHEN THERE IS PRESSURE ON THE TRANSDUCER. IF THIS IS DONE, THE PRESSURE READING MAY BE IN ERROR.

4.1 ADJUSTMENTS -- GT-409D CONTROL SETPOINTS

The GT-409D provides two separate setpoint circuits and relays. By using one relay to trigger an auxiliary alarm, corrective action can be taken before mandatory shut-down is reached. The second relay circuit can then be used for mandatory shut-down.

CONTROL I

1. Push and hold the control selector toggle switch to the right.
2. Adjust the Control 1 potentiometer until the desired control pressure is displayed on the indicator.
3. Release the selector toggle switch.

CONTROL 2

1. Push and hold the control selector toggle switch to the left.
2. Adjust the Control 2 potentiometer until the desired control pressure is displayed on the indicator.
3. Release the selector toggle switch.

4.2 OPTION SWITCH SETTINGS

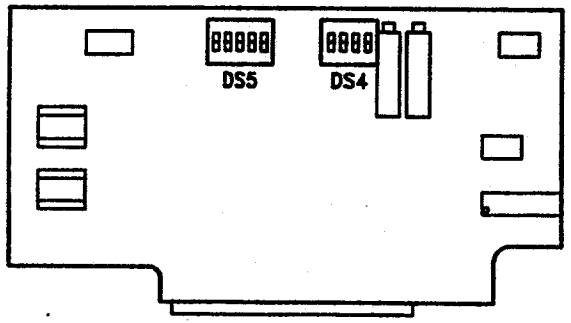


FIGURE C: Amplifier Board (Left Side)

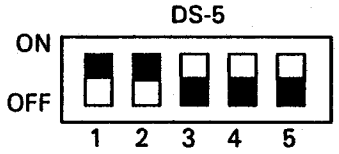
4.2.1 *TRANSDUCER SENSITIVITY (mV/V)*
AMP BOARD -- SWITCH DS-5

ON POSITION IS UP AND OFF POSITION IS DOWN

Switch 2 <2.5 mV/V ON
>2.5 mV/V OFF

EXAMPLE:

Damped output, Filter ON
Transducer output less than 2.5 mV/V



1 Filter
2 <2.5 mV/V
3 200 Kohm
4 54.9 Kohm
5 30.1 Kohm

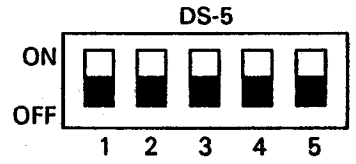
4.2.2 *CALIBRATION SHUNT RESISTOR*
AMP BOARD -- SWITCH DS-5

ON POSITION IS UP AND OFF POSITION IS DOWN

Switch 3 200 KCal
4 54.9 KCal
5 30.1 KCal

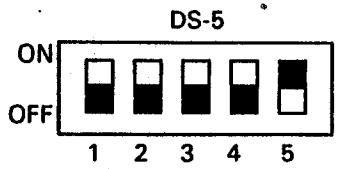
EXAMPLES:

A. Dynisco compatible shunt calibration.



1 Filter
2 <2.5 mV/V
3 200 Kohm
4 54.9 Kohm
5 30.1 Kohm

B. Gentran shunt calibration resistor 30.1 KCal.



1 Filter
2 <2.5 mV/V
3 200 Kohm
4 54.9 Kohm
5 30.1 Kohm

4.2.3 *FILTER (DAMPING CIRCUIT)*
AMP BOARD -- SWITCH DS-5

ON POSITION IS UP AND OFF POSITION IS DOWN

Switch 1 Filter on, slower response, 5 seconds
Filter off, fast response, 1/3 second

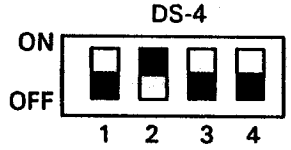
4.2.4 *RECORDER OUTPUT SELECT*
AMP BOARD -- SWITCH DS-4

ON POSITION IS UP AND OFF POSITION IS DOWN

Switch 1 0-10 Volts DC
2 0-5 Volts DC
3 0-2 Volts DC
4 0-1 Volt DC

EXAMPLE:

Five (5) Volt DC output required

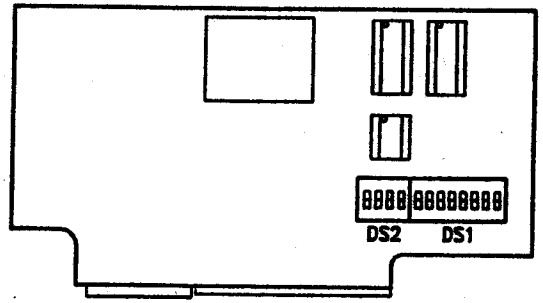


4.2.5 *CONTROL LOGIC*
OPTION BOARD -- SWITCH DS-1

ON POSITION IS UP AND OFF POSITION IS DOWN

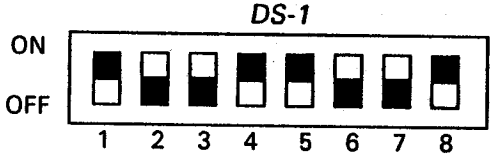
Switch 1 and 4 Control II for above setpoint
2 and 3 Control II for below setpoint
5 and 8 Control I for above setpoint
6 and 7 Control I for below setpoint

FIGURE D: Options Board (Right Side)

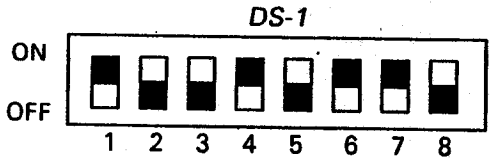


EXAMPLES:

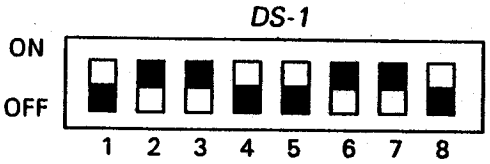
A. Control I and II on "above" setpoints.



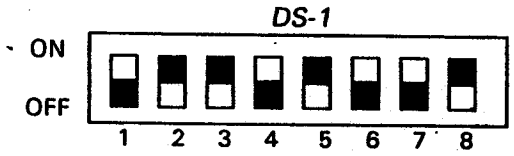
B. Control I on "below" setpoint and Control II on "above" setpoint.



C. Control I and II on "below" setpoint.



D. Control I on "above" setpoint and Control II on "below" setpoint.



4.2.6 RESET LOGIC
OPTION BOARD -- SWITCH DS-2

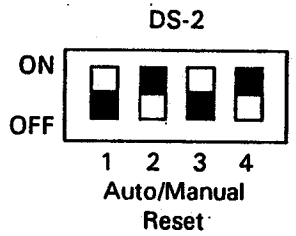
ON POSITION IS UP AND OFF POSITION IS DOWN

Switch 1 Control I Auto Reset
2 Control II Auto Reset
3 Control II Manual Reset
4 Control I Manual Reset

NOTE: CONTROL LOGIC CANNOT OCCUPY TWO STATES AT ONCE. WHEN DESIRED RESET MODE IS SWITCHED ON, ALTERNATE CORRESPONDING MODE SHOULD BE SWITCHED OFF. *(ie. If Control 1 Auto Reset is switched on, Control 1 Manual Reset should be switched off.)*

EXAMPLE:

Manual Reset on Control I and Auto Reset on Control II.



5.0 TROUBLESHOOTING

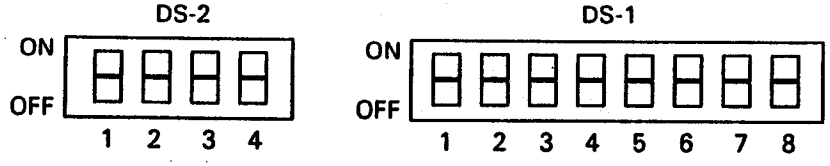
Indicator pegs full scale.
--Opening in wiring between indicator and transducer.
NOTE: Will occur when transducer cable is removed from transducer.

Cannot adjust zero low enough.
--Transducer over-pressured. Check transducer.

OPTION WORKSHEET

GT-409

OPTION BOARD



CONTROL RESET -- DS-2

1 Control I, Auto Reset
2 Control II, Auto Reset
3 Control II, Manual Reset
4 Control I, Manual Reset

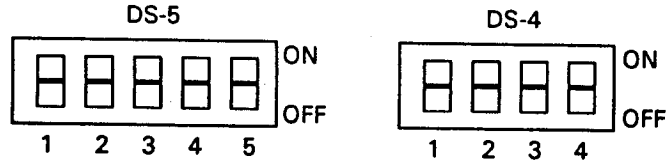
CONTROL LOGIC -- DS-1

1 Control II, Above Setpoint
2 Control II, Below Setpoint
3 Control II, Below Setpoint
4 Control II, Above Setpoint
5 Control I, Above Setpoint
6 Control I, Below Setpoint
7 Control I, Below Setpoint
8 Control I, Above Setpoint

OPTION WORKSHEET

GT-409

AMP BOARD



FILTER, TRANSDUCER SENSITIVITY,
SHUNT CALIBRATION -- DS-5

1 Filter (Damping)
2 <2.5 mV/V Transducer Output
3 200 KCal (Gentran only)
4 54.9 KCal (Gentran only)
5 30.1 KCal (Gentran only)

RECORDER OUTPUT -- DS-4

1 0-10 Volts DC
2 0-5 Volts DC
3 0-2 Volts DC
4 0-1 Volt DC