



**Digital Melt Pressure
and Temperature
Indicator**



GT-439

OWNER'S MANUAL

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GT-439
**DIGITAL MELT PRESSURE AND
TEMPERATURE INDICATOR**

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GT-439 DIGITAL MELT PRESSURE AND TEMPERATURE INDICATOR OWNER'S MANUAL

1.0 DESCRIPTION

The Gentran GT-439 digital combination melt pressure and temperature indicator also functions as a transducer power supply and signal conditioner. The GT-439's 1/4 DIN standard size case of extruded aluminum protects against EMI and RFI noise, heat dispersion and physical damage. The 0.28 inch LED displays give a clear indication, readable even from a distance.

The GT-439 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. Temperature indication is obtained using a J or K type thermocouple. 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. Temperature indication can be specified in degrees Fahrenheit or degrees Celsius. The dual setpoint option, designated by the letter "D" (GT-439D), 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 - 140° F (0 to 60° C)
Display (Pressure):	4½ digit, 0.28 inches high, high efficiency LED display with selectable decimal point and last digit fixed at zero
Accuracy (Pressure):	Within ±0.1% full scale ±1 digit
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 (Span):	1 - 2.5 mV/V or 2.5 - 5.0 mV/V, switch selectable and adjustable
Zero Balance:	±35% adjustable with the front panel potentiometer
Response Time (Damping):	0.3 seconds or 5 seconds selectable
Recorder Outputs (Pressure only):	0-1VDC, 0-2VDC, 0-5VDC, 0-10VDC dip-switch selectable, min. load 5000 ohms -0 option -- 0-20 mA -6 option -- 4-20 mA factory set, min. load 15 ohms, max. load 600 ohms
Recorder Output Accuracy:	Within ±0.1% full scale ±1 digit
Recorder Output Repeatability:	Within ±0.1% full scale ±1 digit
Recorder Output Linearity:	Within ±0.1% full scale ±1 digit
Recorder Output Stability:	Within ±0.1% full scale ±1 digit
Weight:	2.6 lbs.

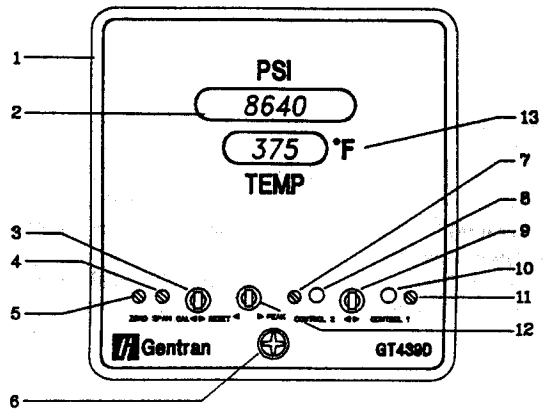
GT-439D CONTROL SPECIFICATIONS

Dual Relays (Pressure only):	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"

TEMPERATURE SPECIFICATIONS

Accuracy:	±0.5% per degree F or C
Calibration:	120-999 degrees F or C
Display:	3 digit LED, 0.28 inch height
Thermocouple Type:	Specify ISA Type J (Iron-Constantan) or ISA Type K (Chromel-Alumel)

2.1 FRONT PANEL FEATURES

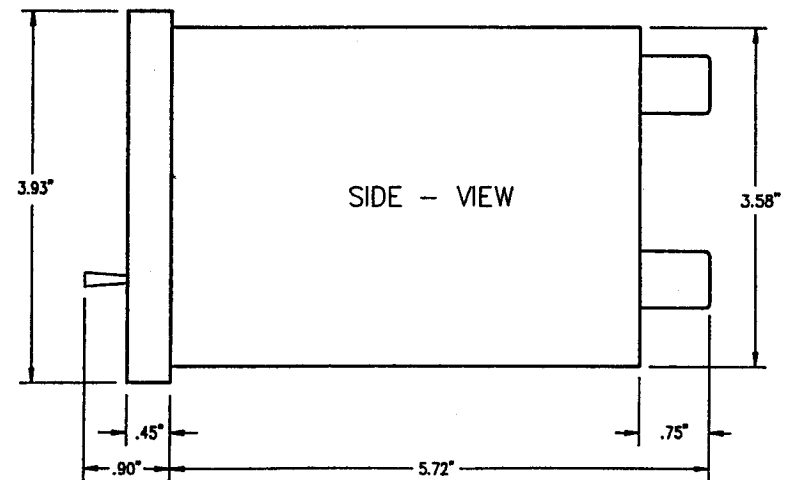
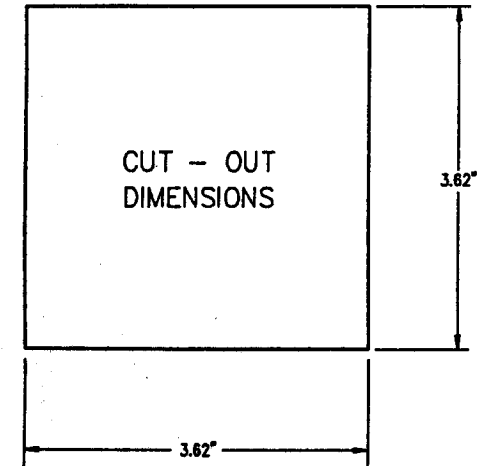


1. 1/4 DIN Enclosure.
2. Large Digital Display with high efficiency LED's. Indicates operating pressure and control alarm setpoints.
3. Calibration Selector/Reset Toggle Switch. Used to display and adjust span for calibration pressure of transducer and to reset control alarms when configured for manual reset.
4. Span Potentiometer. Used to raise/lower calibration pressure in conjunction 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.
12. Peak Hold/Peak Reset Toggle Switch. Used to switch unit into peak hold mode and to reset the peak pressure.
13. Large Digital Display With High Efficiency LED's. Indicates operating temperature.

3.0 INSTALLATION

The GT-439 is normally 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, first remove the screws holding in the slide retainers on the side of the case. Remove the slide retainers by sliding them toward the rear of the unit. Install the indicator into the panel cutout. Slide the slide retainers back into their slots. Install the screws and tighten enough to hold the indicator in place.

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 mA + -". A Type J or K thermocouple is connected at the "+" and "-" terminals marked "Thermocouple".

CAUTION: NEGATIVE RECORDER OUTPUT SHOULD NOT BE GROUNDED.

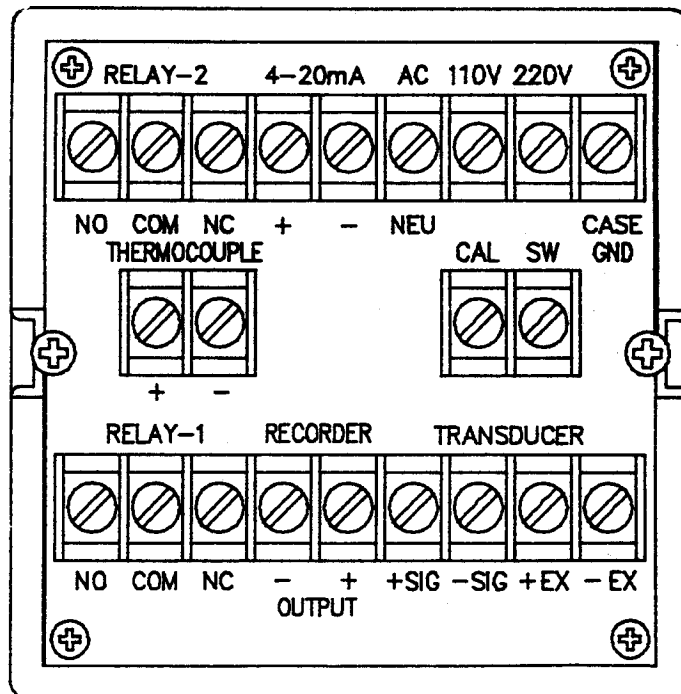


FIGURE B: Rear Terminal Assembly

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. Thermocouple -- positive (+) signal
11. Thermocouple -- negative (-) signal
12. Calibration Switch -- for use with internal shunt transducers
13. Calibration Switch -- for use with internal shunt transducers

LOWER TERMINALS

14. Control 1 Relay -- normally open
15. Control 1 Relay -- common
16. Control 1 Relay -- normally closed
17. Voltage Recorder Output -- negative (-) signal
18. Voltage Recorder Output -- positive (+) signal
19. Transducer -- positive (+) signal connection (green)
20. Transducer -- negative (-) signal connection (white)
21. Transducer -- positive (+) excitation (red)
22. 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 2 through 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 OPTION SWITCH SETTINGS

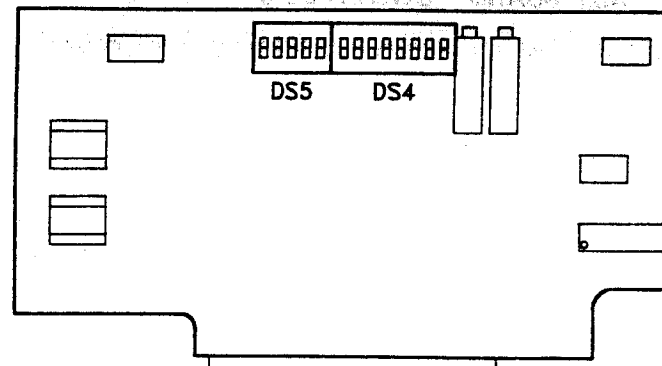


FIGURE C: Amplifier Board (Left Side)

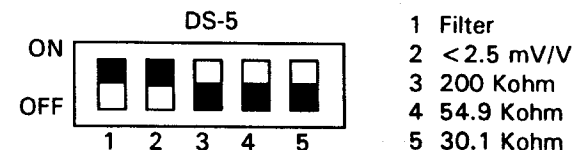
4.1.1 TRANSDUCER SENSITIVITY (mV/V) AMP BOARD -- SWITCH DS-5

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



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

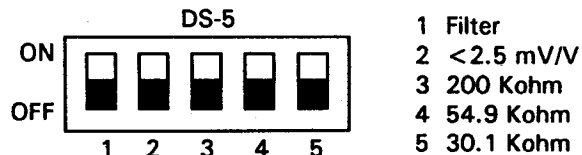
ON POSITION IS UP AND OFF POSITION IS DOWN

- Switch 3 200 KCal
- 4 54.9 KCal
- 5 30.1 KCal

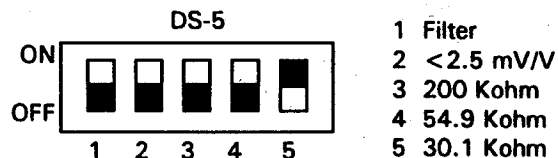
NOTE: Turn switches 3, 4 and 5 off for internal shunt transducers (ie. Dynisco). Use CAL SW terminals on back of indicator for shunt wiring.

EXAMPLES:

A. Dynisco compatible shunt calibration.



B. Gentran shunt calibration resistor 30.1 KCal.



**4.1.3 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, 0.3 second

See example under 4.1.1

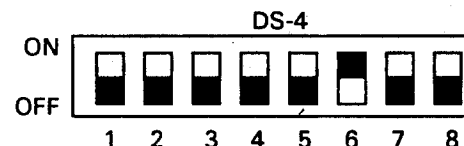
**4.1.4 RECORDER OUTPUT SELECT
AMP BOARD -- SWITCH DS-4**

ON POSITION IS UP AND OFF POSITION IS DOWN

- Switch 5 0-10 Volts DC
- 6 0-5 Volts DC
- 7 0-2 Volts DC
- 8 0-1 Volt DC

EXAMPLE:

Five (5) Volt DC output required



**4.1.5 DECIMAL POINT LOGIC
DISPLAY BOARD -- SWITCH DS-1**

ON POSITION IS UP AND OFF POSITION IS DOWN

- Switch 1 Divide Range by 10
- 2 Divide Range by 100

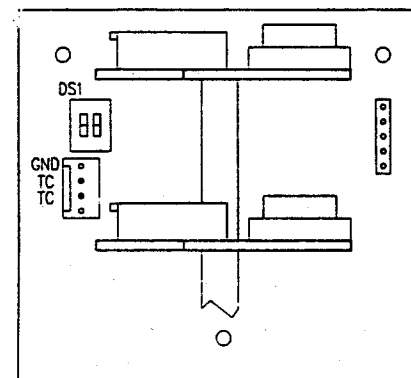
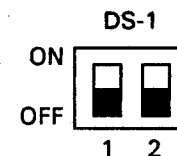


FIGURE D: Display Board (Backside of Display)

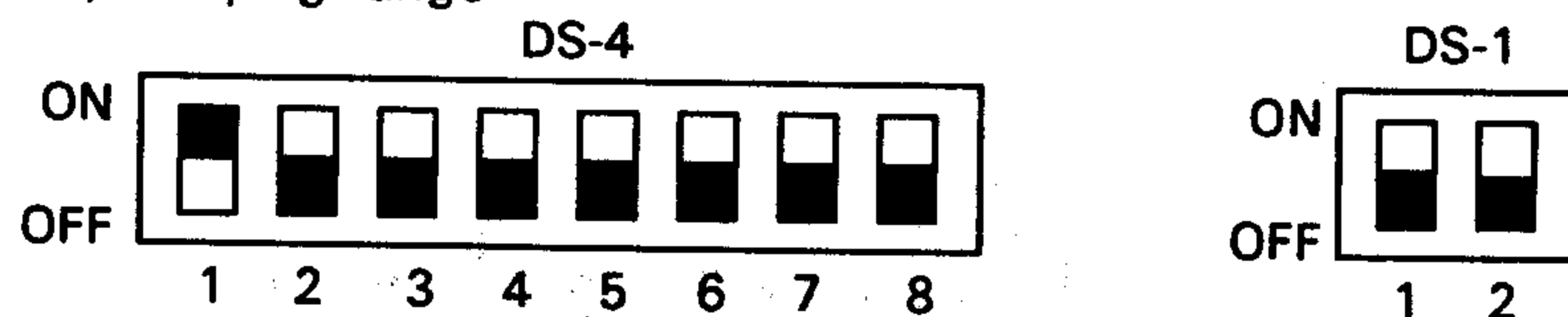
**4.1.6 RANGE SELECT LOGIC
AMP & DISPLAY BOARDS -- SWITCHES DS-1 & DS-4**

ON POSITION IS UP AND OFF POSITION IS DOWN

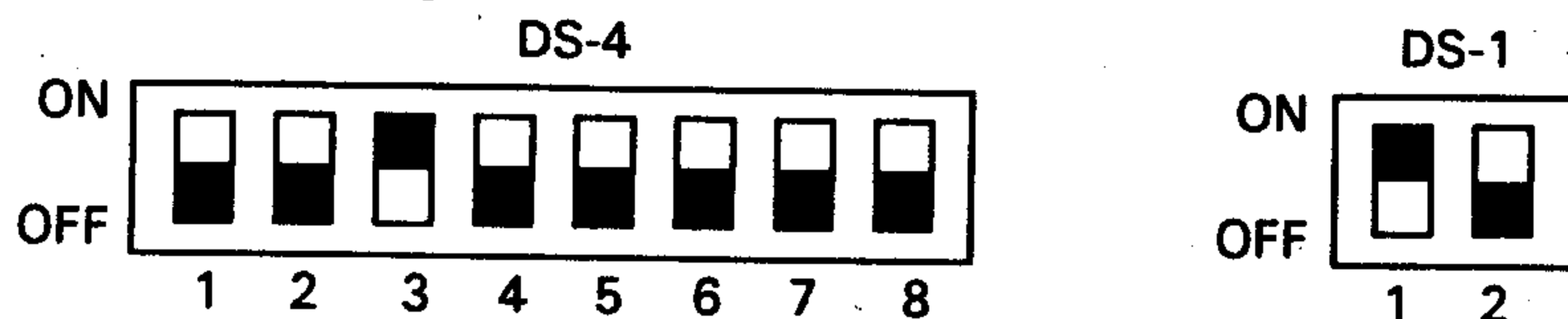
- Switch 1 3,000 counts -- 0-3,000, 0-300 or 0-30 readout
- 2 5,000 counts -- 0-5,000, 0-500 or 0-50 readout
- 3 10,000 counts -- 0-10,000, 0-1,000 or 0-100 readout
- 4 15,000 counts -- 0-15,000, 0-1,500 or 0-150 readout

EXAMPLES:

A. 3,000 psig range



B. 1,000 psig range



4.2 ADJUSTMENTS -- GT-439D CONTROL SETPOINTS

The GT-439D 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 1

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

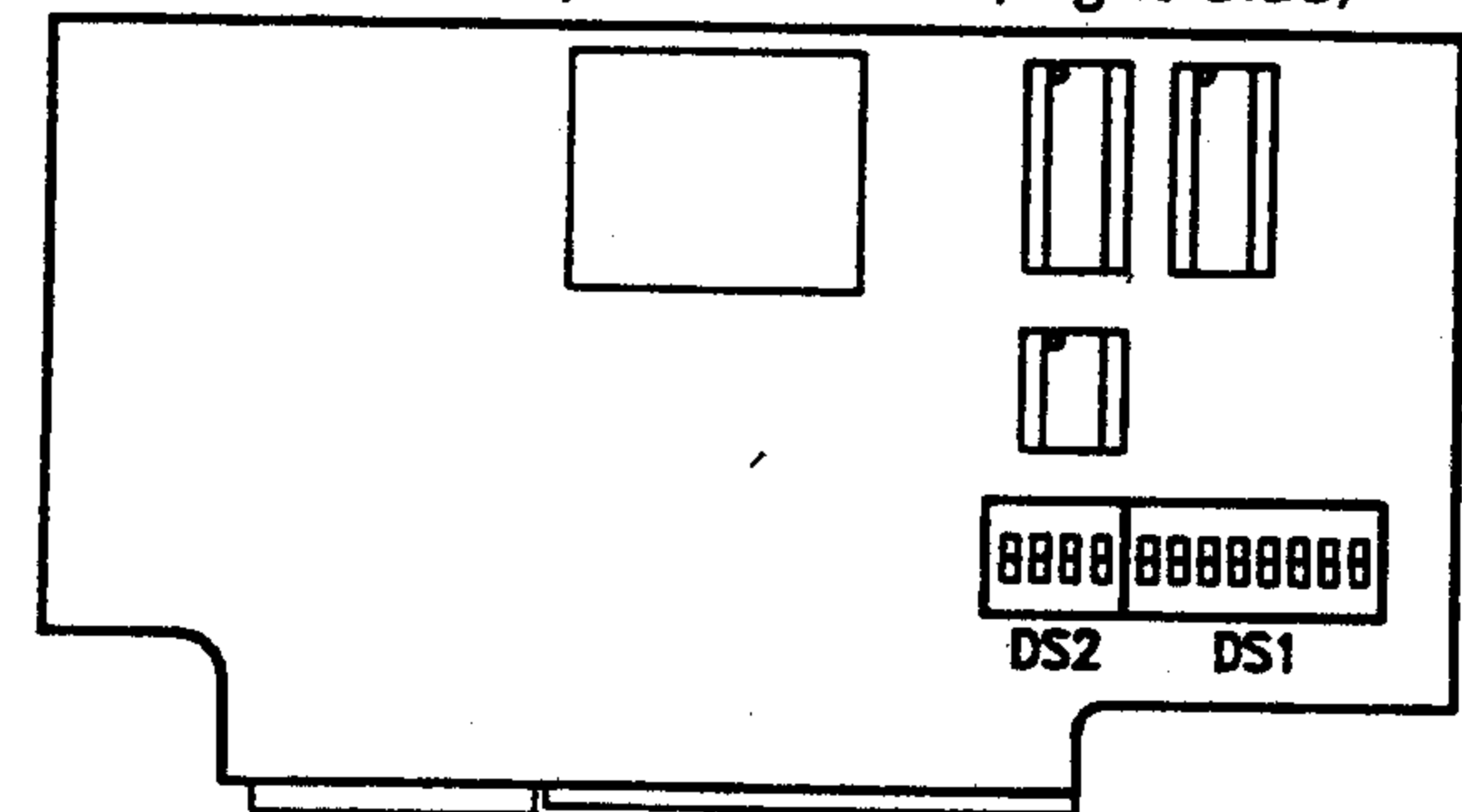
1. Push and hold the control selector toggle switch to the left.
2. Adjust the Control 2 potentiometer until the desired control pressure is displayed on the indicator.
3. Release the selector toggle switch.

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

ON POSITION IS UP AND OFF POSITION IS DOWN

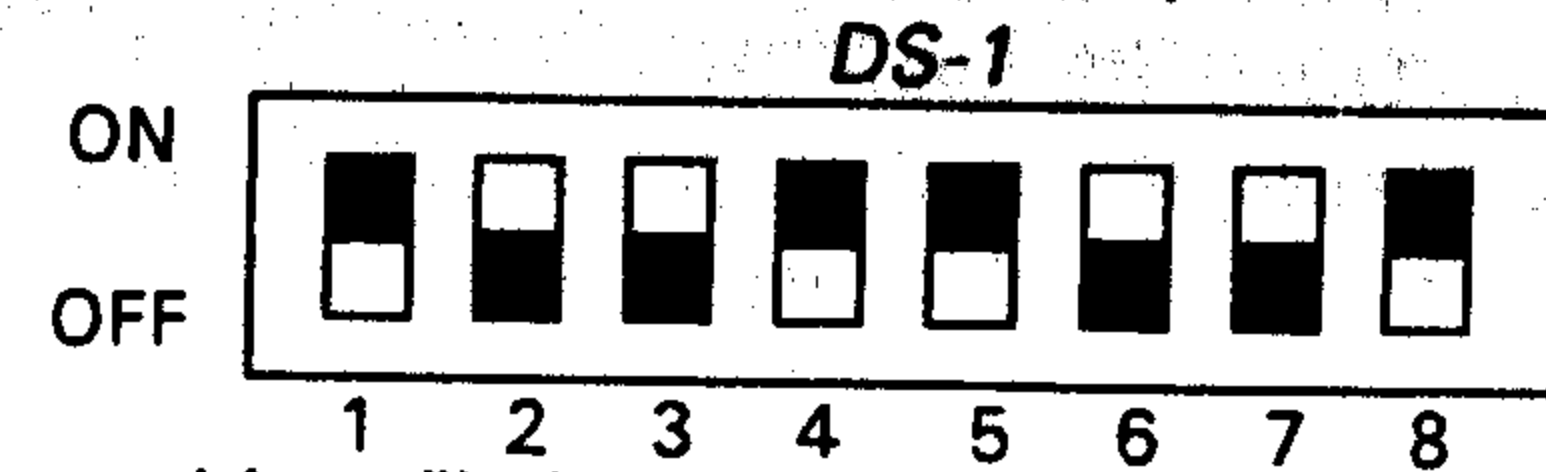
- Switch 1 and 4 Control II for above setpoint
- 2 and 3 Control II for below setpoint
- 5 and 8 Control I for above setpoint
- 6 and 7 Control I for below setpoint

FIGURE E: Options Board (Right Side)

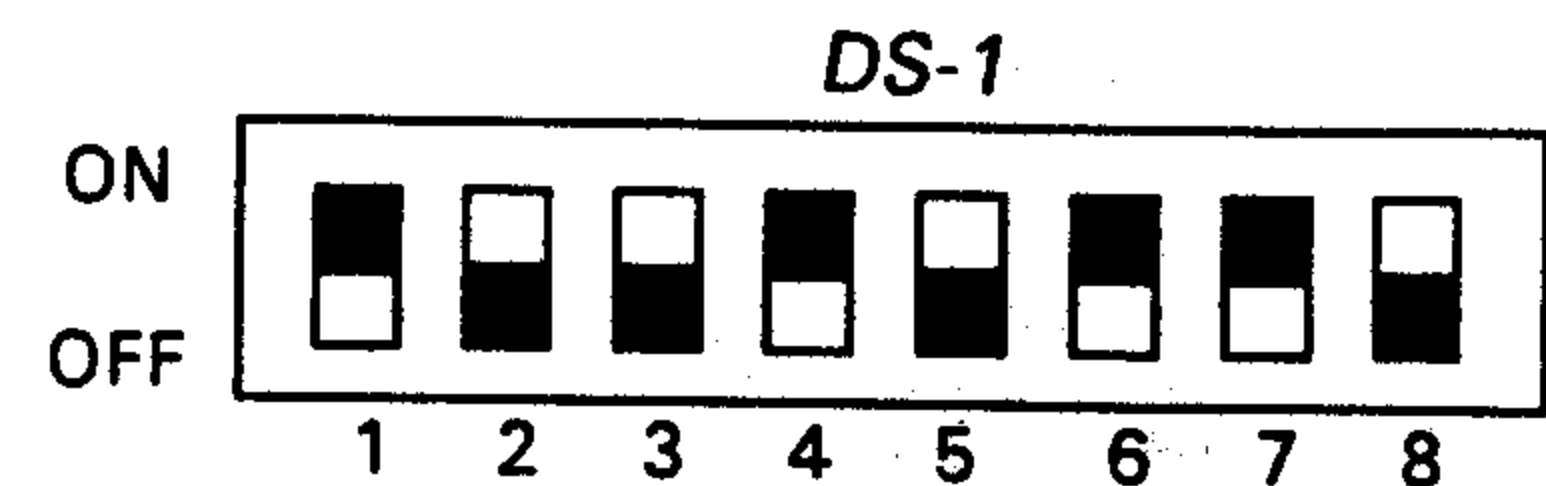


EXAMPLES:

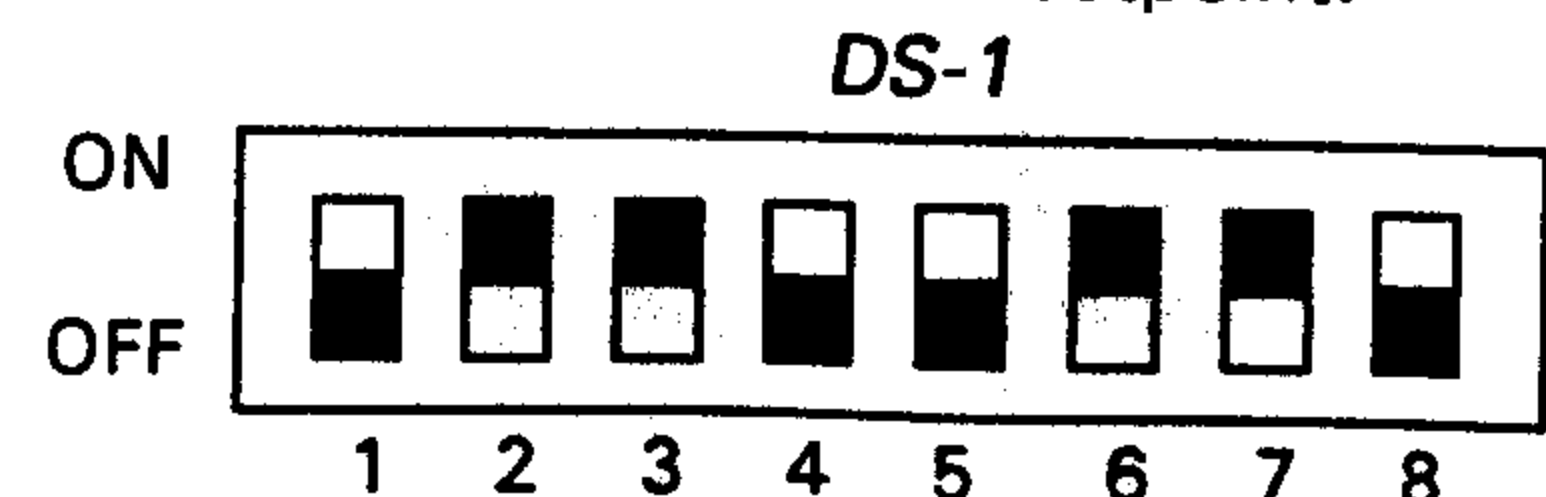
A. Control I and II on "above" setpoints.



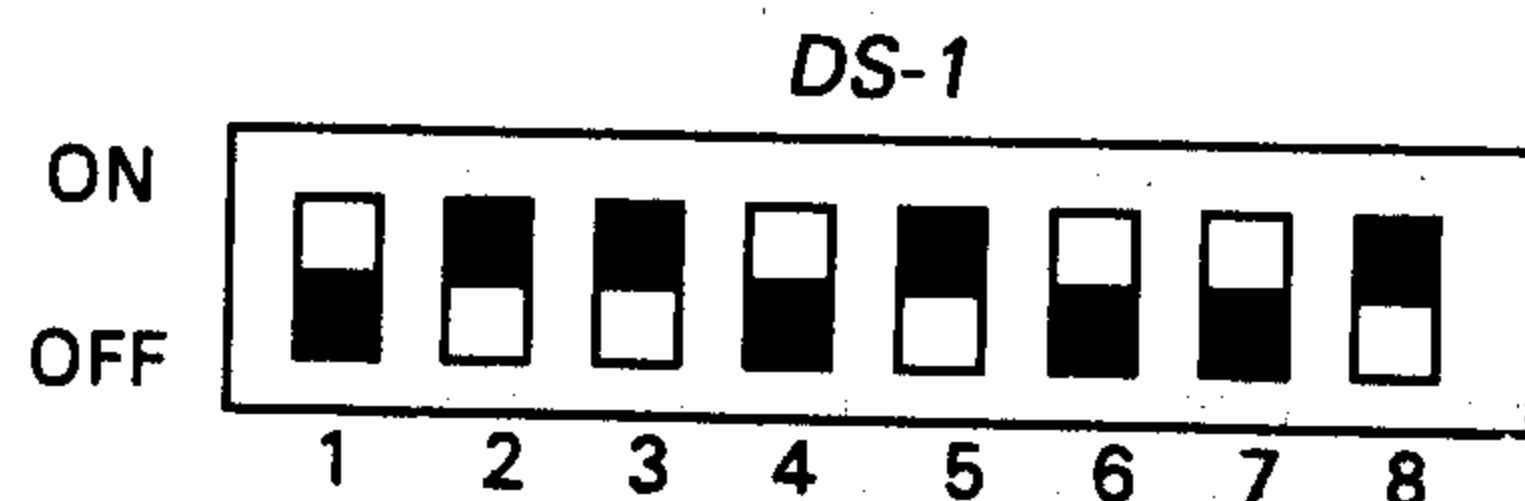
B. Control I on "below" setpoint and Control II on "above" setpoint.



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



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



4.2.2 RESET LOGIC

OPTION BOARD -- SWITCH DS-2

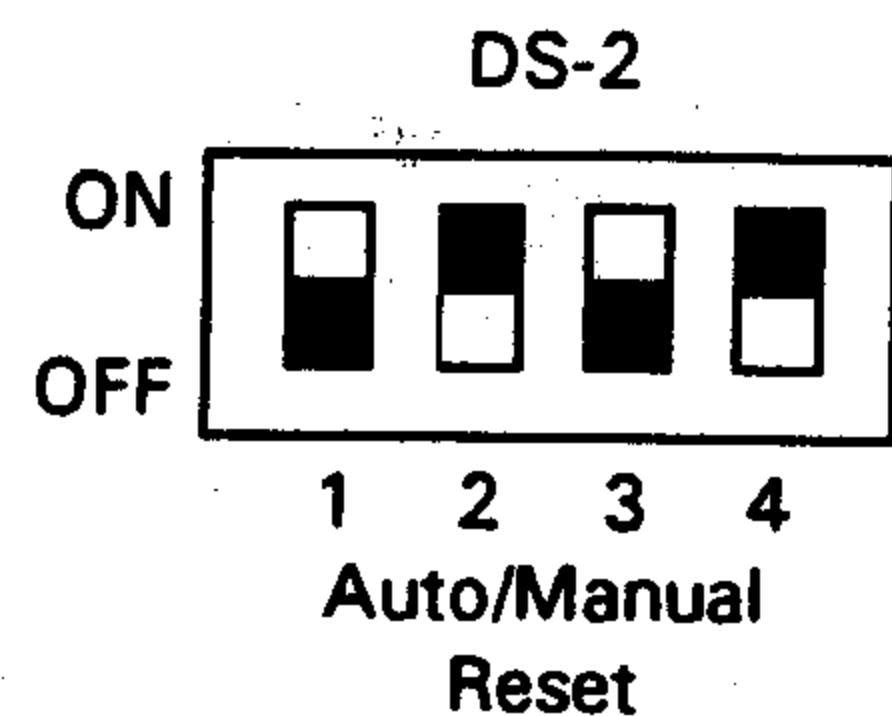
ON POSITION IS UP AND OFF POSITION IS DOWN

- 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.

Temperature display is off.

--Opening in thermocouple wiring.

6.0 REPAIR

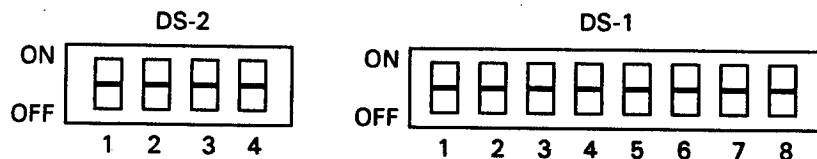
For service contact:

ISE
440-237-3200

OPTION WORKSHEET

GT-439

OPTION BOARD



RESET LOGIC -- DS-2

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

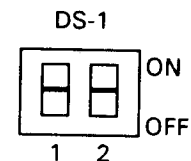
CONTROL LOGIC -- DS-1

- 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-439

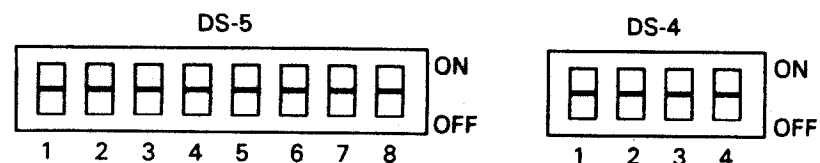
DISPLAY BOARD



DECIMAL POINT LOGIC -- DS-1

- 1 Divide range by 10
- 2 Divide range by 100

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)

DISPLAY RANGE, RECORDER OUTPUT -- DS-4

- 1 0-3,000 Counts
- 2 0-5,000 Counts
- 3 0-10,000 Counts
- 4 0-15,000 Counts
- 5 0-10 Volts DC
- 6 0-5 Volts DC
- 7 0-2 Volts DC
- 8 0-1 Volt DC