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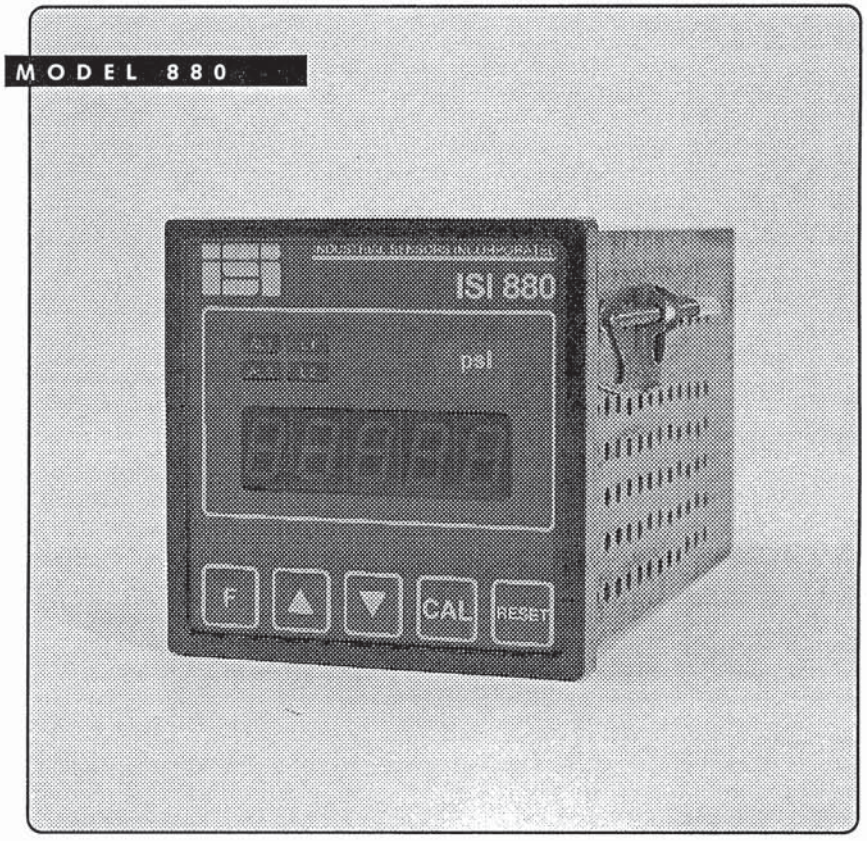
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Find the *Gefran / ISI 880* at our website: *Click HERE*

INDUSTRIAL SENSORS INC.

ISO Certified 9002

MICRO-PROCESSOR BASED MELT PRESSURE INDICATOR



INSTRUCTION MANUAL

INDUSTRIAL SENSORS INCORPORATED (ISO 9002 Certified) ▪ Toll Free 1-888-888-4474
8 Lowell Avenue, Winchester, MA 01890 ▪ Phone (781) 729-5249 ▪ Fax (781) 729-1468

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I. GENERAL DESCRIPTION

The **ISI 880** is a microprocessor-based instrument developed for use with strain gauge sensors and pressure transducers.

The following features are standard on the **ISI 880**:

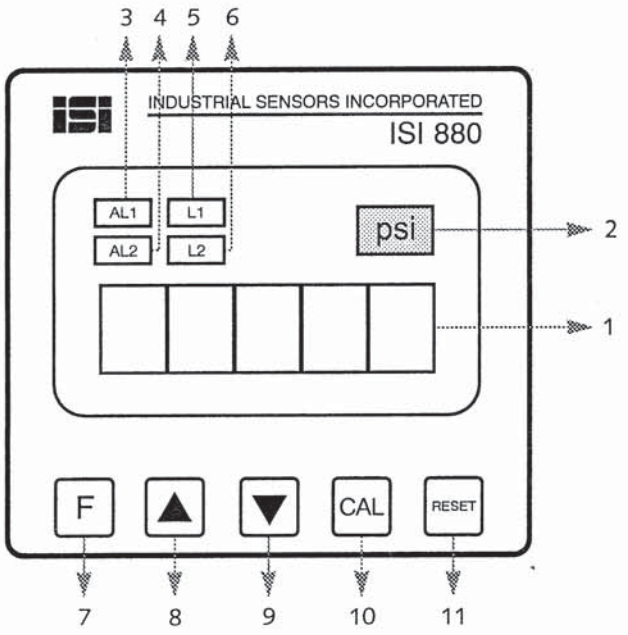
- standard 1/4 DIN enclosure
- fully active five digit (LED) display
- programmable measuring range to 30,000 counts
- automatic calibration of zero and span
- two relay contacts with adjustable setpoints
- user selectable analog outputs: 0 – 20 mA, 4 – 20 mA or 0 – 10 volts
- optional RS485 and RS232 interface
- all functions programmable via front keyboard
- built-in power line filter
- view high transducer readings recorded during operation

II. GUIDELINES FOR SAFE INSTALLATION AND OPERATION

- The **ISI 880** housing should not be exposed to moisture, humidity or dirt. The front panel conforms to IP54 splash proof and dust proof guidelines.
- Ambient temperature must not exceed 130°F (55°C).
- Installers should make electrical connections in accordance with applicable code regulations. The instrument should be installed by a qualified person who has read this manual and is familiar with installation procedures.
- Transducer wiring and cables should be installed separately from power lines and should be shielded wherever necessary. The ISI transducer cable contains a built-in shield to protect against noise and interference. Shield drains supplied with ISI cables are grounded at the connector under the connector clamp. Proper shielding techniques require that this shield be terminated at one end only. The other end of the shield drain should not be terminated.
- Installers must make connections for power, alarms and transducers in accordance with wiring diagrams to ensure safe and effective operation.
- Any power relays used with or near the **ISI 880** must use RC combinations to ensure proper noise suppression, as recommended by the relay manufacturer.

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III. DISPLAY ELEMENTS



1.	Five Digit Display	Displays transducer pressure reading. Additional readings and programming menus may be displayed by pressing keys
2.	Measuring Unit	The measurement unit is displayed in this window (BAR, PSI or Kg/cm²)
3./4.	Alarms	LEDs illuminate when an alarm has been activated
5.	L 1 LED	Illuminates during Level 1 programming
6.	L 2 LED	Illuminates during Level 2 programming
	L 1 and L 2 LEDs	Illuminate simultaneously during Level 3 programming
7.	F	Pushing the F key interrupts set up for a parameter and switches to the next parameter
8./9.	▲▼	These keys display prompts and navigate among parameter levels
10.	CAL	The CAL key moves the prompt during set up and accepts a new parameter setting
		Pushing CAL during operation will indicate input as a percent of full scale range. See Programming Notes, page 6
11.	RESET	See Programming Notes, page 6.

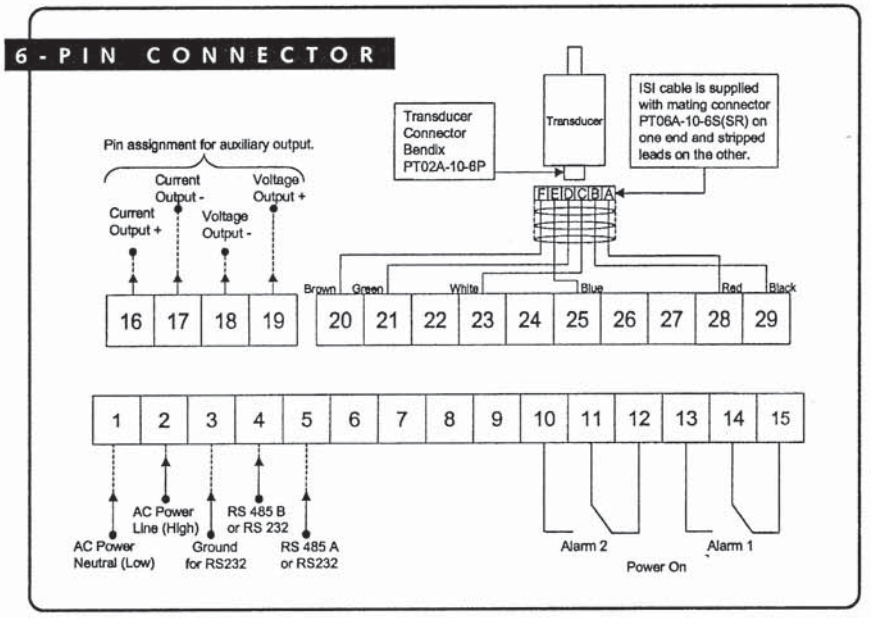
IV. TECHNICAL SPECIFICATIONS

ELECTRICAL	
Power	120VAC ± 10% or 230VAC ± 10% customer specified (50/60Hz) with built-in line filter
Operating Temperature	32°F to 130°F (0°C to 55°C)
Regulation	0.1% full scale display/output for 10% power input change
Noise Immunity	Conforms to VDE 0843 and IEC 801 (Parts 1-6)
Degree of Protection	Conforms to IP54 splash-proof/dust-proof guidelines
Termination	Screw terminals
SIGNAL INPUT	
Type	350 ohm strain gauge bridge
Input Sensitivity	1.0 mV/V to 4.5 mV/V
Zero Balance	± 30% of full scale
Bridge Excitation	10VDC at 40mA
Calibration	Will accept transducers with internal shunt calibration values from 40% to 100% and external calibration resistors
HOUSING	1/4 DIN: 96mm x 96mm x 160mm (3.78 x 3.78 x 6.15 inches)
PANEL CUTOUT	92mm x 92mm (3.625 x 3.625 inches)
DISPLAY	
Type	Fully active five digit LED display
Ranges	User programmable to 30,000 units
Units	PSI, Kg/cm², BAR, KPa, Pa, MPa
Decimal	Selectable from keyboard
Peak Hold	High peak value reading reset via front panel
Set up prompts	Displays program steps and error conditions
ALARMS	
Type	2 SPDT: In the event of a power failure, relays go into alarm condition
Mode	Low/high, latch/non-latch. Set and reset via front panel keyboard
Set point range	Alarm 1: 0 – 100% of full scale Alarm 2: 0 – 120% of full scale
Hysteresis	1.5% of full scale (fixed)
Response Time	100 milliseconds
Relay contact rating	5A at 115 VAC / 230VAC, 8A at 30 VDC
Indication	Alarm 1 and 2 LEDs illuminate on front panel
AUXILIARY OUTPUT	
Voltage output	0 – 10 VDC 1,000 Ohm minimum load
Current output	4 – 20 mA 650 Ohm maximum load 0 – 20 mA 650 Ohm maximum load
Linearity	Less than 0.1% full scale ± one digit

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V. PIN ASSIGNMENT AND WIRING DIAGRAM

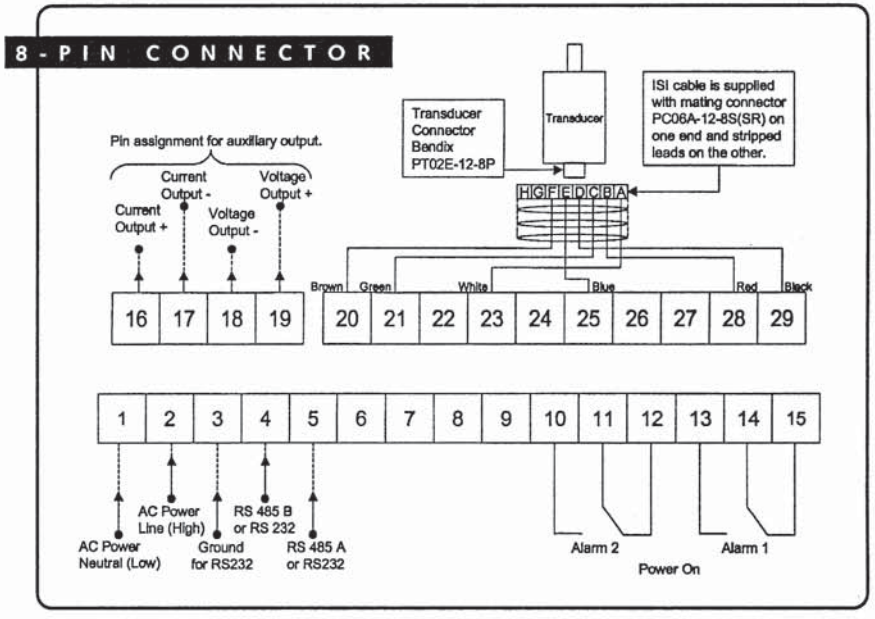
6-PIN CONNECTOR



Pin #	Function	Pin #	Function	ISI Cable Color
10	Normally Open	20	R-Cal	Brown
11	Common	21	Excitation (-)	Green
12	Normally Closed	23	Excitation (+)	White
13	Normally Open	25	R-Cal	Blue
14	Common	28	Signal (+)	Red
15	Normally Closed	29	Signal (-)	Black

Note: The ISI 880 is configured for 120 VAC power. If operating at 230 VAC, the ISI 880 must be ordered with "Mod 220."

8-PIN CONNECTOR



Pin #	Function	Pin #	Function	ISI Cable Color
10	Normally Open	20	R-Cal	Brown
11	Common	21	Excitation (-)	Green
12	Normally Closed	23	Excitation (+)	White
13	Normally Open	25	R-Cal	Blue
14	Common	28	Signal (+)	Red
15	Normally Closed	29	Signal (-)	Black

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VI. PROGRAMMING NOTES

INSTALLATION AND CALIBRATION PROCEDURES

Important: All parameters except calibration range and zero balance offset (taring) can be set at any time. The calibration procedure must be performed at room temperature and zero pressure to ensure that the instrument provides an accurate pressure reading. See page 10, Sections A.

Bring extruder to operating temperature. At this point the **ISI 880** will need to be zeroed (tared) to remove any offset due to temperature. See page 10, Sections B.

TIME LIMIT ON SETTING PARAMETERS

If the indicator has been idle for two minutes during set up, set up sequences will be interrupted and all parameters will revert to their previous settings.

TO RETURN TO TRANSDUCER PRESSURE READING

From any of the programming menus or display options, press **F** until the transducer reading is displayed.

RESET KEY

The Reset key has three functions:

1. Unlatching Alarm 2: Pushing **RESET** when the **LATCH** prompt of Alarm 2 is displayed in Menu 2 unlatches Alarm 2.
2. Resetting Peak Reading to Zero: Pushing **RESET** during the peak prompt display will reset the peak reading to zero.
3. Re-zero Transducer Offset: Pushing **RESET** together with the ▼ key will re-zero any transducer offset.

CAL KEY

Pushing the **CAL** key during parameter set up moves the prompt to the right to the next digit. Once a parameter has been set, pushing **CAL** accepts the value and moves to the next parameter or prompt.

Pushing **CAL** during operation will indicate input as a percent of full scale range. Thus, if the **ISI 880** is set to display a pressure range up to 5,000 psi and the extruder is operating at 1,000 psi, then pushing **CAL** will display 20.0, meaning that the extruder is operating at 20.0% of full scale.

CALIBRATION OF THE ISI 880

The **ISI 880** is shipped from the manufacturer set at an industry standard calibration level of 80%. A calibration point at a value other than 80% may be set within Code 30. The calibration range is 40% to 100% of full scale. If you attempt to set the calibration point outside of this range, an error message, **ERROR**, will appear on the instrument display. If **ERROR** appears while you are setting the calibration point, then hold the F key to return to actual pressure display.

OPTIONAL R-CAL

ISI 880 users may set a calibration point other than the industry standard 80% within Code 30 by entering the desired calibration point after the **CAL-P** prompt. The range of possible calibration points is 40% to 100% of full scale and must match the transducer's internal **R-CAL**. After entering the desired calibration point, the **ISI 880** will automatically recalibrate.

AUTO RE-ZERO

To zero out (tare) any transducer offset due to temperature, press RESET and ▼ simultaneously. If the amount of the offset is higher than the allowed zero offset (± 40% of full scale), **ERROR** will appear in the instrument display. If **ERROR** appears, then hold the **F** key to return to actual pressure display.

ALARM 1 AND ALARM 2

Set Alarm 1 and Alarm 2 within Code 20.

Alarm 1 may be set as the high alarm (**HI**) or the low alarm (**LO**) and is non latching. "Non-latching" means that the AL 1 indicator light turns itself off automatically when the transducer has returned to normal levels.

The **ISI 880** always treats Alarm 2 as the high (**HI**) alarm. Alarm 2 can be set as either latching or non-latching. When set as latching, the operator must press RESET in Code 20 to turn off Alarm 2. When Alarm 2 is set as non-latching, AL 2 indicator light turns itself off automatically once the transducer reading has returned to normal levels. See page 10, section C for instructions on setting alarms.

Both alarms operate with a switching hysteresis of 1.5% of full scale.

AUXILIARY OUTPUTS

Operators may choose one of three kinds of output in Code 20 after the prompt **Au.Out**. The three possible outputs are:

0 – 10 volts 0 – 20 mA 4 – 20 mA

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ACTUAL VALUE FILTERING

The transducer pressure reading may be filtered or unfiltered. When unfiltered, the **ISI 880** shows the transducer reading at every recording cycle. The least significant digit on the display will flicker when the pressure reading is unfiltered. When filtered, the ISI 880 displays a pressure reading average over a preset number of cycles recorded at 0 to 15 second intervals. The filter can be switched on within Code 30.

PEAK VALUE MEMORY

ISI 880 users may view the highest recorded transducer reading by viewing the peak value display within Code 30.

VII. OVERVIEW OF PROGRAMMING AND DISPLAY OPTIONS

The indicator display default shows a transducer pressure reading. Additional readings and the programming menus may be reached through three main menus and submenus. Within each menu, you may set the following parameters for the **ISI 880**:

Actual Display
- Tare or Auto Re-zero

Code 10
- Set up sequence for calibration range (**rAnGE**), setting zero, setting span
- L 1 LED illuminates to confirm that you are in Menu 1

Code 20
- Set up sequence for Alarm 1 (**AL 1**) and Alarm 2 (**AL 2**)
- Select auxiliary output (**Au.Out**):
  - 0 – 10 volts
  - 0 – 20 mA or
  - 4 – 20 mA
- L 2 LED illuminates to confirm that you are in Menu 2.

Code 30
- Set up sequence for calibration. The default is 80%.
- Set calibration range, or R-Cal (**CAL-P**) from 40% to 100%.
- Set Actual Value Filtering (**FiLt**)
- Display highest pressure value recorded (**PEA**)
- Both the L 1 and the L 2 lights are on in Menu 3

VIII. TO DISPLAY PROGRAMMING MENUS AND DISPLAY OPTIONS

To reach the main menus, input Code 10, 20 or 30 as follows:

Press **F** to display **CodE**.

Use ▲ or ▼ until the desired code (10, 20 or 30) appears in the LED display.

Press **CAL** to accept the digit displayed.

For example, from the default reading to reach Code 10:

Press **F** to display **CodE**.

Press ▲ to display a flashing 1.

Press **CAL** to accept 1.

Flashing 0 will be displayed. Press **CAL** to accept 0.

RanGE, the first parameter that may be set in Menu 1, will be displayed.

Code 20 and Code 30 may be similarly reached by pushing ▲ and ▼ following **CodE** to display the code desired. See page 8, Section V for an overview of Programming Options.

IX. PROGRAMMING INSTRUCTIONS

A. TARE OR AUTO RE-ZERO

B. CODE 10
- Calibrating ISI 880 to the Transducer

C. CODE 20
- Alarm1
- Alarm 2
- Auxiliary output

D. CODE 30
- Calibration range
- Actual Value Filtering
- View Peak transducer reading

E. PROGRAMMING SHORTCUTS
- Displaying peak high value

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A. CODE 10: TO SET CALIBRATION RANGE

With instrument displaying a transducer reading:

1. Press **F** to display **CodE**.
2. Press ▲ until flashing digit reads **1**.
3. Press **CAL**. Next digit will flash.
4. Press **CAL** to accept 0, or press ▲ and ▼ if necessary until **0** is displayed.
5. Press **CAL** to accept 10 and enter programming sequence.

To calibrate the ISI 880:

6. **rAnGE** will be displayed.
7. Press ▲ or ▼ to input the upper end of the pressure range of the transducer. Press **CAL** to move to next digit.
8. When last digit is set, press **CAL** to accept range setting.
9. **C 0** will be displayed for a moment while the instrument calibrates.
10. **C** plus 80% of full scale will be displayed for a moment. (e.g. if the transducer is calibrated to 10,000 psi, the display will show **C8000**, or 80% of full scale.) The ISI 880 automatically sets the zero and span.

Note: If display reads **Error**, press and hold **F** to return to actual pressure display. Then see trouble shooting guide, page 18.

B. TARE OR AUTO RE-ZERO

To zero out (tare) any transducer offset due to temperature, press RESET and ▼ simultaneously. If the amount of the offset is higher than the allowed offset (±/40% of full scale), **ERROR** will appear in the instrument display. If **ERROR** appears, then hold the F key to return to the actual pressure display.

C. CODE 20: TO SET ALARM 1 (AL 1), ALARM 2 (AL 2), SELECTING AUXILIARY OUTPUT (AU.OUT)

1. Press **F** to display **CodE**.
2. Press ▲ until flashing digit reads **2**.
3. Press **CAL**. Next digit will flash.
4. Press **CAL** to accept 0, or, press ▲ or ▼ if necessary until **0** is displayed.
5. Press **CAL** to accept 20 and enter programming sequence.

To set Alarm 1:

6. **AL 1** will be displayed.
7. Use ▲ ▼ keys to input setpoint for Alarm 1. Press **CAL** to move to next digit in sequence.
8. When last digit is set, press **CAL** to accept Alarm 1 setting.

To designate alarm setpoint as the "HI" or "LO" alarm:

9. **HI-LO** will be displayed.
10. Press ▲ and ▼ to display **HI** (high alarm) or **LO** (low alarm).
11. Press **CAL** to select value and move to next setting.

To set Alarm 2:

12. **AL 2** will be displayed.
13. Use ▲ ▼ keys to input setpoint for Alarm 2. Alarm 2 is always the high alarm. Press **CAL** to move to next digit in sequence.
14. Press **CAL** to accept alarm setting.

To set alarm as latching or non-latching:

Designating Alarm 2 as "latching" means that the alarm indicator will remain lit even when pressure has fallen below the high alarm setpoint. Designating Alarm 2 as "non-latching" means that the alarm indicator will switch itself off after the pressure reading has returned to normal levels.

15. **LAtCH** will be displayed.
16. Press ▲ and ▼ to display **On** (latching) or **OFF** (non-latching).
17. Press **CAL** to select value and move to next setting.

Selecting value for auxiliary output:

18. **Au.Out** will be displayed.
19. Press ▲. Use ▲▼ keys to select value for auxiliary outputs.

    Available outputs are:

    0 – 10 volts

    0 – 20 mA

    4 – 20 mA
20. Press **CAL** to accept auxiliary output. Actual output of transducer in psi, BAR, or Kg/cm2 will now be displayed

D. CODE 30: TO SET CALIBRATION RANGE (CAL-P), ACTUAL VALUE FILTERING (FiLt), PEAK VALUE MEMORY (PEA), SOFTWARE INTERFACE

1. Press **F** to display **CodE**.
2. Press ▲ until flashing digit reads **3**
3. Press **CAL**. Next digit will flash.
4. Press **CAL** to accept 0, or press ▲ and ▼ if necessary until **0** is displayed.
5. Press **CAL** to accept 30 and enter programming sequence.

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To set calibration value:

6. **CAL-P** will be displayed.
7. Use ▲ and ▼ keys to select new calibration value other than 80% of full scale. Press **CAL** to move to next digit
8. Press **CAL** to accept value. Instrument will automatically recalibrate to new calibration value.

To set placement of decimal point:

9. **dP** will be displayed.
10. Use ▲ and ▼ keys to select position of decimal point
11. Press **CAL** to accept decimal point placement.

To set Actual Value Filtering:

12. **FiLt** will be displayed.

With filter **ON**, the instrument will display a steady transducer reading over a preset number of sampling cycles.

With filter **OFF**, the least significant digit will vary over sampling cycles

To turn filter ON or OFF:

13. Press ▼ or ▲ to display **ON** (filtered) or **OFF** (unfiltered)
14. Press **CAL** to accept filter setting

To display peak high value reading:

15. **PEA**, or "peak value" will be displayed.
16. Press ▲ to display peak value.
17. Press **RESET** to erase peak value. Press **CAL** to keep peak high value reading in memory.
18. **rS.Adr** will be displayed.

Press F to complete settings and transducer output will be displayed.

Or if ISI 880 is to be interfaced with computer-based controls:

19. Press ▲.
20. Using ▲ and ▼ keys, input **RS** address.
21. Press **CAL** to move to next digit.
22. When output is set, press **CAL** and transducer output in psi, BAR, etc. will be displayed.

Software Interface:

The **ISI 880's** built in RS 485 interface provides bus capability to link to a host computer. A maximum of 31 ISI instruments may be addressed in a master/slave configuration with the host computer as the master. Baud rate is fixed at 9600 baud, 8 bit, 1 stop bit, no parity.

A twisted or screened two-conductor cable should be used as the transmission line.

E. PROGRAMMING SHORTCUTS

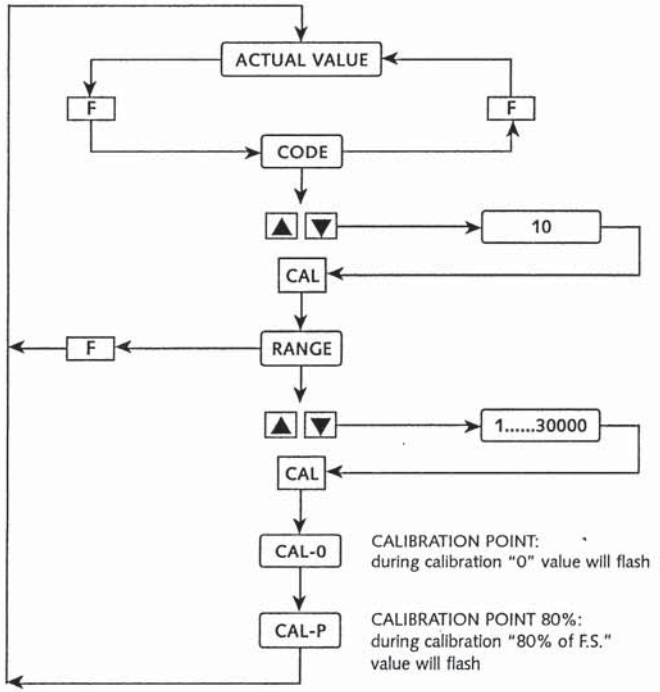
Displaying peak high value reading:

1. Press **F** to display **CodE.**
2. Press ▲ until flashing digit reads **3.**
3. Press **CAL.** Next digit will flash.
4. Press **CAL** to accept 0, or press ▲ and ▼ if necessary until **0** is displayed.
5. Press **CAL** to accept 30 and enter programming sequence.
6. **CAL-P** will be displayed.
7. Press **F** three times.
8. **PEA**, or "peak value" will be displayed.
9. Press ▲ to display peak value.
10. Press **RESET** to erase peak value. Press **CAL** to keep peak reading in memory.
11. **rS.Adr** will be displayed.
12. Press **F** to display transducer pressure reading.

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X. PROGRAMMING FLOW CHARTS

Parameter Level 1 Code 10

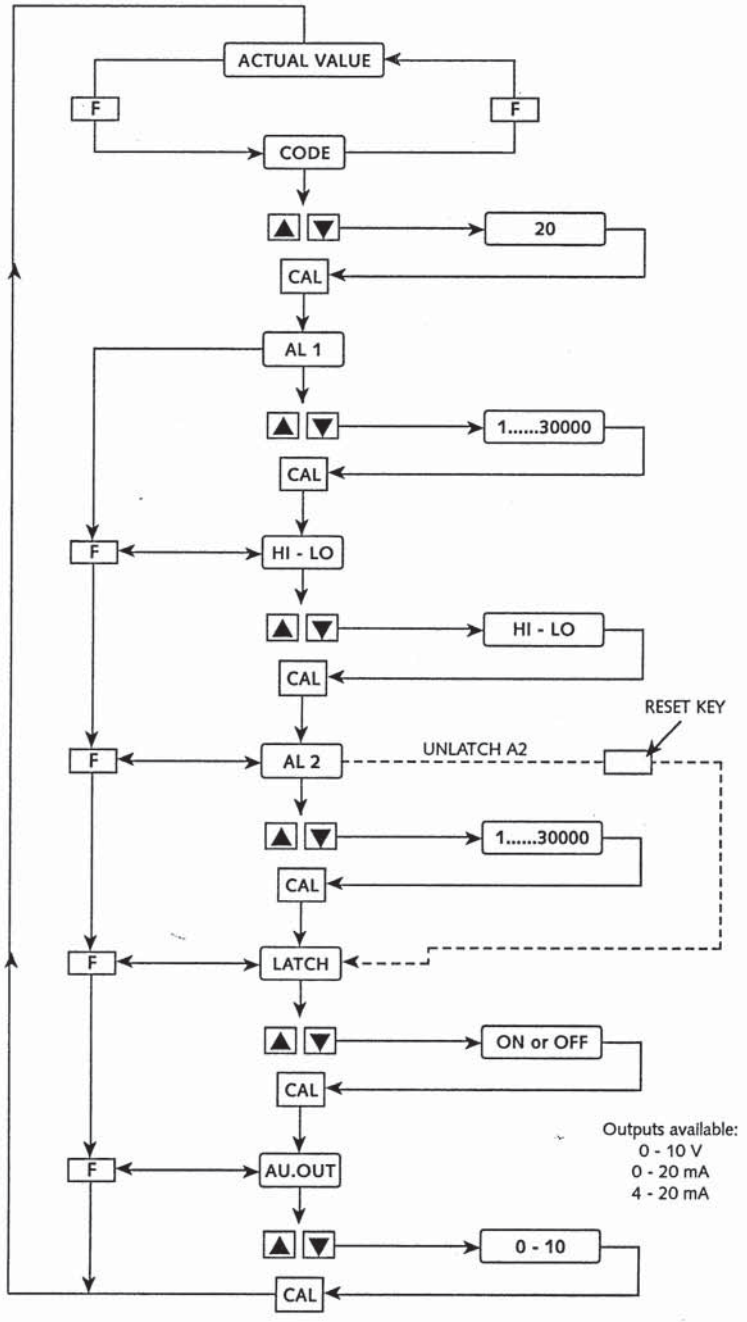


Key

Indicates display

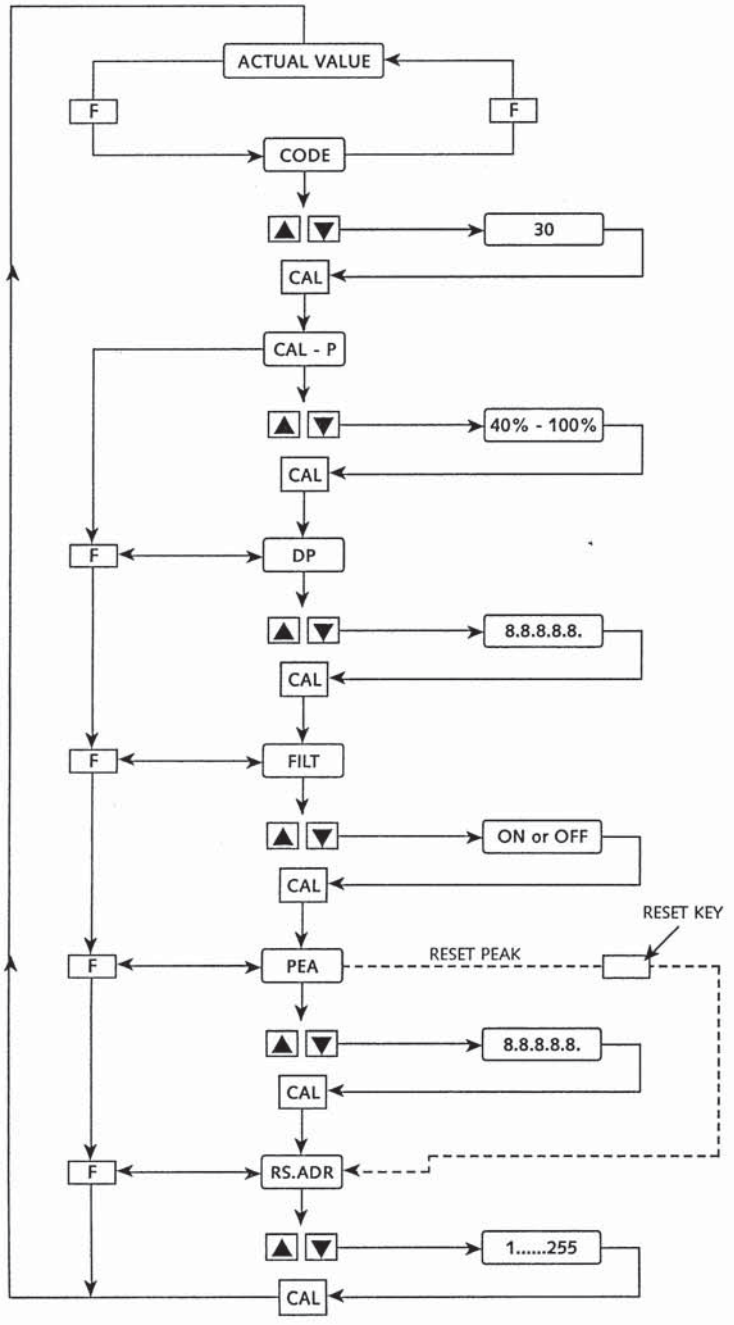
Indicates key

Parameter Level 2 Code 20

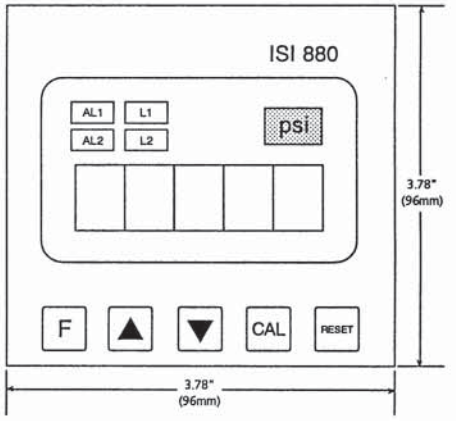


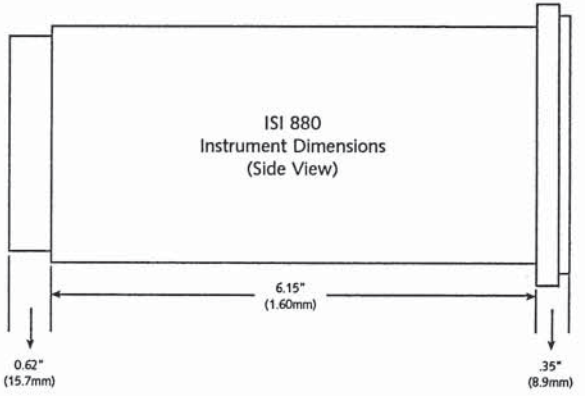
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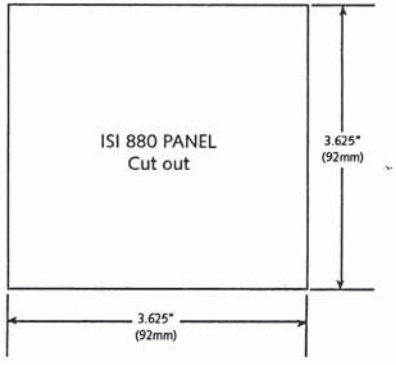
Parameter Level 3 Code 30



XI. INSTRUMENT AND CUTOUT DIMENSIONS







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XII. TROUBLE SHOOTING GUIDE

ER.CAL	**ER.CAL** indicates that a calibration error has been detected. All parameters should be checked and the **ISI 880** should be recalibrated. See page 6, Section B.
OVER	Instrument readout displays **"OuEr"**. A lead has been broken. Check all wiring and rewire if necessary. Transducer input is open or maximum value is exceeded. Transducer may have been damaged by being overloaded, or may be miswired.
UNDER	Wire has been disconnected or is loose at Pin 23, the Excitation (+) wire. There has been a lead short circuit. Check all wiring and rewire if necessary.
Blank screen	Damaged fuse, transformer or internally miswired for power supply (120 or 230 VAC).
Pressure indication 'frozen'	Disconnected or loose Excitation (+) wire at Pin 23.
ERROR	Loose or disconnected R-Cal wires. If you are using an external R-Cal, resistor (Pins 20 and 25) may be loose or disconnected. Perform continuity check of cable connectors. Operator may have attempted to calibrate the **ISI 880** while pressure is being applied to the transducer. Actual pressure may be 40% of full scale or greater. Press and hold F to clear error message.
Negative number on screen	Signal wires (Pins 28 and 29) are reversed.
00000	Unit is internally wired for 230 volts, but is receiving 115 volts (miswired).

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