

OPERATION MANUAL

DUAL CHANNEL TEMPERATURE INDICATOR (WITH CONTROL OUTPUTS)



MODEL 8080PR3

INTERNATIONAL METAL ENGINEERING

Released on 11th Mar 2013

DESCRIPTION

The IME 8080PR3 is a micro-controller based Digital Dual-channel Indicator with two relay outputs having ON/OFF control output feature, offered in a highly compact, rugged and reliable execution. The instrument has three keys on the front panel, with which the operator can set the parameters and configure the instrument as desired. A four-digit red LED digital display is provided on the front panel which indicates the process temperature value in real time.

The instrument has non-volatile memory (i.e., in case of power failure, the set points and other settings are retained in memory and the indication and control actions resume after power is restored).

The instrument can accept a RTD Pt-100 and displays the temperature while providing ON/OFF control outputs. Set points are configured through the Membrane Keypad on the front panel.

The temperature display is factory calibrated to the normal operating ranges of the respective temperature sensors through the instrument software and may be changed whenever desired.

The instrument accepts any one of the following input signals:

SR. NO.	TEMPERATURE SENSOR	CALIBRATED RANGE °C
1.	RTD Pt-100 (three-wire)	-70.0 to 500.0

The type of sensor input is selected during the instrument configuration (see SETTINGS section).

The selected input signal is suitably isolated and conditioned by the micro-controller, which displays the actual temperature value in real time on the digital display.

Two Relay outputs are included in this model – each of which may be configured to operate on either Heating or Cooling setting, with its independent hysteresis value. These set-points are configured through the Membrane Keypad on the front panel [see *Operation & Settings section*].

The micro-controller based Dual channel Temperature Indicating Controller Model: 8080PR3 is an ideal instrument for temperature measurement and control applications because of its versatility and inherent accuracy in process measurement and control. Other superior features are; total immunity to shocks, dust, ambient temperatures, and humidity. Additionally, the 8080PR3 operates on 12–28 V DC.

All I.M.E instruments are manufactured using selected high-grade components which guarantee functionality and long operational life. Our confidence in the products is stated in a performance guarantee against manufacturing and workmanship defects (see Warranty clause).

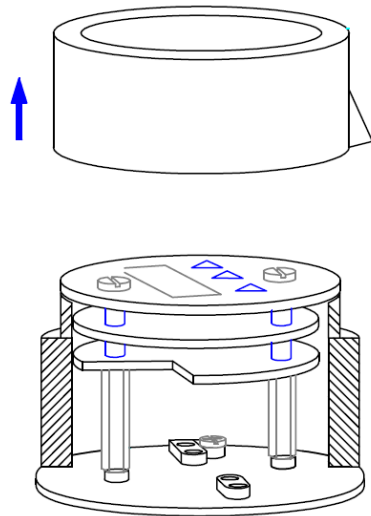
INSTALLATION

The device should be mounted so that it is secure and not subject to damage or excessive vibration [See *Technical Specifications*]. All interconnections to the instrument should be made with strong multi-strand wire of the order of 2.5 sq.mm. The ends of the wires should be properly ferruled and suitable lugs must be used for effective termination.

The cables carrying the input (Sensor) signal should be routed separately and properly isolated from the power line cables and Control Relay wiring, to prevent any electromagnetic interference in the input signal readings from the main power line. Use of shielded twisted pair cable is recommended for input signals. The shield must be connected to Earth (Ground) only at the instrument end. The instrument should be earthed (grounded) to a proper grounding point before connecting the Power Supply. The voltage between the Earth (Ground) and Neutral terminals should be negligible (Approx. 1 V AC). The Relay contacts are potential free and any desired voltage may be used in conjunction with the same.

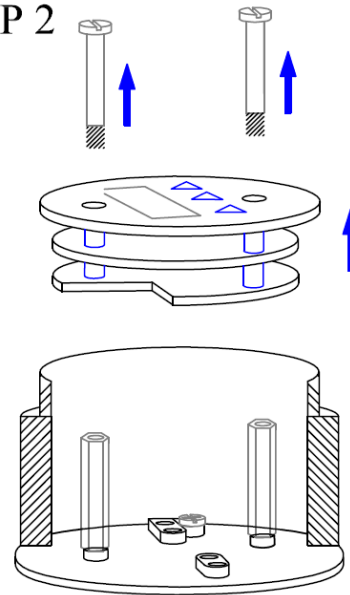
All Relay Circuits shall be connected to same phase circuit only.

STEP 1



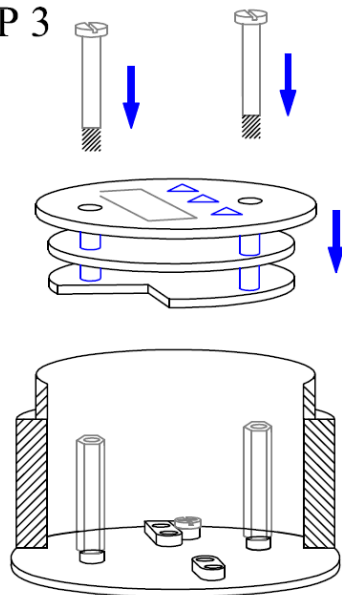
1) UNSCREW AND REMOVE ENCLOSURE COVER

STEP 2



2) UNSCREW CAPTIVE SCREW AND DISMOUNT CIRCUIT BOARD FOR NECESSARY WIRING AND SETTINGS

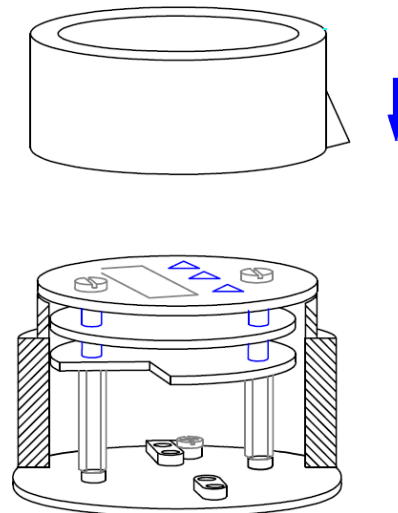
STEP 3



3) REST CIRCUIT BOARD ON THE OPENING OF THE HOUSING ALIGNING THE MOUNTING HOLES WITH THE STANDOFFS.

USE THE SUPPLIED CAPTIVE SCREW TO MOUNT THE CIRCUIT BOARD BACK ON THE HOUSING.

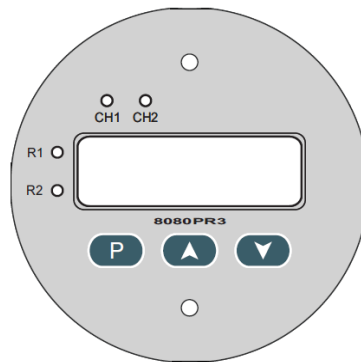
STEP 4



4) CLOSE ENCLOSURE COVER

OPERATION AND SETTING

The front panel of the Digital Temperature Indicator Controller is as shown below:



The 8080PR3 Digital Temperature Indicator Controller has a four-digit LED display window on the front panel for indicating the temperature value. Four other LED status indicators are displayed on the front panel – two Yellow LEDs show the channel status, i.e., whether channel 1 or channel 2 is being displayed and two red LEDs indicate the status of each control Relays.

CONTROL KEYS

The instrument has three keys on the front panel. The functions of these are described below:

<p>PROG P</p>	<p>The PROG or PROGRAM key marked "P" is the central co-ordinating key to access the settings of the instrument. Pressing this Key allows the operator to sequentially view, change and save the parameters such as Sensor selection, Channel selection, Relay Set-points, Hysteresis, Control Logic, etc.</p>
<p>INC ↑</p>	<p>The INC or Incrementing key allows the operator to select the numeral in the digit being set on an increasing scale. The digit will sequentially display 0, 1, 2...9 on each pressing of the INC key. This may be used to set the Zero/Span of the temperature range and the Set-points of the Relays. The incrementing speed increases if the key is kept pressed.</p>
<p>DEC ↓</p>	<p>The DEC or Decrementing key allows the operator to select the numeral in the digit being set on a decreasing scale. The digit will sequentially display 9, 8, 7...0 on each pressing of the DEC key. This may be used to set the Zero/Span of the temperature range and the Set-points of the Relays. The decrementing speed increases if the key is kept pressed.</p>

CONTROL AND USER SETTINGS

The following is the sequence of settings on the Digital Temperature Indicator / Controller. (NOTE that you do NOT require any Sensor or external Signal source to be connected to the instrument for Calibration or any instrument settings)

CONTROL SETTINGS

Access Menu by Pressing P Button
All settings to be done using INC (↑) and DEC (↓) keys.

KEY PRESSED	INITIAL DISPLAY	ALTERNATING DISPLAY	FUNCTION
(POWER ON)	8.8.8.8.	- - - -	Initialization of internal controller and Lamp Test (self diagnostics).
-	O P E n		If Input Sensor is not connected.
-	actual temp		If Input Sensor is connected.
PROG P	St1	(preset value)	The Set-point "Set1" for Relay-1 is displayed alternately with the factory preset value.
PROG P	St2	(preset value)	The Set-point "Set2" for Relay-2 is displayed alternately with the factory preset value.
PROG P	(process value)		(if Sensor is connected)

USER SETTINGS

Access Menu by Pressing ↑ & ↓ button
All settings to be done using INC (↑) and DEC (↓) keys.

KEY PRESSED	DISPLAY	ALTERNATING DISPLAY	FUNCTION
Press and hold INC(↑) DEC(↓) key for 2 seconds			Instrument goes into "User" mode.
PROG P	SCLE	CEnt	Set Temperature Scale. The options are : Cent ----- Degrees Centigrade FAH ----- Degrees Fahrenheit
PROG P	SEn1	Γ t d 1	The active Input Signal / Sensor of Channel 1 will be displayed on the upper display for three seconds. Γ t d 1 ----- RTD Pt-100 sensor with one digit resolution Γ t d.1 ----- RTD Pt-100 sensor with 0.1 digit resolution
PROG P	SEn2	Γ t d 1	The active Input Signal / Sensor of Channel 2 will be displayed on the upper display for three seconds. Γ t d 1 ----- RTD Pt-100 sensor with one digit resolution Γ t d.1 ----- RTD Pt-100 sensor with 0.1 digit resolution
PROG P	IPC1	0000	Set the input correction which directly adds or subtracts from displayed reading if necessary. This is an offset count to the displayed value. You can set from -999 to 9999 counts.
PROG P	IPC2	0000	Set the input correction which directly adds or subtracts from display reading if necessary. This is an offset count to the displayed value. You can set from -999 to 9999 counts.
PROG P	Con1	HEt	Type of Control Action for Relay-1. Options are : HEt : Heating Logic COL : Cooling Logic
PROG P	HY1	0001	Temperature Hysteresis: Adjust the desired Hysteresis in deg Celsius for Relay-1 using INC and DEC keys [e.g. 0001 for a hysteresis of 1 degree].
PROG P	dLY1	0001	Time Hysteresis: Adjust the desired minimum off time (in seconds) between Relay-1 resets (to avoid chatter) using INC and DEC keys. [e.g. 0001 for a hysteresis of 1 second].

PROG P	Con2	HEt	Type of Control Action for Relay-2. Options are : HEt : Heating Logic COL : Cooling Logic OFF : For Single Relay Operation
PROG P	HY2	0001	Temperature Hysteresis: Adjust the desired Hysteresis in deg Celsius for Relay-2 using INC and DEC keys [e.g. 0001 for a hysteresis of 1 degree].
PROG P	dLY2	0001	Time Hysteresis: Adjust the desired minimum off time (in seconds) between Relay-2 resets (to avoid chatter) using INC and DEC keys. [e.g. 0001 for a hysteresis of 1 second].
PROG P	St1	C H 1	Channel assign: The desired channel can be assign to first set point using INC and DEC keys.
PROG P	St2	C H 2	Channel assign: The desired channel can be assign to second set point using INC and DEC keys.
PROG P	MOdE	tOGL	Display Options are : tOGL : Toggle display between Channel 1 and Channel 2 every 8 seconds CH1 : Display Channel 1 only CH2 : Display Channel 2 only
PROG P	St1	(preset value)	Adjust the desired Set-Point for Relay-1 using INC and DEC keys. The indication "St1" which is the control set-point for Relay-1, is displayed alternately with the last preset value.
PROG P	St2	(preset value)	Adjust the desired Set-Point for Relay-2 using INC and DEC keys. The indication "St2" which is the control set-point for Relay-1, is displayed alternately with the last preset value.
PROG P	(process value)		(if Input Signal is connected)

PARAMETER OPTIONS AND INDICATIONS

1 Escape function with saving parameters: Pressing the program key for 5 seconds while in user setting mode will save any changes made and the display will revert to the process value. Also, scrolling through to the end of the menu until you return to the process value will save any changes made.

2 Escape function without saving parameters: Pressing the INC (↑) and DEC (↓) keys simultaneously while in user setting mode will not save any changes made. The display will then revert to the process value or open if there's no connection.

3 Time out: If no key is pressed for a period of 30 seconds the device will come out of user setting mode WITHOUT SAVING ANY CHANGES MADE and revert to the process value.

4 Factory Reset: If operator press the Decrement (↓) key for 10 seconds, unit will return to factory settings.

5 Sensor fail indication: In the case of sensor failure, the display will show the process value of one channel and "O P E n" for failed channel.

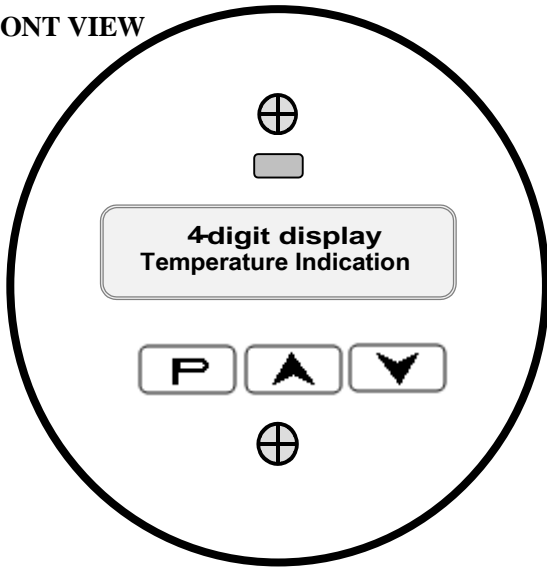
This completes the entire settings of the Digital Temperature Indicator/ Controller.

The explanation of the various Displays and Messages that would be visible on the instrument Menu are as follows:-

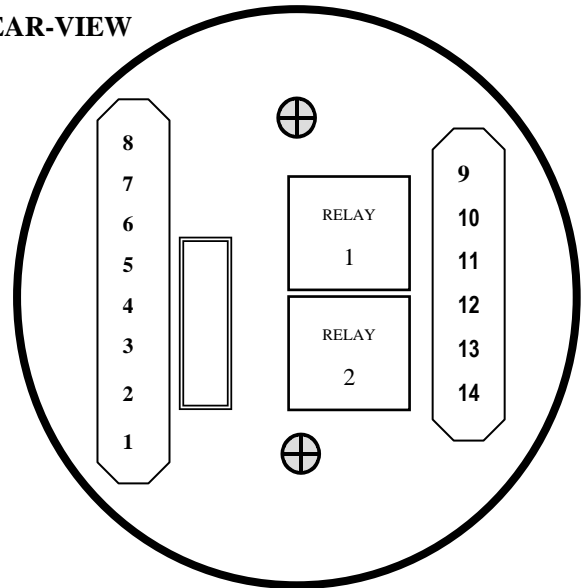
SR.	MESSAGE	DESCRIPTION
1.	Con1 / Con2	Set-Point for Relay-1/2.
2.	HY1 / HY2	Hysteresis for Relay-1/2 [e.g. 0010 for a hysteresis of 10 degrees].
3.	dLY1 / dLY2	Time Hysteresis: To adjust the desired minimum off time (in seconds) between Relay resets (to avoid chatter).
5.	HEt	Heating Control Logic for Relay-1/2
6.	COL	Cooling Control Logic for Relay-1/2
7.	Sen	The active Input Temperature Sensor / Signal. Options include : Γtd 1 ----- RTD Pt-100 [three-wire] sensor 1°C Γtd. 1 ----- RTD Pt-100 [three-wire] sensor 0.1°C

TERMINAL DIAGRAM

FRONT VIEW



REAR-VIEW



TERMINAL BLOCK – 1 (For RTD Pt-100 Sensor)

1	2	3	4	5	6	7	8
+	-	-	-	+	-	-	+
12-28V DC Power Supply		RTD PT-100 CH 2			RTD PT-100 CH 1		

TERMINAL BLOCK – 2

9	10	11	12	13	14
NC	C	NO	NC	C	NO
RELAY – 1			RELAY – 2		

TERMINAL DETAILS

TERMINAL BLOCK	TERMINAL NO.	NOTATION	DETAILS	
TERMINAL BLOCK - 1	1	+	Power Supply 12 to 28V DC	
	2	-		
	3	SEE SENSOR TABLE ALONGSIDE	-	RTD PT-100
	4		-	
	5		+	RTD PT-100
	6		-	
	7	-		
	8	+		
TERMINAL BLOCK - 2	9	NC	RELAY – 1	
	10	COM		
	11	NO		
	12	NC	RELAY – 2	
	13	COM		
	14	NO		

TECHNICAL SPECIFICATIONS

Model	:	8080PR3
Type	:	Microcontroller based Digital Temperature Indicator with Control option
No. of Channels	:	Two nos. of RTD Inputs
Input Signal	:	▶ RTD Pt-100 (three-wire)
Display	:	Seven-segment, red LED display
Indications	:	Four-digit temperature display
Scale Range	:	-70 to 500 (RTD PT-100)
Calibration Range	:	May be calibrated as required
Decimal point	:	Preset depending on Sensor
Response time	:	Typically 200 mS
Output	:	Relay-1 with Heating/Cooling Relay-2 with Heating/Cooling
Contact rating	:	230VAC, 5A RESISTIVE; 24VDC, 5A RESISTIVE
Memory	:	Non-Volatile (on EEPROM)
Settings	:	By Membrane Switchpad on front panel.
Accuracy	:	± 0.1% FS
Power Consumption	:	112mA at 12 V DC
Power Supply	:	12 to 28V DC
Operating Temperature	:	-40 to 60 Degrees C

WARRANTY

International Metal Engineering Pte. Ltd. (IME) for the effective period of the warranty set out below, warrants that its standard products will be free from defects in materials and workmanship under normal use and service.

International Metal Engineering Pte Ltd.'s obligation under this warranty shall not arise until Buyer returns the defective product, freight prepaid to IME's facility in Singapore or any other authorized destination, specified in writing by IME.

The only responsibility of IME under this warranty is, at its option and sole discretion, to replace or repair, free of charge any defective component part of such product.

EFFECTIVE PERIOD OF WARRANTY

Three years from date of invoice for new products. For repairs the warranty shall be one year from the date of shipment.

LIMITATION OF WARRANTY

The warranty set forth herein does not extend to and shall not apply to:

Products which have been repaired or altered by other than IME's personnel, unless Buyer has properly altered or repaired the products in accordance with procedures previously approved in writing by IME.

Products, which have been subject to misuse, neglect, accident, or improper installation or operation.

Products, which have been mechanically damaged.

The warranty and remedies set forth above are in lieu of all other warranties expressed or implied, oral or written, either in fact or by operation of law, statutory or otherwise, including warranties of merchantability and fitness for a particular purpose, which IME specifically disclaims.

IME neither assumes nor recognizes any other liability in connection with the sales, installation or use of its products.

IME shall have no liability for incidental or consequential damages of any kind arising out of the sale, installation or use of its product.

The IME address to which notices, authorizations, and approvals and written communications pertaining to this warranty are to be delivered is:

INTERNATIONAL METAL ENGINEERING PTE. LTD.

Blk 13 Toa Payoh Lorong 8

#06-05 Braddell Tech Park

Singapore 319261

Tel. +65-6353-6506

Fax. +65-6353-6281

E-mail: admin@intmet.com

Please refer to our website for other locations around the world. www.intmet.com