OP926-V02

selec **PIC101-N**
Operating Instructions

FEATURES

- Accepts Sensor Inputs : Thermocouple / RTD
  Analog inputs : mV, Current, Voltage.
- High Indication Accuracy : ± 0.25%.
- Sensor Break Detection.
- 24 VDC Sensor Supply.
- Supply Voltage : 85 to 270V AC / DC
  24V DC

SPECIFICATIONS

DISPLAY
4-digit (7 segment LED) 0.5" height
Display Messages:
"Or" - Appears when
1) Measurement exceeds display scaling range (9999)
2) Open sensor is detected.
"rE" - Appears when
1) Measurement is below display scaling range (-1999)
2) Sensor reverse condition occurs.

POWER SUPPLY
85 to 270V AC / DC (AC: 50/60 Hz), 4VA
24V DC, 4VA

SETTINGS Via three keys on front panel.

MEMORY
Nonvolatile EEPROM retains all programmable parameters and values.

MAIN SENSOR INPUT
Thermocouple inputs
J : -200 to 750°C
K : -200 to 1350°C
T : -200 to 400°C
R : 0 to 1750°C
S : 0 to 1750°C
RTD input (2 wire or 3 wire)
PT100 : -100 to 850°C
Signal Inputs
mV : -5 to 56 mV
Voltage : 0 to 10 VDC
Current : 0 to 20 mA

SENSOR SUPPLY
24 VDC (30mA) to power the sensors

INDICATION ACCURACY
Temperature : 0.25% of Span ±1°C
(After 20min. Warmup)

ISOLATION BREAKDOWN RATINGS
AC line with respect to all inputs and outputs :
2000 Volts

ENVIRONMENTAL CONDITIONS
Operating Range : 0 to 50°C
Storage Range : -20 to 75°C
Humidity : 85% max.

CONNECTION
Wire clamping screw terminal

WEIGHT
220 grams

SAFETY SUMMARY

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If the equipment is not handled in a manner specified by the manufacturer it might impair the protection provided by the equipment.

⚠ **CAUTION :** Read complete instructions prior to Installation and operation of the unit.

⚠ **CAUTION :** Risk of electric shock.

WIRING GUIDELINES

⚠ **CAUTION :**
1. To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement.
2. Wiring shall be done strictly according to the terminal layout with shortest connections. Confirm that all connections are correct.
3. Use lugged terminals to meet M3 screws.
4. To eliminate electromagnetic interference use of short wire with adequate ratings and twists of the same in equal size shall be made.
5. Cable used for connection to power source, must have a cross section of 1mm^2 or greater. These wires shall have insulation capacity made of at least 1.5KV.

MAINTENANCE

1. The equipment should be cleaned regularly to avoid blockage of ventilating parts.
2. Clean the equipment with a clean soft cloth. Do not use isopropyl alcohol or any other cleaning agent.

INSTALLATION GUIDELINES

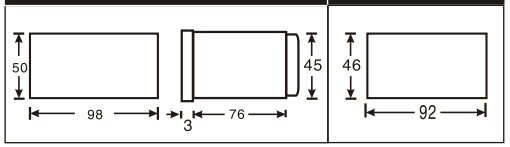
⚠ **CAUTION:**
1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
2. Conductors must not come in contact with the internal circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. Circuit breaker or mains switch must be installed between power source and supply terminals to facilitate power 'ON' or 'OFF' function. However this switch or breaker must be installed in a convenient position normally accessible to the operator.

⚠ **CAUTION :**
1. The equipment shall not be installed in environmental conditions other than those mentioned in this manual.
2. Fuse Protection : The equipment does not have a built-in-type fuse. Installation of external fuse of rating 75VAC/1Amp for electrical circuitry is highly recommended.
3. Thermal dissipation of equipment is met through ventilation holes provided on chassis of equipment. Such ventilation holes shall not be obstructed else it can lead to a safety hazard.
4. The output terminals shall be strictly loaded to the manufacturer specified values/range.

MECHANICAL INSTALLATION

For installing the controller
1. Prepare the panel cutout with proper dimensions as shown (in mm)

Outline Dimensions (in mm)	Panel Cutout Dimensions (in mm)



2. Remove Clamp from the controller and push the controller into the panel cutout. Secure the controller in its place by pushing the clamp on rear side.
3. For proper sealing, tighten the screws evenly with required torque.

⚠ **CAUTION :**
The equipment in its installed state must not come in close proximity to any heating sources, caustic vapors, oils, steam or other unwanted process by-products.

EMC Guidelines :

1. Use proper input power cables with shortest connections and twisted type.
2. Layout of connecting cables shall be away from any internal EMI source.

LOAD CONNECTIONS

1. For load current less than 0.5A

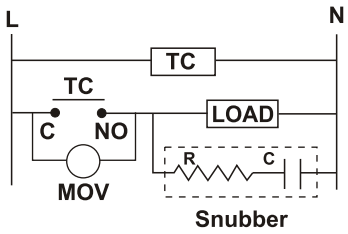


Fig.01

2. For bigger loads, use interposing relay / contactor **(refer fig.02)**
   1) Snubber Part No.: APRC - 01.
   2) MOV Part No.: AP-MOV - 03.

Note : For inductive loads, use of snubber and MOV as shown above, is recommended.

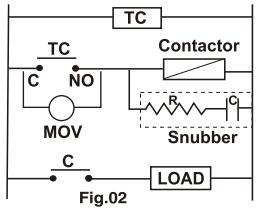


Fig.02

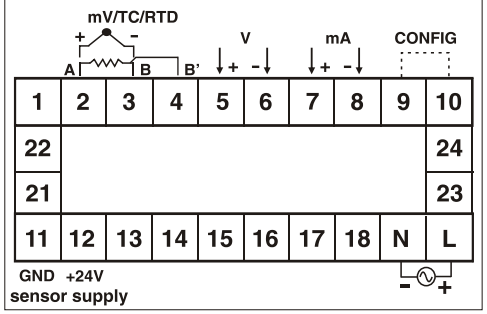
ELECTRICAL PRECAUTIONS DURING USE

Electrical noise generated by switching of inductive loads can create momentary disruption, erratic display, latch up, data loss or permanent damage to the instrument. To reduce noise:

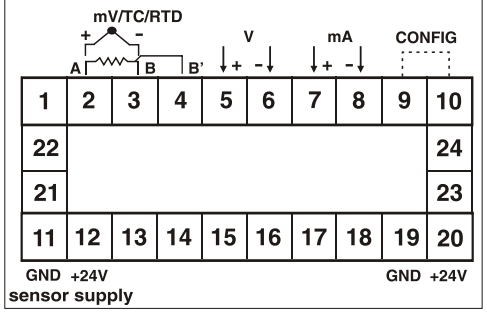
a) Use of MOV across supply of temperature controller & snubber circuits across loads are Recommended
b) Use separate shielded wires for inputs.

TERMINAL CONNECTIONS

1) 230V SUPPLY



2) 24V SUPPLY



CONFIGURATION SCHEME

METHOD 1 :
1. Short terminals 9 and 10.
2. Turn Power ON.
3. Remove the shorting.
Unit will directly enter into programming mode.
METHOD 2 :
Press ▷ for 3 sec to enter into Programming

Key press	Display	Description
1. Lock code for program entry		
		Factory setting : 0

NOTE : This parameter will not be prompted if programming is entered using METHOD 1.

(Display CODE for 1 second)

0

Press ■ + ▲ key and program the lock code as 85

Key press	Display	Description

2. Press ▲ to program Sensor type

Factory setting: J

(Display INPt for 1 second)

	J	J : -200 to 750°C
Press ▲	K	K : -200 to 1350°C
Press ▲	t	T : -200 to 400°C
Press ▲	r	R : 0 to 1750°C
Press ▲	S	S : 0 to 1750°C
Press ▲	Ptd	PT100 (-100 to 850°C)
Press ▲	mV	mV : 0 to 56 mV
Press ▲	CURR	Current
Press ▲	VOLt	Voltage

3. Press ■ to program Resolution.

Factory setting: 1

(Display RESL for 1 second)

	1	TC/RTD: 1 / 0.1 °C Analog input: 1/ 0.1/0.01/0.001 (Decimal point position)
Press ▲	0.1	
Press ▲	0.01	
Press ▲	0.001	

4. Press ■ key to select Temperature unit.

NOTE: Valid for TC / RTD inputs

Factory setting: °C

(Display tEMP for 1 second)

°C

Press ▲ °F

5. Press ■ key to program Display scaling point low

Factory setting: 0

NOTE: Valid for analog inputs (mV, current, voltage)

(Display dSCL for 1 second)

Press ▲ to change value. 0 Range: -1999 to DSCH (display as per decimal point selected.)

Key press	Display	Description

6. Press ■ key to program Input scaling point low

Factory setting: 0.00

NOTE: Valid for analog inputs (mV, current, voltage)

(Display ISCL for 1 second)

Press ▲ to change value. 0.00 Range: 0.0mA/V/mV to ISCH (default value changes as per analog input selected)

7. Press ■ key to program Display scaling point high

Factory setting: 9999

NOTE: Valid for analog inputs (mV, current, voltage)

(Display dSCH for 1 second)

Press ▲ to change value. 9999 Range:DSCL to 9999 (display as per decimal point selected.)

8. Press ■ key to program Input scaling point high

Factory setting: 20.00

NOTE: Valid for analog inputs (mV, current, voltage)

(Display ISCH for 1 second)

Press ▲ to change value. 20.00 Range : ISCL to 20.00mA/10.00V/56mV (default value changes as per analog input selected)

9. Press ■ key to select Reverse scaling

Factory setting: N

NOTE: Valid for analog inputs (mV, current, voltage)

(Display REV for 1 second)

N

Press ▲ Y

10. Press ■ key to program Filter time constant

Factory setting: 1

(Display FtC for 1 second)

Press ▲ to change value. 1 Range : OFF, 1 to 99 sec.

11. Press ■ key to program PV Bias

Factory setting: 0.0

(Display bIAS for 1 second)

Press ▲ to change value. 0.0 Range : -99.9 to + 99.9 °C (Fixed 0.1 resl for TC/RTD & 1 unit for analog input)

Key press	Display	Description

12. Press ■ key to select reset all

Factory setting: N

(Display rSt for 1 second)

N

Press ▲ Y

Press ■ key to reset all the parameters

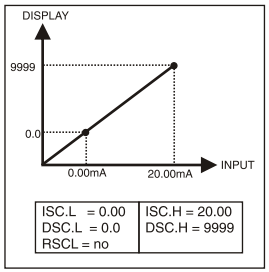
Program Enter or Exit:
Press ● key for 3 sec.

Unit will auto exit the programming mode if no key is pressed for 60 sec

USER GUIDE

SCALING FOR ANALOG INPUT:

To scale the controller, two scaling points are necessary. Each scaling point has a coordinate pair of Display Values and Input Values. It is recommended that the two scaling points be at the low and high ends of the input signal being measured. Process value scaling will be linear between and continue past the entered points to the limits of the input range. (Factory settings example will display 0.0 at 0 mA input and display 9999 at 20.00 mA input.) Reverse acting indication can be accomplished by setting



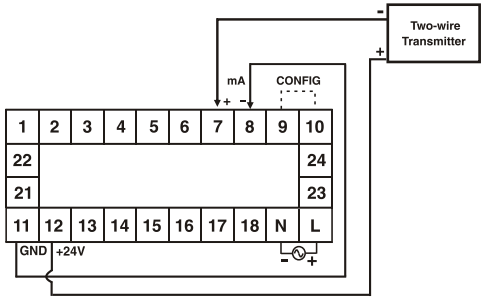
reverse scaling parameter as YES. In this case **referring the above eg.** for 0.00 mA input the display will show 9999 and 20.00 mA input the display will show 0.0.

NOTE : This change will not be visible in the programming menu.

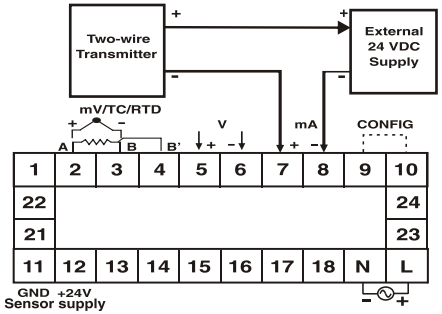
Connection with 2-wire Transmitter

Eg. : for 4-20 mA input

Connection with Internal 24VDC Sensor supply :



Connection with external 24VDC supply :



CALIBRATION CERTIFICATE

Model No: PIC101-N / PIC101-N-24

Claimed Accuracy: ± 0.25 % of full scale ± 1 digit (After 20min warmup time)

Standard used for calibration of the product is traceable to NABL

The calibration of this unit has been verified at the following values:

SENSOR	CALIBRATION TEMP.(°C) (0.1Resolution)	DISPLAY VALUE (°c)
K	35.0	35.0
	700.0	700.0
	1350	1350
PT100	0.0	0.0
	500.0	500.0
	800.0	800.0

SENSOR	CALIBRATION VALUE (0.1Resolution)	DISPLAY VALUE
Voltage (VDC)	0.0	0.0
	10.0	10.0
Current (mA)	0.0	0.0
	20.0	20.0

The thermocouple / RTD curves are linearised in this microprocessor based product; and hence the values interpolated between the readings shown above are also equally accurate; at every point in the curve.

Unit is accepted as accuracy is within the specified limit of claimed accuracy and certificate is valid up to one year from the date of issue

(Specifications subject to change as development is a continuous process.)

Selec Controls Pvt. Ltd., India

Factory Address :
EL-27/1, Electronic Zone, TTC Industrial Area, MIDC, Mahape, Navi Mumbai - 400 710, INDIA.
Tel. No. : +91-22-41 418 452/468
Fax No. : +91-22-28471733 I Toll free : 1800 227 353
Website: www.selec.com I Email: sales@selec.com

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