PPI RTD Pt100 Self Tune PID Temperature Controller Instruction Manual

Contents

PPI RTD Pt100 Self Tune PID Temperature Controller

Product Information

The Composite Temperature + Humidity Controller is a device that controls temperature and humidity using RTD Pt100, 3-wire for temperature measurement and DC Linear (Voltage) for humidity measurement. The device comes with a brief operation manual that provides quick reference to wiring connections and parameter searching. For more details on operation and application, the users can visit **www.ppiindia.net**. The device is manufactured by PPI India and can be contacted at 101, Diamond Industrial Estate, Navghar, Vasai Road (E), Dist. Palghar – 401 210. Sales : 8208199048 / 8208141446 Support : 07498799226 / 08767395333 E: **sales@ppiindia.net**, **support@ppiindia.net**.

Product Usage Instructions

The Composite Temperature + Humidity Controller comes with various utility parameters, temperature parameters, relative humidity (% RH) parameters, OP3 function parameters, supervisory parameters, and compressor operation & power indication parameters. The users can refer to the respective pages in the manual for detailed information on these parameters.

To use the device, follow the below steps:

1. Connect the RTD Pt100, 3-wire for temperature measurement and DC Linear (Voltage) for humidity measurement to the device as per the wiring connections mentioned in the manual.
2. Configure the utility parameters using the PAGE-33 section of the manual. The users can set the compressor control strategy, zero offset for temperature value, and range for low and high temperature values.
3. Configure the temperature parameters using the PAGE-10 section of the manual. The users can set alarm-1 band, alarm-1 hysteresis, proportional band, integral time, derivative time, and cycle time.
4. Configure the relative humidity (% RH) parameters using the PAGE-11 section of the manual. The users can

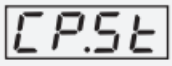
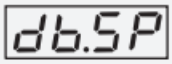
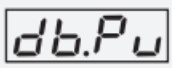
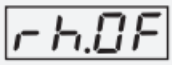
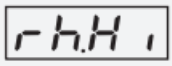
set alarm-2 band, alarm-2 hysteresis, proportional band, integral time, derivative time, and cycle time.

5. Configure the OP3 function parameters using the PAGE-13 section of the manual. The users can set output-3 function selection, compressor setpoint, compressor hysteresis, and compressor time delay.
6. Configure the supervisory parameters using the PAGE-12 section of the manual. The users can enable/disable SP adjustment on PAGE-0, self-tune command, and baud rate.
7. Configure the compressor operation & power indication parameters using the PAGE-1 section of the manual. The users can set compressor operation mode, output power for temperature loop, and output power for %RH loop.

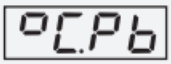
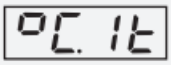
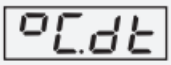
Note: The users can refer to TABLE-1 in the manual for RH input configuration. The device is calibrated for 0 to 5 VDC input for % RH. However, the transmitter output signal may be any voltage between 0 to 5 VDC. The users can use the formulae mentioned in TABLE-1 to compute the range low and range high values for RH input configuration.

PARAMETERS

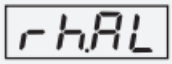
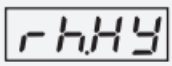
UTILITY PARAMETERS

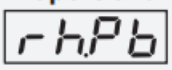
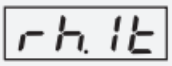
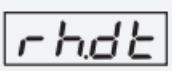
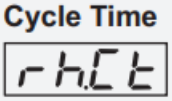
Parameters	Settings (Default Value)
Compressor Control Strategy 	 Dry Bulb SP  Dry Bulb PV (Default : Dry Bulb SP)
Zero Offset for Temperature Value 	-25.0 to +25.0°C (Default : 0.0)
Zero Offset for RH Value 	-25.0 to +25.0% (Default : 0.0)
Range Low 	-199.9 to 999.9 (Refer Table 1) (Default : 0.0)
Range High 	-199.9 to 999.9 (Refer Table 1) (Default : 151.5)

TEMPERATURE PARAMETERS

Parameters	Settings (Default Value)
Alarm-1 Band 	0.3 to 25.0°C (Default : 0.5)
Alarm-1 Hysteresis 	0.2 to 10.0°C (Default : 0.2)
Proportional Band 	0.1 to 999.9°C (Default : 5.0)
Integral Time 	0 to 1000 Seconds (Default : 100)
Derivative Time 	0 to 250 Seconds (Default : 25)
Cycle Time 	0.5 to 25.0 Seconds (in steps of 0.5 secs.) (Default : 1.0)

RELATIVE HUMIDITY (% RH) PARAMETERS

Parameters	Settings (Default Value)
Alarm-2 Band 	0.3 to 25.0% (Default : 2.0)
Alarm-2 Hysteresis 	0.2 to 10.0% (Default : 2.0)

Parameters	Settings (Default Value)
Proportional Band 	0.1 to 999.9% (Default : 10.0)
Integral Time 	0 to 1000 Seconds (Default : 100)
Derivative Time 	0 to 250 Seconds (Default : 25)
Cycle Time 	0.5 to 25.0 Seconds (in steps of 0.5 secs.) (Default : 1.0)

OP3 FUNCTION PARAMETERS

Parameters	Settings (Default Value)
Output-3 Function Selection OP3.F	AL Alarm CP Compressor (Default : Alarm)
Compressor Setpoint CP.SP	0.0 to 50.0°C **or** 0.0 to 25.0°C (Default : 45.0 **or** 0.2)
Compressor Hysteresis CP.HY	0.1 to 25.0°C (Default : 0.2)
Compressor Time Delay t.dLY	0.00 to 10.00 Min. Sec (in steps of 5 Seconds) (Default : 00.00)

SUPERVISORY PARAMETERS

Parameters	Settings (Default Value)
SP Adjustment on PAGE-0 SP	EnbL Enable dSbL Disable (Default : Enable)
Self-Tune Command tUnE	no No YES Yes (Default : No)
Baud Rate bAUd	1200 2400 4800 9600 (Default : 4800)

Parameters	Settings (Default Value)
ID for Temperature Loop PC.id	1 to 8 (Default : 1)
ID for %RH Loop rh.id	1 to 8 (Default : 2)

COMPRESSOR OPERATION & POWER INDICATION

Parameters	Settings (Default Value)
Compressor Operation Mode CP.OP	AUTO Automatic OFF Off On On (Default : Auto)
Output Power for Temperature Loop OUt. 1	0 to 100.0% (View Only - Non editable)
Output Power for %RH Loop OUt.2	0 to 100.0% (View Only - Non editable)

TABLE-1 RH INPUT CONFIGURATION

The controller is calibrated for 0 to 5 VDC input for % RH. The transmitter output signal, however, may be any voltage between 0 to 5 VDC (For e.g. 0 to 1 VDC,1 to 3.6 VDC, 0 to 3.3 VDC etc.). The value for 'Range Low' and 'Range High' parameters must be corresponding to 0 and 5 VDC only. For this, use the following formulae for computing the 'Range Low' and 'Range High' values.

$$\text{Range Low} = \frac{100}{\text{Span}} \text{ X (0 - Signal Low)} \qquad \text{Range High} = \frac{100.0}{\text{Span}} \text{ X (5 - Signal Low)}$$

(where; Span = Signal High – Signal Low)

Example 1

Signal Low = 0 VDC, signal High = 1.0 Vdc

Range Low = $\frac{100.0}{1.0}$ X (0 - 0) = **0.0**

Range High = $\frac{100.0}{1.0}$ X (5 - 0) = **500.0**

Example 2

Signal Low = 0 VDC, signal High = 3.3 VDC

Here, Span = 3.3 -0 = 3.3 VDC

Range Low = $\frac{100.0}{3.3}$ X (0 - 0) = **0.0**

Range High = $\frac{100.0}{3.3}$ X (5 - 0) = **151.5**

Example 3

Signal Low = 1.0 VDC, signal High = 3.6 VDC

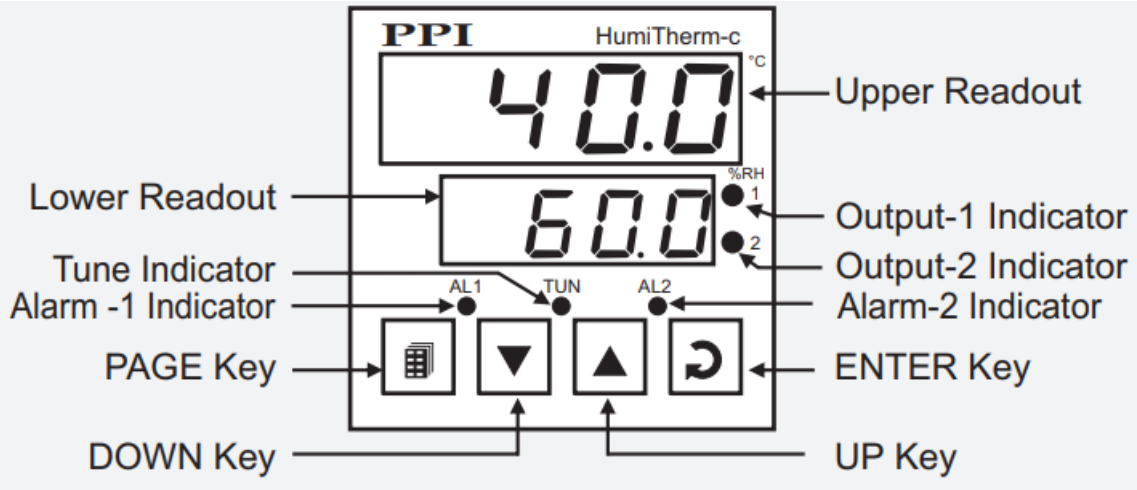
Here, Span = 3.6 - 1.0 = 2.6 VDC

Range Low = $\frac{100.0}{2.6}$ X (0 - 1.0) = **-38.5**

Range High = $\frac{100.0}{2.6}$ X (5 - 1.0) = **153.8**

FRONT PANEL LAYOUT

Front Panel



Keys Operation

Symbol	Key	Function
	PAGE	Press to enter or exit set-up mode.
	DOWN	Press to decrease the parameter value. Pressing once decreases the value by one count; keeping pressed speeds up the change.
	UP	Press to increase the parameter value. Pressing once increases the value by one count; keeping pressed speeds up the change.
	ENTER	Press to store the set parameter value and to scroll to the next parameter on the PAGE.

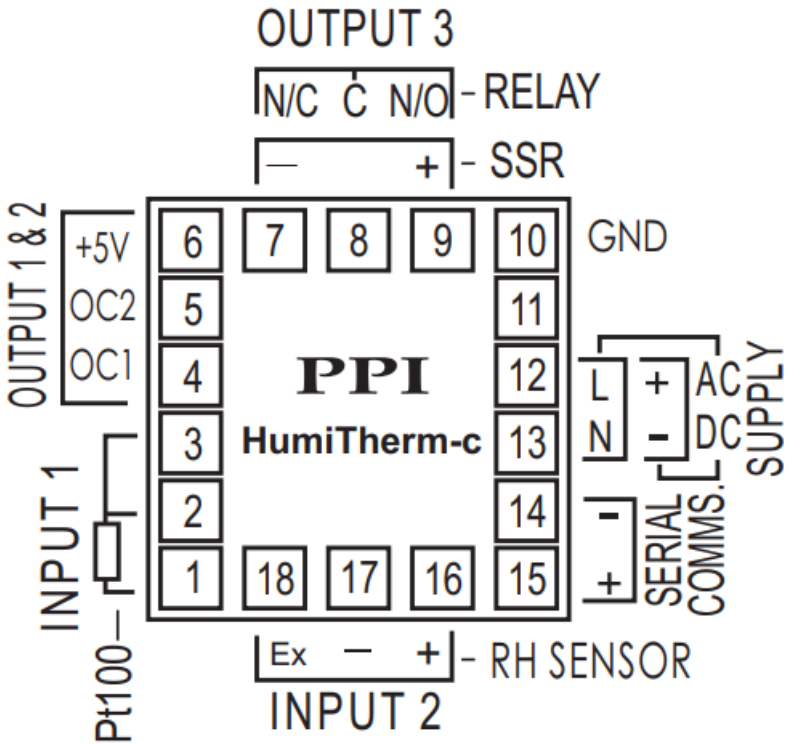
PV Error Indications For Dry Bulb Temperature (Upper Readout)

Message	PV Error Type
Or	Over-range (Dry-Bulb Temp. above Max. Range)
Ur	Under-range (Dry-Bulb Temp. below Min. Range)
OPEn	Open (Sensor open / broken)

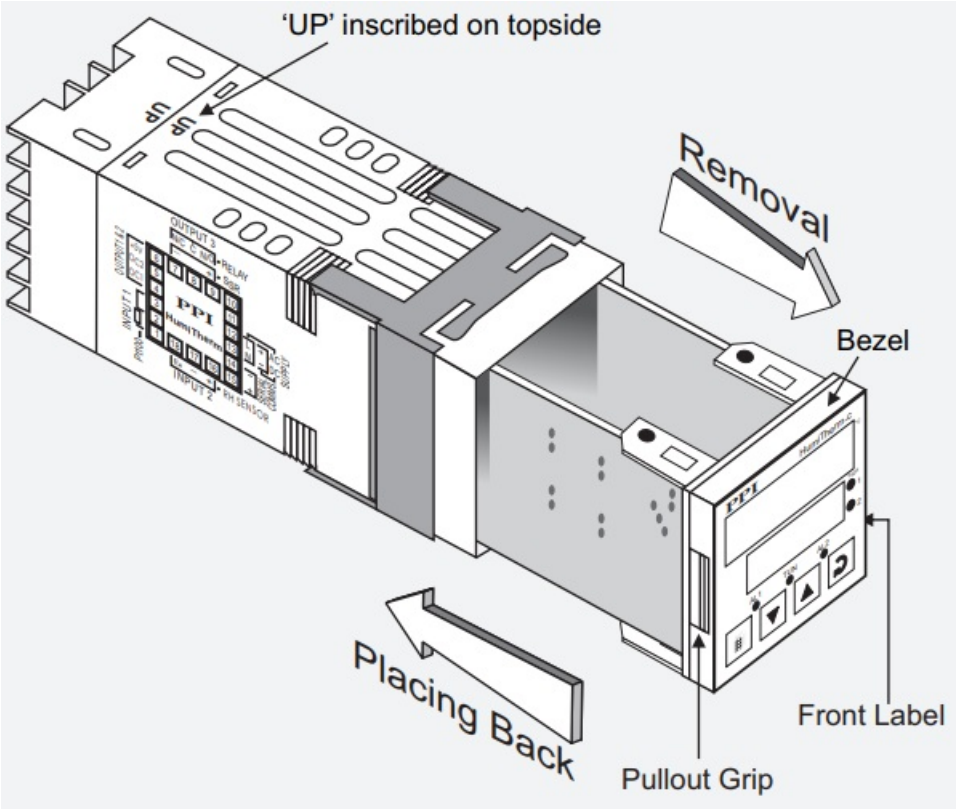
PV Error Indications For Relative Humidity (RH) (Lower Readout)

Message	PV Error Type
Or	Over-range (Wet-Bulb Temp. above Max. Range)
Ur	Under-range (Wet-Bulb Temp. below Min. Range)
OPEn	Open (Sensor open / broken)
rh.Er	Either Dry Bulb Temp. is below -20.0°C or above 162.0°C. The error may also occur if Wet Bulb depression is more then 60.0°C.

ELECTRICAL CONNECTIONS



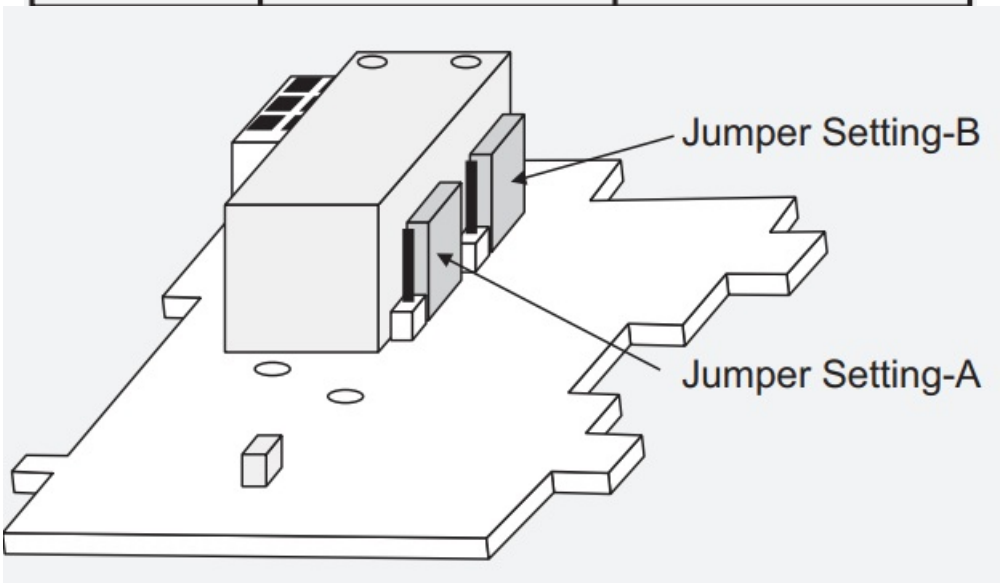
ENCLOSURE ASSEMBLY



JUMPER SETTINGS

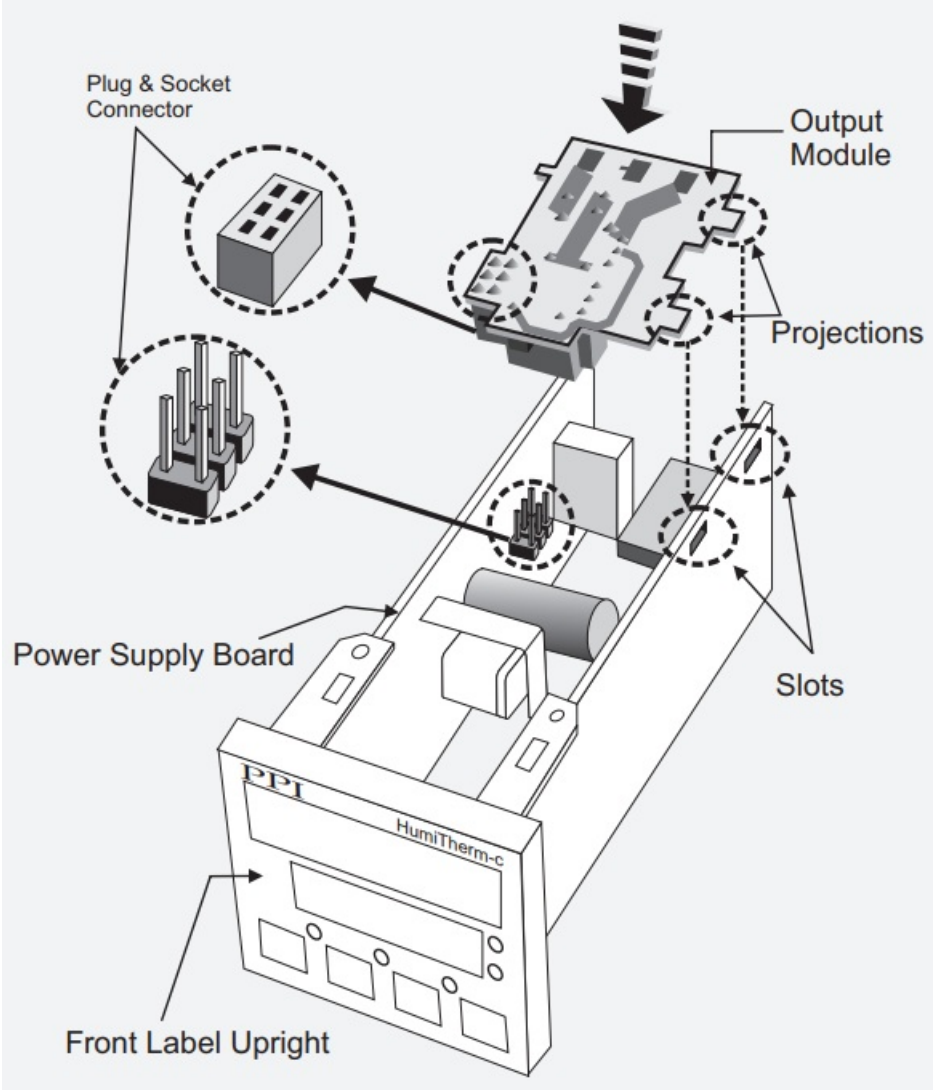
OUTPUT-3

Output Type	Jumper Setting - A	Jumper Setting - B
Relay		
SSR Voltage Pulses		

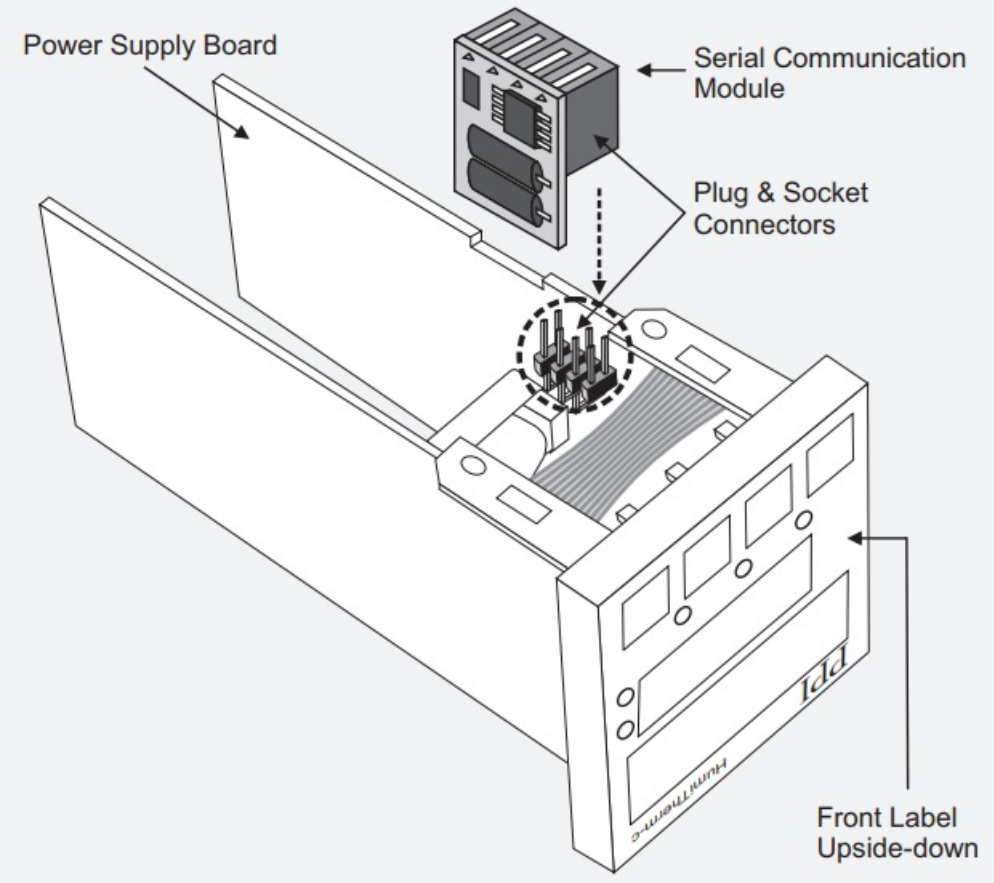


MOUNTING DETAILS

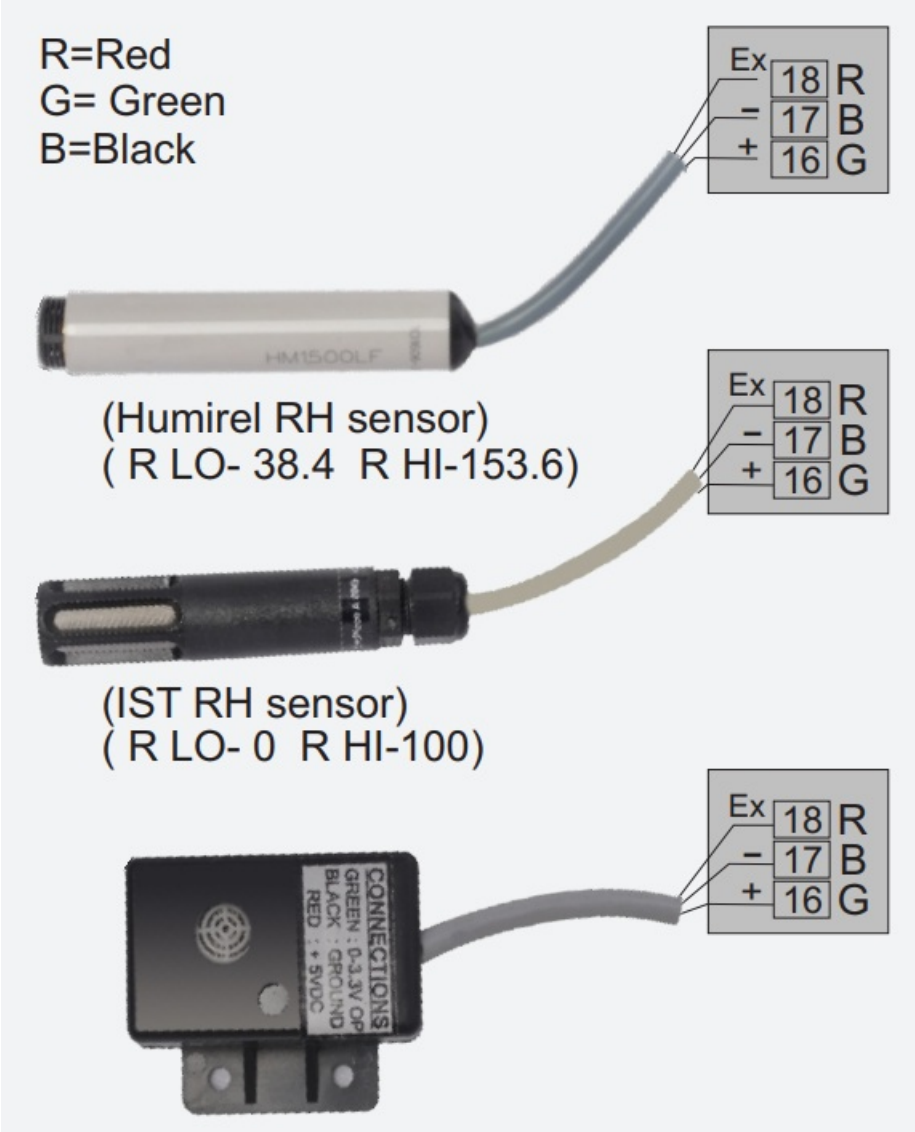
OUTPUT-3 MODULE



SERIAL COMM. MODULE


Power Supply Board
Serial Communication Module
Plug & Socket Connectors
Front Label Upside-down

RH SENSORS



This brief manual is primarily meant for quick reference to wiring connections and parameter searching. For more details on operation and application; please log on to **www.ppiindia.net**

- 101, Diamond Industrial Estate, Navghar, Vasai Road (E), Dist. Palghar – 401 210.
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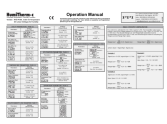
Documents / Resources

	**PPI RTD Pt100 Self Tune PID Temperature Controller** [pdf] Instruction Manual RTD Pt100 Self Tune PID Temperature Controller, RTD Pt100, Self Tune PID Temperature Cont roller, PID Temperature Controller, Temperature Controller, Controller

References

- **Factory Automation Products India | Automation Solutions in India**