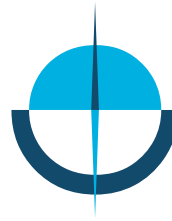


HumiTherm-i Pro



PPI

The Perfection Experts

Enhanced
'Temperature + Humidity' Indicator
(with Dry/Wet RTD Input Selection)



User Manual

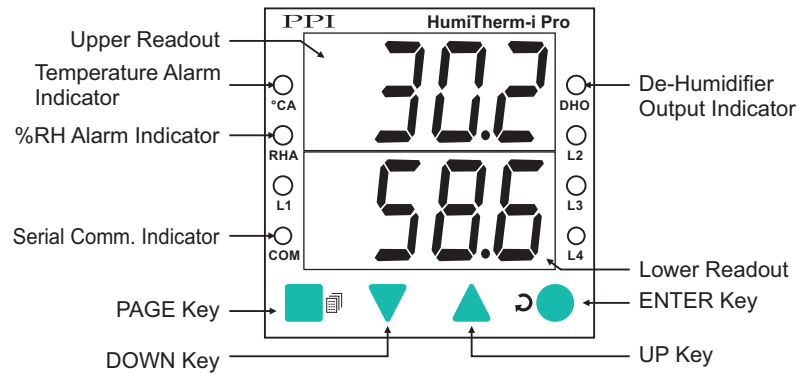
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Section 1
FRONT PANEL LAYOUT

The indicator front panel comprises of digital readouts, LED indicators and membrane keys as shown in Figure 1.1 below.

Figure 1.1



READOUTS

The Upper Readout is a 4 digit, 7-segment bright green LED display and usually displays the Temperature Value in °C or °F (depending upon the Unit selected). In Program Mode, the Upper Readout displays parameter values.

The Lower Readout is a 4 digit, 7-segment bright green LED display and usually displays Relative Humidity (RH) Value in %. For Dry/Wet Configuration, upon holding the UP or DOWN key pressed, the Lower Readout shows the Wet-Bulb Temperature in °C or °F. In Program Mode, the Lower Readout displays prompts for the parameters.

INDICATORS

There are 8 front panel red LED indicators (4 are unused). These indicator show various statuses. The Table 1.1 below lists each LED indicator (identified by the front panel legend) and the associated status it indicates.

Table 1.2

Indicator	Function
°CA	Temperature Alarm Status. Flashes when temperature alarm is active.
RHA	%RH Alarm Status. Flashes when %RH alarm is active.
COM	Serial Communication Status. Flashes when data is being exchanged with Master Device.
DHO	Shows On/Off Status of de-humidifier control output.
L1, L2, L3, L4	Unused

KEYS

There are four tactile keys provided on the front panel for configuring the controller and setting-up the parameter values. The Table 1.2 below lists each key (identified by the front panel symbol) and the associated function.

Table 1.2

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.



Section 2

BASIC OPERATIONS

POWER-UP

Upon power-up, all displays and indicators are lit on for approximately 3 seconds. This is followed by the indication of the indicator model name (HUm.i) on the Upper Readout and the loaded firmware version on the Lower Readout, for approximately 1 second.

MAIN DISPLAY MODE

After the Power-up display sequence, the Upper and Lower Readout start showing the measured Temperature Value in °C or °F and the Relative Humidity in %RH, respectively. If the Indicator is configured for Dry/Wet assembly, the Wet Bulb Temperature (in °C) can be viewed by holding the UP or DOWN key depressed. This is called the MAIN Display Mode and this is the one that shall be used most often.

PV ERROR INDICATIONS

The indicator flashes the PV error messages for Temperature and RH Values on Upper and Lower Readout, respectively.

- Error Indications for Dry-Bulb Temperature

In case of Dry-Bulb Temperature exceeding the specified Minimum or Maximum Range or in case of input sensor (RTD Pt100) open / broken; the Upper Readout flashes the Error Messages as listed in Table 2.1 below.

Table 2.1

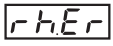
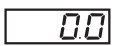
Message	Error Type	Cause
	Over-range	Dry Bulb Temperature above Max. Range
	Under-range	Dry Bulb Temperature below Min. Range
	Sensor Open	Dry Bulb Sensor (RTD) Broken / Open

- Error Indication for Relative Humidity (RH)

If RH transmitter is connected for direct %RH measurement, the signal output is either DC Voltage (e.g. 0 - 5 V, 0 - 10 V, etc.) or DC Current (e.g. 4 - 20 mA). Thus, an open or broken sensor means either 0 V or 0 mA output. In this case the indicator reads the %RH that corresponds to this signal output. For example, consider 0-5V signal scaled to display 0.0 to 100.0 %RH. The Upper Readout then shows approximately 0.0 %RH (corresponding to 0 V) upon sensor open / broken.

If Dry/Wet assembly is used for RH measurement and if either Wet-Bulb RTD is open / broken or there is an error condition while computing %RH value, the Lower Readout flashes the Error Messages as listed in Table 2.2 below.

Table 2.2

Message	Error Type	Cause
	Over-range	Wet Bulb Temperature above Max. Range
	Under-range	Wet Bulb Temperature below Min. Range
	Sensor Open	Wet Bulb Sensor (RTD) Broken / Open
	RH Error	This error is indicated in the following cases : <ul style="list-style-type: none"> • Dry Bulb Temperature above 102.0°C. • Dry Bulb Temperature below -20.0°C. • Wet Bulb depression beyond: <ul style="list-style-type: none"> 50.0°C for Dry Bulb Temperature above 0°C 5.6°C for Dry Bulb Temperature below 0°C
	Display Freezes To 100.0%	This error is indicated in the following cases : <ul style="list-style-type: none"> • Wet-Bulb Temperature exceeds Dry-Bulb Temperature. • Computed % RH above 100.0%.
	Display Freezes To 0.0%	Computed % RH is below 0.0%.

Note:

For both Dry and Wet Bulb, 3-wire RTD sensor input, if the compensating lead is not connected or gets open, the indicator does not indicate PV error but the measured value is not compensated for the lead resistance.

OPERATOR PAGE AND PARAMETERS

The indicator provides a separate page, called *Operator Page*, for the purpose of viewing and / or resetting the stored Min. / Max. values for Dry- Bulb Temperature and %RH. The parameters on this page are available only if the Min. / Max. feature is Enabled in Page -13 parameter list.

Accessing Operator Page

Step through the following sequence to open the operator page and to adjust the operator parameter values.

1. Press and release PAGE key. The Lower Readout shows (PAGE) and Upper Readout shows (0).
2. Press ENTER key. The Lower Readout shows prompt for the first available operator parameter and the Upper Readout shows value for the parameter.
3. Use UP / DOWN keys to adjust the value and then press ENTER key to store the set value and scroll to next parameter.

The indicator automatically reverts to MAIN Display Mode upon scrolling through the last operator parameter. Alternatively, use PAGE key to return to MAIN Display Mode.

The operator parameters are described in Table 2.3. Note that the parameters are presented only if 'Min / Max Monitoring' feature is enabled.

Table 2.3

Parameter Description	Settings (Default Value)
MAXIMUM DRY BULB TEMPERATURE VALUE db.Hi This parameter indicates the Maximum value attained by the Dry-Bulb Temperature. This is a read only value.	View Only
MINIMUM DRY - BULB TEMPERATURE VALUE db.Lo This parameter indicates the Minimum value attained by the Dry-Bulb Temperature. This is a read only value.	View Only
MAXIMUM %RH VALUE rh.Hi This parameter indicates the Maximum value attained by the Relative Humidity. This is a read only value.	View Only
MINIMUM %RH VALUE rh.Lo This parameter indicates the Minimum value attained by the Relative Humidity. This is a read only value.	View Only
RESET COMMAND rst This feature clears the current Min. / Max. values and starts afresh monitoring the Process Values for new Min & Max.	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">no</div> <div>No</div> </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">YES</div> <div>Yes</div> </div> (Default : No)
RESET PASS - CODE CODE For Resetting the Min. / Max. values, set the reset command to 'Yes' and then set this parameter value to the Pass - Code value stored at Supervisory level on Page-13.	0 to 250 (Default : 0)



Section 3

SET-UP MODE : ACCESS AND OPERATION

The various parameters are arranged in different groups, called PAGES, depending upon the functions they represent. Each group is assigned a unique numeric value, called PAGE NUMBER, for its access.

The parameters are always presented in a fixed format: The Lower Readout displays the parameter prompt (Identification Name) and the Upper Readout displays the set value. The parameters appear in the same sequence as listed in their respective sections.

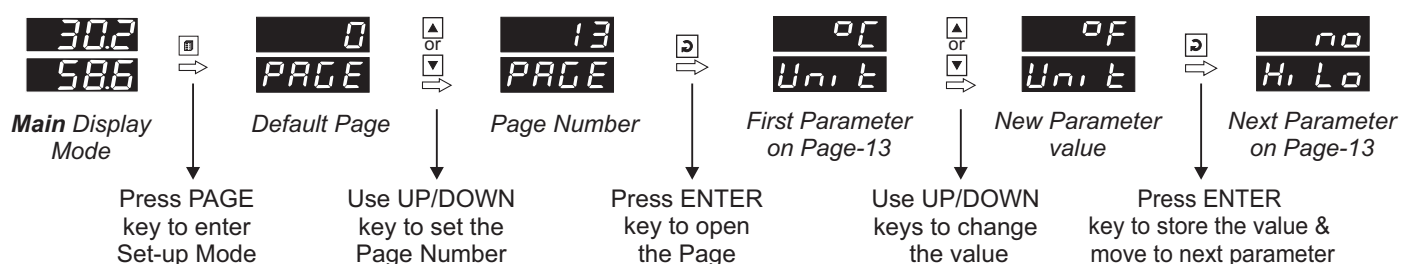
SET-UP MODE

The Set-up Mode allows the user to view and modify the parameter values. Follow the steps below for setting the parameter values:

1. Press and release PAGE key. The Lower Readout shows PAGE and the Upper Readout shows page number 0. Refer Figure 3.1.
2. Use UP / DOWN keys to set the desired PAGE NUMBER.
3. Press and release ENTER key. The Lower Readout shows the prompt for the first parameter listed in the set PAGE and the Upper Readout shows its current value. If the entered PAGE NUMBER is invalid (contains no parameter list or any associated function), the indicator reverts to the MAIN Display Mode.
4. Press and release the ENTER key until the prompt for the required parameter appears on the Lower Readout. (The last parameter in the list rolls back to the first parameter).
5. Use UP / DOWN keys to adjust the parameter value. (The display flashes if UP key is pressed after reaching the maximum value or DOWN key is pressed after reaching the minimum value).
6. Press and release the ENTER key. The new value gets stored in the indicator's non-volatile memory and the next parameter in the list is displayed.

The Figure 3.1 illustrates the example of altering the value for the parameter 'Units' on PAGE-13.

Figure 3.1



Notes

1. Each page contains a fixed list of parameters that are presented in a pre-determined sequence. Note however that availability of a few parameters, called Conditional Parameters, depend upon the settings for some other parameters. For example, the parameter 'Control Hysteresis' for Output-1 is available only if, the set value for the parameter 'Control Action' is 'On-Off'.
2. To exit the set-up mode and return to the MAIN Display Mode, press and release PAGE key.
3. If no key is pressed for approximately 30 seconds, the set-up mode times out and reverts to the MAIN Display Mode.

MASTER LOCKING

The indicator facilitates locking all the PAGES (except Operator PAGE) by applying Master Lock Code. Under Locking, the parameters are available for *view only* and cannot be adjusted. The Master Lock, however does not lock the operator parameters. This feature allows protecting the rather less frequently used parameters against any inadvertent changes while making the frequently used operator parameters still available for any editing.

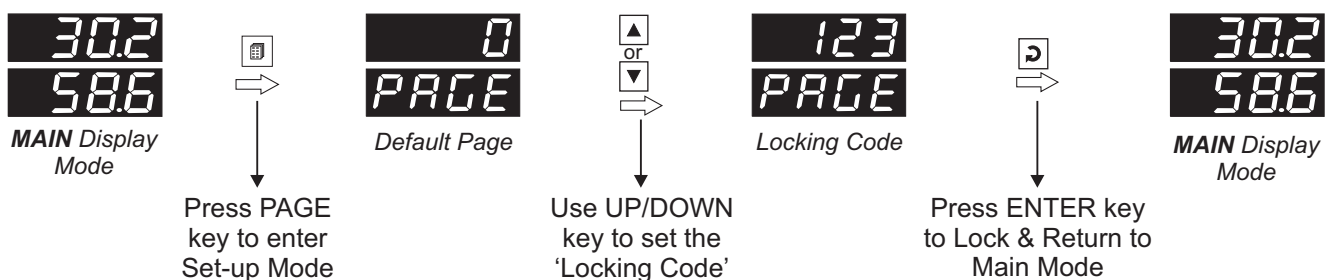
For enabling / disabling the Lock, step through the following sequence:

Locking

1. Press and release PAGE key while the indicator is in the MAIN Display Mode. The Lower Readout shows PAGE and the Upper Readout shows 0.
2. Use UP / DOWN keys to set the Page Number to 123 on the Upper Readout.
3. Press and release ENTER key. The indicator returns to the MAIN Display Mode with the Lock enabled.

The Figure 3.2 below illustrates the Locking procedure.

Figure 3.2



UnLocking

Repeat the Locking procedure twice for unlocking.



Section 4

PAGE-10 : TEMPERATURE - ALARM PARAMETERS

Table 4.1

Parameter Description	Settings (Default Value)
TEMPERATURE ALARM TYPE TYPE <i>None</i> Alarm activation is disabled. <i>Process Low</i> The Alarm activates when the Temperature Value equals or falls below the 'Alarm Setpoint' value. <i>Process High</i> The Alarm activates when the Temperature Value equals or exceeds the 'Alarm Setpoint' value.	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">none</div> None </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">P_Lo</div> Process Low </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">P_Hi</div> Process High </div> <p>(Default : None)</p>
TEMPERATURE ALARM SETPOINT ALSP This parameter sets the Process High or Process Low limit for Alarm.	-50.0 to 150.0 °C or -58.0 to 302.0 °F (Default : For Process Low : -50.0 For Process High : 150.0)
TEMPERATURE ALARM HYSTERESIS ALHY This parameter sets a differential (dead) band between the ON and OFF Alarm states. Keep it large enough to avoid frequent switching of the Alarm relay.	0.1 to 25.0 °C or °F (Default : 0.2)
TEMPERATURE ALARM LOGIC ALLO <i>Direct</i> Alarm Relay is energized when the alarm is active; remains de-energized otherwise. <i>Reverse</i> Alarm Relay remains energized as long as the alarm is not active. The relay de-energized upon alarm activation.	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">dir</div> Direct </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">rev</div> Reverse </div> <p>(Default : Direct)</p>
TEMPERATURE ALARM INHIBIT ALIH <i>No</i> The Alarm is not suppressed during the start-up Alarm conditions. <i>Yes</i> The Alarm activation is suppressed until the Temperature Value is within Alarm limits from the time the indicator is switched ON. This allows suppressing the Alarm during the start-up Alarm conditions.	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">no</div> No </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">yes</div> Yes </div> <p>(Default : Yes)</p>

Section 5

PAGE-11 : RELATIVE HUMIDITY - ALARM PARAMETERS

Table 5.1

Parameter Description	Settings (Default Value)
%RH ALARM TYPE TYPE <i>None</i> Disable the Alarm. <i>Process Low</i> The Alarm activates when the %RH Value equals or falls below the 'Alarm Setpoint' value. <i>Process High</i> The Alarm activates when the %RH Value equals or exceeds the 'Alarm Setpoint' value.	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">none</div> None </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">P_Lo</div> Process Low </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">P_Hi</div> Process High </div> <p>(Default : None)</p>
%RH ALARM SETPOINT ALSP This parameter sets the Process High or Process Low limit for Alarm.	0.0 to 100.0% (Default : For Process Low : 0.0 For Process High : 100.0)
%RH ALARM HYSTERESIS ALHY This parameter sets a differential (dead) band between the ON and OFF Alarm states. Keep it large enough to avoid frequent switching of the Alarm relay.	0.1 to 25.0% (Default : 0.2)
%RH ALARM LOGIC ALLO <i>Direct</i> Alarm Relay is energized when the alarm is active; remains de-energized otherwise. <i>Reverse</i> Alarm Relay remains energized as long as the alarm is not active. The relay de-energized upon alarm activation.	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">dir</div> Direct </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">reu</div> Reverse </div> <p>(Default : Direct)</p>
%RH ALARM INHIBIT ALIH <i>No</i> The Alarm is not suppressed during the start-up Alarm conditions. <i>Yes</i> The Alarm activation is suppressed until the %RH Value is within Alarm limits from the time the indicator is switched ON. This allows suppressing the Alarm during the start-up Alarm conditions.	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">no</div> No </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">YES</div> Yes </div> <p>(Default : Yes)</p>

Section 6

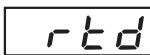
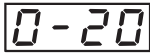
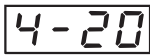
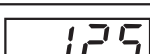
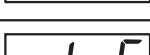
PAGE-12 : INPUT CHANNEL CONFIGURATION PARAMETERS

Table 6.1

Parameter Description	Settings (Default Value)																					
<div>INPUT TYPE FOR TEMP SENSOR<div>db.In</div></div> <div>Select Input type in accordance with the type of Temperature sensor / transmitter connected.</div>	<div>Refer Table 6.1 (Default : RTD)</div>																					
<div>SIGNAL LOW FOR TEMP SENSOR<div>db.5L</div></div> <div>(Available if temperature input type is mV/V/mA)</div> <div>The transmitter output signal value corresponding to Range Low temperature value. Refer <i>Appendix-A : DC Linear Signal Interface</i> for details.</div>	<table><tr><th>Input Type</th><th>Settings</th><th>Default</th></tr><tr><td>0 to 20 mA</td><td>0.00 to Signal High</td><td>0.00</td></tr><tr><td>4 to 20 mA</td><td>4.00 to Signal High</td><td>4.00</td></tr><tr><td>0 to 1.25 V</td><td>0.000 to Signal High</td><td>0.000</td></tr><tr><td>0 to 5 V</td><td>0.000 to Signal High</td><td>0.000</td></tr><tr><td>0 to 10 V</td><td>0.00 to Signal High</td><td>0.00</td></tr><tr><td>1 to 5 V</td><td>1.000 to Signal High</td><td>1.000</td></tr></table>	Input Type	Settings	Default	0 to 20 mA	0.00 to Signal High	0.00	4 to 20 mA	4.00 to Signal High	4.00	0 to 1.25 V	0.000 to Signal High	0.000	0 to 5 V	0.000 to Signal High	0.000	0 to 10 V	0.00 to Signal High	0.00	1 to 5 V	1.000 to Signal High	1.000
Input Type	Settings	Default																				
0 to 20 mA	0.00 to Signal High	0.00																				
4 to 20 mA	4.00 to Signal High	4.00																				
0 to 1.25 V	0.000 to Signal High	0.000																				
0 to 5 V	0.000 to Signal High	0.000																				
0 to 10 V	0.00 to Signal High	0.00																				
1 to 5 V	1.000 to Signal High	1.000																				
<div>SIGNAL HIGH FOR TEMP SENSOR<div>db.5h</div></div> <div>(Available if temperature input type is mV/V/mA)</div> <div>The transmitter output signal value corresponding to Range High temperature value. Refer <i>Appendix-A : DC Linear Signal Interface</i> for details.</div>	<table><tr><th>Input Type</th><th>Settings</th><th>Default</th></tr><tr><td>0 to 20 mA</td><td>Signal Low to 20.00</td><td>20.00</td></tr><tr><td>4 to 20 mA</td><td>Signal Low to 20.00</td><td>20.00</td></tr><tr><td>0 to 1.25 V</td><td>Signal Low to 1.250</td><td>1.250</td></tr><tr><td>0 to 5 V</td><td>Signal Low to 5.000</td><td>5.000</td></tr><tr><td>0 to 10 V</td><td>Signal Low to 10.00</td><td>10.00</td></tr><tr><td>1 to 5 V</td><td>Signal Low to 5.000</td><td>5.000</td></tr></table>	Input Type	Settings	Default	0 to 20 mA	Signal Low to 20.00	20.00	4 to 20 mA	Signal Low to 20.00	20.00	0 to 1.25 V	Signal Low to 1.250	1.250	0 to 5 V	Signal Low to 5.000	5.000	0 to 10 V	Signal Low to 10.00	10.00	1 to 5 V	Signal Low to 5.000	5.000
Input Type	Settings	Default																				
0 to 20 mA	Signal Low to 20.00	20.00																				
4 to 20 mA	Signal Low to 20.00	20.00																				
0 to 1.25 V	Signal Low to 1.250	1.250																				
0 to 5 V	Signal Low to 5.000	5.000																				
0 to 10 V	Signal Low to 10.00	10.00																				
1 to 5 V	Signal Low to 5.000	5.000																				
<div>TEMPERATURE RANGE LOW<div>db.Lo</div></div> <div>(Available if temperature input type is mV/V/mA)</div> <div>The temperature value corresponding to the Signal Low value from the temperature transmitter. Refer <i>Appendix-A : DC Linear Signal Interface</i> for details.</div>	<div>-199.9 to 999.9 (Default : 0.0)</div>																					
<div>TEMPERATURE RANGE HIGH<div>db.Hi</div></div> <div>(Available if temperature input type is mV/V/mA)</div> <div>The temperature value corresponding to the Signal High value from the temperature transmitter. Refer <i>Appendix-A : DC Linear Signal Interface</i> for details.</div>	<div>-199.9 to 999.9 (Default : 100.0)</div>																					
<div>ZERO OFFSET FOR TEMP VALUE<div>db.OF</div></div> <div>This value is algebraically added to the measured Temperature Value to derive the final Value that is displayed and compared for alarm / control. Use this value to nullify any known constant error.</div>	<div>-25.0 to 25.0 (Default : 0.0)</div>																					

Parameter Description	Settings (Default Value)																					
<div>INPUT TYPE FOR HUMIDITY SENSOR</div> <div></div> <div>Select Input type in accordance with the type of Humidity sensor / transmitter connected.</div>	Refer Table 6.1 (Default : 0 to 5 V)																					
<div>SIGNAL LOW FOR HUMIDITY SENSOR</div> <div></div> <div>(Available if temperature input type is mV/V/mA)</div> <div>The transmitter output signal value corresponding to Range Low %RH value. Refer Appendix-A : DC Linear Signal Interface for details.</div>	<table><tr><th>Input Type</th><th>Settings</th><th>Default</th></tr><tr><td>0 to 20 mA</td><td>0.00 to Signal High</td><td>0.00</td></tr><tr><td>4 to 20 mA</td><td>4.00 to Signal High</td><td>4.00</td></tr><tr><td>0 to 1.25 V</td><td>0.000 to Signal High</td><td>0.000</td></tr><tr><td>0 to 5 V</td><td>0.000 to Signal High</td><td>0.000</td></tr><tr><td>0 to 10 V</td><td>0.00 to Signal High</td><td>0.00</td></tr><tr><td>1 to 5 V</td><td>1.000 to Signal High</td><td>1.000</td></tr></table>	Input Type	Settings	Default	0 to 20 mA	0.00 to Signal High	0.00	4 to 20 mA	4.00 to Signal High	4.00	0 to 1.25 V	0.000 to Signal High	0.000	0 to 5 V	0.000 to Signal High	0.000	0 to 10 V	0.00 to Signal High	0.00	1 to 5 V	1.000 to Signal High	1.000
Input Type	Settings	Default																				
0 to 20 mA	0.00 to Signal High	0.00																				
4 to 20 mA	4.00 to Signal High	4.00																				
0 to 1.25 V	0.000 to Signal High	0.000																				
0 to 5 V	0.000 to Signal High	0.000																				
0 to 10 V	0.00 to Signal High	0.00																				
1 to 5 V	1.000 to Signal High	1.000																				
<div>SIGNAL HIGH FOR HUMIDITY SENSOR</div> <div></div> <div>(Available if temperature input type is mV/V/mA)</div> <div>The transmitter output signal value corresponding to Range High %RH value. Refer Appendix-A : DC Linear Signal Interface for details.</div>	<table><tr><th>Input Type</th><th>Settings</th><th>Default</th></tr><tr><td>0 to 20 mA</td><td>Signal Low to 20.00</td><td>20.00</td></tr><tr><td>4 to 20 mA</td><td>Signal Low to 20.00</td><td>20.00</td></tr><tr><td>0 to 1.25 V</td><td>Signal Low to 1.250</td><td>1.250</td></tr><tr><td>0 to 5 V</td><td>Signal Low to 5.000</td><td>5.000</td></tr><tr><td>0 to 10 V</td><td>Signal Low to 10.00</td><td>10.00</td></tr><tr><td>1 to 5 V</td><td>Signal Low to 5.000</td><td>5.000</td></tr></table>	Input Type	Settings	Default	0 to 20 mA	Signal Low to 20.00	20.00	4 to 20 mA	Signal Low to 20.00	20.00	0 to 1.25 V	Signal Low to 1.250	1.250	0 to 5 V	Signal Low to 5.000	5.000	0 to 10 V	Signal Low to 10.00	10.00	1 to 5 V	Signal Low to 5.000	5.000
Input Type	Settings	Default																				
0 to 20 mA	Signal Low to 20.00	20.00																				
4 to 20 mA	Signal Low to 20.00	20.00																				
0 to 1.25 V	Signal Low to 1.250	1.250																				
0 to 5 V	Signal Low to 5.000	5.000																				
0 to 10 V	Signal Low to 10.00	10.00																				
1 to 5 V	Signal Low to 5.000	5.000																				
<div>%RH RANGE LOW</div> <div></div> <div>(Available if humidity input type is mV/V/mA)</div> <div>The %RH value corresponding to the Signal Low value from the humidity transmitter. Refer Appendix-A : DC Linear Signal Interface for details.</div>	-199.9 to 999.9 (Default : 0.0)																					
<div>%RH RANGE HIGH</div> <div></div> <div>(Available if humidity input type is mV/V/mA)</div> <div>The %RH value corresponding to the Signal High value from the humidity transmitter. Refer Appendix-A : DC Linear Signal Interface for details.</div>	-199.9 to 999.9 (Default : 100.0)																					
<div>WET-BULB TEMPERATURE ZERO OFFSET</div> <div></div> <div>(Available for Dry/Wet RTD Assembly only)</div> <div>This value is algebraically added to the Temperature Value measured by Wet bulb RTD sensor. Use this value to nullify any known constant error.</div>	-25.0 to 25.0 (Default : 0.0)																					
<div>%RH ZERO OFFSET</div> <div></div> <div>This value is algebraically added to the measured %RH Value to derive the final Value that is displayed and compared for alarm / control. Use this value to nullify any known constant error.</div>	-99.0 to 99.0 (Default : 0.0)																					

Table 6.2

Option	What it means	Range (Min. to Max.)	Resolution
	3-wire, RTD Pt100	-199.9 to +600.0 °C / -199.9 to 999.9 °F	0.1 °C / °F
	0 to 20mA DC current	-199.9 to 999.9 units	0.1 units
	4 to 20mA DC current		
	Reserved (Don't Select)		
			
	0 to 1.25V DC voltage		
	0 to 5.0V DC voltage		
	0 to 10.0V DC voltage		
	1 to 5.0V DC voltage		



Section 7

PAGE-13 : SUPERVISORY PARAMETERS

Table 7.1

Parameter Description	Settings (Default Value)
UNIT SELECTION FOR TEMPERATURE Unit Select Temperature Units in °C or °F.	0C °C 0F °F (Default : °C)
DRY-BULB TEMPERATURE AND % RH MIN / MAX MONITORING H,Lo Set this parameter value to 'Yes' for enabling the Dry-Bulb Temperature and % RH monitoring for Min/Max values.	no No YES Yes (Default : No)
PASSWORD FOR RESETTING PV HIGH - LOW Code This parameter allows protection against inadvertent resetting of Min/Max values. That is, the reset command is executed only if the operator sets the password that matches with this parameter value.	0 to 250 (Default : 0)
SLAVE ID Id Communication ID used by host for serial communication.	1 to 127 (Default : 1)
BAUD RATE baud Communication speed in 'Bits per Second'. Set the value to match with the host baud rate.	4.8 4800 9.6 9600 19.2 19200 (Default : 9600)
PARITY PAR. Parity setting for serial communication protocol	none None Even Even Odd Odd (Default : Even)
COMMUNICATION WRITE ENABLE CoñE Setting to 'No' disallows the host to set or modify any parameter values. The parameter values however, are still available for reading by the host.	no No YES Yes (Default : Yes)



Section 8

PAGE-14 : DE-HUMIDIFIER CONTROL PARAMETERS

Table 8.1

Parameter Description	Settings (Default Value)
DE-HUMIDIFIER CONTROL dHUN Set this parameter to Enable if Humidifier Control is desired. If enabled, the measured %RH value is compared with the set value and a relay output is switched.	d5bL Disable EnbL Enable (Default : Disable)
DE-HUMIDIFIER SETPOINT dHSP If the measured %RH value becomes equal or exceed this setpoint value, the de-humidifier control output relay is switched-On. <i>De-humidifier ON condition :</i> %RH $\geq$ De-humidifier Setpoint	0.0 to 100.0 (Default : 0)
DE-HUMIDIFIER HYSTERESIS dHHY If the measured %RH value becomes equal or falls below the setpoint minus hysteresis, the de-humidifier control output relay is switched- Off. <i>De-humidifier OFF condition :</i> %RH $\leq$ (De-humidifier Setpoint - De-humidifier Hysteresis)	0.1 to 99.9 (Default : 2.0)

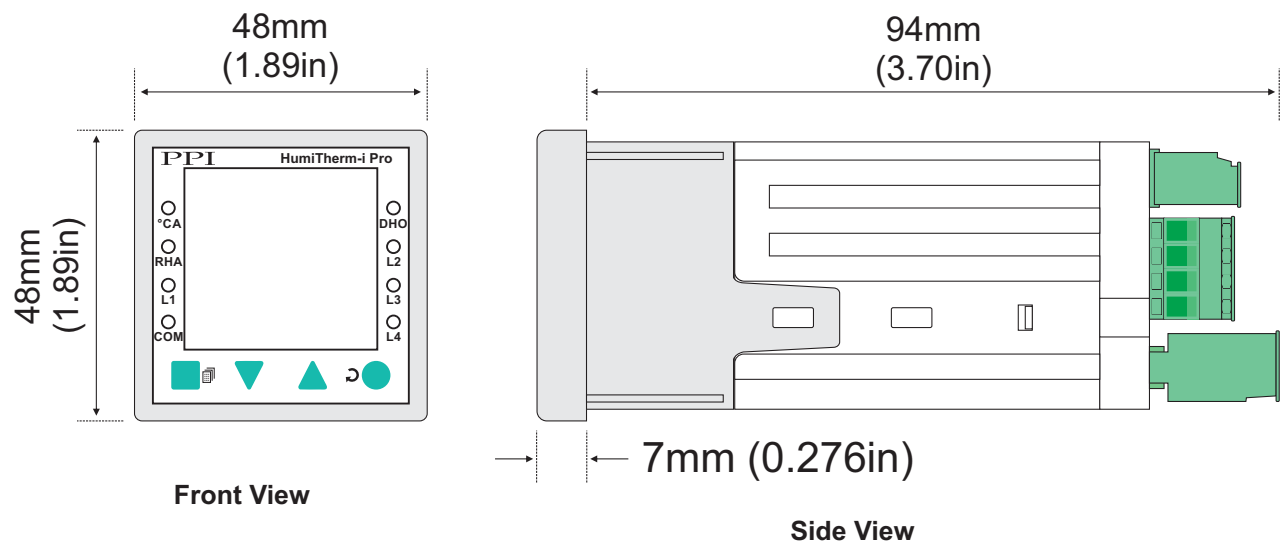


Section 9
MECHANICAL INSTALLATION

OUTER DIMENSIONS AND PANEL CUTOUT

The Figure 9.1 shows the controller outer dimensions.

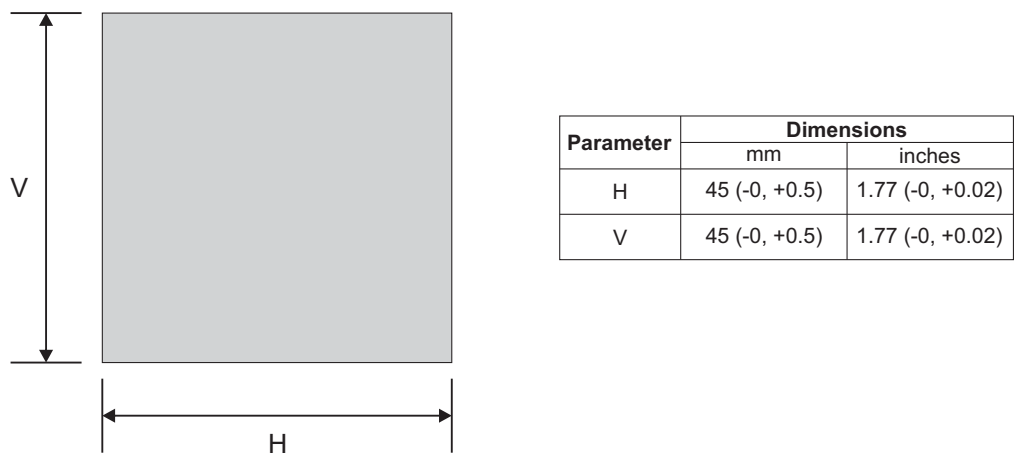
Figure 9.1



PANEL CUTOUT

The Figure 9.2 shows the panel cutout requirements for a single controller.

Figure 9.2

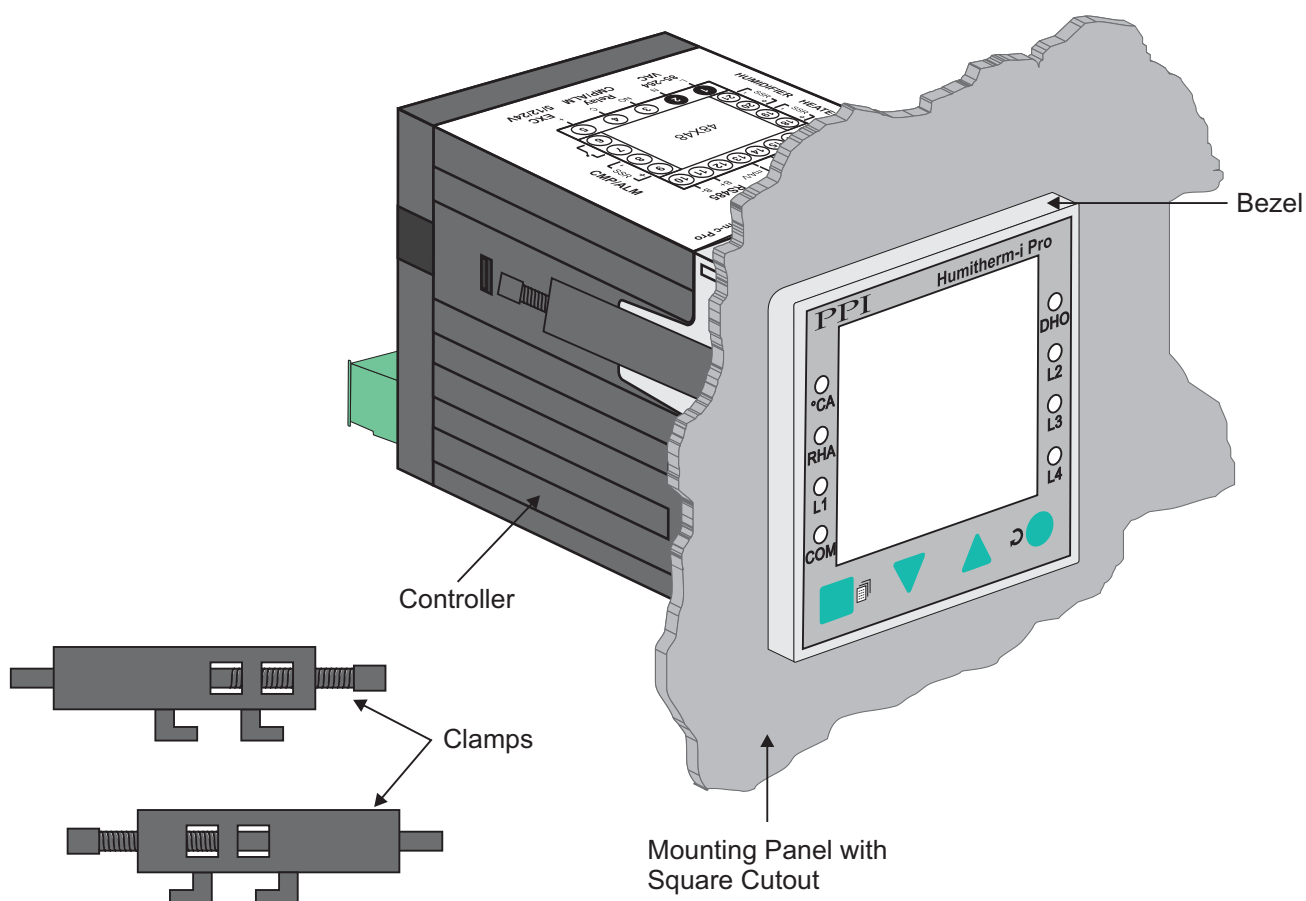


PANEL MOUNTING

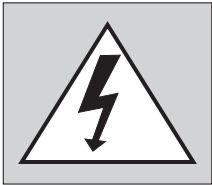
Follow the steps below for mounting the controller on panel:

1. Prepare a square cutout to the size shown in Figure 9.2.
2. Remove the Panel Mounting Clamp from the controller Enclosure and insert the rear of the controller housing through the panel cutout from the front of the mounting panel.
3. Hold the controller gently against the mounting panel such that it positions squarely against the panel wall, see Figure 9.3. Apply pressure only on the bezel and not on the front label.
4. Insert the mounting clamps on either side of the controller in the slots provided for the purpose. Rotate the screws clockwise so that they move forward until they push firmly against the rear face of the mounting panel for secured mounting.

Figure 9.3



Section 10
ELECTRICAL CONNECTIONS



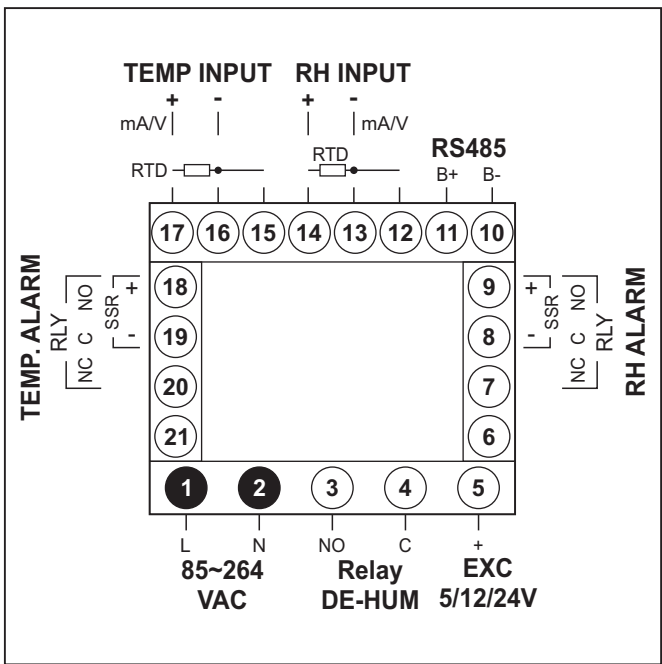
WARNING
MISHANDLING / NEGLIGENCE CAN
RESULT IN PERSONAL DEATH OR
SERIOUS INJURY.

1. The user must rigidly observe the Local Electrical Regulations.
2. Do not make any connections to the unused terminals for making a tie-point for other wires (or for any other reasons) as they may have some internal connections. Failing to observe this may result in permanent damage to the controller.
3. Run power supply cables separated from the low-level signal cables (like RTD, DC Linear (Voltage) signals, etc.). If the cables are run through conduits, use separate conduits for power supply cable and low-level signal cables.
4. Use appropriate fuses and switches, wherever necessary, for driving the high voltage loads to protect the controller from any possible damage due to high voltage surges of extended duration or short-circuits on loads.
5. Take care not to over-tighten the terminal screws while making connections.
6. Make sure that the controller supply is switched-off while making/removing any connections or removing the controller from its enclosure.

CONNECTION DIAGRAM

The Electrical Connection Diagram is shown on the top side of the enclosure. The diagram shows the terminals viewed from the REAR SIDE with the controller label upright. The connectors provided for wiring are pluggable male-female type. The female parts are soldered on the controller PCBs while the male parts are with screws and removable. The rear panel electrical wiring connection diagram is shown in Figure 10.1.

Figure 10.1



DESCRIPTIONS

TEMP INPUT : RTD Pt100, 3-Wire / mA / V (Terminals 17, 16, 15)
RH INPUT : RTD Pt100, 3-Wire / mA / V (Terminals 14, 13, 12)

Figure 10.2 (a) : RTD Input

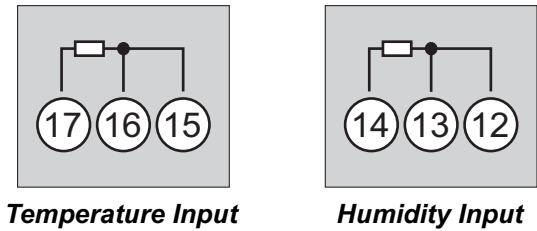
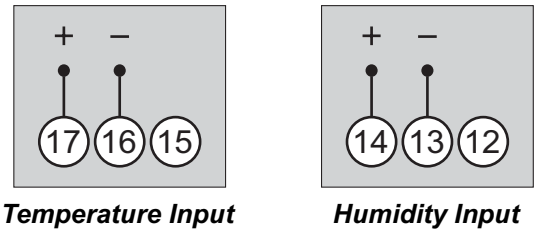


Figure 10.2 (b) : mA / V Input



RTD Pt100, 3-wire

Connect single leaded end of RTD bulb to terminal 17 (14) and the double leaded ends to terminal 16 (13) and 15 (12), interchangeable, as shown in Figure 10.2 (a). Use copper conductor leads of very low resistance ensuring that all 3 leads are of the same gauge and length. Avoid joints in the cable.

DC Linear Signal (mA/V)

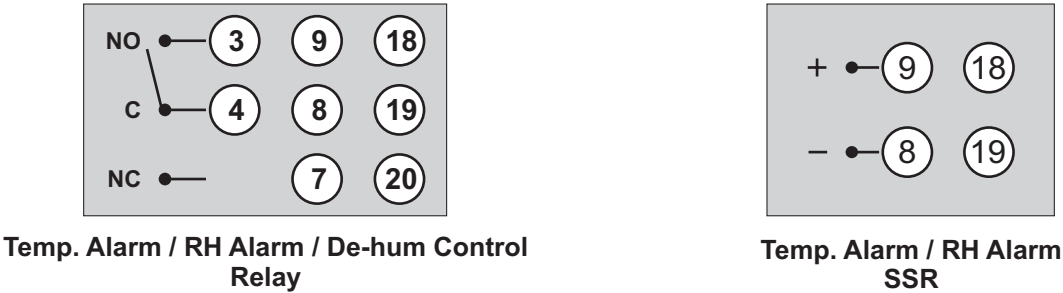
Use a shielded twisted pair with the shield grounded at the signal source for connecting Voltage source. Connect common (-) to terminal 16 (13) and the signal (+) to terminal 17 (14), as shown in Figure 10.2 (b). The DC Current source (mA) is also connected in the similar way.

TEMP. ALARM : Relay (Terminals 18, 19, 20)
TEMP. ALARM : SSR (Terminals 18, 19)

RHALARM : Relay (Terminals 7, 8, 9)
RHALARM : SSR (Terminals 8, 9)

DE-HUM CONTROL OUTPUT : Relay (Terminals 3, 4)

Figure 10.3



Relay Output

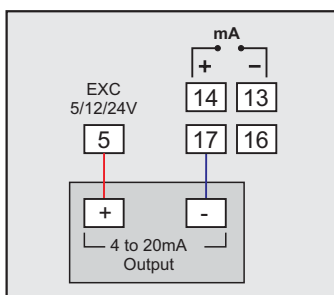
Potential-free Relay changeover contacts NO (Normally Open) and C (Common) rated 10A/240 VAC (resistive load).

SSR Output

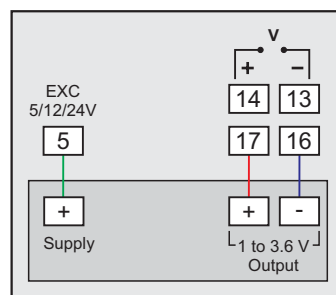
Connect (+) and (-) terminals of SSR to (+) and (-) terminals of controller, respectively. Use Zero-Crossover, 3 to 30 VDC operated SSR.

EXC 5/12/24VDC : Excitation Voltage for Transmitters (Terminal : 5)

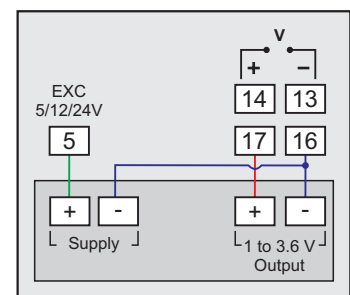
The Controller is supplied with either 5 or 12 or 24VDC @ 30 mA power source. This is primarily meant for exciting 2-wire or 4-wire Current / Voltage output transmitters. Please note that only the Source terminal (positive) is provided on the back panel termination. The Sensor negative terminal is used as Return terminal (ground) for excitation output.



2-wire Current Transmitter
(5/12/24VDC Supply)



3-wire Voltage Transmitter
(5/12/24VDC Supply)



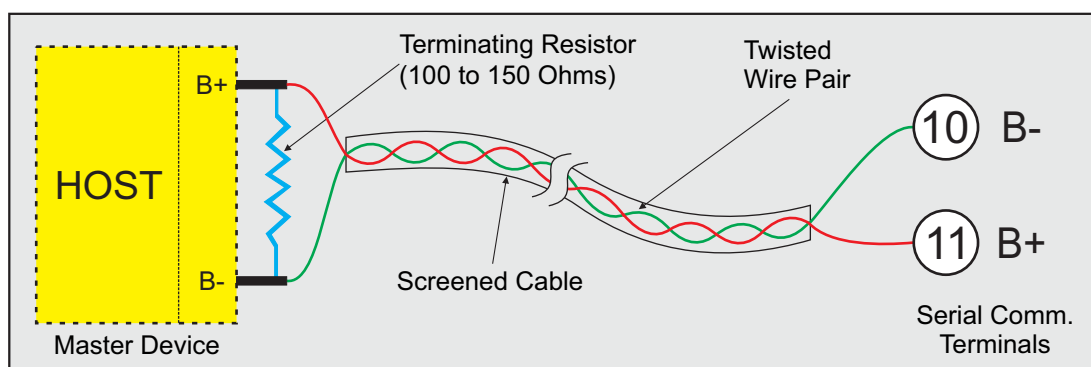
4-wire Voltage Transmitter
(5/12/24VDC Supply)

RS485 : Serial Communication Port (Terminals 10, 11)

Connect terminal 11 and 10 of the controller to (+) and (-) RS485 terminals of the Master device.

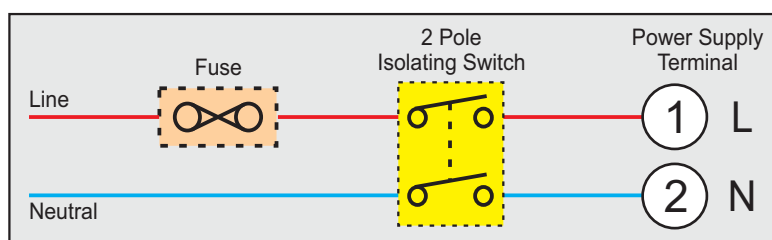
To ensure reliable operation of the Serial Communication Link (without data corruption due to line noise or reflections), use a pair of twisted wires inside screened cable with the terminating resistor (100 to 150 Ohms) at one end, as shown in Figure 10.4 below.

Figure 10.4



85~264 VAC : Power Supply (Terminals 1, 2)

The controller is supplied with power connections suited for 85 to 264 VAC line supply. Use well-insulated copper conductor wire of the size not smaller than 0.5mm^2 for power supply connections. Connect Line (Phase) supply line to terminal 1 and the Neutral (Return) supply line to terminal 2 as shown in Figure 10.5 below. The controller is not provided with fuse and power switch. If necessary, mount them separately. Use a time lag fuse rated $1\text{A} @ 240\text{ VAC}$.

Figure 10.5



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