TDU Series

Temperature Display Units for 0-10 VDC or Thermistor Inputs

Features

- Ultra slim wall-mount display unit to match any decor
- Large easy-to-read liquid crystal display (LCD), with LED backlight (white)
- A stylish bi-directional rotating dial and one compact touch key to provide ease of operation
- Accepts 0-10 VDC or 10 kΩ@25ºC NTC thermistor inputs
- Displays 3 inputs in sequence by turning the rotating dial, one at a time, for 3-input unit or 1 input constantly for single-input unit

General

The TDU Series microprocessor-based display units are designed for indicating temperature corresponding to 0-10 VDC inputs or 10 kΩ@25ºC NTC thermistors with resistance-temperature characteristics as shown in Table 1 on Page 3. They can be mounted on a control panel or on wall in plant rooms.

The TDU Series is a stand-alone display unit for temperature indication of 0-40ºC range and is available with either single or maximum of three inputs. For 3-input units, temperature will be displayed in sequence by turning the bi-directional rotating dial.

Ordering

To order, specify complete model number.

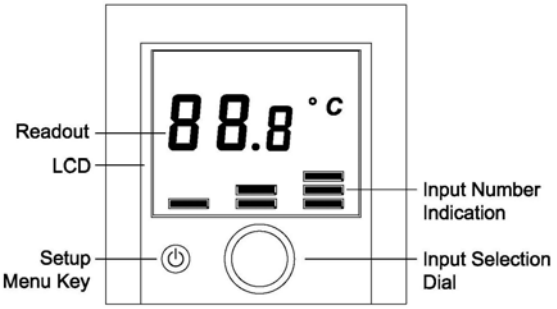
Specifications

Product model number	TDU-R1	With one 10 kΩ@25ºC NTC thermistor input, corresponding to 0-40ºC range
	TDU-R3	With three 10 kΩ@25ºC NTC thermistor inputs, corresponding to 0-40ºC range
	TDU-V3	With three 0-10 VDC inputs, corresponding to 0-40ºC range
Power requirements	24 V ±15%, 50/60 Hz or 15-24 VDC	
Power consumption	4 VA @ 24 VAC	
Display range	0-40ºC in 0.5 degree increments: accuracy ±0.5	
Offset adjustment of indication	-5 to 5, factory setting 0, for each input	
Display engineering unit	ºC	
Inputs	0-10 VDC or 10 kΩ@25ºC NTC thermistors	
Input sampling time	2 s	
Enclosure	Material: Self-extinguishing, molded ABS	
	Finish: Off white housing and gray acrylic faceplate	
Protective class	IP30	
Ambient/Storage temperature limits	0 to 50ºC / -30 to 50ºC, 10% to 90% RH non-condensing	
Connectors	Non-removable screw-type terminal blocks	
Power and voltage signal wires	Wire size 1 mm^2 or 18 AWG solid copper recommended	
Agency approval	CE Mark compliant to EMC Directive pending	
Dimensions	See Figure 3: Dimensions in mm	
Shipping weight	0.12 kg (0.3 lb)	

The performance specifications above are nominal and subject to tolerances and application variables of generally acceptable industry standards. The manufacturer shall not be liable for damages resulting from misapplication or misuse of its products.

Figure 1: Display Unit and LCD Layout

3-Input Unit



Single-Input Unit

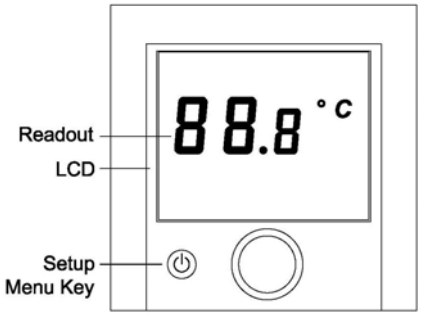


Figure 3: Wiring Terminals

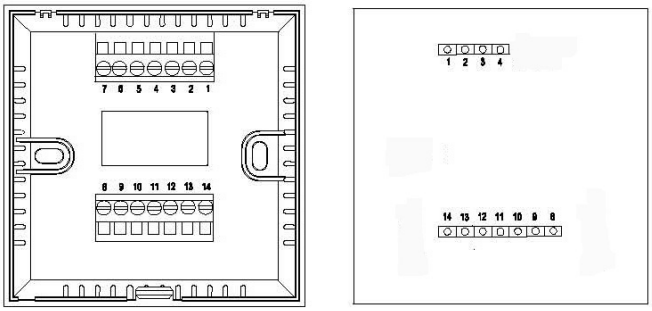


Figure 2: Dimensions in mm

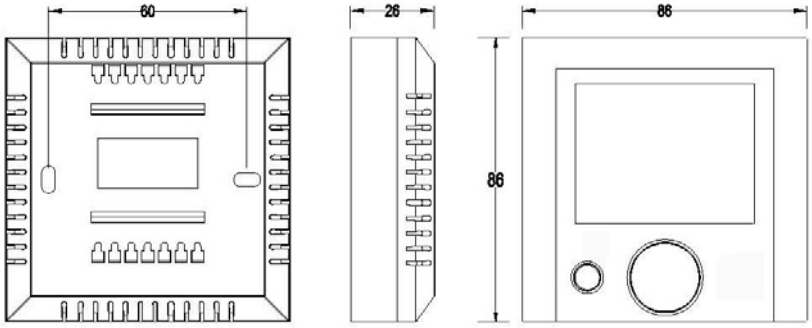
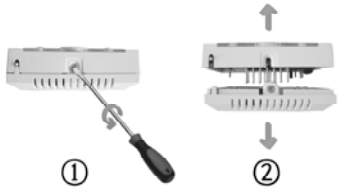
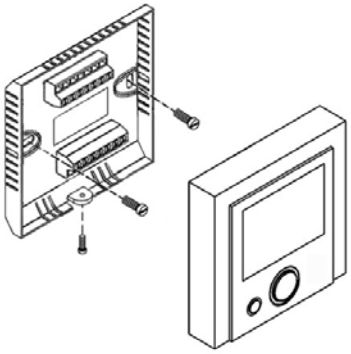


Figure 4: Cover Removal Procedure



1. Loosen the fixed screw.
2. Slightly twist the screw driver to crack open the cover from the base.
3. Hold the base firmly with one hand and remove the cover with another hand by pulling away from the base forcibly.

Figure 5: Mounting Details



Mounting

The display unit can be surface mounted or secured to a standard European 75 x 75 x 35 mm electrical box or on a control panel. Two mounting screws are included.

Figure 6: Wiring Diagrams

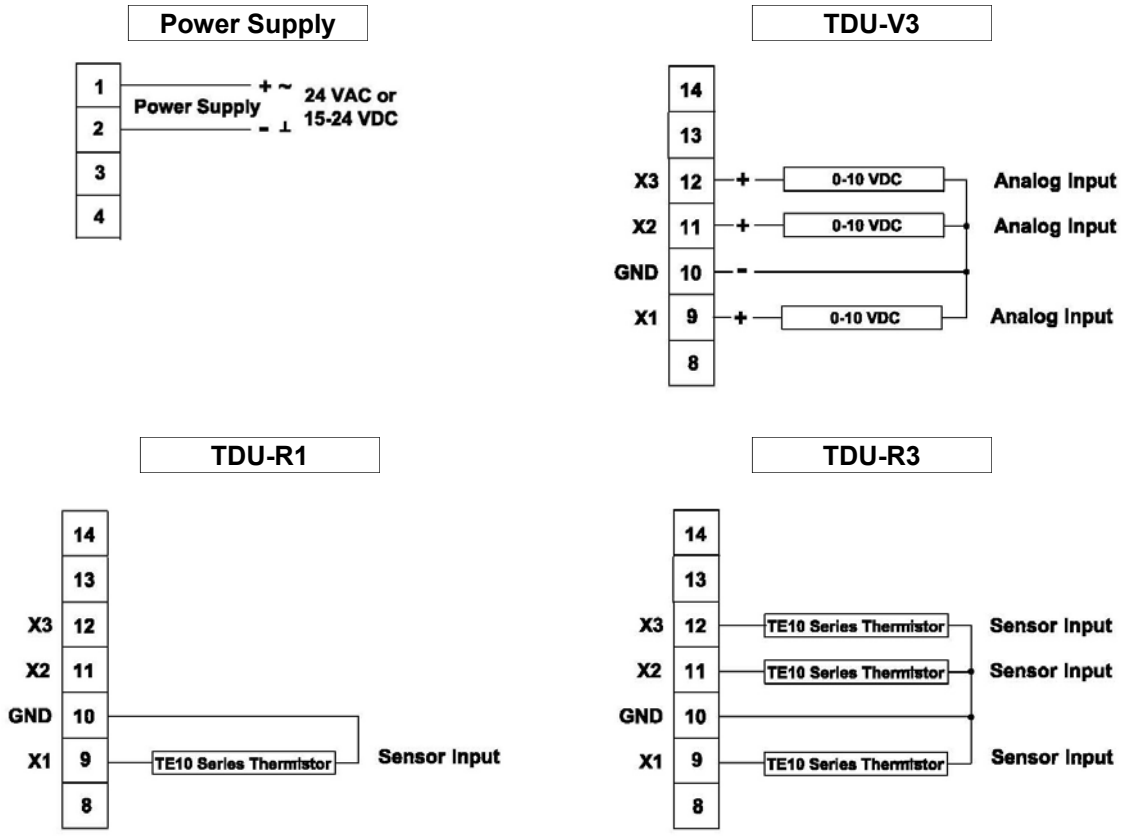


Table 1 - Resistance versus Temperature for 10 kΩ@25ºC Thermistor Temperature Sensors

Temperature °C	Resistance Ω	Temperature °C	Resistance Ω	Temperature °C	Resistance Ω	Temperature °C	Resistance Ω
0	27280	13	15998	26	9663	39	6050
1	26234	14	15344	27	9325	40	5827
2	25188	15	14690	28	8988	41	5629
3	24142	16	14170	29	8650	42	5438
4	23096	17	13650	30	8313	43	5255
5	22050	18	13130	31	8038	44	5080
6	21232	19	12610	32	7764	45	4911
7	20414	20	12090	33	7489	46	4749
8	19596	21	11672	34	7215	47	4593
9	18778	22	11254	35	6940	48	4443
10	17960	23	10836	36	6717	49	4299
11	17306	24	10418	37	6495	50	4160
12	16652	25	10000	38	6272		

Wiring Notes

- The display unit is designed for 24 VAC or 15-24 VDC power supply.
- 22 or 24 AWG twisted shielded pair double-insulated cable is recommended as 0-10 VDC input signal wiring and its length must not exceed 25 m.
- Do not bundle and run power wiring and signal wiring in the same conduit.
- Run the signal wires away from any electric motors or power wiring. Failure to do so may result in poor display accuracy due to electrical noise. When several isolated double-wound step-down transformers are used in a control loop, observe the polarities of the AC power supply of all devices including the display unit.

Operation Notes

- For the 3-input units, LCD shows the temperature input X1, X2 or X3 constantly, one at a time. Select input by turning the bi-directional rotating dial about 90º either way to display the next temperature input. For the single-input units, LCD shows the single temperature input constantly.
- The backlight will turn on for 5 seconds when the enter key is pressed.
- The display unit allows authorized service agent to change the operating parameters in the below setup menu.

Symbol	Function	Description
0	MCU firmware revision level	Appears after entering the setup menu
1	Display offset for readout value of X1 input	1 5 = temperature indication plus 5 degrees 1 4 = temperature indication plus 4 degree 1 3 = temperature indication plus 3 degree 1 2 = temperature indication plus 2 degrees 1 1 = temperature indication plus 1 degree 1 0 = no offset (factory setting) 1- 1 = temperature indication minus 1 degree 1-2 = temperature indication minus 2 degrees 1-3 = temperature indication minus 3 degree 1-4 = temperature indication minus 4 degrees 1-5 = temperature indication minus 5 degrees
2	Display offset for readout value of X2 input	2 5 = temperature indication plus 5 degrees 2 4 = temperature indication plus 4 degree 2 3 = temperature indication plus 3 degree 2 2 = temperature indication plus 2 degrees 2 1 = temperature indication plus 1 degree 2 0 = no offset (factory setting) 2- 1 = temperature indication minus 1 degree 2-2 = temperature indication minus 2 degrees 2-3 = temperature indication minus 3 degree 2-4 = temperature indication minus 4 degrees 2-5 = temperature indication minus 5 degrees
3	Display offset for readout value of X3 input	3 5 = temperature indication plus 5 degrees 3 4 = temperature indication plus 4 degree 3 3 = temperature indication plus 3 degree 3 2 = temperature indication plus 2 degrees 3 1 = temperature indication plus 1 degree 3 0 = no offset (factory setting) 3- 1 = temperature indication minus 1 degree 3-2 = temperature indication minus 2 degrees 3-3 = temperature indication minus 3 degree 3-4 = temperature indication minus 4 degrees 3-5 = temperature indication minus 5 degrees
rS	Restoration of default factory settings	rS 1 = Retain current settings (factory setting) rS2 = Restore default factory settings

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