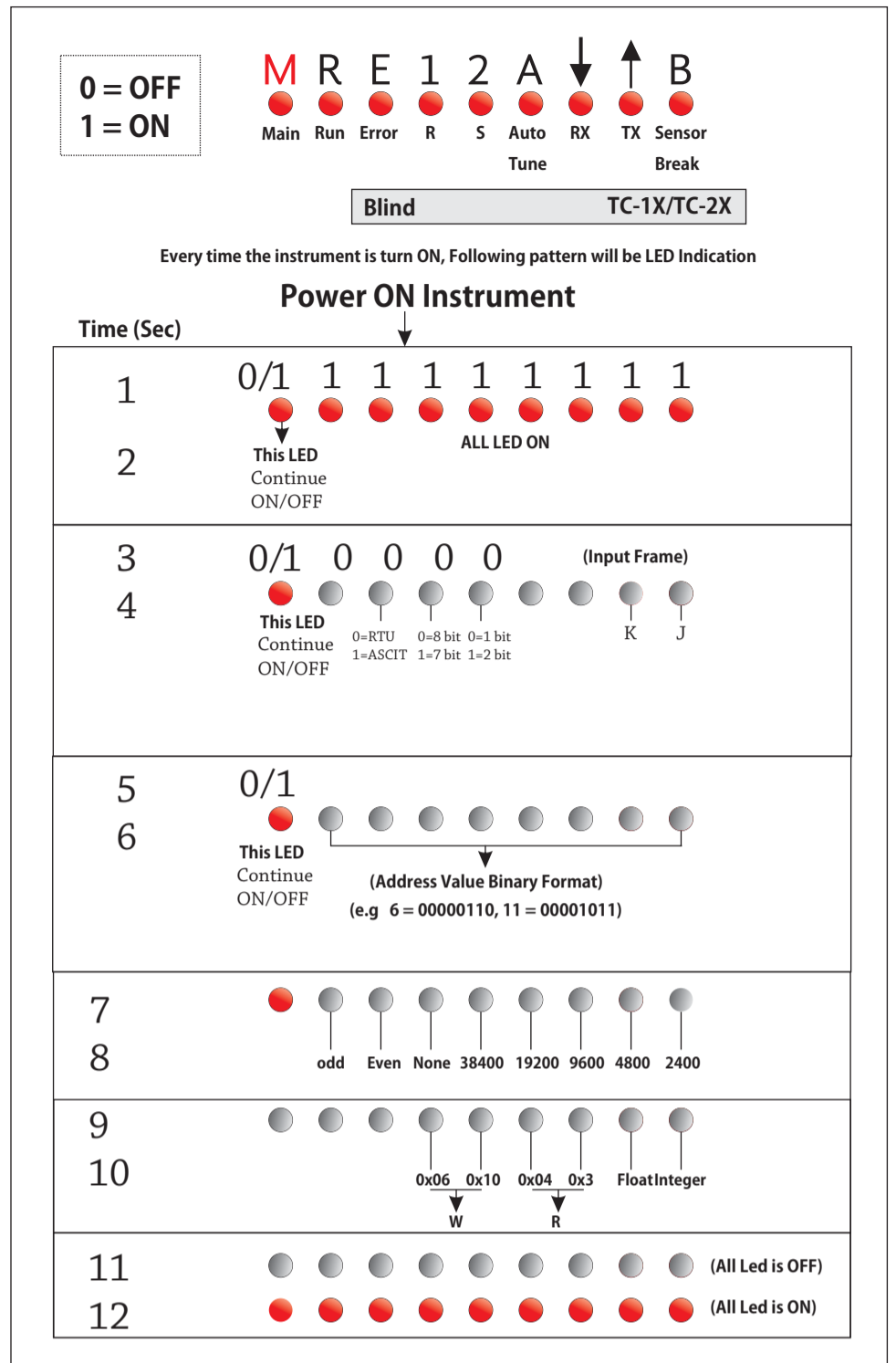
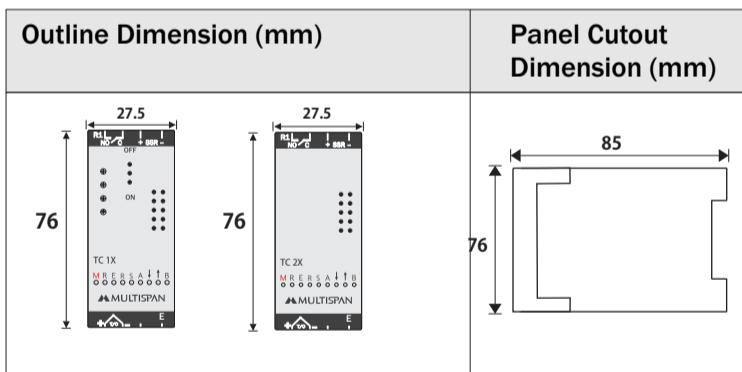


TECHNICAL SPECIFICATION

Model	TC-1X	TC-2X
Size	76 (H) X 27 (W) X 85 (D) mm	
Input	J, K	
Temperature Range	J: 0 to 400°C / K: 0 to 500°C	
Control Action	PID/TP/ON-OFF	
Output	1Relay    1S.S.R. 1C/O contact, 230V AC,5A	
Power Supply	24V DC	
Operating Temperature	0°C To 55°C	
Relative Humidity	Up to 95% RH Non Condensing	
Accuracy	1% of FSD	
Communication	RS-485 (Modbus)	
Format	RTU / ASCII	

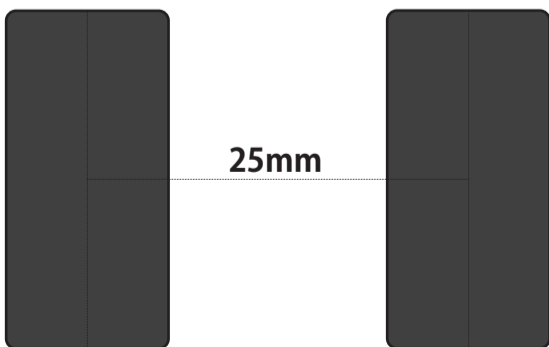


MECHANICAL INSTALLATION

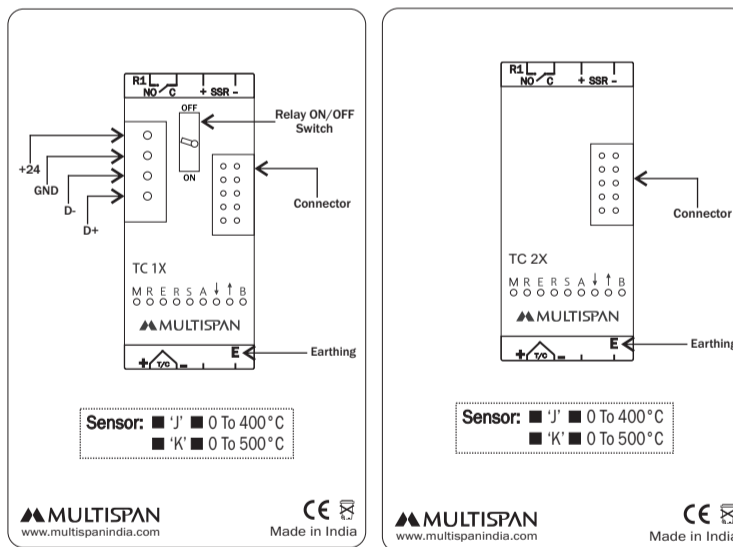


Din rail Mounting Distance

52.5mm - 2.067 inches



TERMINAL CONNECTION



TC-1X

TC-2X

MECHANICAL INSTALLATION GUIDELINES

1. Prepare the panel cutout with proper dimensions as shown above.
2. Fit the unit into the panel with the help of clamp given.
3. The equipment in its installed state must not come in close proximity to any heating source, caustic vapors, oils steam, or other unwanted process byproducts.
4. Use the specified size of crimp terminal (M3.5 screws) to wire the terminal block. Tightening the screws on the terminal block using the tightening torque of the range of 1.2 N.m.
5. Do not connect anything to unused terminals.

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.
3. Fusible resistor must not be replaced by operator.

SAFETY PRECAUTION

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

Read complete instructions prior to installation and operation of the unit.

WARNING : Risk of electric shock.

INSTALLATION GUIDELINES

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. Do not allow pieces of metal, wire clippings, or fine metallic fillings from installation to enter the product 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 terminal to facilitate power 'ON' or 'OFF' function. However this mains switch or circuit breaker must be installed at convenient place normally accessible to the operator.
4. Use and store the instrument within the specified ambient temperature and humidity ranges as mentioned in this manual.

WARNING GUIDELINES

WARNING : Risk of electric shock.

1. To prevent the risk of electric shock, power supply to the equipment must be kept OFF while doing the wiring arrangement. Do not touch the terminals while power is being supplied.
2. To reduce electro magnetic interference, use wire with adequate rating and twists of the same of equal size shall be made with shortest connection.
3. Cable used for connection to power source, must have a cross section of 1mm or greater. These wires should have insulations capacity made of at least 1.5kV.
4. When extending the thermocouple lead wires, always use thermocouple compensation wires for wiring for the RTD type, use a wiring material with a small lead resistance (5 Ωmax per line) and no resistance differentials among three wires should be present.
5. A better anti-noise effect can be expected by using standard power supply cable for the instrument.

**MODBUS DATABASE**

**Modbus Setting:**

**BLIND TC 1X and 2X (Modbus manual)**

- |   |  |                               |
|---|--|-------------------------------|
| 1. Device Address: 1 To 127                       | 4. Data Type: Sign Integer, Float          | 7. NA = 32100 (Not Available) |
| 2. Baudrate: 2400, 4800, 9600, 19200, 38400 (bps) | 5. Read Function Registers: 0x03 and 0x04  | 8. Sensor Open = 32101        |
| 3. Parity: None, Even, Odd                        | 6. Write Function Registers: 0x06 and 0x10 | 9. Sensor Open = 32102        |

Read / Write	Parameter	Read Function		Data Type = Sign Integer
		0x03	0x04	
		Address		Range
R	Temperature	30000	40000	as per input sensor range
R	Relay Status	30001	40001	0 off
R	SSR Status	30002	40002	1 on
R	PID Control Output	30003	40003	0 to 1000%
R/W	output type	30004	40004	0 = Relay 1 = SSR 2 = Both
R/W	SET (Setpoint)	30005	40005	SLL to SHL
R/W	INP (Input Sensor)	30006	40006	0 - J (0 to 400) 1 - K (0 to 500)
R/W	SLL (Set Low Limit)	30007	40007	Input = 0,1 0 to SHL
R/W	SHL (Set High Limit)	30008	40008	Input = 0 SLL to 400 Input = 1 SLL to 500
R/W	OFST (Offset)	30009	40009	Input=0,1 -20 to 20
R/W	HYS (Hysterisys)	30010	40010	Input=0,1 1 to 50
R/W	PB (for PID action)	30011	40011	0 to 9999
R/W	IT (for PID action)	30012	40012	
R/W	DT (for PID action)	30013	40013	
R/W	CT (for PID action)	30014	40014	
R/W	MR (for PID/TP action)	30015	40015	Input=0,1 -9 to 9
R/W	Pb2 (for TP action)	30016	40016	Input=0,1 2 to 20 20 to 200
R/W	CT2 (for TP action)	30017	40017	4 to 99 Sec
R/W	CTRL (Control Action)	30018	40018	0 = ONOFF action 1 = TP action 2 = PID action
R/W	RMD (Relay Mode) (R1MD=0 To 2 Available)	30019	40019	0 = Off 1 = Heating 2 = Cooling
R/W	Tim (Time)	30020	40020	1 to 99 min
R/W	Timer Unit	30021	40021	0 -Sec 1 - Min
R	Sensor Status	30022	40022	0 - Normal 1 - Sensor Open/Break 2 - Sensor Reverse
R/W	Tuning Status	30023	40023	0 - Tuning OFF 1 - Tuning ON
R	Time1 Running Value	30024	40024	Depend on selected time value
R/W	Reset all Timer	30025	40025	Enter 50 value to factory setting
R	Run/Stop	30026	40026	0 = STOP 1 = RUN
R/W	ADDR (Device Address)	30027	40027	1 to 127
R/W	BAUD (Baudrate)	30028	40028	0 = 2400 (bps) 1 = 4800 (bps) 2 = 9600 (bps) 3 = 19200 (bps) 4 = 38400 (bps)
R/W	PRTY (Parity)	30029	40029	0 = None 1 = Even 2 = Odd
R/W	DATA (Datatype)	30030	40030	0 = Sign Integer 1 = Float
R/W	RDFC (Read Function Register)	30031	40031	0 = 0x03 1 = 0x04
R/W	WRFC (Write Function Register)	30032	40032	0 = 0x10 1 = 0x06
R/W	Frame Delay (FMDL)	30033	40033	0 to 99
R/W	Relay mode for isolation	30034	40034	0 = Normal 1 = Isolation mode
R/W	Communication format	30035	40035	1 = ASCII 0 = RTU
R/W	Blind Count	30036	40036	1 = Master 0 = Slave
R/W	Data length	30037	40037	1 = 7 bit 0 = 8 bit
R/W	Stop bit	30038	40038	0 = 1 bit 1 = 2 bit

Read Function		Data Type = Float	
0x03	0x04	Range	
Address		Range	
30000	40000	as per input sensor range	
30002	40002	0 off	
30004	40004	1 on	
30006	40006	0.0 to 100.0%	
30008	40008	0 = Relay 1 = SSR 2 = Both	
30010	40010	SLL to SHL	
30012	40012	0 - J (0 to 400) 1 - K (0 to 500)	
30014	40014	Input = 0,1 0 to SHL	
30016	40016	Input = 0 SLL to 400 Input = 1 SLL to 500	
30018	40018	Input=0,1 -20 to 20	
30020	40020	Input=0,1 1 to 50	
30022	40022	0.0 to 999.9	
30024	40024	0 to 9999	
30026	40026	0 to 9999	
30028	40028	1 to 99 Sec	
30030	40030	Input=0,1 -9 to 9	
30032	40032	Input=0,1 2 to 20 2.0 to 20.0	
30034	40034	4 to 99 Sec	
30036	40036	0 = ONOFF action 1 = TP action 2 = PID action	
30038	40038	0 = Off 1 = Heating 2 = Cooling	
30040	40040	1 to 99 min	
30042	40042	0 -Sec 1 - Min	
30044	40044	0 - Normal 1 - Sensor Open/Break 2 - Sensor Reverse	
30046	40046	0 - Tuning OFF 1 - Tuning ON	
30048	40048	Depend on selected time value	
30050	40050	Enter 50 value to factory setting	
30052	40052	0 = STOP 1 = RUN	
30054	40054	1 to 127	
30056	40056	0 = 2400 (bps) 1 = 4800 (bps) 2 = 9600 (bps) 3 = 19200 (bps) 4 = 38400 (bps)	
30058	40058	0 = None 1 = Even 2 = Odd	
30060	40060	0 = Sign Integer 1 = Float	
30062	40062	0 = 0x03 1 = 0x04	
30064	40064	0 = 0x10 1 = 0x06	
30066	40066	0 to 99	
30068	40068	0 = Normal 1 = Isolation mode	
30070	40070	1 = ASCII 0 = RTU	
30072	40072	1 = Master 0 = Slave	
30074	40074	1 = 7 bit 0 = 8 bit	
30076	40076	0 = 1 bit 1 = 2 bit	

**If Datatype is Sign integer,**

- 1) Fix DP Parameters, Parameter =  $\frac{\text{Parameter}}{10}$   
 (Where Parameter is PB (For PID action), C-PB (For Blower TP) and PID Control Output)

**Note :-**

- ➔ In RTU mode = only 8 bit is supported
- ➔ In ASCII mode = both 8 bit & 7 bit are supported
- ➔ Non Supported Formats :
  - 7-N-1- Time Out
  - 8-E-2- Write Error
  - 8-0-2- Write Error