TC7 Series
Digital Room Thermostats with LCD

Features

- Stylish appearance to match any decor
- Large easy-to-read Liquid Crystal Display (LCD), with blue LED backlight
- Direct connection of valve actuators
- Direct connection to 3-speed fan
- Dual-output models with manual cooling/ heating changeover
- 2-wire on-off, 3-wire floating and 0-10 VDC output models available
- External temperature sensor capability
- Power surge protection

General

The TC7 Series digital room thermostats are available in 3 different models for line voltage on-off control of valves, relays and/or fan motors in fan coil units for commercial, industrial and residential installations.

A system switch provides “off-cool” or “heat-off-cool” mode selection, depending on the model selected. The operating mode will be displayed on the LCD with the icons ☼ for cooling, ❄ for heating and O for off. When system switch is in “O” position, the LCD will be deactivated.

A fan-speed control switch, which is enabled when the LCD is in active mode, allows control of a 3-speed fan. In the “Hi”, “Med” or “low” position, the fan runs continuously at the selected speed. The 3 fan speeds are displayed and represented on the LCD by a bar chart.

Both the 3-wire floating and 0-10 VDC output models adopt true proportional, integral plus derivative control algorithm.

External temperature sensor is available to all models as a standard feature.

For 3-wire floating models, when thermostat is turned on or turned off, the valve output will drive the valve to its fully-closed position before shutting down or entering into operating mode.

Mounting

The TC7 Series electronic room thermostats can be surface mounted or secured to a standard European 75x75x35 mm electrical box. Two mounting screws are included.

Ordering Instruction

To order, specify complete product model number.

If the fan outputs are required to be connected to the multi-speed motor windings through intermediary relays, specify this requirement on ordering.

Specifications

Model Numbers	TC7-1	Off-cool, 3-speed fan, single on-off output, cooling only, 2-pipe system
	TC7-2	Heat-off-cool, 3-speed fan, single on-off output, manual cooling/heating changeover, for 2-pipe system
	TC7-3	Heat-off-cool, 3-speed fan, dual on-off outputs, manual cooling/heating changeover, for 4-pipe system
	TC7-4	Heat-off-cool, 3-speed fan, single 3-wire floating output, manual cooling/heating changeover, for 2-pipe system
	TC7-5	Heat-off-cool, 3-speed fan, single 0-10 VDC output, manual cooling/heating changeover, for 2-pipe system (standard version for direct fan output connections)
Power Requirements	230 V ±10%, 50/60 Hz, 6 VA without load	
Operating Temperature Differential	Fixed at 1 K for both cooling and heating modes for models RT7-1, RT7-2 and RT7-3	
Temperature Display Range	0-40°C in 0.2 K increments: accuracy ±0.5 K	
Temperature Set Point Range	10-30°C in 0.2 K increment, initial factory setting at 25°C	
3-wire Floating Travel Time	Maintain closing output signal for 150 s when thermostat is turned off	
Sensing Element	NTC thermistor, 10 kΩ@25ºC; accuracy ±0.5 K@25ºC	
Fan Output	Continuous, selectable at high, medium or low Speed	
Body Material	Self-extinguishing, molded ABS, conforming to UL-94 standard	
Finish	Off white color	
Electrical Ratings	Valve outputs	Thyristor, 220 V 1(0.5) A, 50/60 Hz
	Fan switch	220 V 2(1) A , 50/60 Hz
Protection Class	IP20	
Ambient / Storage Temperature Limits	0 to 55°C / -10 to 60°C, 10% to 90% RH non-condensing	
Power Wires	Wire size 1 mm^2 or 18 AWG solid copper recommended	
Sensor Wires	22 AWG twisted shielded pair double-insulated cable	
Accessories	See Figure 1: Accessories	
Agency Approval	CE Mark compliant to EMC and Low Voltage Directives pending	
Shipping Weight	0.24 kg (0.53 lb)	
Dimensions	See Figure 4: Dimensions in mm	

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: Accessories

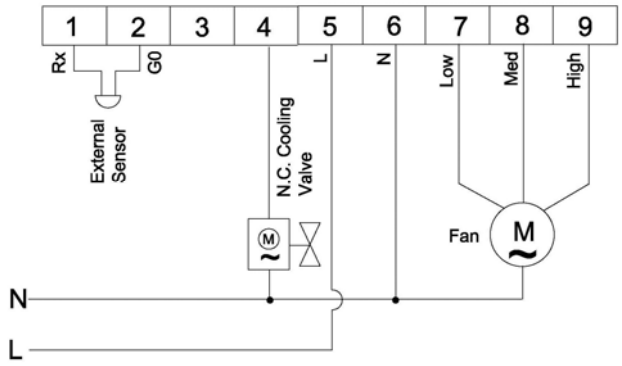
Description	Part No.
Probe-type external temperature sensor	TE10-1
Duct-mount external temperature sensor	TE10-2

Figure 2: Wiring Notes

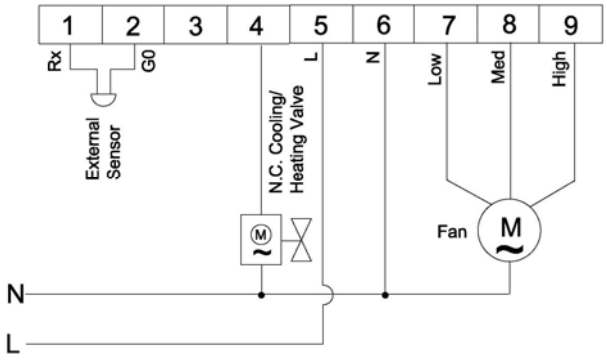
1. 22 or 24 AWG twisted shielded pair double-insulated cable is recommended as remote sensor wiring and its length must not exceed 50 m.
2. Do not bundle and run power wiring and remote sensor wiring in the same conduit.
3. Run the remote sensor wiring away from any electric motors or power wiring. Failure to do so may result in poor thermostat performance due to electrical noise.

Figure 3: Wiring Diagrams

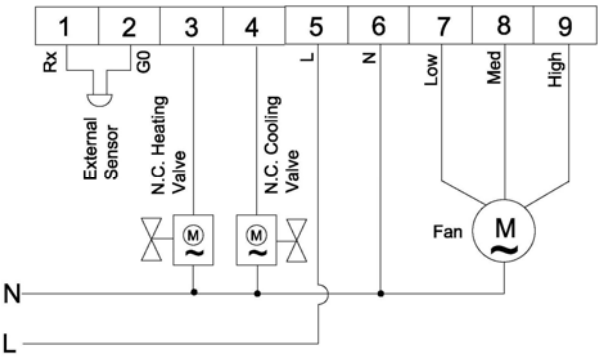
TC7-1



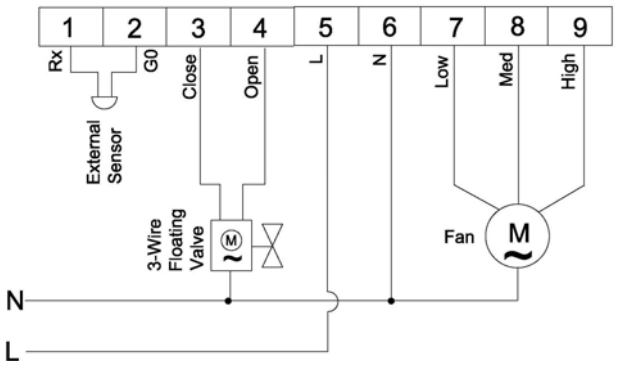
TC7-2



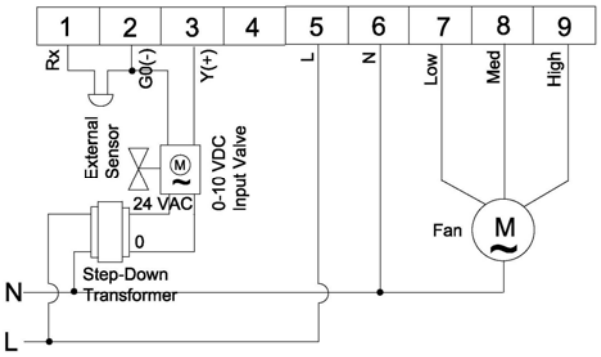
TC7-3



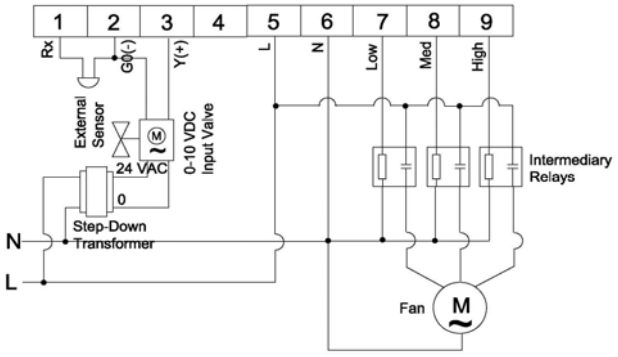
TC7-4



TC7-5 (standard version)



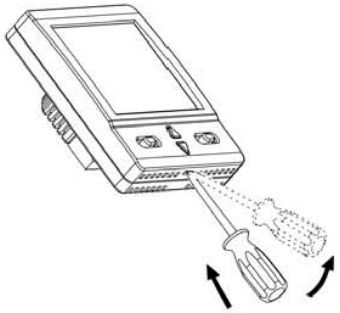
TC7-5 (for fan output connections via intermediary relays)



N.C. = Normally-closed

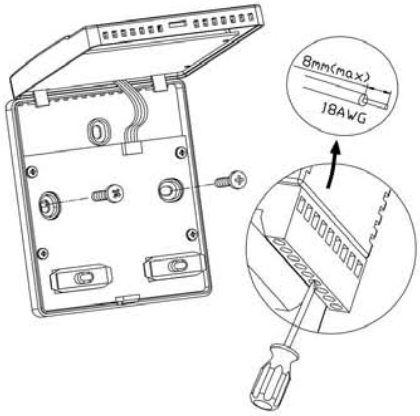
All N.C. valves are 2-wire spring-return valves.

Figure 4: Cover Removal Procedure



1. Poke a thin-blade screw driver into the rift of the latch position between the cover and the base.
2. Slightly twist the screw driver to crack open the cover from the base.
3. Hold the base firmly with one hand and lift the cover with another hand.

Figure 5: Installation Instruction



1. Disconnect the cable connector and remove the thermostat from the base before terminating wires to the terminal block at the back of the base.
2. Mount the base to the wall box with two screws provided with the thermostat.
3. Reconnect the cable connector and reinstall the thermostat to the base.

Figure 6: Dimensions in mm

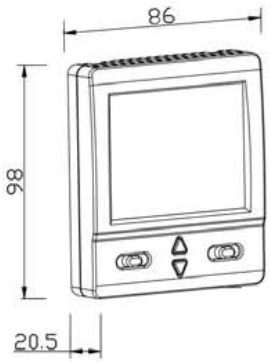


Figure 7: Jumper Settings

1. Place jumper JP3 to position “Ext” when external sensor is used and connected. JP3 is factory set at position “Int” for built-in sensor.
2. Place jumper JP4 to position “1” if constant set point setting at 25ºC is desired. JP4 is factory set at position “0” for adjustable set point settings.
3. If and when intermediary relays are used for fan speed outputs to boost rated inductive motor currents, place jumper JP8 to position “1”. JP8 is factory set at position “0” for direct connection of fan speed outputs to fan motor windings. Incorrect setting will cause misleading indications of fan speed icons on the LCD display.

Operation Notes

- LCD shows both ambient temperature and set point setting constantly when the system is in active mode.
- Slide the system control switch to enter into the desired operating mode: Off-Cool or Heat-Off-Cool.
- Slide the fan control key to change the fan speed mode: High-Med-Low.
- Increase or decrease temperature set point value by pressing adjustment keys ▲ and ▼ respectively. When the adjustment key is pressed, the LCD shows the new set point value. If there is no key operation in 5 s, the new set point value will be entered and the LCD will return to normal ambient temperature and set point value display mode.
- When the system control switch is at position “O”, the LCD screen goes off and the thermostat is completely shut down.