

Overview of product

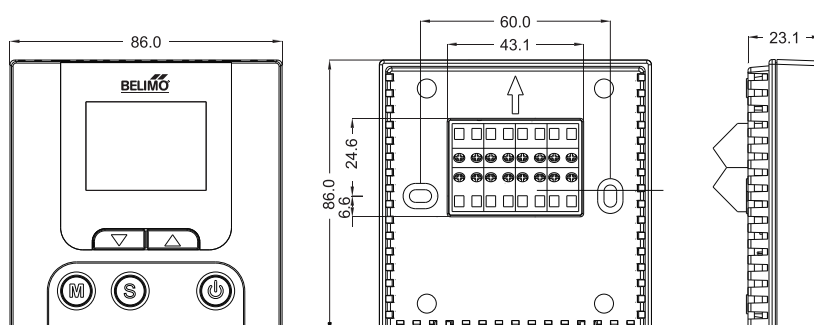
LCD temperature controller EXT-T24-D201 provides the foundation for modern single room concepts.

Features

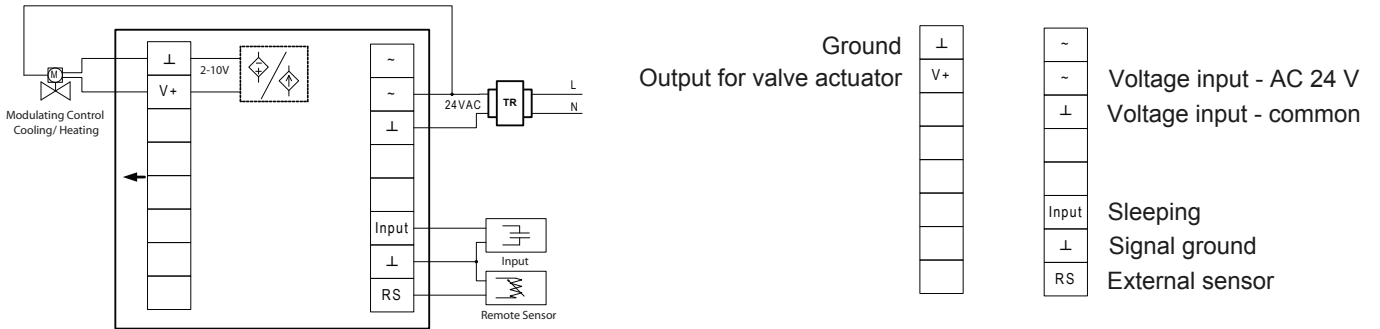
- LCD with green backlight
- Suits 2-pipe system
- Proportional output, DC 2...10V (factory default) / DC 0...10V / 4...20mA (600Ω) / 0...20mA (600Ω)
- Adjustable P-band, I-time and setpoint range
- Sleeping mode available
- Last status memory function
- Low temperature protection
- External sensor included


Technical data

Norminal voltage	AC 24V 50/60Hz (±10%, AC 21.6V...29.7V)
Power consumption	<1W@AC 24V
Output(s)	DC 2...10V (factory default) / DC 0...10V / 4...20mA (600Ω) / 0...20mA (600Ω), by parameter setting and DIP switch
Built-in sensor	NTC thermistor, 10kΩ@25°C
External sensor	NTC thermistor, probe type 10k@25°C
Temperature range	Display : 0...99.5°C Setpoint : 0...99.5°C, 0.5K per step
Mode	On / Off / Sleeping Cooling / Heating
Proportional band	1K...20K adjustable, 0.5K per step (factory default 2K)
Integral time	10...300 seconds adjustable, 10s per step (factory default 90 seconds)
Display offset	±20K adjustable, 0.1 per step (factory default 0)
Heating setpoint Cooling setpoint	0...99.5°C adjustable, 0.5°C per step (factory default 35°C) 0...99.5°C adjustable, 0.5°C per step (factory default 5°C)
Sleeping mode setpoint range	Cooling : 0...99.5°C (factory default 28°C) Heating : 0...99.5°C (factory default 7°C)
Low temperature protection	When thermostat is switched off and ambient temperature < 5°C, thermostat automatically starts in heating mode until ambient temperature rise to 7°C.
Connection	Screw terminals, maximum 1.0mm ² or 18 AWG
Ambient humidity	Max. 90% RH, non-condensing
Body material	PC + ABS retardant material
Weight	225g
Dimensions (LxWxH)	86 x 86 x 23mm
Mounting	Wall mounted, holes separate 60mm vertically, 2x screws provided
Degree of protection	IP20
Agency approval	CE mark compliant to EMC Directive

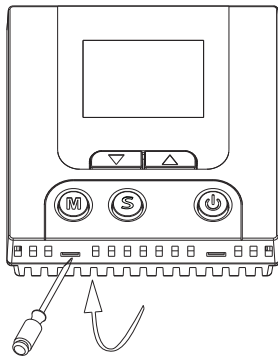
Dimensions


Wiring diagram

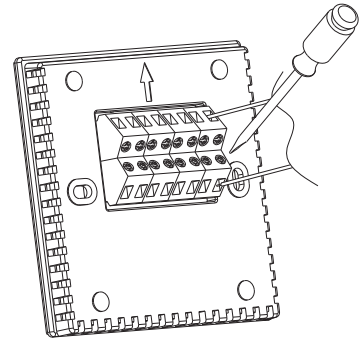


Installation

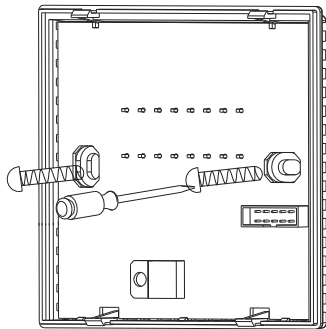
1. Open the back panel with screwdriver.



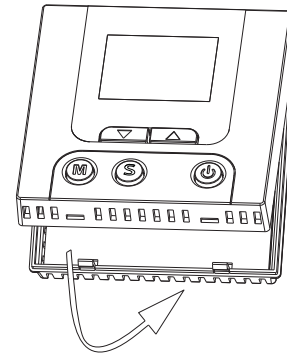
2. Connect the wires per the wiring diagram.



3. Secure the base with the screws provided.




4. Reattach the front panel.



Setup menu

1. On/ Off	Press “⏻” buttons to turn on; press “⏻” again to turn off.
2. Setpoint	Press “Ⓢ” button to display the set point, press “▼” to reduce the setpoint, press “▲” to increase the setpoint, the setpoint step is 0.5°C, the setpoint will be confirmed automatically after 5 seconds.
3. Mode	With thermostat on, press “Ⓜ” to change the working mode – Cooling “❄️”, Heating “❄️”.
4. Sleep mode	Press “Ⓜ” button for 3 seconds till “⌚” display, there is a number of count down in the center of LCD. Use “▲” or “▼” to adjust the desired sleep time: the max. = 48 hours; thermostat will return to the working status after 5 seconds, “⌚” is flashing to start counting down. The setpoint should be replaced by the sleep setpoint.
5. Exit setup menu	When thermostat get into Sleep function, “⌚” will flash, press “▲” or “▼” to quit.
6. Keypad lock	Press “▲” and “▼” for 10 seconds till “🔒” display to activate, under this function, any keypad is locked. Press “▲” and “▼” for 10 seconds till “🔒” disappear to quit the function.
7. Backlight	Press “Ⓢ” to activate the backlight. Avoid pressing “Ⓜ”, “▲” or “▼” to activate backlight as it will change the setting at the same time.

Parameter setting

With thermostat off, press “” for 10 seconds to enter menu to set the parameters. It will confirm itself 20 seconds later after setting and return to Off state.

Parameter table

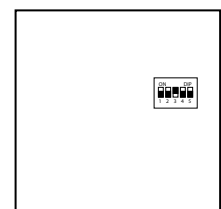
	Description	Default	Range	Step
1	Power on status (0: Off; 1: On; 2: Last status)	2	0 - 2	
2-3	N/A			
4	Sensor selection (0: Internal; 1: Remote)	0	0 - 1	
5	Temperature format (0: Celsius; 1: Fahrenheit)	0	0 - 1	0.1
6	Temperature calibration	0	-20.0 - +20.0	0.1
7	Minimum setpoint	5°C/41°F	0 - 99.5	0.5
8	Maximum setpoint	35°C/96°F	0 - 99.5	0.5
9	N/A			
10	Heating & Auto sleep setpoint	7°C/45°F	0 - 99.5	0.5
11	Cooling sleep setpoint	28°C/82°F	0 - 99.5	0.5
12	N/A			
13	Input Signal Mode 0: Invalid 1: N/A 2: thermostat will be sleep without input signal 3: thermostat will be Off without input signal	2	0 - 3	
14	Heating integral time	90 sec.	10 - 300 sec.	10 sec.
15	Cooling integral time	90 sec.	10 - 300 sec.	10 sec.
16	Valve mode (0: Modulation ; 1: On/Off)	0	0 - 1	
17	Valve status as turn off (0: Close; 1:Hold; 2: Open)	0	0 - 2	
18	Valve Modulation direction(0:10V Open; 1:10V Close)	0	0 - 1	
19	Valve Modulation minimum signal	51Bit	0-128Bit(5V/10mA)	0.04V/Bit (0.08m A/Bit)
20	Valve Modulation proportional	2	1 - 20	0.5
21-22	N/A			
23	Port2 Modulation proportional	2	1 - 20	0.5
24-27	N/A			

Note:

Keep last status of Parameter 20: If Parameter 20 is reset to value other than default “2” and the value needs to keep upon power reset, Parameter 23 is needed to set to the same value as Parameter 20.

Switch

There is a 5-pole DIP switch on PCB. The meaning is below:



Location	Pole	Default value
1	N/A	N/A
2	Valve Modulation 4 - 20mA or 0- 20mA	Off
3	Valve Modulation 2- 10VDC or 0 - 10VDC	On
4	N/A	N/A
5	N/A	N/A

External sensor

The probe type sensor is included in the EXT-T24-D201 temperature controller.


Sensor specifications

Sensing Element	NTC Thermistor, 10 kΩ@25°C, See Table 1 for Characteristics
Range	-40°C...105°C
Maximum Length of Connecting Wires	1.5 m
Ambient / Storage Temperature Limits	-10°C...40°C (avoid air corrosion or sunlight)
Ambient / Storage Humidity	≤75% RH
Dimensions	See Fig. 1: Dimensions in mm

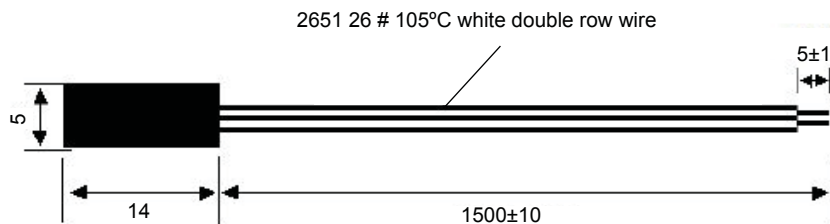


Fig. 1

Table 1 - Resistance versus Temperature

Temperature °C	Resistance Ω	Temperature °C	Resistance Ω	Temperature °C	Resistance Ω	Temperature °C	Resistance Ω
0	32116	11	18892	21	11939	31	7716
1	30570	12	18026	22	11418	32	7396
2	29105	13	17204	23	10921	33	7090
3	26399	14	16423	24	10418	34	6798
4	26399	15	15681	25	10000	35	6520
5	25150	16	14976	26	9571	36	6255
6	23965	17	14306	27	9164	37	6002
7	22842	18	13669	28	8775	38	5760
8	21776	19	13063	29	8405	39	5529
9	20764	20	12487	30	8052	40	5309
10	19783						