Temperature controls and limiters
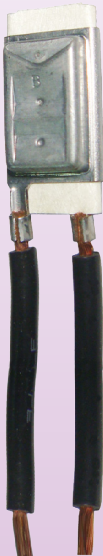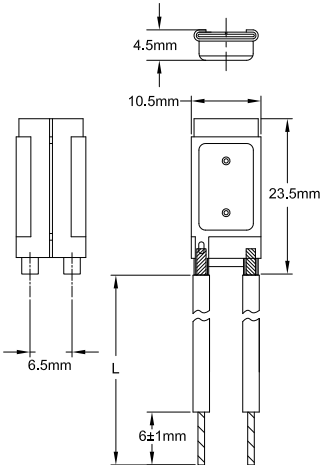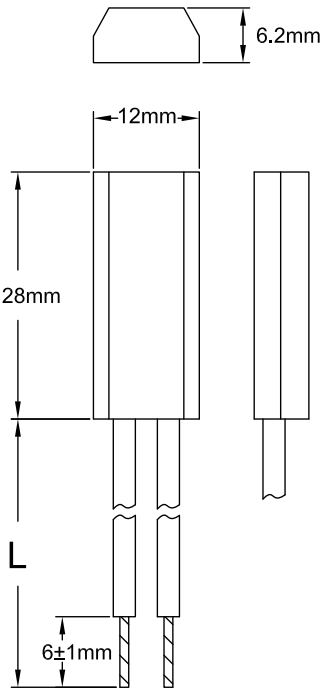
Temperature sensors

Electronic temperature control boxes for remote control. On-Off or PID action

Fixed setting temperature limiters.
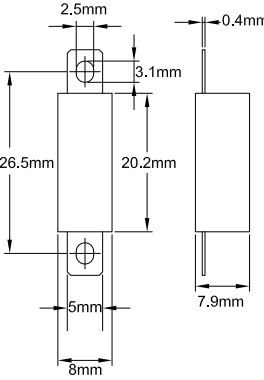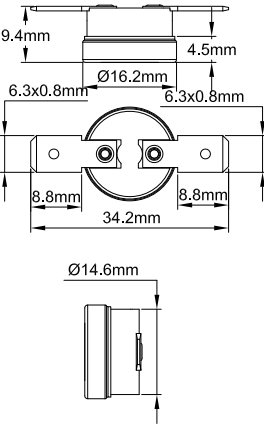## (Selection of models usable on silicone heating elements).
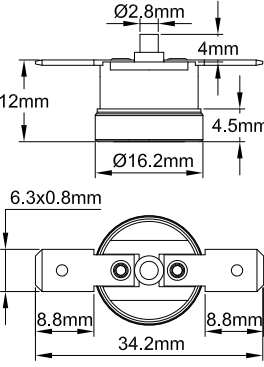
Temperature range	Electric rating	Contact style	Temperature sensing device	Temperature setting	Types
50 - 200°C (120 - 390°F)	Up to 15A	Snap action	Bimetal	Fixed setting	**UJA, 4A, 4903 4R05, 4T**

Picture	Drawing	Text	References
	4.5mm, 10.5mm, 23.5mm, 6.5mm, L, 6±1mm	**Construction:** Bimetal crossed by the current. The current passing in the bimetal causes its heating by Joule effect. The calibration temperature must take into account this heating. **Housing:** 11.7 x 4.1 x 23.6 mm, body is live. **Electric rating:** 5A 120 VAC, 4A 240 VAC, 100000 cycles (UL) and 22A 120V, 13A 250V, 10000 cycles (VDE) **Calibration range:** 50°C to 160°C. Tolerances +/- 5°C and +/- 7°C. **Contact action:** Snap action, instantaneous opening and closing contact, suitable for 120 and 240V applications. **Differential:** The differential between opening and closing of the contact can be specified between 2 and 40°C. **Calibration:** Fixed setting, factory-made, not modifiable by the user. **Terminals:** Can be supplied with factory set wires. **Part numbers:** The full part number and the technical sheet are issued when products are ordered. **Compatible with:** 9BFL1 silicone protective boot, which can be vulcanized or glued. (See technical pages on silicone boots).	UJA
	6.2mm, 12mm, 28mm, L, 6±1mm	**Construction:** Bimetal crossed by the current. The current passing in the bimetal causes its heating by Joule effect. The calibration temperature must take into account this heating. **Housing:** 28 x 12 x 6.2 mm, PPS body is waterproof and electrically insulated. **Electric rating:** 9A 250V, 10000 cycles **Calibration range:** 50°C to 150°C. Tolerances +/- 5°C and +/- 7°C. **Contact action:** Snap action, instantaneous opening and closing contact. **Differential:** 7±4°C (16±9°F) **Calibration:** Fixed setting, factory-made, not modifiable by the user. **Terminals:** XLPE insulated AWG20 wires, length made on order. **Part numbers:** The full part number and the technical sheet are issued when products are ordered. **Compatible with:** These waterproof limiters can be glued directly on the silicone heater or be put under a 9BFL5 silicone protective boot, which can be vulcanized or glued. (See technical pages on silicone boots).	4A

|			
	2.5mm / 0.4mm / 3.1mm / 26.5mm / 20.2mm / 5mm / 7.9mm / 8mm	**Construction:** Bimetal not crossed by the current. Current flowing through the thermostat does not change its opening temperature. **Case:** 20.2 x 5 x 5.9mm, in PPS (not waterproof). **Sensing element:** Bimetal disc, snap-action contact **Set Point:** Factory set, 60 °C to + 160°C (140 to 320°F). Not adjustable by the user. Standard tolerance from ± 4°C to ± 6°C (± 9°F to ± 16°F), depending on models. **Connection:** by solder terminals. **Differential:** 7 ± 4°C (16 ± 9°F). **Mounting:** no flange or bracket **Electrical rating:** 10A at 240V (resistive, alternating current) **Part numbers:** These products are made to order only. (M.O.Q apply). The full part number and the technical sheet are issued when products are ordered. **Compatible with:** 9BFL6 silicone boot, (see technical pages on silicone caps), which can be vulcanized or glued.	4T
	9.4mm / 4.5mm / Ø16.2mm / 6.3x0.8mm / 6.3x0.8mm / 8.8mm / 8.8mm / 34.2mm / Ø14.6mm	**Construction:** Bimetal not crossed by the current. Current flowing through the thermostat does not change its opening temperature. **Body:** Phenolic resin (ceramic body above 150°C). **Sensing element:** Bimetal disc, snap-action contact **Set Point:** Factory set from -15 to + 150°C (5 to 302°F) with phenolic resin body, and 150 to 200°C (302 to 392°F) with ceramic body. Not adjustable by the user. Standard tolerance from ± 4°C to ± 6°C (± 9°F to ± 14°F) depending on models. **Connection:** 6.3 tabs or solder terminals. **Differential:** Factory set. Standard values from 5°C to 25°C, (9°F to 50°F) **Bracket:** Without bracket. **Electrical rating:** 15A at 125VAC, 10A at 240VAC, 100,000 cycles (resistive load). **Part numbers:** These products are made to order only. (M.O.Q apply). The full part number and the technical sheet are issued when products are ordered. **Compatible with:** 9BFL2; 9BFL3; 9BFP1; 9BFV1; 9BFV2; 9BFV3, silicone boots, which can be vulcanized or glued. (See technical pages on silicone boots).	4903
	Ø2,8mm / 4mm / 12mm / 4.5mm / Ø16.2mm / 6.3x0.8mm / 8.8mm / 8.8mm / 34.2mm	**Construction:** Bimetal not crossed by the current. Current flowing through the thermostat does not change its opening temperature. **Body:** Phenolic resin (ceramic body above 150°C). **Sensing element:** Bimetal disc, snap-action contact. **Set Point:** Factory set from -15 to + 150°C (5 to 302°F) with phenolic resin body, and 150 to 200°C (302 to 392°F) with ceramic body. Not adjustable by the user. Standard tolerance from ± 4°C to ± 6°C (± 9°F to ± 14°F) depending on models. **Connection:** 6.3 tabs or solder terminals. **Differential:** Manual reset. **Bracket:** Without bracket. **Electrical raring:** 15A at 125VAC, 10A at 240VAC, 100,000 cycles (resistive load). **Part numbers:** These products are made to order only. (M.O.Q apply). The full part number and the technical sheet are issued when products are ordered. **Compatible with:** 9BFL4 silicone boot, which can be vulcanized or glued. (See technical pages on silicone boots).	4R05

Note: These temperature limiters are not manufactured by Ultimheat, and the information given is that of our suppliers.

Bimetal surface temperature control thermostat, adjustable set point.
(Selection of models usable on silicone heating elements).

Temperature range	Electric rating	Contact style	Temperature sensing device	Temperature setting	Type
50- 200°C (120- 390°F)	Up to 7.5A	Slow break contact	Bimetal	Set point adjustable by customer	**IB**
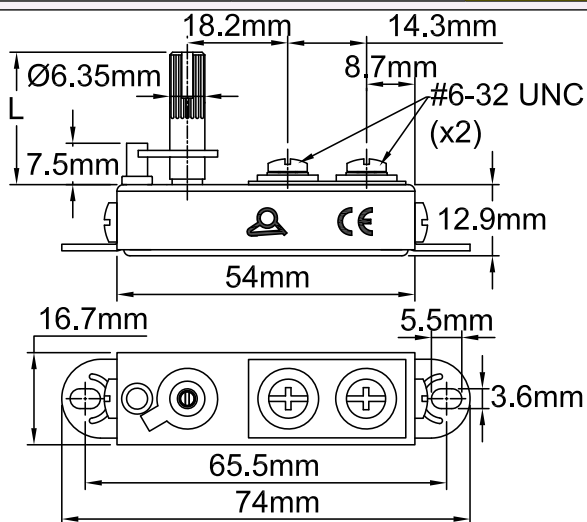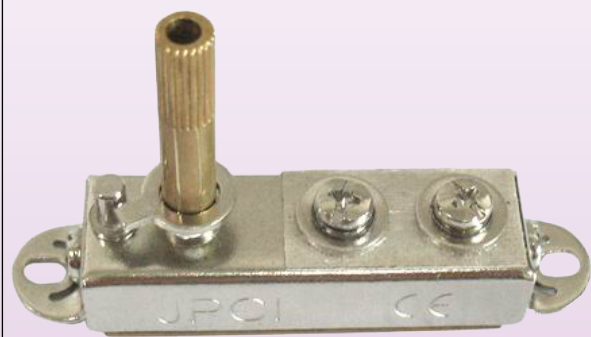
Applications
Adjustable and low differential device to control the surface temperature on flexible heating elements.

Main Features
Dimensions: 58.5 x 17.5 x 17.5 mm (not including shaft).
Material: metal and ceramic body.
Temperature sensing element: high thermal conductivity copper alloy.
Terminals: 2 screw terminals 6-32 UNC
Set point adjustment: dia. 6.35 mm shaft, 32 mm length, rotation angle 310°(other shaft lengths, or screwdriver or fixed setting available on request).
Mounting: To be mounted on the surface of the silicone heater with a silicone boot 9BFF4, which can be vulcanized or glued. (See technical pages on silicone caps).
Electrical rating: 1500 watts 110/240VAC, resistive (slow break action). In 220-240V applications, it may be necessary to provide an anti-radio interference device on the circuit to comply with European EMC rules.
Contact: Slow break, open by temperature rise.
Differential: Less than 1°C (2°F)
Maximum ambient temperature on the thermostat: 300°C (570°F).
Approval: Complies with UL 873.

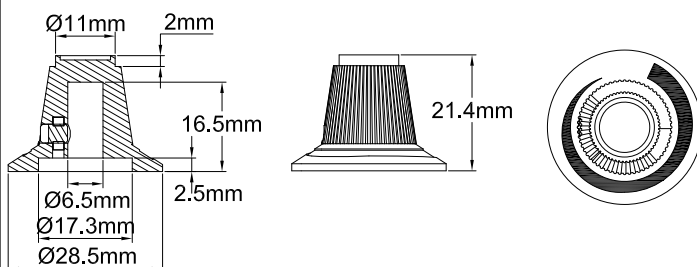## Main part numbers used on flexible silicone heaters

Part numbers	Shaft length (L)	Calibration value at high stop °C(°F)
IBK2000632313001	32mm	150 (300)
IBK2000632313901	32mm	200 (390)

Accessory
Knob for 6.35 mm shaft. Black PPS material, white printed crescent. Maximum temperature on the knob: 200°C (390°F).

Part number: 66MB0600000010MW

Single pole bulb and capillary surface temperature control thermostat, with adjustable set point
(Selection of models usable on silicone heating elements).

Temperature range	Electric rating	Contact style	Temperature sensing device	Temperature setting	Type
50- 200°C (120- 390°F)	16A 250V	Snap action single pole contact	Liquid expansion	Set point adjustable by customer	**8G**

Applications

Adjustable thermostat, with snap action contact to control the surface temperature on flexible heaters.
Body dimensions: 43 x 35 x 29 mm (terminals not included)
Bulb and capillary: Stainless steel. Bending radius 5mm minimum
Temperature sensing: liquid filled bulb and capillary.
Terminals: 6.3 x 0.8mm tabs.
Set point adjustment: Shaft, length 11.5 mm, diameter 6mm with 4.6mm flat
Mounting: 2 holes with M4 thread, 28 mm distance between axis. The body of the thermostat is mounted on the surface of the heating element by means of the silicone boot 9BFF10 including a silicone foam sheet insulating the body of the thermostat from the surface temperature. The bulb is mounted outside of the thermostat boot by means of the boots 9BFS6 (for bulbs up to 80mm length) or 9 BFS7 (or bulbs up to 100mm length), which can be vulcanized or glued. (See technical pages on silicone boots).
Contact: single pole, snap action.
Electrical rating:16A (2,6) 250VAC,100,000 cycles.

Main part numbers used on flexible silicone heaters

Part number	Temperature range °C (°F)	Capillary length (C, mm)	Bulb diameter (D, mm)	Bulb length (E, mm)	Max temperature on bulb °C (°F)
8GB030110AA80001	30-110°C (85-230°F)	250	8	55±5	140°C (284°F)
8GB050200AA60001	50-200°C (120-390°F)	250	6	65±5	230°C (446°F)

Accessories: Printed knobs

°C Printing		°F Printing	
30-110°C	50-200°C	85-230°F	120-390°F
66MZ0060301101FW	66MZ0060502001FW	66MZ0060502001FX	66MZ0060502001FX

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Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice
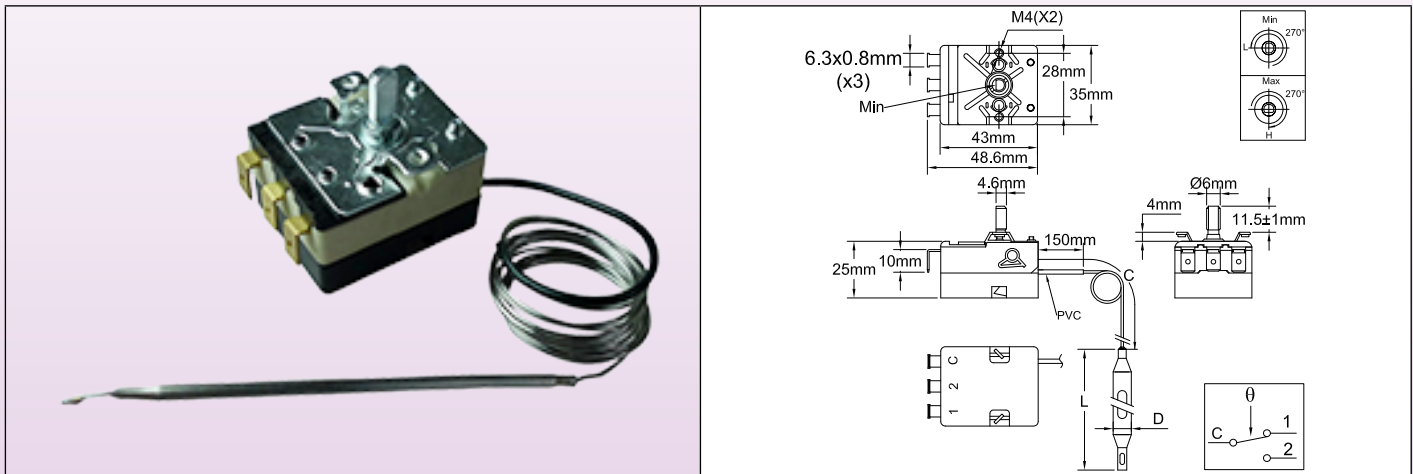
3 pole bulb and capillary surface temperature control thermostat, with adjustable set point.
(Selection of models usable on silicone heating elements).

Temperature range	Electric rating	Contact style	Temperature sensing device	Temperature setting	Type
50- 200°C (120- 390°F)	3x16A 250V	Snap action 3 pole contact	Liquid expansion	Set point adjustable by customer	**8C**
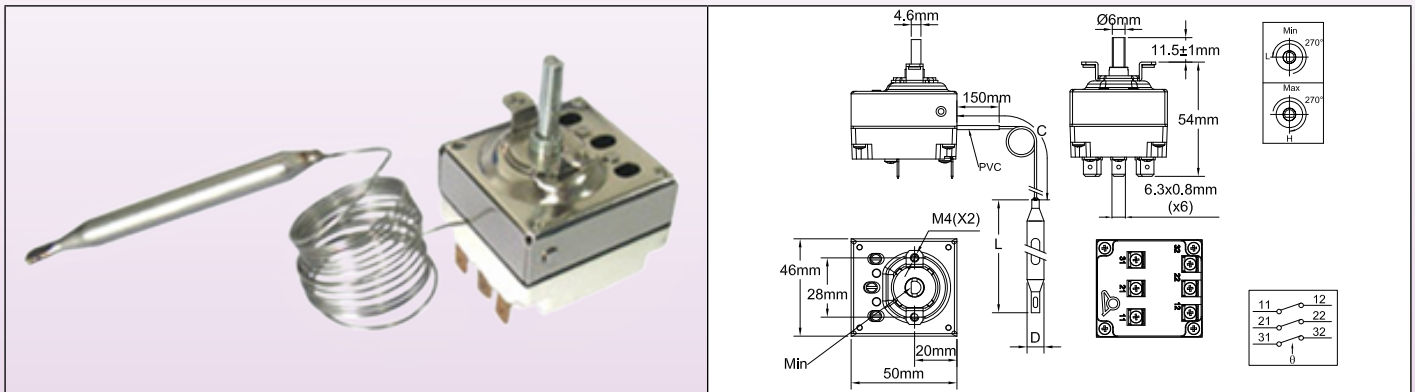
Applications

Adjustable thermostat, with snap action contact to control the surface temperature on 3 phase flexible heaters.
Body dimensions: 46 x 50 x 45 mm (terminals not included)
Bulb and capillary: Stainless steel. Bending radius 5mm minimum
Temperature sensing: liquid filled bulb and capillary.
Terminals: 6.3 x 0.8mm tabs.
Set point adjustment: Shaft, length 11.5 mm, diameter 6mm with 4.6mm flat
Mounting: 2 holes with M4 thread, 28 mm distance between axis. The body of the thermostat is mounted on the surface of the heating element by means of the silicone boot 9BFF14 including a silicone foam sheet insulating the body of the thermostat from the surface temperature. The bulb is mounted outside of the thermostat boot by means of the boots 9BFS6 (for bulbs up to 80mm length) or 9 BFS7 f(or bulbs up to 100mm length), which can be vulcanized or glued. (See technical pages on silicone boots).
Contact: 3 pole, snap action.
Electrical rating:3 x 16A (2,6) 250VAC,100,000 cycles.

Main part numbers used on flexible silicone heaters

Part number	Temperature range °C (°F)	Capillary length (C, mm)	Bulb diameter (D, mm)	Bulb length (E, mm)	Max temperature on bulb °C (°F)
8CB030110AA60001	30-110°C (85-230°F)	250	6	90	140°C (284°F)
8CB050200AA60001	50-200°C (120-390°F)	250	6	67	230°C (446°F)

Accessories: Printed knobs

°C Printing		°F Printing	
30-110°C	50-200°C	85-230°F	120-390°F
66MZ0060301101FW	66MZ0060502001FW	66MZ0060502001FX	66MZ0060502001FX

Temperature sensors: K thermocouple, naked welding, for incorporation on flexible silicone heaters.

Temperature range	Cable insulation	Probe protection	Temperature sensing device	Signal type	Type
20- 200°C (120- 390°F)	FEP	Without	K thermocouple	Millivolts	**TPR**

3mm x 1.5mm

L

6mm

AWG24 +

−

50mm

2: FED
4: Naked welding
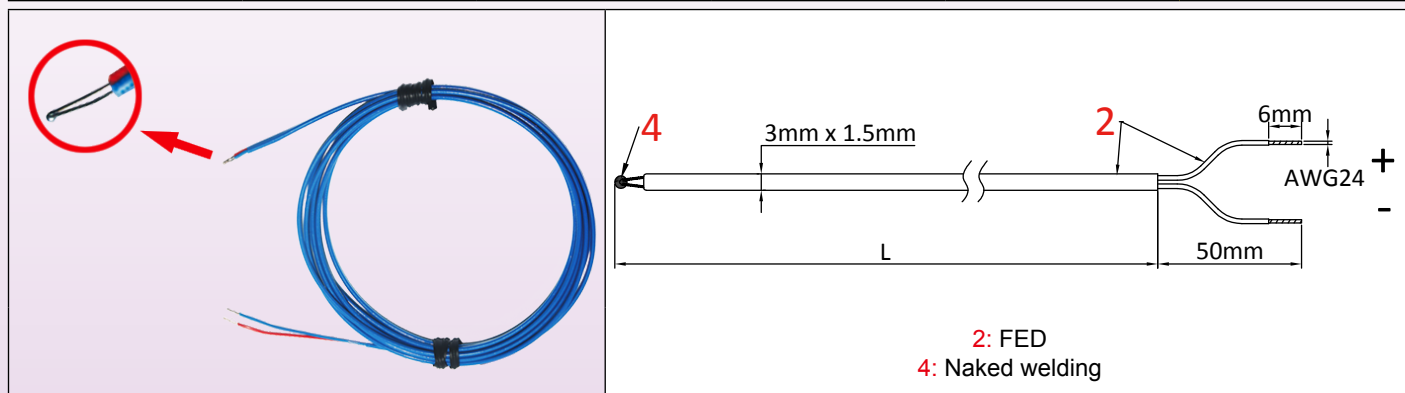
Main applications

The main advantage of these thermocouples in the temperature measurement of flexible heating elements is their small size and fast response. The welding of the thermocouple takes up little space and has a very low mass. They can be integrated into the heating elements without significantly increasing their thickness and without modifying their flexibility. They are resistant to shocks and vibrations.

Main Features

A thermocouple consists of two different metal wires soldered at one end. When heated, the solder generates a thermoelectric potential proportional to the temperature. This signal is used by electronic temperature controllers. Thermocouples are simple, but they need special connecting cables and a cold junction compensation system. Consequently, the electronic regulators using them are more complicated to produce than those using platinum thermistor or thermistor sensors.

Construction: The two conductors of the thermocouple are welded under a controlled atmosphere, in order to form a spheroidal weld, of small dimension (about 0.6 mm of diameter). It is this weld, which remains bare in this version, which measures the temperature.

Mounting: The end with the weld is then attached to the flexible heating element with a protective cap type 9BFS2, 9BFS7, 9BFM3 (see technical pages on silicone caps), which can be vulcanized or bonded.

Temperature range: Use temperature limited to 200°C due to FEP insulated cable.

Accuracy and tolerances: ± 2.5°C between -40°C and 333°C (According to EN 60584-1 and 2 and IEC 584-1 and 2, for accuracy class 2).

Color code (according to DIN 43714): Red = positive, blue = negative, blue cable sleeving.

Cable composition: 2 rigid conductors, dia 0.3 mm, 200°C FEP insulation.

Main part numbers

| Part numbers	Wire length (mm)
TPR00060W02002F4	200
TPR00060W05002F4	500
TPR00060W10002F4	1000
TPR00060W20002F4	2000
TPR00060W30002F4	3000

Note: These temperature sensors are not manufactured by Ultimheat, and the information given is that of our suppliers.

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Temperature sensors: Encapsulated 100 Ohms platinum RTD for incorporation on flexible silicone heaters.

Temperature range	Cable insulation	Probe protection	Temperature sensing device	Signal type	Type
20- 200°C (120- 390°F)	FEP	Epoxy dipping	Pt100 platinum resistance	Ohms	**TS0**
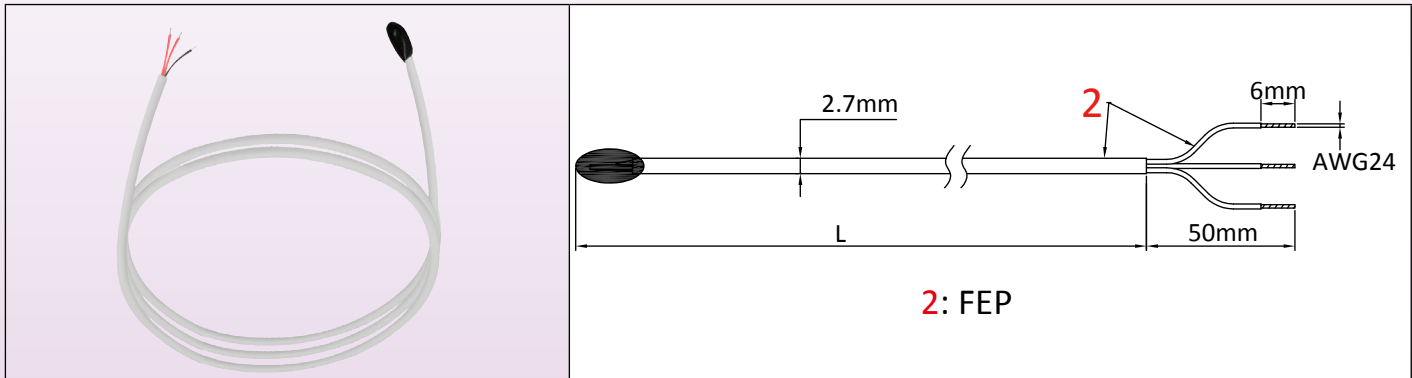
2.7mm

2

6mm

AWG24

L

50mm

2: FEP

Main applications

The main advantage of these Pt100 sensors in the temperature measurement of flexible heating elements is their small size and fast response.
Due to their small dimensions, they can be glued to the surface of flexible heating elements under a protective cap. However they are significantly less resistant to shock and vibration than thermocouples, and are more expensive.

Main Features

The platinum resistivity has excellent repeatability, and high accuracy over a wide temperature range. The resistance variation curve of platinum as a function of temperature is much more linear than that of thermocouples or thermistors. Electronic controllers using Pt100 are simpler and less expensive than thermocouple ones.
In addition, they don't need temperature-compensated cable such as thermocouples. Pt100 are used worldwide and are interchangeable, using the DIN 43760 curve.
Construction: A platinum film is deposited on a ceramic substrate, conductors are welded to it, and the whole is encapsulated in an epoxy resin.
Mounting: The end with the Pt100 measuring element is then attached to the flexible heating element with a protective cap type 9BFM3 or 9BFV1, (see technical pages on silicone caps), which can be vulcanized or bonded.
Temperature range: Temperature limited to 200°C due to FEP insulated cable and epoxy used for encapsulation
Accuracy and tolerances:
- Nominal value at 0°C: 100 Ohms.
- Nominal value at 100°C: 138.51 Ohms.
The international standard IEC 751-1983 and DIN EN 60751 2009-05 give the parameters of the temperature response curve.
Class B, the most common, has a tolerance of ± 0.3°C at 0°C. (± 0.12 Ω at 0°C).
Color Code: The two red wires are connected together to their solder on one of the terminals of the ceramic substrate, and the white wire is connected to the other terminal.
- Section of the wires: 7 x 0.15 mm.
Cable composition: 3 conductors, 0.12 mm² (AWG 24), FEP insulation 200°C, outside diameter 2.7 mm (0.127 «).
- Diameter on conductor insulation: 0.95 ± 0.5 mm.
- Wires gauge: 7 x 0.15 mm.

Main parts numbers (Accuracy class B)

Part number	Cable length (mm)
TS040201W0200BD6	200
TS040201W0500BD6	500
TS040201W1000BD6	1000
TS040201W2000BD6	2000
TS040201W3000BD6	3000

Note: These temperature sensors are not manufactured by Ultimheat, and the information given is that of our suppliers.

Temperature sensors: 100 Ohms platinum RTD, dia. 5mm x 30 mm stainless steel probe for incorporation on flexible silicone heaters.

Temperature range	Cable insulation	Probe protection	Temperature sensing device	Signal type	Type
20- 200°C (120- 390°F)	FEP	Stainless steel probe, dia.5mm x 30mm	Pt100 platinum resistance	Ohms, linear	**TSR5**
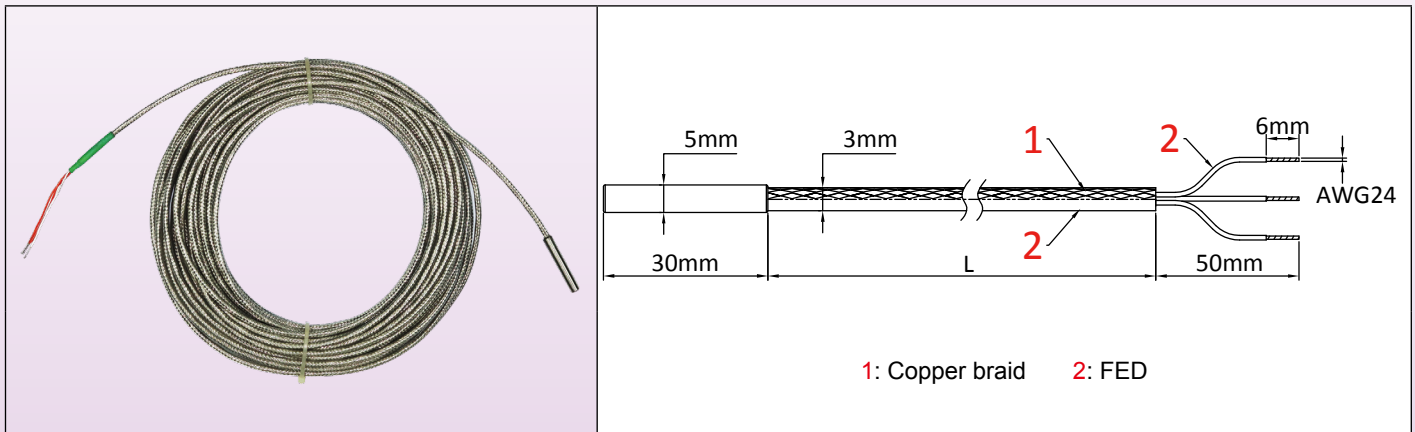
1: Copper braid   2: FED

Main applications

The main advantage of these PT100 sensors in the temperature measurement of flexible heating elements is their robustness. Because of their small size, they can be glued or incorporated into flexible flat elements. They are resistant to shocks and vibrations, but their reaction time is longer, and they are more expensive than models with encapsulated measuring element.

Main features

The platinum resistivity has excellent repeatability, and high accuracy over an extended temperature range. The resistance variation curve of platinum as a function of temperature is much more linear than that of thermocouples or thermistors. Electronic controllers using Pt100 are simpler and less expensive than thermocouple ones.
In addition, they do not need temperature-compensated cable such as thermocouples. Pt100 are used worldwide and are interchangeable, using the DIN 43760 curve.
Construction: A platinum film is deposited on a ceramic substrate, conductors are welded to it, and the whole is inserted in a stainless-steel protection probe.
Mounting: The end with the measuring element Pt100 is then fixed on the flexible heating element with a protective cap of type 9BFS3, 9BFM1, or 9BFV2 (see technical pages on the silicone caps), which can be vulcanised or glued.
Temperature range: Use temperature limited to 200°C due to FEP insulated cable.
Accuracy and tolerances:
- Nominal value at 0°C: 100 Ohms.
- Nominal value at 100°C: 138.51 Ohms
The international standard IEC 751-1983 and DIN EN 60751 2009-05 give the parameters of the temperature response curve.
Class B, the most common, has a tolerance of ± 0.3°C at 0°C. (± 0.12 Ω at 0°C).
Color Code: The two red wires are connected together to their solder on one of the terminals of the ceramic substrate, and the white wire is connected to the other terminal.
Cable composition: 3 x 0.35 mm², (AWG24), FEP insulation + braid + FEP sleeving, T 200°C, O.D. 3 mm

Main parts numbers (Accuracy class B)

| Part number	Cable length (mm)
TSR50030I0200BK6	200
TSR50030I0500BK6	500
TSR50030I1000BK6	1000
TSR50030I2000BK6	2000

Note: These temperature sensors are not manufactured by Ultimheat, and the information given is that of our suppliers.

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Temperature sensors: 10 kohms NTC, dia. 6mm x 30 mm nickel plated copper probe for incorporation on flexible silicone heaters.

Temperature range	Cable insulation	Probe protection	Temperature sensing device	Signal type	Type
20- 120°C (68- 390°F)	FEP	Nickel plated copper probe, dia.6mm x 30mm	10 Kohms thermistor	Ohms Logarithmic	**TNR6**

2 : FEP ; 3 : Silicone
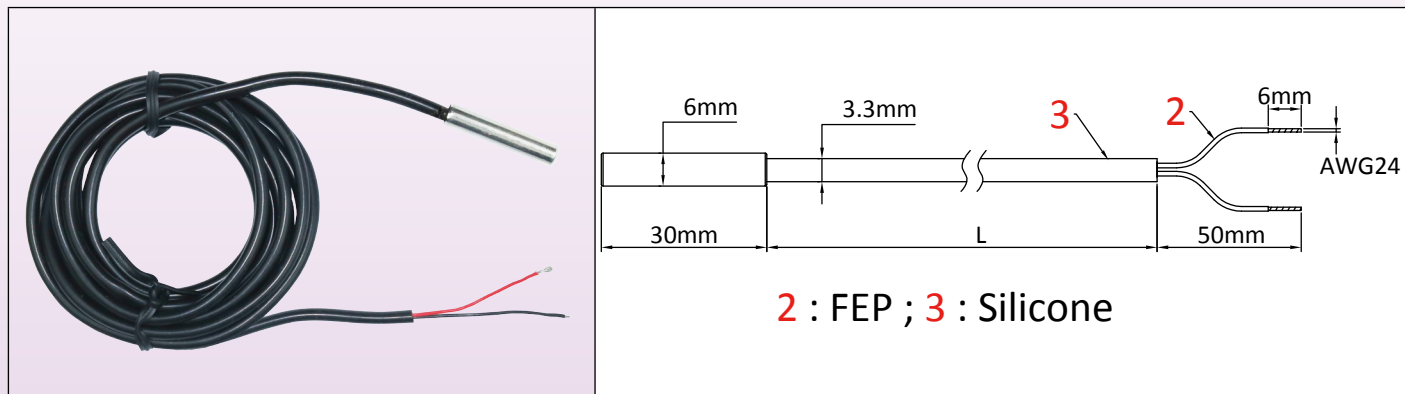
Main applications

The main advantage of these NTC sensors in the temperature measurement of flexible heating elements is their robustness and a relatively short response time. Because of their small size, they can be glued or incorporated into flexible flat elements. They are resistant to shocks and vibrations, but their temperature resistance is limited.

Main features

The thermistor is particularly economical. Its accuracy is correct for temperature ranges from 0 to 120°C. Its resistance decreases logarithmically with temperature. Its repeatability is good, but the interchangeability of the sensors between different suppliers is average. This is the reason why most electronic controllers using these thermistor sensors have a zero-correction system. These regulators are generally simple and inexpensive.

Construction: The measuring element is a glass bead encasing the sintered alloy with a negative temperature coefficient, from which two wires emerge. The conductors of the connecting cable are welded therein, and the assembly is inserted into a nickel-plated copper protection tube with low thermal inertia.

Mounting: The end with the NTC measuring element is then attached to the flexible heating element with a protective cap of type 9BFS4, 9BFM2 or 9BFV3 (see technical pages on silicone caps), which can be vulcanized or bonded.

Temperature range: The operating temperature is limited to 120°C.

Accuracy and tolerances:
- Nominal value at 25°C: 10 Kohms +/- 1%. B = 3380 +/- 1%

Color Code: The two conductors are identical in color and each corresponds to one of the terminals of the thermistor. Due to the high resistance of the measuring element, a third conductor is not necessary.

Composition of the cable: 2 x 0.35 mm², (AWG24) silicone insulation with FEP sleeving, outer diameter 3.3 mm.

Main parts numbers (accuracy class 1%)

| Part number	Cable length (mm)
TNR60030C02001F4	200
TNR60030C05001F4	500
TNR60030C10001F4	1000
TNR60030C20001F4	2000
TNR60030C30001F4	3000

Note: These temperature sensors are not manufactured by Ultimheat, and the information given is that of our suppliers.

Electronic thermostats, NTC sensor
Selection of part numbers used in flexible silicone heaters

Temperature range	Mounting	Adjustment	Sensor	Action type	Types
20-125°C (68-260°F)	Equipment board	Temperature printed knob	NTC thermistor	On-Off	**2PE2N6**
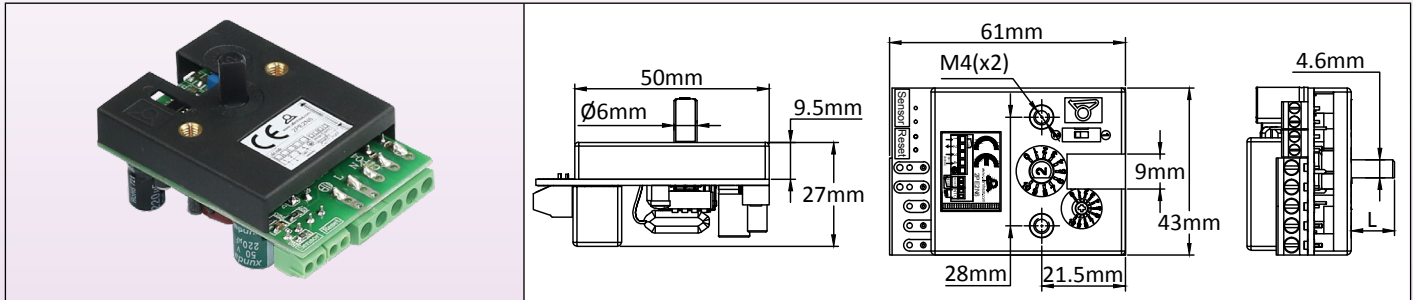
50mm · Ø6mm · 9.5mm · 27mm · 61mm · M4(x2) · 4.6mm · 9mm · 43mm · 28mm · 21.5mm · L

Applications principles

This electronic thermostat for incorporation has been designed to allow a distant temperature control of flexible silicone heaters. It is mounted with two screws M4 at the same distance 28 mm than bulb and capillary thermostats, uses a 6mm dia. shaft with 4.6mm flat, and its knob rotation angle is 230°. Its electrical rating is 16A 230V, identical to the electromechanical thermostats. This is an economical solution, useful in catering equipment.

Main features

Action: On-Off**.**
Size: 60 x 43 x 23 mm.
Temperature sensor: NTC thermistor, 10Kohms @25°C, B(25-50)= 3380
Temperature ranges: 20-125°C (68-260°F)
Temperature differential: Adjustable, by potentiometer with front access, from 0.5 to 5.5°C (0.9 to 10°F) for other temperature ranges.
Accuracy: +/-1% of scale (NTC sensor tolerances not included).
Power supply: 180 to 240V, 50Hz or 60Hz.
Relay output: 16A250V resistive, 100000 cycles.
Relay action: open on temperature rise
Ambient: -20+50°C, 10-85% RH.
Power: <2W
Electrical connections:
- Power supply and power relay: 2.5 mm² screw terminal block.
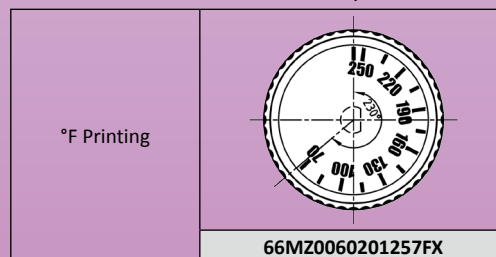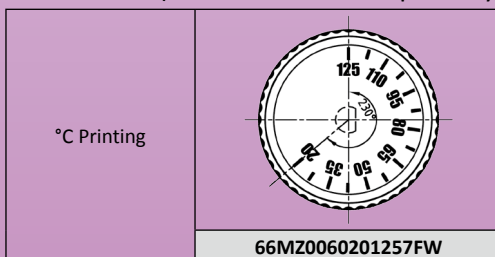- Temperature sensor: 1.5 mm² screw terminal block.
Adjustment shaft: The thermostat is shipped with a dia. 6mm with 4.6 mm flat shaft, length 11 mm, assembled. Included is also a set of: one 15mm shaft, one 28 mm shaft and one screw driver adjustment shaft.
Options: Available with many other temperature ranges. Also available with manual reset action (Ask for full technical data sheet).

1: Cover
2: Printed circuit
3: Elastic washer
4: Screw driver shaft
5: 11 mm shaft fitted in standard
6: 15 mm shaft
7: 28 mm shaft
8: Shaft bearing
9: Plastic spacer
10: Cover screws, (unscrew to change shaft length)

Standards: Comply with LVD and EMC (CE certificate by TÜV), upon the following standards:
EN55014-1: 2006+A1+A2;
EN55014-2: 1997+A1+A2;
EN61000-3-2:2014;
EN61000-3-3: 2013;
EN60730-1:2011;
EN60730-2-9: 2010, and ROHS compliance certificate.

Reference: 2PE2N6

Soft grip printed knobs references
(Must be ordered separately, not included in the electronic thermostat)

| °C Printing		°F Printing	
	66MZ0060201257FW		66MZ0060201257FX

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Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice

Electronic thermostats, Pt100 RTD sensor
Selection of part numbers used in flexible silicone heaters

Temperature range	Mounting	Adjustment	Sensor	Action type	Types
50-200°C (120-390°F)	Equipment board	Temperature printed knob	Pt100 RTD sensor	On-Off	**2PE2P6**
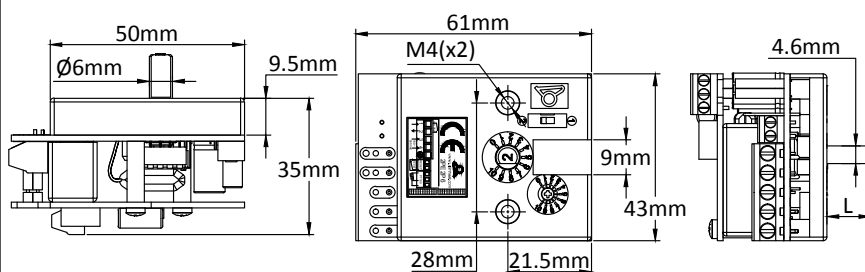
50mm · Ø6mm · 9.5mm · 35mm
61mm · M4(x2) · 9mm · 43mm · 28mm · 21.5mm
4.6mm · L

Applications principles

This electronic thermostat for incorporation has been designed to allow a distant temperature control of flexible silicone heaters. It is mounted with two screws M4 at the same distance 28 mm than bulb and capillary thermostats, uses a 6mm dia. shaft with 4.6mm flat, and its knob rotation angle is 230°. Its electrical rating is 16A 230V, identical to the electromechanical thermostats. This is an economical solution, useful in catering equipment.

Main features

Action: On-Off.
Size: 61 x 43 x 35 mm.
Temperature sensor: Pt100
Temperature range: 50-200°C (120-390°F)
Temperature differential: Adjustable, by potentiometer with front access, from 0.5 to 5.5°C (0.9 to 10°F) for other temperature ranges.
Accuracy: +/-1% of scale (NTC sensor tolerances not included).
Power supply: 180 to 240V, 50Hz or 60Hz.
Relay output: 16A250V resistive, 100000 cycles.
Relay action: open on temperature rise.
Ambient: -20+50°C, 10-85% RH.
 Power: <2W
Electrical connections:
- Power supply and power relay: 2.5 mm² screw terminal block.
- Temperature sensor: 1.5 mm² screw terminal block.
Adjustment shaft: The thermostat is shipped with a dia. 6mm with 4.6 mm flat shaft, length 11 mm, assembled. Included is also a set of: one 15mm shaft, one 28 mm shaft and one screw driver adjustment shaft.
Options: Available with many other temperature ranges. Also available with manual reset action (Ask for full technical data sheet).

1: Cover
2: Main printed circuit board
3: Elastic washer
4: Screw driver shaft
5: 11 mm shaft fitted in standard
6: 15 mm shaft
7: 28 mm shaft
8: Shaft bearing
9: Plastic spacer
10: Cover screws, (unscrew to change shaft length)
11: Pt100 input printed circuit board

Standards: Comply with LVD and EMC (CE certificate by TÜV), upon the following standards: EN55014-1:2006+A1+A2; EN55014-2: 1997+A1+A2; EN61000-3-2:2014; EN61000-3-3:2013; EN60730-1:2011; EN60730-2-9:2010, and ROHS compliance certificate.

Part number: 2PE2P6

Soft grip printed knobs and bezels part numbers
(Must be ordered separately, not included in the electronic thermostat)

°C Printing	°F Printing	Black ABS bezel	Chrome plated ABS Bezel
66MZ0060502001FW	66MZ0060502001FX	66EN1	66EN3

Temperature range	Mounting	Adjustment	Sensor	Action type	Types
-30+200°C (-20+390°F)	On Din rail	Digital	NTC thermistor or Pt100 RTD	On-Off	**2DNA**

Applications

This electronic temperature controller with **the simplest and the most instinctive setting by end user** was designed for easy incorporation inside cabinets with DIN rail mounting. It can be used by untrained operators.
It provides simple On Off action temperature control.
End user has access to set point and differential setting only.
Adjustment of maximum temperature can be set.

Main features

Dimensions: 86.9 x 58 x 52.5 mm
Display: 3+1 digit LED. The fourth digit is used to display °C or °F
Set point setting: In normal use, the display shows the measured temperature. Push "**+**" or "**-**" keys will display the set point value, and at that time it can be adjusted with "**+**" and "**-**" keys. No action during 5 seconds will register the new set point value and bring back display to measured value.
Temperature differential setting: In normal use, the display shows the measured temperature. Push "**D**" key will display the differential value, at that time it can be adjusted with "**+**" and "**-**" keys. Push "**D**" again or no action during 5 seconds will register the new differential value and bring back display to the measured value.
Action: On-Off
Temperature sensor: Pt100 (2 or 3 wires) or NTC 10Kohms @25°C, B= 3380 (2 wires).
Accuracy: +/-1% of scale
Temperature adjustment ranges:
-30+120°C (-20+250°F), with 1° display
-30+200°C (-20+390°F), with 1° display
Power supply: 90 to 240V, 50Hz or 60Hz
Relay output: 16A 250V res., 100,000 cycles. Output Led displays relay position.
Maximum possible set point adjustment by user: Push "D" button more than 10 seconds, display shows the maximum temperature that can be set by the user. Then it is possible to adjust this value with "**+**" and "**-**". Push again on "D" or do nothing during 5 seconds will register the maximum possible setting value and control will come back to the measured valued.
Ambient: -20+60°C, 10-90% RH
Power: <4W
Fail safe safety:
- If no power supply, relay output contact will open.
- If Pt100 sensor or NTC is broken or not connected properly, relay output contact will open and display will show "EEE"
- If measured temperature is higher than allowed by the set range, display will show HHH
- If measured temperature is lower than -30.0°C or -20.0°F, display will show LLL.
Electrical connections:
- Power input: Neutral, phase, ground, with 2.5 mm² terminals
- Power output: Neutral, phase, ground, with 2.5 mm² terminals for direct connection to the load.
- Temperature sensor: three 2.5 mm² screw terminal.
One removable jumper provides a potential free relay output for applications needing a separate circuit for relay, external timer or other.
Standards: Comply with LVD, EMC (CE certificate by TUV), ROHS and Reach.

Electronic temperature controllers, Din rail mounting NTC or Pt100 RTD sensor
Selection of part numbers used in flexible silicone heaters

Main references

| References	Temperature range	Sensor	Display
2DNAP6FA	-30+120°C	NTC	°C
2DNAP6FB	-20+250°F	NTC	°F
2DNAP6FI	-30+200°C*	Pt100	°C
2DNAP6FJ	-20+390°F*	Pt100	°F

* It is possible to unlock this value up to 400°C (750°F)

77 x 35mm electronic temperature controllers, digital display, panel mounting, NTC, Pt100 RTD or K thermocouple sensor

Selection of part numbers used in flexible silicone heaters

Temperature range	Mounting	Adjustment	Sensor	Action type	Types
-30+200°C (-20+390°F)	Panel mounting in 71x29mm cut-out	Digital	NTC thermistor or Pt100 RTD or K thermocouple	On-Off	**273**
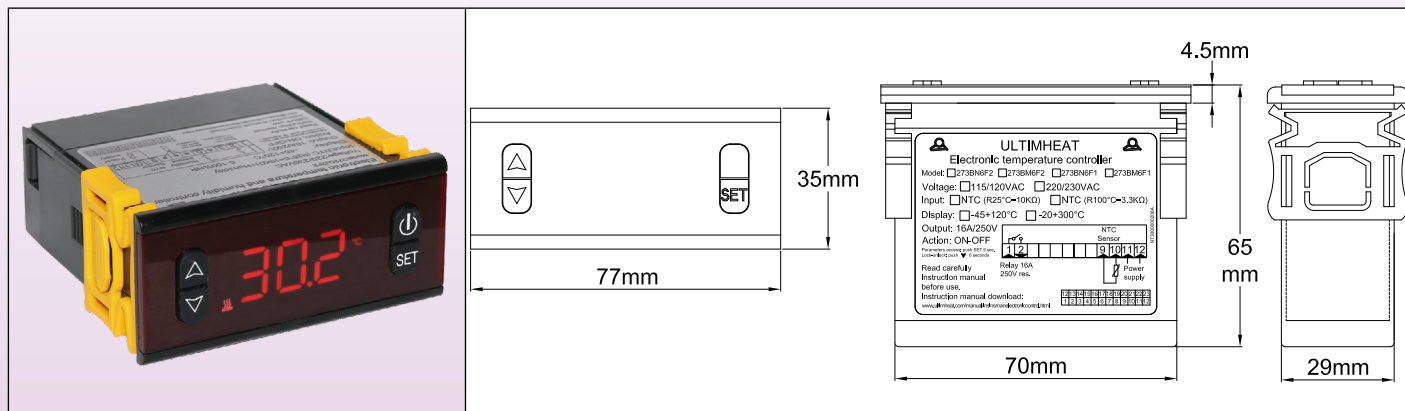
Applications

This electronic temperature controller with **the simplest and the most instinctive setting by end user** was designed for easy incorporation on control panels. It has a very simple user interface with a set point change without password, using the ''up'' and ''down'' keys. It can be used by untrained operators.
End user has access to set point and differential setting.

Main features

Dimensions: 77 x 35 x 60mm. Board hole cutting * 71x29mm.
Compatible temperature sensors:
-The model with NTC input, uses a thermistor with R @ 25 °C value: 10KΩ (± 1%), B @ 25/50 °C: 3380KΩ (± 1%).
-Pt100 and thermocouple K.
Action: On-Off with adjustable differential.
Output: Relay with 16A or 10A resistive resistive according to models.
Alarm: 5A alarm relay on K thermocouple model.
Display: In °C
Power supply: AC 220-230V 50-60Hz
Accuracy: ± 1°C (± 2°F) or 0.3% end scale ± one digit.
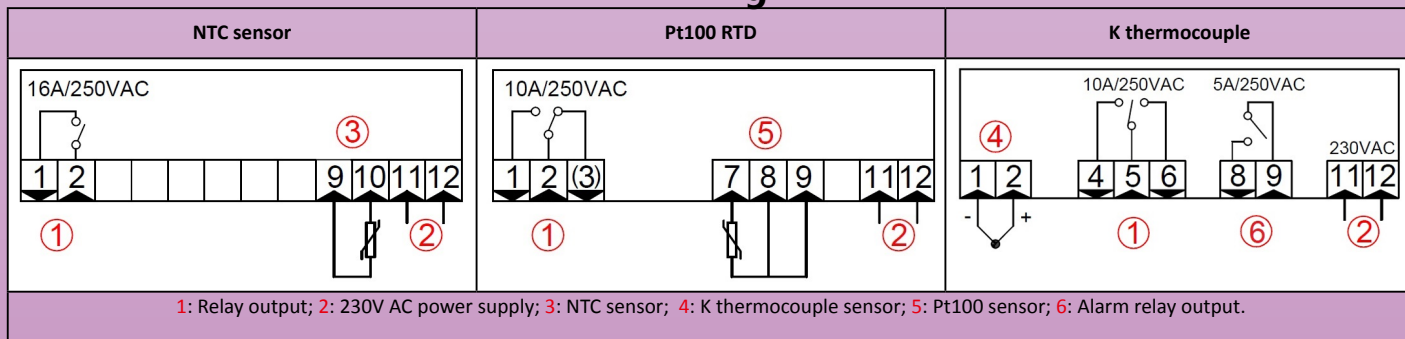**Auto test:** Alarm display of off high or low scale, and open sensor circuit detection.
Ambient: temperature from -10 to 60°C, relative humidity from 20 to 85%, non-condensing.
Resolution: 1° (0.1° in the range - 19.9° to 99.9° for the model -45 + 120 °C)

Main part numbers (230V models)

Part numbers	Température rang	Sensor	Rating of the main output relay
273BN6F2	-45+120°C	NTC	16A
273BP0F2	-150+550°C	Pt100	10A
273BK1F2	0-999°C	K	10A

Wiring

NTC sensor	Pt100 RTD	K thermocouple

1: Relay output; 2: 230V AC power supply; 3: NTC sensor; 4: K thermocouple sensor; 5: Pt100 sensor; 6: Alarm relay output.

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48 x 48mm electronic temperature controllers, double digital display, PID action, panel mounting, Pt100 RTD or K thermocouple sensor

Selection of part numbers used in flexible silicone heaters

Temperature range	Mounting	Adjustment	Sensor	Action type	Types
Configurable	Panel mounting in 45x45mm cut-out	Digital	Pt100 RTD or K thermocouple	PID or On-Off	**244**

Electronic temperature controller
Model reference: 244CUUB
Power supply: 85~265 VAC

6mm
68.4 mm
48mm
48mm
44.6mm
44.6mm

OP1 OP2 AT
AL1 AL2 COM
°C °F PRG

244CUUB
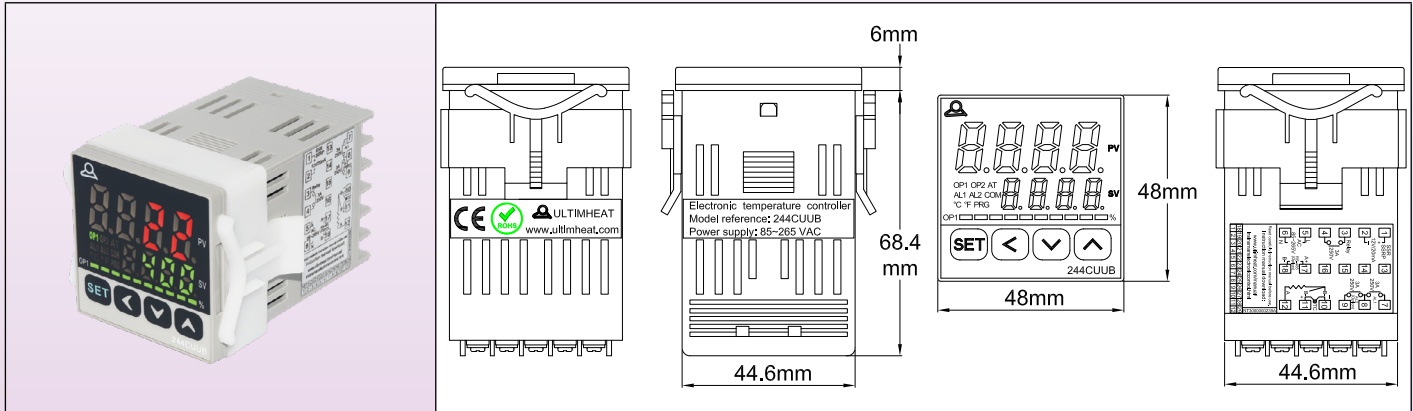
Applications

This electronic controller, designed to be **the most universal**, is intended to be integrated into control panels. It is totally configurable. Its use requires reading and understanding of its instructions.
Its small size makes it easy to integrate, and the auto-tune function allows automatic adjustment of PID parameters. The incorporation of a microprocessor using Fuzzy Logic technology makes it possible to reach a predetermined setpoint as quickly as possible, with a minimum of overheat during disturbances related to the ramp-up or the external load.
The electromechanical relay and static relay outputs are standard.
The temperature sensor input is configurable, and in particular allows the use of Pt100 and thermocouple K sensors of flexible silicone heating elements.

Main features

Dimensions: 48 x 48 x 74.4mm, Panel cut-out: 45 x 45 mm.
Input: Pt l00 and thermocouples K, T, R, J, B, S, E.
Output: Relay output or voltage pulse for SSR.
Output percentage indication: with graphic LED bar.
Alarm: 1 alarm relay in standard. Second alarm in option.
Operation: auto-tune function sets automatically the PID parameters to the system characteristics.
Power supply voltage: AC 85~265V 50-60Hz.
Power: <6W.
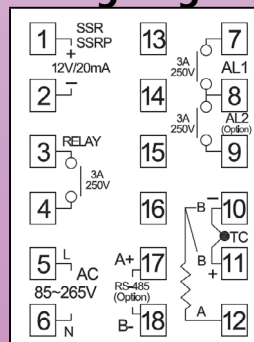**Output Specifications**:
- Main Control Output: 1 relay, heating or cooling selectable,
- Contact Rating (SPST): 3A, 250Vac Res.
- Alarm output: 3A, 250Vac Res.
- SSR drive: 12V DC (20mA).
Accuracy: 0.3% end of scale.
Ambient temperature: 0 to 50°C, 0 to 95% RH.

Part number	244CUUB

Wiring diagram

1	SSR SSRP 12V/20mA	13		7	AL1
2		14	3A 250V	8	AL2 (Option)
3	RELAY 3A 250V	15	3A 250V	9	
4		16		10	B TC
5	L AC 85~265V	A+ 17 RS-485 (Option)		11	B +
6	N	B- 18		12	A

IP65 fixed setting antifreeze thermostat, 2 cable gland outputs, two pilot lights
(Selection of models usable on silicone heating elements).

Temperature range	Electric rating	Contact style	Temperature sensing device	Temperature setting	Types
3~10°C 37.4~50°F	8 to 16A	Snap action	Bimetal	Fixed setting	**Y22**
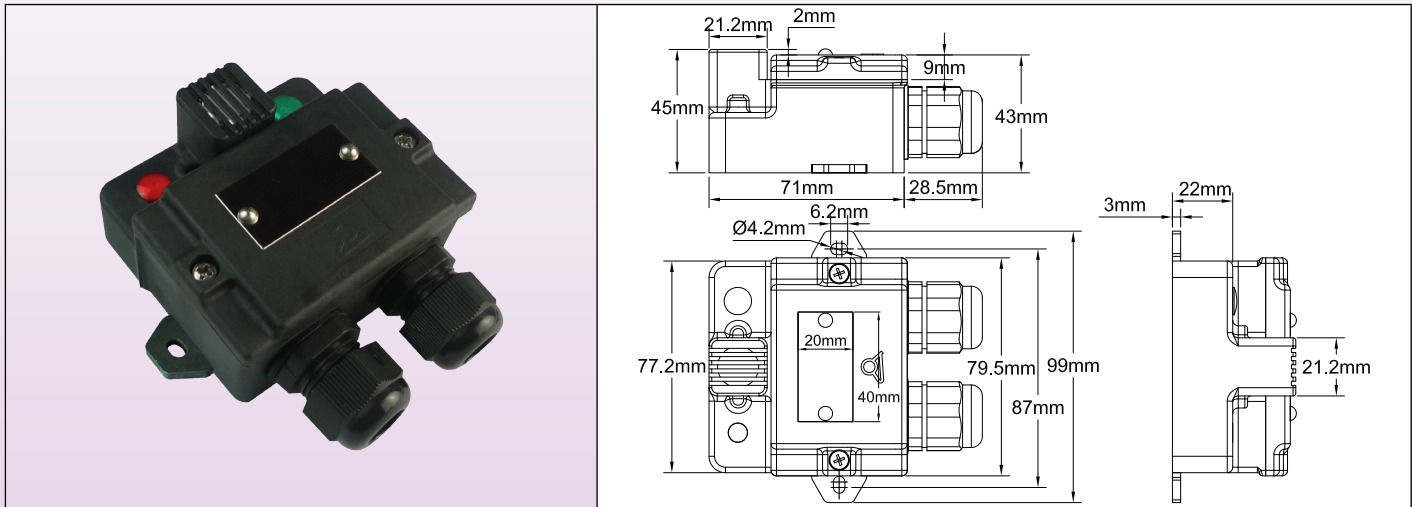
Applications

Prevention against freezing, activation of defrost or heating system.

In these boxes, the thermostat, bimetal disc type, is over-molded, and is thermally insulated from the wall on which it is mounted. Its temperature sensing cup is mechanically protected by a grid. It is located in front of the enclosure to be in an area of natural circulation of air. It can therefore be used outdoors, for the control of silicone heating ribbons without antifreeze thermostat, in the protection of water meters, water tanks, pipes, livestock waterers, etc.

Mounting: On wall, by external side brackets. These tabs can be folded inwards. A knockout hole allows electrical connection through the backside. (Note: in this case the ingress protection class IP65 is lost).

Protection against water and dust ingress: IP65

Protection against shocks: IK03 on thermostat guard, IK10 the rest of the housing.

Material: Black PA66, glass-fiber reinforced

Screws: Stainless steel, captives

Output: 2 Cable glands M20, PA66, IP66, for cables diameter from 6 to 12 mm.

Electrical rating: Single pole, 8 to 16A 250V (100000 cycles). Contact opens on temperature rise. 230V neutral and line power supply is requested.

Pilot lights: Visualize the power supply and thermostat contact position.

Connection: Built in 4mm² screw terminal block.

Options:
- Other calibration temperatures
- 115V pilot lights

**Customization**: On request (MOQ apply).

| Contact open temperature °C (°F)	Contact close temperature °C (°F)	Electric rating	Part numbers
8°C/ (46.4°F)	3°C (37.4°F)	8A 250V	Y22D9Z00805HCSV0
10°C (50°F)	4°C (39.2°F)	10A 250V	Y22D9P01006CUSV0
10°C (50°F)	4°C (39.2°F)	16A 250V	Y22D9J01006CUSV0

Digital display temperature control box, On-Off action, NTC sensor, for temperature control of flexible silicone heaters

Temperature ranges	Mounting	Adjustment	Sensor	Action type	Types
- 45 + 120°C / (- 49 + 250°F) - 150 + 550°C / (- 238 + 1022°F) 0 - 999°C / (32 - 1830°F)	Wall mounting	Digital	NTC thermistor or Pt100 RTD or K thermocouple	On-Off	**Y8WH**
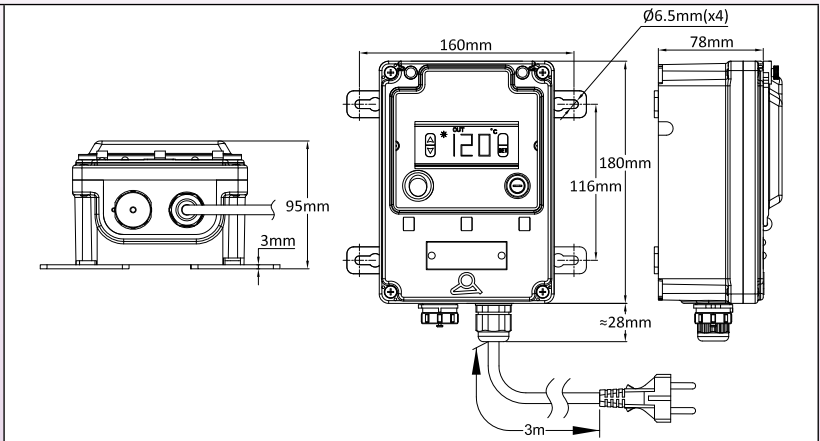
Model with 5 ways waterproof connector
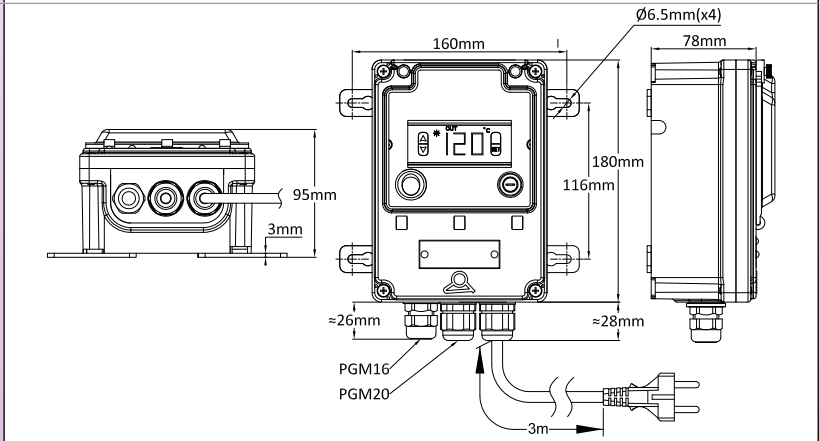
Model with 5 ways waterproof connector

Model with 3 cable glands

Model with 3 cable glands

Applications

These waterproof control boxes allow remote control of the temperature of the flexible heating elements. This model is easy to use and is not intended for specially trained users. Models with 5-way connector can accept all models of our range with a cord having a connector, provided that the temperature sensors are identical. The models with 3 cable glands can be used on all versions without connectors, also provided that the temperature sensors are identical.

Main features

Enclosure: IP69K, reinforced PA66, with polycarbonate window access. Sealable cover and window.
Wall mounting: Four removable and rotatable legs.
Electrical connection: On internal connection block.
Switching devices: Main power illuminated switch and safety fuse.
Controller: With very simple end-user interface. Change of set point is made without password, with up and down keys.
Action: On-Off with adjustable differential.
Sensor input: NTC, R@25°C:10 Kohms (±1%), B@25/50°C: 3380 Kohms (±1%), K thermocouple or Pt100 depending of models.
Power output: 10 or16A 230V res. relay, depending of models.
Display: 3 digits
Power supply: AC 220-230V 50-60Hz.
Accuracy: ±1°C (±2°F) or 0.3% end of scale ± one digit.
Self-testing: Over-scale, under-scale, and open sensor circuit.
Ambient temperature: -10 to 60°C, 20 to 85% relative humidity, non-condensing.
Temperature display range: see part numbers table

Digital display temperature control box, On-Off action, NTC sensor, for temperature control of flexible silicone heaters

Main part numbers (230V models, cord with euro plug) *

Part numbers	Temperature ranges	Sensor	Rating of the main output relay	Output to the flexible heating element
Y8WHQ02101000AUV	-45+120°C (-49+250°F)	NTC	16A	By 5 terminals waterproof connector
Y8WHS02101000AUV	-150+550°C (-238 +1022°F)	Pt100	10A	By 5 terminals waterproof connector
Y8WHS02181000DUV	--150+550°C (-238 +1022°F)	Pt100	16A**	By 5 terminals waterproof connector
Y8WHT02101000AUV	0-999°C (32-1830°F)	K	10A	By 5 terminals waterproof connector
Y8WHT02181000DUV	0-999°C (32-1830°F)	K	16A**	By 5 terminals waterproof connector
Y8WHQ02101000AUQ	-45+120°C (-49+250°F)	NTC	16A	By one M20 cable gland for power, and one M16 cable gland for temperature sensor
Y8WHS02101000AUQ	-150+550°C (-238 +1022°F)	Pt100	10A	By one M20 cable gland for power, and one M16 cable gland for temperature sensor
Y8WHS02181000DUQ	--150+550°C (-238 +1022°F)	Pt100	16A**	By one M20 cable gland for power, and one M16 cable gland for temperature sensor
Y8WHT02101000AUQ	0-999°C (32-1830°F)	K	10A	By one M20 cable gland for power, and one M16 cable gland for temperature sensor
Y8WHT02181000DUQ	0-999°C (32-1830°F)	K	16A**	By one M20 cable gland for power, and one M16 cable gland for temperature sensor

* UL plug: replace the last character Q by R or V by U
**: These products have an additional 16A relay board

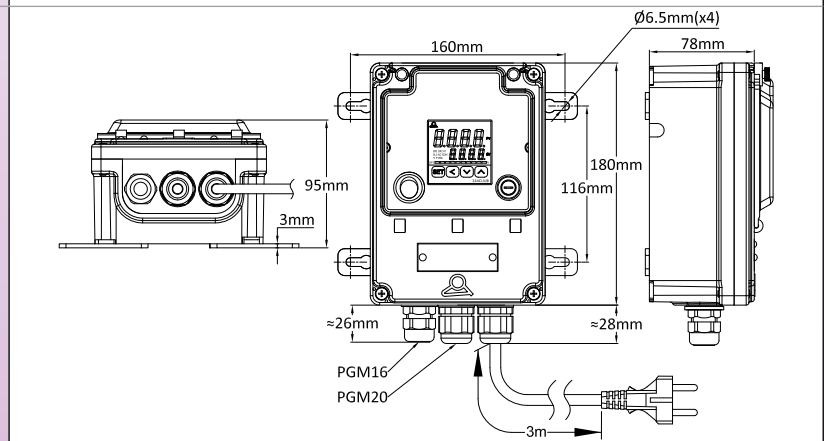Contact us   Web: www.ultimheat.co.th

Double digital display temperature control box, PID action, for temperature control of flexible silicone heaters

Temperature ranges	Mounting	Adjustment	Sensor	Action type	Types
Configurable	Wall mounting	Digital	Configurable	PID	**Y8WJ**
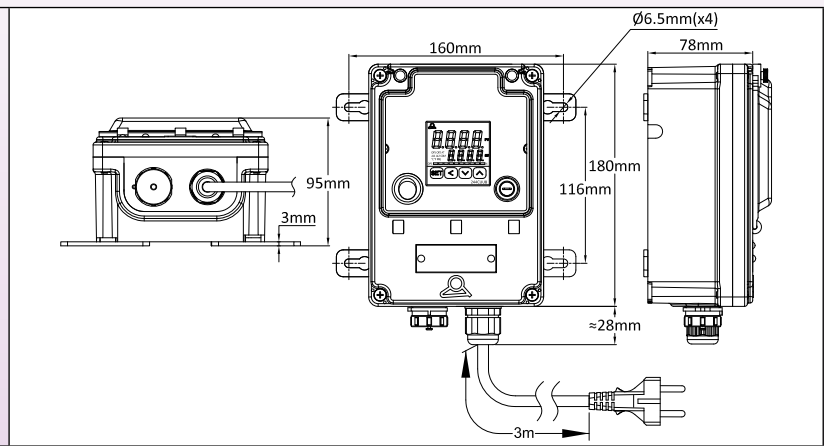
Model with 5 ways waterproof connector

Model with 5 ways waterproof connector

Model with 3 cable glands

Model with 3 cable glands

Applications

These waterproof control boxes allow remote control of the temperature of the flexible heating elements.

This electronic controller used is designed to be **the most universal**, is intended to be integrated into control panels. It is totally configurable. Its use requires reading and understanding of its instructions.

It includes an auto-tune function allowing automatic adjustment of PID parameters. The incorporation of a microprocessor using Fuzzy Logic technology makes it possible to reach a predetermined setpoint as quickly as possible, with a minimum of overheat during disturbances related to the ramp-up or the external load.

A 20A 250V solid state relay board is included in standard.

The temperature sensor input is configurable, and in particular allows the use of Pt100 and thermocouple K sensors of flexible silicone heating elements.

Models with 5-way connector can accept all models of our range with a cord having a connector, provided that the temperature sensors are identical. The models with 3 cable glands can be used on all versions without connectors, also provided that the temperature sensors are identical.

Main features

Enclosure: IP69K, reinforced PA66, with polycarbonate window access. Sealable cover and window.

Wall mounting: Four removable and rotatable legs.

Electrical connection: With 5 ways waterproof connector, or on internal connection block for 3 cables gland model. With 3 meters power supply cord,3x1.5mm², rubber insulated, euro plug (UL plug in option).

Switching devices: Main power illuminated switch and safety fuse.

Controller: Double display, of process value and of set-point.

Action: PID with automatic parameters adjustment by auto-tune function.

Sensor input: configurable for Pt100, K thermocouple and other sensors.

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Double digital display temperature control box, PID action, for temperature control of flexible silicone heaters

Power output: 20A 230V solid state relay.
Alarm: 3A 230V relay.
Display: 4 digits display configurable in °C or °F
Power supply: AC 220-230V 50-60Hz.
Accuracy: ±1°C (±2°F) or 0.3% ES± one digit.
Self-testing: open sensor circuit.
Ambient temperature: -10 to 60°C, 20 to 85% relative humidity, non-condensing.
Temperature display range: Configurable
Resolution: 0.1°.

Main part numbers usable on flexible heating elements (230V models)

Part number of the model with 5 ways connector, euro plug cord	Part number of the model with 3 cable glands, euro plug cord. (One M20 cable gland for power output, one for power supply cord and one M16 for the temperature sensor)	Part number of the model with 5 ways connector, UL plug cord	Part number of the model with 3 cable glands, UL plug cord. (One M20 cable gland for power output, one for power supply cord and one M16 for the temperature sensor)
Y8WJU021D1000FUV	Y8WJU021D1000FUS	Y8WJU021D1000FUU	Y8WJU021D1000FUT

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