

Thermostatic actuators Series 148 - 148SD - 148CD - 148GA



Main features

With liquid-filled sensitive elements and temperature locking

- Available in the versions:

- Standard
- With Remote Sensor
- With Remote Control

- Provision for using them with tamper-proof cover.

- Compact size and reduced weights

- Derived from actuator model 138 which, when associated with valves of Series 130UM and 131UM, it is CEN certified in accordance with EN215/1 and HD1215.2.


WATTS
INDUSTRIES
Technology by nature

Description

Thermostatic actuators **Series 148, 148SD, 148CD** are devices for automatic room temperature control, by acting directly on the radiator of radiator-type heating systems. The actuators, which are installed on the thermostat adaptable radiator valves, automate the valve plug movement through the presence of an element, inside the knob, which is sensitive to variations in room temperature.

Application

These devices (whose use is compulsory through Italian Act 10/91), when coupled with thermostat adaptable valves, adapt the amount of heat emitted by the radiators to the required temperature and ensure high comfort levels with consistent energy saving thanks to naturally occurring heat sources in the room.



148

Thermostatic actuator with oil-filled sensitive element. Temperature limiting and locking device. ABS handwheel. Graduated scale from 0 to 5. Setting range : 0°C - 28°C. Anti-freeze position : 8°C. Max. differential pressure: 1.5 bar.

Available in chrome-plated version.

Type	Part number	Weight (g)
148	148	150
148 Chrome-plated version	148CR	150



148SD

Thermostatic actuator with remote sensor. 2 m capillary tube. Other characteristics as per Item 148.

Type	Part number	Weight (g)
148SD	148SD	250



148CD

Thermostatic actuator with remote sensor. 2 m capillary tube. Max. pressure differential : 1.0 bar. Other characteristics as per Item 148.

Type	Part number	Weight (g)
148CD	148CD	450



148GA

Tamper-proof cover for thermostatic actuators series 148. Provision for limiting and locking temperature range on rivettable closing position. Complete with standard mounting screws and break-stem rivets.

Type	Part number	Weight (g)
148GA	148GA	30

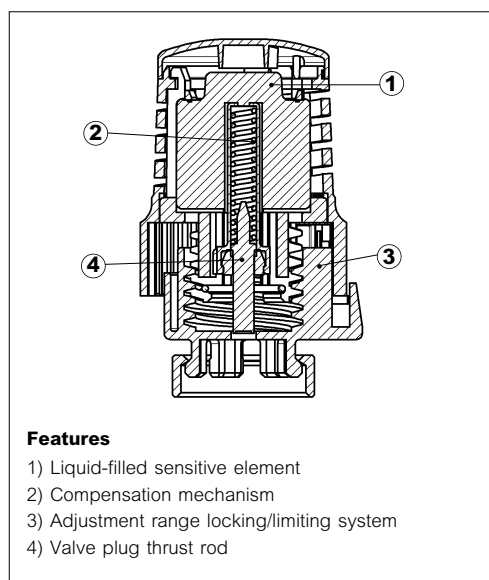
Operation

The device is operated by a liquid-filled sensitive element incorporated in the knob, which, upon expanding or contracting, acts on the valve plug rod in relation to the deviation between set-point and actual room temperature.

When the room temperature exceeds the required level, the sensitive element determines the gradual closing of the valve plug and therefore it appropriately reduces the hot water flow feeding the radiator; when, instead, the room temperature drops, the actuator causes the valve plug to open thus producing an increase in the circulation of hot water in the radiator, so that the temperature set in each single room is held at a constant level.

Technical Characteristics	
Thermostatic actuator 148 (derived from CEN certified model 138 coupled to valves Series 130 D and F, Series 131 D and F)	UNI EN215-1/90
Range of adjustment	8 ÷ 28° C
Range of inalterability of thermostatic element	-15 ÷ 60° C
Hysteresis max	0.6 K and 1,0 K (series 148SD)
Proportional band	2 K
Time constant	34 min
Effect of fluid temperature	1.5 K
Max effect of differential pressure	0.5 K and 0,75 K (series 148SD)
Length of capillary (Art. 148SD - 148CD)	2 m

Design features	
Sensitive element capsule	Bronze
Springs	Stainless steel
Thrust rod	Polyammide + 30% FV
Handwheel	ABS



Setting

The required temperature is set by turning the handwheel until the indicator coincides with the chosen value: The numbers and symbols given are associated with the temperatures indicated in picture A.

The interval between the numbers corresponds to about 4°C.

①	☼	1	2	③	4	5
Closed	8 °C Antifreeze	12 °C	16 °C	20 °C	24 °C	28 °C

Pic. A

Example :

- Pos. 0 Fully closed
- Pos. ☼ Anti-freeze 8 °C
- Pos. 2 Reduced night-time setting 16 °C
- Pos. 3 Day-time setting 20 °C

The anti-freeze position ensures minimum temperature conditions (8 °C) thus protecting the intactness of the system, if regularly in operation, against intense cold.

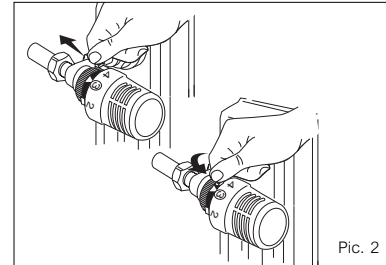
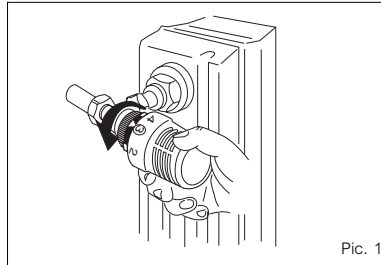
Temperature locking

For quick setting and finding the ideal adjustment for each single room, the actuator is provided with temperature locks, degree-by-degree, which allow above all:

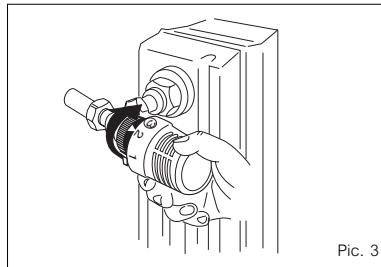
- Limiting the temperature adjustment range
- Selecting a set value
- Limiting the valve closing set-point

To fix a range of adjustment 16 to 20 °C proceed as follows:

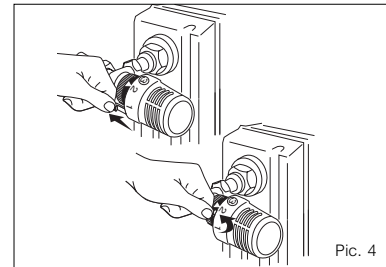
Pic. 1 - Turn the actuator knob so that the indicator corresponds to the required max. value.
See Pic. 1: Pos. 3 = 20°C.



Pic. 2 - Lift out the first lock on the right and place it immediately alongside the indicator. Hence the **upper** limit of the adjustment range is fixed (Pos. 3).



Pic. 3 - Turn the actuator knob until the indicator points to the required minimum value.
See Pic. 3: Pos. 2 = 16°C.



Pic. 4 - Lift out the lock on the left and place it immediately alongside the indicator. Hence the lower limit of the adjustment range is fixed (Pos. 2).

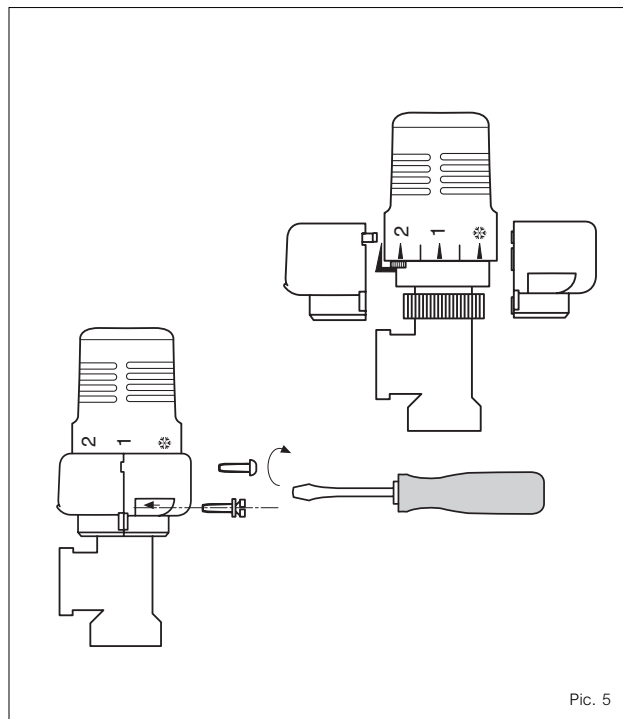
Therefore the setting can easily be readjusted in relation to the various daily requirements thanks to this "memory" system.

Installation

Never allow the actuator to be affected by factors which could falsify measurement of room temperature (e.g. behind curtains, direct exposure to the sun's rays, radiator placed in a recess, etc...) and allow access to the adjustment handwheel (e.g. shielding of the radiator). When this is not possible, it is advisable to adopt versions with remote sensor **Pic. 10 (Art. 148SD)** or with remote control **Pic. 11 (Art. 148CD)**.

These models differ in that the sensor, detached from the transducer element through a liquid-filled capillary, may be placed in the most suitable point and hence measure the exact temperature existing in the room.

Above all, **model 148CD** allows having both remote sensor and remote control; it is used when the valve position is such as to make manual adjustment difficult. The use of tamper-proof cover **Art. 148GA** is highly recommended to protect the actuator against accidental tampering and/or vandalism in public places (schools, hospitals, etc). Its installation is shown in **Pic.5**.

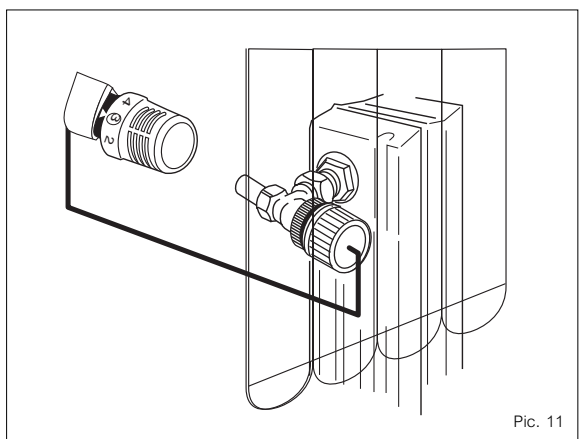
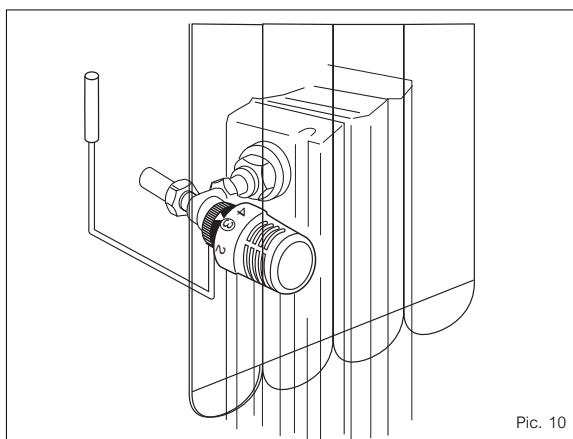
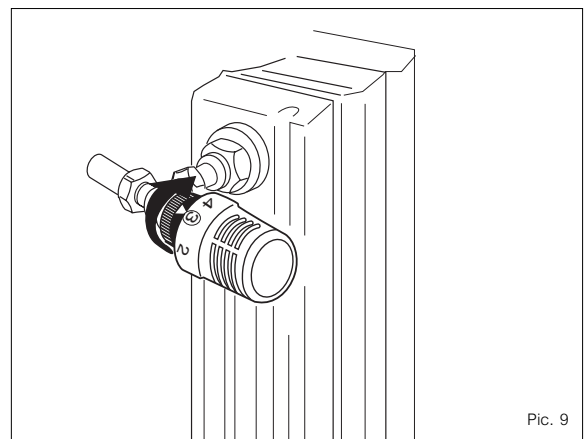
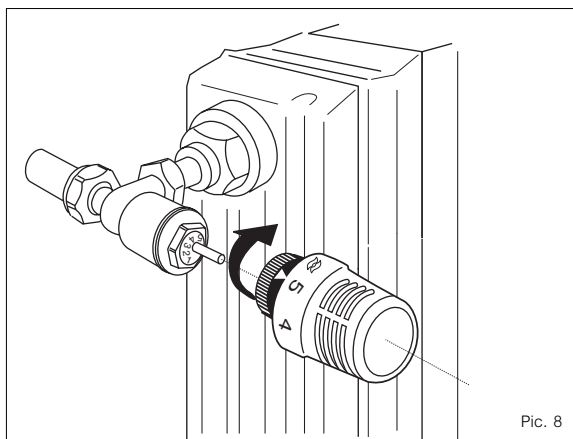
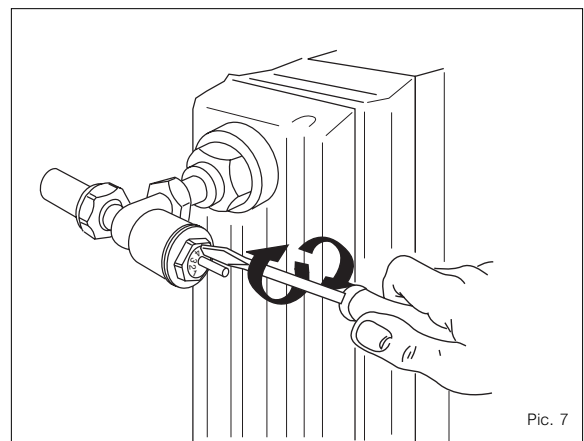
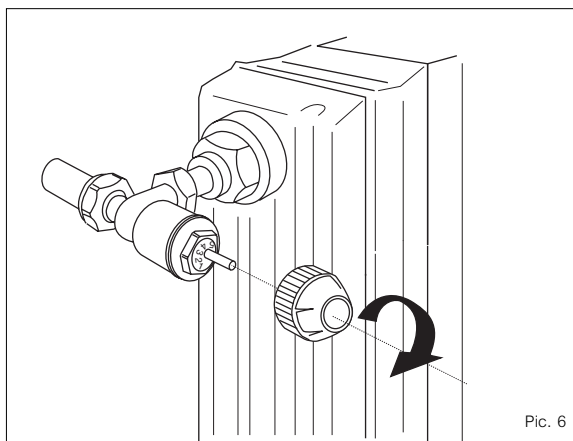


Pic. 5

The installation, which does not require any plumbing work, may **also be carried out with the systems running** and involves the following steps:

- 1) Remove the cap or handwheel from the valve body (**Pic. 6**).
- 2) Make the presetting if necessary by following the design instructions or selecting the position from the appropriate charts (**Pic. 7**).
- 3) Approach the thermostatic actuator in fully open position (Pos. 5) to the valve body, with the reference indicator clearly visible (**Pic. 8**).
- 4) Tighten the nickel-plated ring nut by hand until fully home (**Pic. 9**).

It is recommended to avoid vertical positions of the actuator during installation.

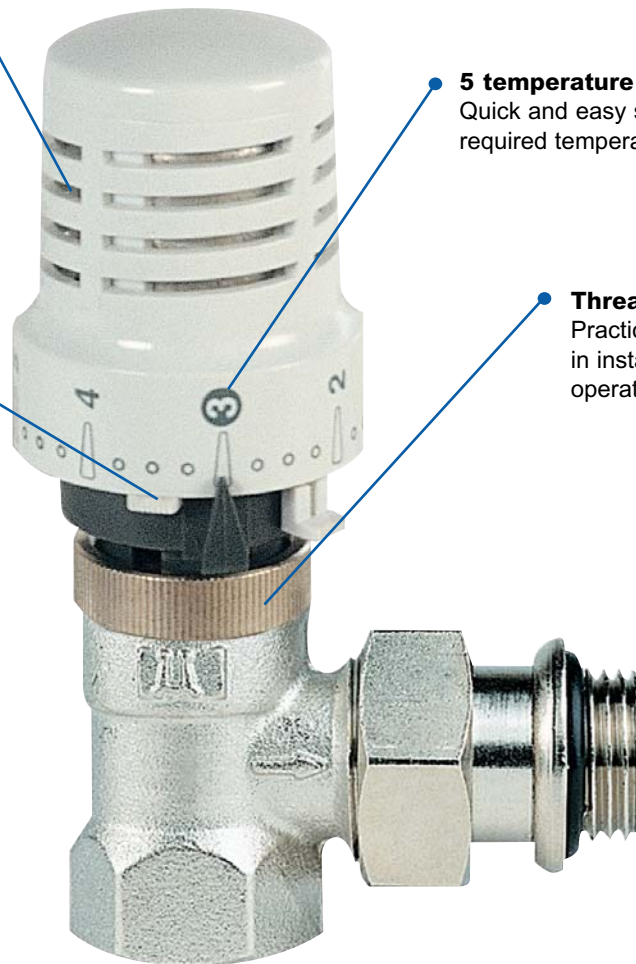


Radial slots
high sensitivity in ambient temperature measurement

5 temperature levels
Quick and easy setting of the required temperature

Adjustment riders
Provision for adjusting or blocking the preset temperature range

Threaded ring nut
Practical and quick in installation operations



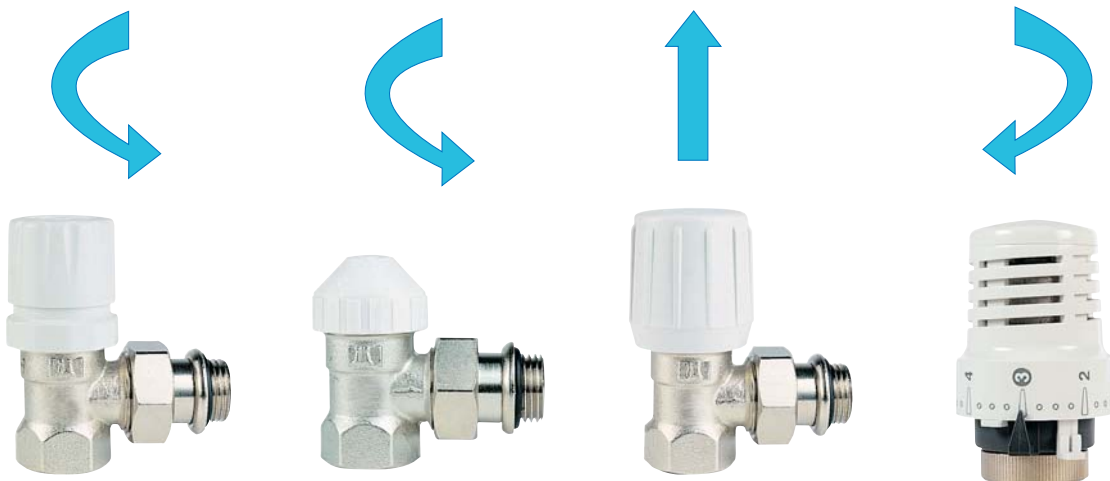
Modern design
adaptable to any type of furnishing

Certified EN215-1

UNSCREW

LIFT OUT

SCREW-IN THE RING NUT OF THE THERMOSTATIC ACTUATOR



Flow rate/pressure drop charts

The charts show the hydraulic flow rate and pressure drop characteristics for the valve body-actuator combination: in the thermostatic function they assume their own particular characteristics represented by straight lines -1K, -2K. The nominal flow rate q_{mN} is the one corresponding to -2K when the presetting device is not operative. The straight line marked max represents the flow rate when the valve is fully opened. The diagrams are valid when a presetting is not made on the valve body.

Use of the tamper-proof cover

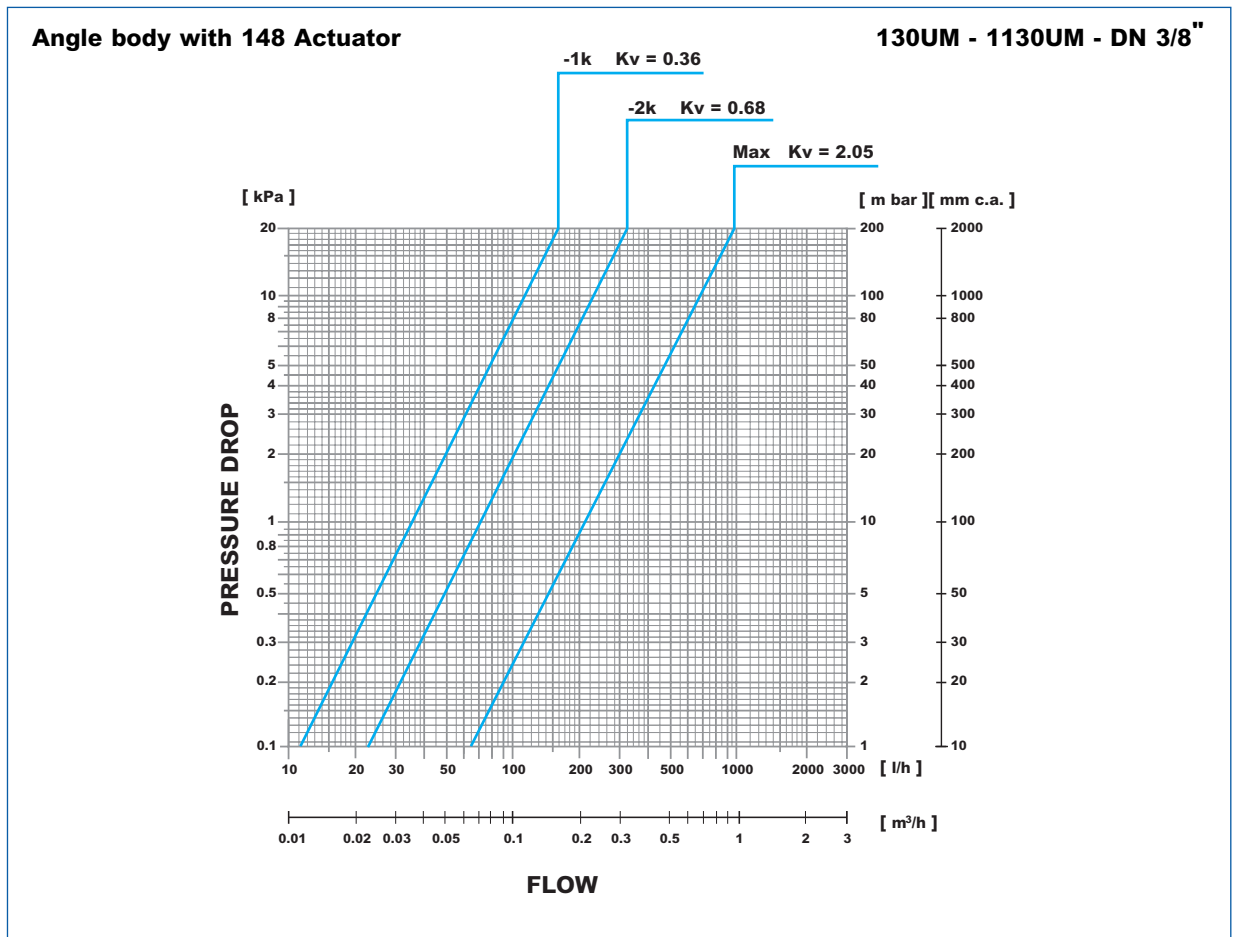
Thermostat adaptable valve bodies **Series 130UM, 131UM**, are fitted with a tamper-proof cover which protects the valve rod and threading before the preliminary mounting on the thermostatic head. It can be used for setting different flow rates by rotating either clockwise (to close valve plug) or anti-clockwise (to open valve plug), passing from full shut-off to full opening according to the indications stamped on the handwheel .



Thermostatic valve certified EN215-1

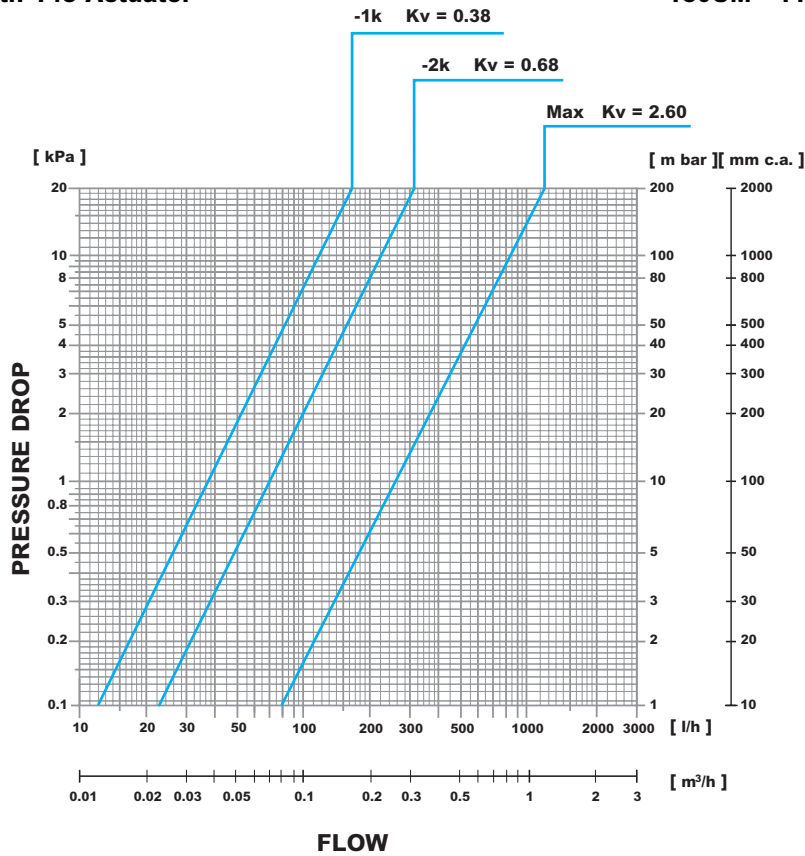
Coupled with thermostatic actuator Series 138 and derived products Series 148.

Type	DN	K _v n	q _{mN} (l/h)
130UM + 148	3/8"	0,68	215
130UM + 148	1/2"	0,68	215
130UM + 148	3/4"	0,73	230



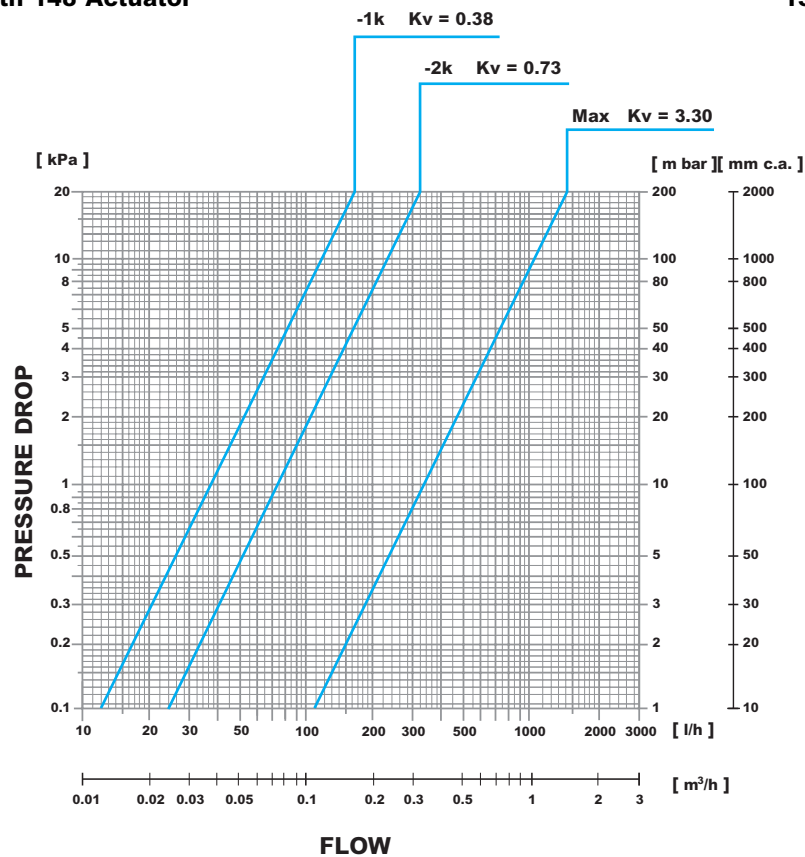
Angle body with 148 Actuator

130UM - 1130UM - DN 1/2"



Angle body with 148 Actuator

130UM - DN 3/4"



Example

When it is preferred to use an analytical method to know the pressure drop D_p (kPa), given the flow rate (litres/h) and the K_{vn} , adopt the following relation:

$$D_p = \left(\frac{0.01 * q}{K_{vn}} \right)^2 =$$

Determine the pressure drop of the thermostat adaptable valve Art. 131UM + 148 Nd 3/8" with a flow rate of 80 litres

$$D_p = \left(\frac{0.01 * 80}{0,63} \right)^2 = 1,61 \text{ kPa}$$



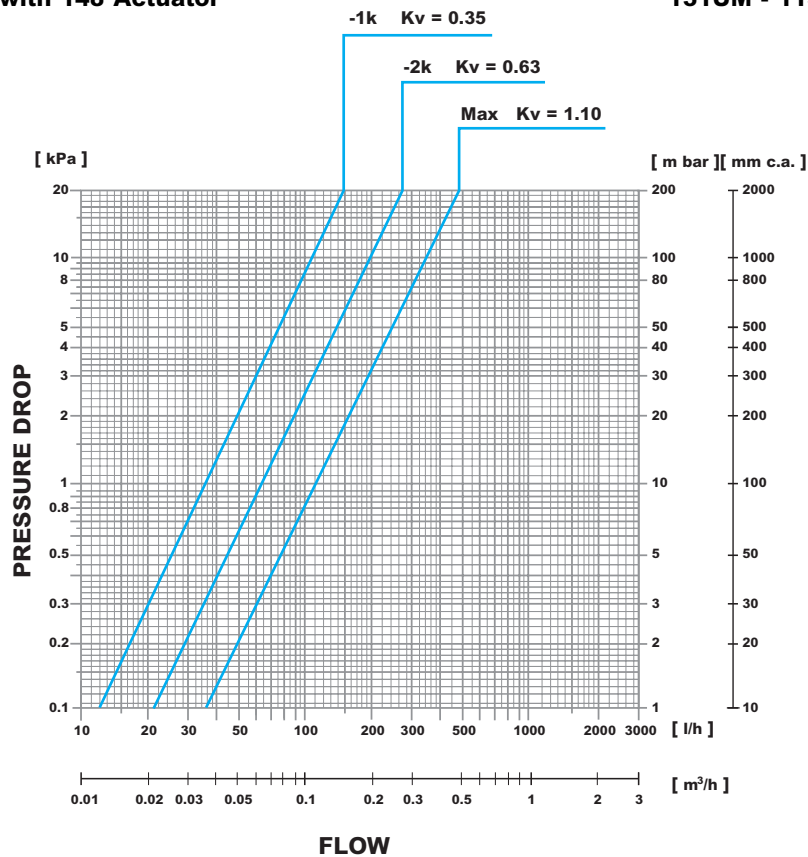
Thermostatic valve certified EN215-1

Coupled with thermostatic actuator Series 138 and derived products Series 148.

Type	DN	K_{vn}	qmN (l/h)
131UM + 148	3/8"	0,63	200
131UM + 148	1/2"	0,71	225
131UM + 148	3/4"	0,76	240

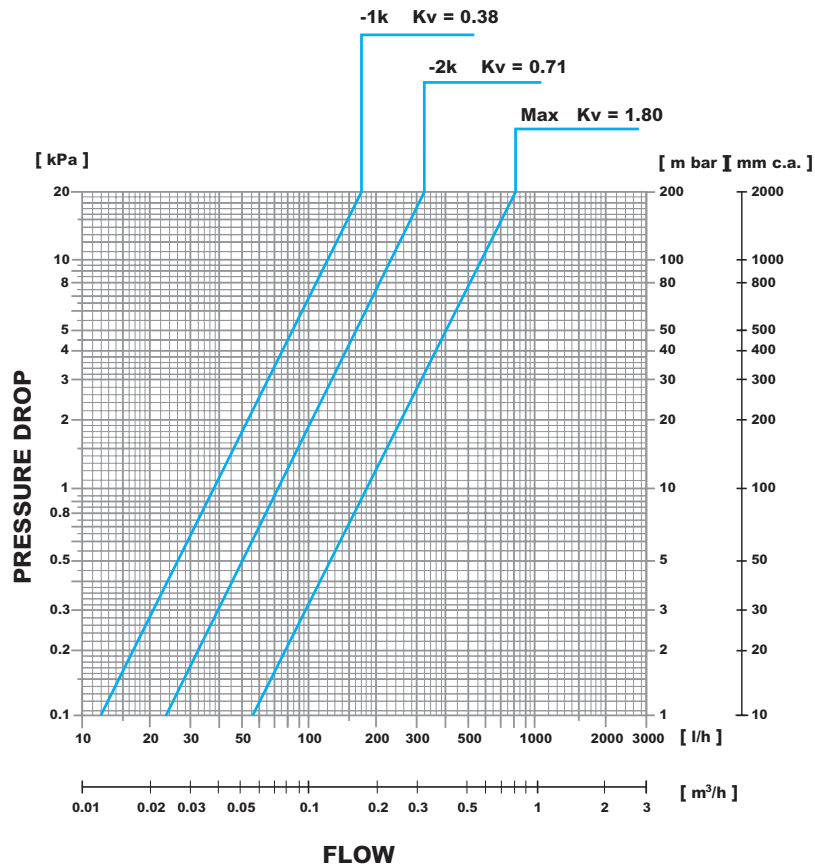
Straight body with 148 Actuator

131UM - 1131UM - DN 3/8"



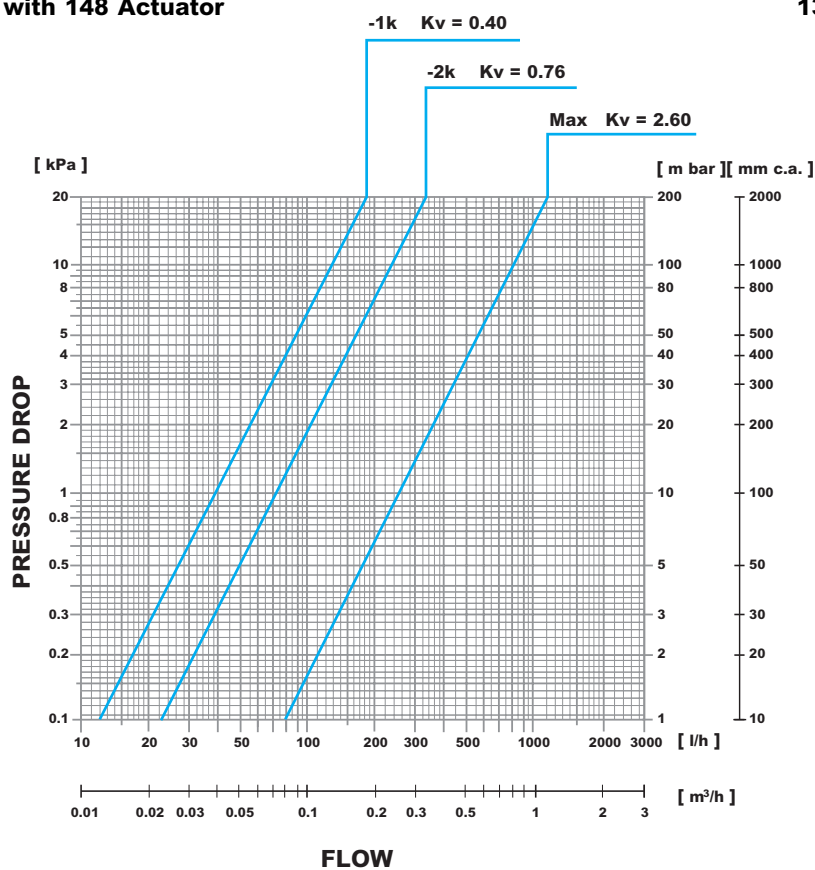
Straight body with 148 Actuator

131UM - 1131UM - DN 1/2"



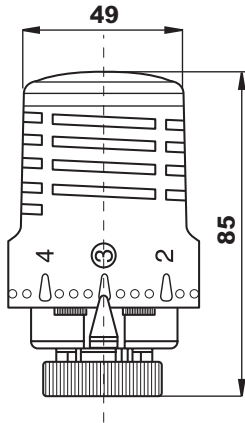
Straight body with 148 Actuator

131UM - DN 3/4"

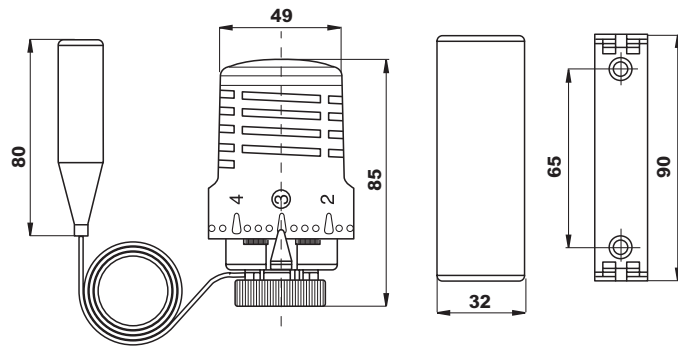


Overall dimensions (mm)

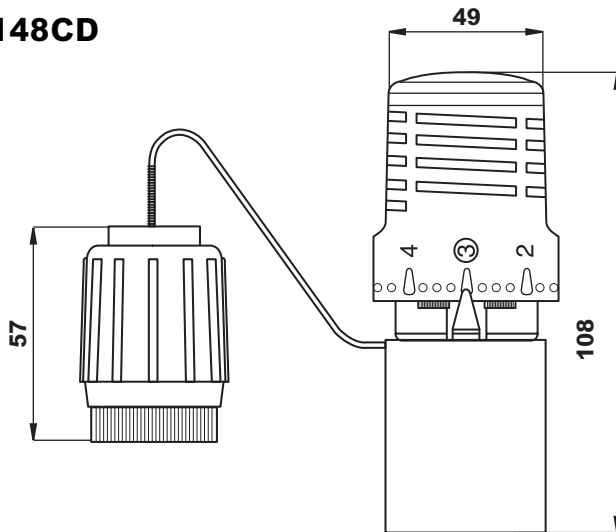
148



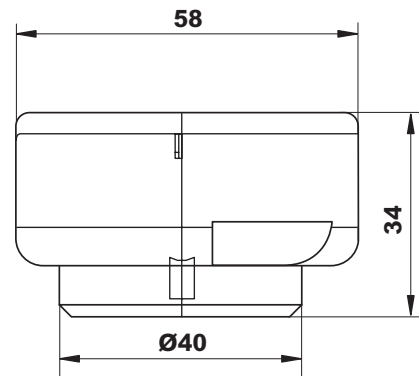
148SD



148CD



148GA



Product range Watts Industries

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- Safety units
- Safety relief valves
- Pressure reducing valves
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- Butterfly valves
- Shut off valves
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Watts Industries Italia S.r.l.

Via Brenno, 21 - 20046 Biassono (MI), Italy

Ph. +39 039 4986.1 - Fax +39 039 4986.222

e-mail : info@wattsindustries.it - www.wattsindustries.com