

Thermostatic radiator valves

series 220



cert. n° 0003
ISO 9001

01034/05 GB

Replaces 01034/01 GB



Function

Thermostatic valves are typically used for regulating the fluid flow to the radiators of central heating systems.

They are provided with a regulating element which automatically controls the opening of the valve to keep the ambient temperature of the room where they are installed constant at the set value. This prevents unwanted temperature rises and achieves considerable energy savings.

These valves have a special tailpiece with rubber hydraulic seal, permitting quick, safe connection to the radiator without the use of additional sealing materials.

Product range

VALVES:

For steel pipes:

Series 220	Angled thermostatic radiator valve	Sizes 3/8", 1/2", 3/4" (*)
Series 221	Straight thermostatic radiator valve	Sizes 3/8", 1/2", 3/4" (*)
Series 224	Reverse thermostatic radiator valve	Sizes 3/8", 1/2"
Series 225	Double angled thermostatic radiator valve	Sizes 3/8", 1/2" Rh and 3/8", 1/2" Lh

For plastic and copper pipes:

Series 222	Angled thermostatic radiator valve	Sizes 1/2" radiator x 23 p.1,5 piping
Series 223	Straight thermostatic radiator valve	Sizes 1/2" radiator x 23 p.1,5 piping
Series 227	Reverse thermostatic radiator valve	Sizes 1/2" radiator x 23 p.1,5 piping

THERMOSTATIC CONTROL HEADS

Series 200	Thermostatic control head with built-in sensor with liquid-filled element	Regulating scale 0-5 corresponding to 0-28°C
Series 201	Thermostatic control head with remote sensor with liquid-filled element	Regulating scale 0-5 corresponding to 0-28°C
Series 203	Thermostatic control head with contact probe for fluid temperature limitation	Graduated scale 20-50°C, 40-90°C
Series 209	Tamper-proof and antitheft cap for use in public places	For control head 200 series

* 3/4" with tailpiece without rubber seals

Technical specification of valve bodies

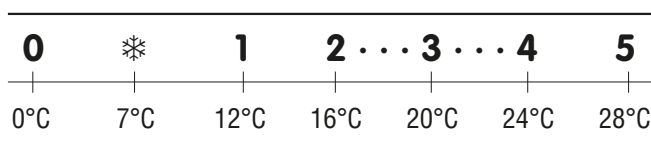
- Material: - Body: brass EN 12165 CW617N, chrome plated
- Obturator stem: stainless steel
- Hydraulic seals: EPDM
- Control knob and cap: ABS (RAL 9010)

Medium: water, glycol solutions
 Max percentage of glycol: 30%
 Max differential pressure with control fitted: 1 bar
 Max working pressure: 10 bar
 Temperature range: 5-100°C

Technical specification of control heads 200/201 series

Scale of adjustment: 0-5
 Setting temperature range: 0-28°C
 Frost protection cut-in: 7°C
 Max ambient temperature: 50°C
 Length of capillary, 201 series: 2 m

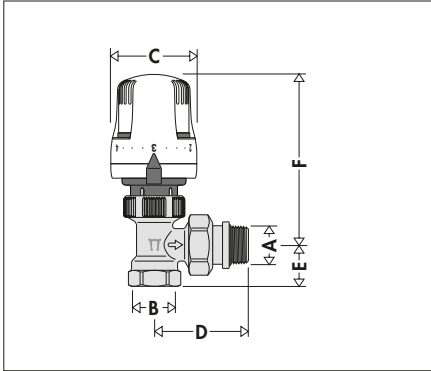
Control adjustment scale, 200/201 series



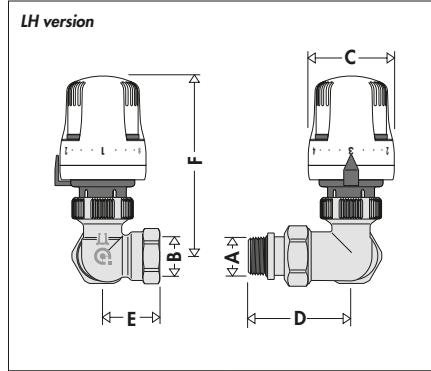
Technical specification of control heads 203 series

Setting temperature range: - code 203502 20-50°C
 - code 203702 40-90°C
 Max sensor temperature: 100°C
 Max pocket pressure: 10 bar
 Length of capillary: 2 m

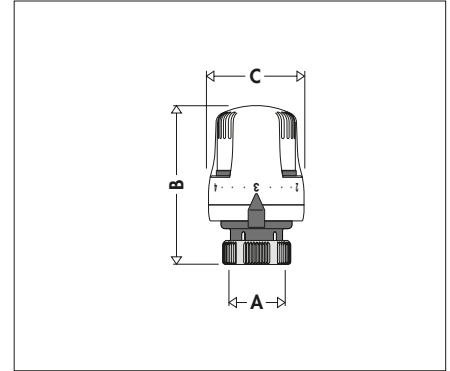
Dimensions



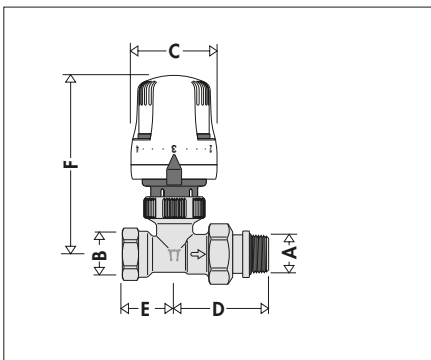
Code	A	B	C	D	E	F
220302 + 200001	3/8"	3/8"	48	48	20	100
220402 + 200001	1/2"	1/2"	48	52,5	23	100
220500 + 200001	3/4"	3/4"	48	62	26	100



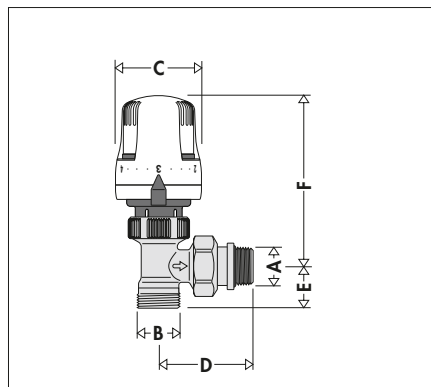
Code	A	B	C	D	E	F
225322 + 200001	3/8"	3/8"	48	51	25	104
225422 + 200001	1/2"	1/2"	48	57	30	104



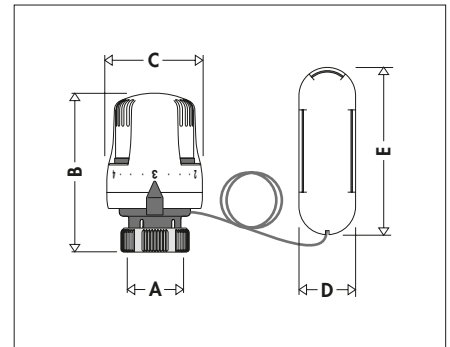
Code	A	B	C
200001	30 p. 1,5	80	48



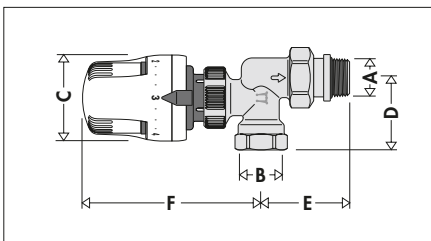
Code	A	B	C	D	E	F
221302 + 200001	3/8"	3/8"	48	48	26	104
221402 + 200001	1/2"	1/2"	48	52,5	29	104
221500 + 200001	3/4"	3/4"	48	62	35	104



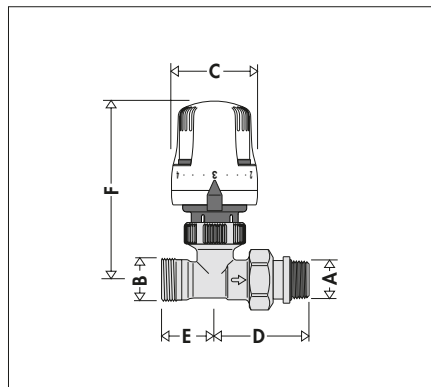
Code	A	B	C	D	E	F
222402 + 200001	1/2"	23 p. 1,5	48	52,5	20,5	100



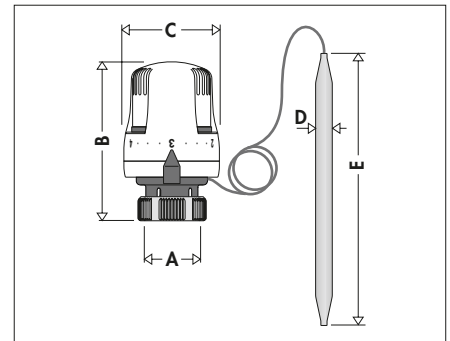
Code	A	B	C	D	E
201000	30 p. 1,5	80	48	33	95



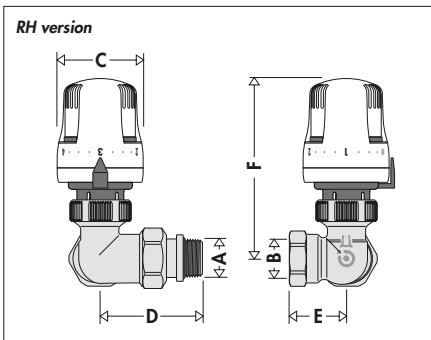
Code	A	B	C	D	E	F
224302 + 200001	3/8"	3/8"	48	35	45	104
224402 + 200001	1/2"	1/2"	48	40	51	104



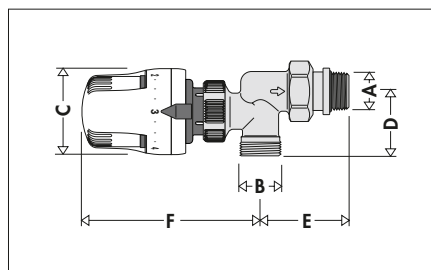
Code	A	B	C	D	E	F
223402 + 200001	1/2"	23 p. 1,5	48	52,5	24	104



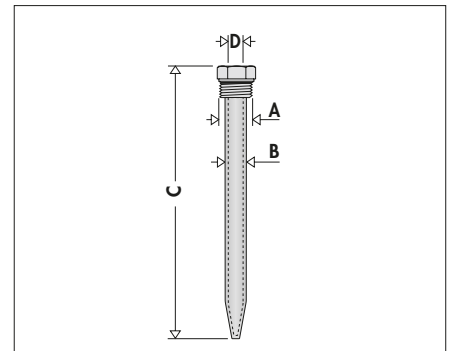
Code	A	B	C	D	E
203502	30 p. 1,5	80	48	∅ 11	158
203702	30 p. 1,5	80	48	∅ 9,5	134



Code	A	B	C	D	E	F
225312 + 200001	3/8"	3/8"	48	51	25	104
225412 + 200001	1/2"	1/2"	48	57	30	104



Code	A	B	C	D	E	F
227402 + 200001	1/2"	23 p. 1,5	48	37	49,5	104

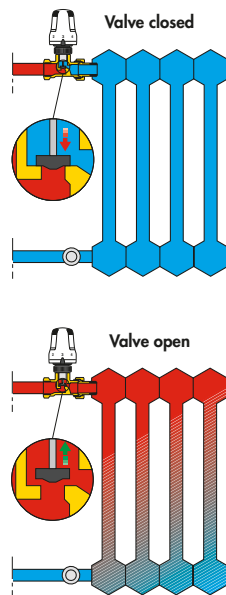


Code	A	B	C	D
475002	1/2"	∅ 13	187	11,5
475003	1/2"	∅ 13	187	10

Operating principle of thermostatic control head

The thermostatic valve control head is a proportional temperature regulator, consisting of bellows containing liquid.

When the ambient temperature increases, the consequent build-up in pressure causes an expansion in volume in the bellows, which, in turn, dilate. When the temperature falls, the reverse takes place; the bellows contract due to the effect of the thrust generated by the return spring. The axial movement of the sensitive element is transmitted to the valve obturator through the connecting spindle, thus regulating the flow of liquid to the heat emitter.

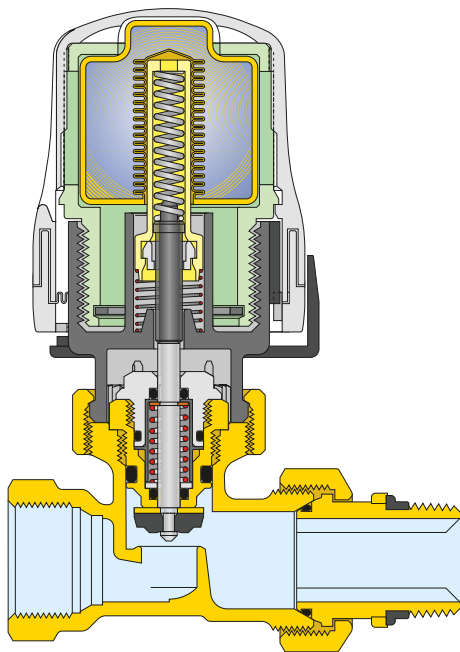


Construction details

Valve

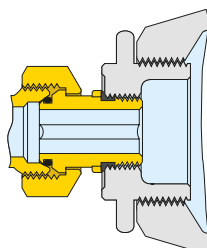
The control stem is stainless steel with EPDM O-Ring double seal. This means that the upper part of the control device can be replaced even when the system is in operation.

The obturator is shaped in such a way as to optimise the fluid-dynamic characteristics of the valve during the progressive opening and closing actions in thermostatic operation. The large passage between seat and obturator causes reduced pressure drops in manual use.



Tailpiece with rubber seal

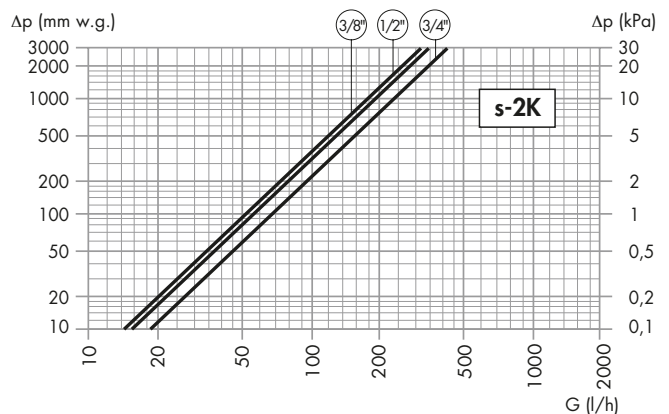
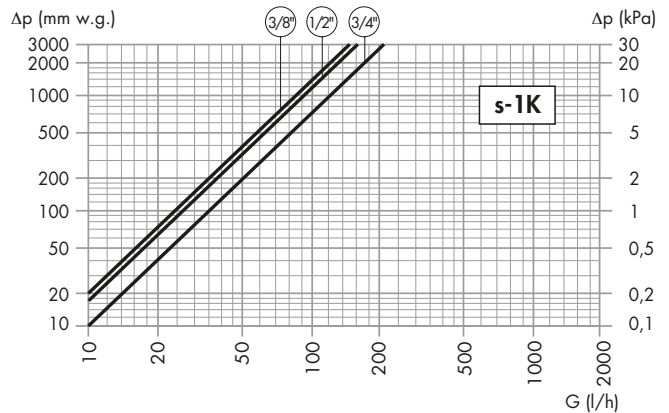
The coupling union to the radiator connection thread has a specially shaped rubber seal. This system guarantees the hydraulic seal with no need for further sealing materials, such as PTFE tapes etc.



Hydraulic characteristics

Details are given in accordance with the specification in standard UNI EN 215: 1990.

Thermostatic valves with angled connections 220 series, with straight connections 221 series for steel pipe and thermostatic valves with angled connections 222 series and with straight connections 223 series for copper pipe (*); with thermostatic control head 200 or 201 series



Valves with angled connections

Code	Size	Kv (m ³ /h) Proportional band (K)				
		1	1,5	2	3	Kvs
220302	3/8"	0,32	0,50	0,60	0,86	2,29
220402/222402	1/2"	0,34	0,52	0,64	0,90	2,39
220500	3/4"	0,40	0,63	0,81	1,09	3,19

Code	Size	Nominal flow (l/h)	Obturator authority	Max diff. press. (bar)
220302	3/8"	180	0,92	0,1
220402/222402	1/2"	180 (170*)	0,92	0,1
220500	3/4"	240	0,93	0,1

* With control head 201 series

Valves with straight connections

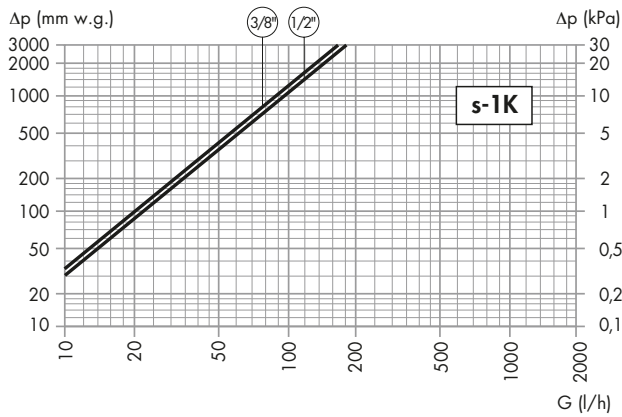
Code	Size	Kv (m ³ /h) Proportional band (K)				
		1	1,5	2	3	Kvs
221302	3/8"	0,28	0,45	0,59	0,77	1,05
221402/223402	1/2"	0,32	0,50	0,67	0,86	1,52
221500	3/4"	0,43	0,63	0,82	1,05	2,20

Code	Size	Nominal flow (l/h)	Obturator authority	Max diff. press. (bar)
221302	3/8"	180	0,60	0,1
221402/223402	1/2"	180	0,60	0,1
221500	3/4"	240	0,86	0,1

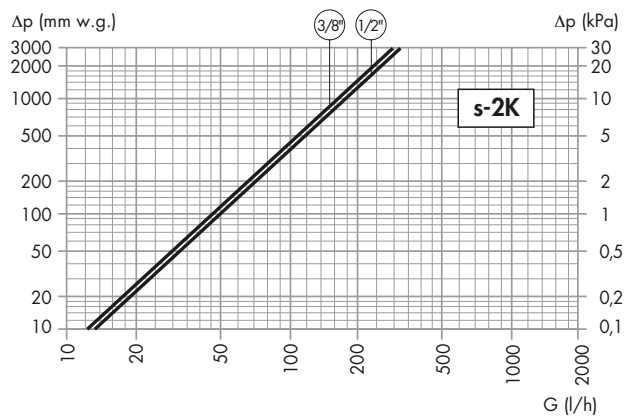
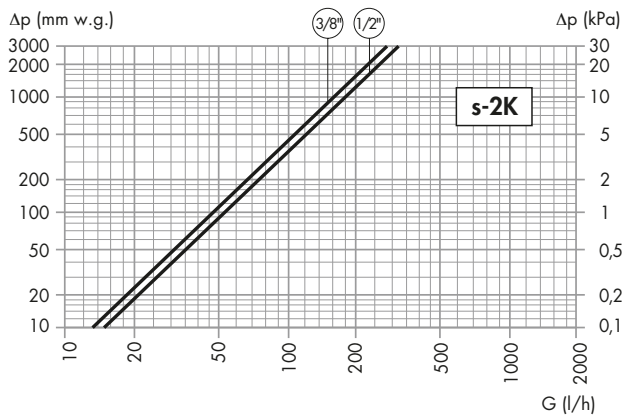
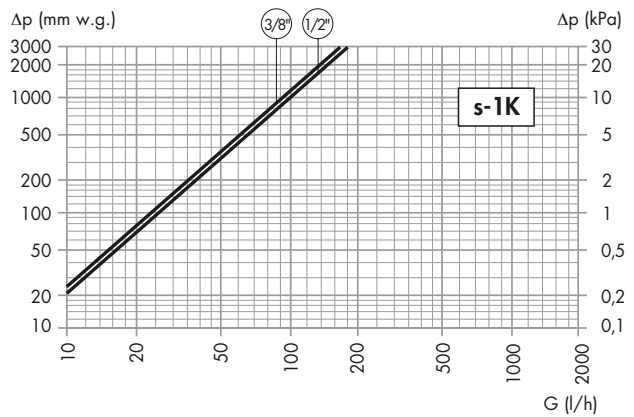
Kv = Volume flow in m³/h producing pressure drop 1 bar

Kvs = Kv with valve totally open

Thermostatic valves with reverse connections 224 series for steel pipe and 227 (*) series for copper and plastic pipe, with thermostatic control head 200 or 201 series



Thermostatic valves with double angled connections 225 series for steel pipe with thermostatic control head 200 or 201 series



Valves with reverse connections
(not to HD 1215-2)

Code	Size	Kv (m ³ /h) Proportional band (K)				Kvs
		1	1,5	2	3	
224302	3/8"	0,36	0,48	0,57	0,66	0,93
224402	1/2"	0,37	0,51	0,63	0,82	1,39
227402	1/2"	0,37	0,51	0,63	0,82	1,39

Code	Size	Nominal flow (l/h)	Obturator authority	Max diff. press. (bar)
224302	3/8"	180	0,65	0,1
224402	1/2"	180	0,93	0,1
227402	1/2"	180	0,93	0,1

(*) Certification

Caleffi valves 220, 221 series sizes 3/8", 1/2", 3/4" and 224, 225 series sizes 3/8", 1/2", in combination with control heads 200 and 201 series, are approved to standard UNI EN 215: 1990.

Additional information available on request.

Valves with double angled connections

Code	Size	Kv (m ³ /h) Proportional band (K)				Kvs
		1	1,5	2	3	
2253.2	3/8"	0,34	0,46	0,58	0,75	0,96
2254.2	1/2"	0,35	0,52	0,60	0,83	1,40

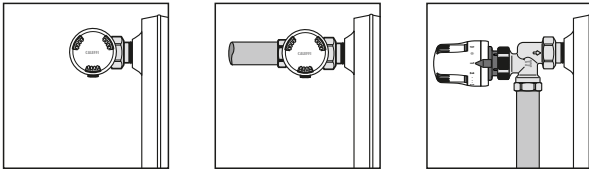
Code	Size	Nominal flow (l/h)	Obturator authority	Max diff. press. (bar)
2253.2	3/8"	180	0,60	0,1
2254.2	1/2"	180	0,80	0,1

System sizing

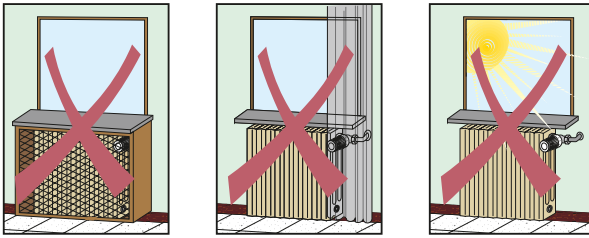
For correct system sizing, the valves are normally selected by identifying the pressure drop in accordance with the flow on diagrams s-2K as above (regulation with proportional band of 2K).

Installation

Thermostatic controls should be installed in the horizontal position.



The sensitive element of the thermostatic control head must not be sited in niches, alcoves, behind curtains or directly exposed to sunlight, any of which would falsify the readings.

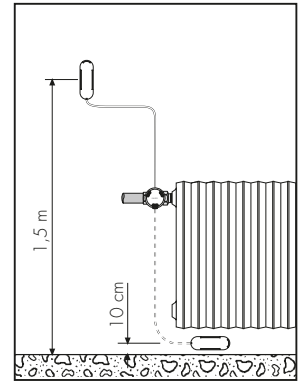


Before fitting the thermostatic control head, turn the control knob to the number 5 position.



Remote sensor control

The use of the thermostatic head with remote sensor requires installation of the latter in accordance with the dimensions shown in the diagram.



Tamper-proof and antitheft cap

The thermostat control can be protected against tampering and theft by mounting the cover (code 209000) on the knob as shown in the figure at side.

The cover is fastened with two screws with special heads that can only be tightened or loosened by means of the appropriate wrench. (code 209001).



Locking and restricting the thermostat control temperature

Temperature restriction



1. Turn the knob to the fully open position (Pos.5). Using a screw-driver, unlock the ring, pressing it fully towards the valve body.

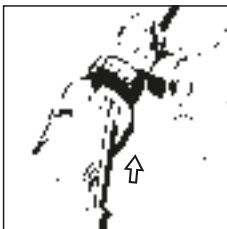


2. Turn the knob to the new maximum open position required (e.g. Pos.3). Turn the ring **anti-clockwise** up to the stop.

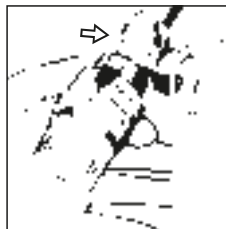


3. Re-lock the ring. The valve will now have a temperature range restriction from 0 to the set value.

Locking the temperature



1. Turn the knob to the fully open position (Pos.5). Using a screw-driver, unlock the ring, pressing it fully towards the valve body.

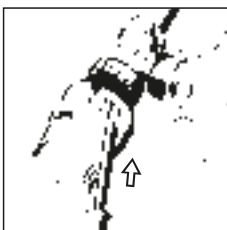


2. Position the valve at the required temperature and turn the ring **clockwise** up to the stop.

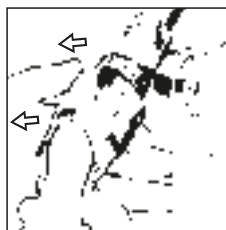


3. Re-lock the ring. The valve will now be locked at the set temperature.

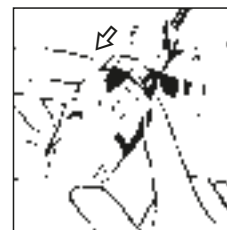
Resetting the temperature restriction and temperature lock



1. Using a screw-driver, unlock the ring, pressing it fully towards the valve body.



2. Turn the knob to the fully open position and the ring **anti-clockwise**, up to the stop. The **RESET** arrows will match up.



3. Re-lock the ring. The valve will now no longer have any temperature restriction or lock.

SPECIFICATION SUMMARIES

Series 220

Thermostatic valve for radiators suitable for thermo-electric and thermostatic control heads. Angled connections for steel pipes 3/8", 1/2" and 3/4". Radiator connection 3/8" and 1/2" M with tailpiece provided with EPDM seal, 3/4" with tailpiece without seal. Brass body. Chrome plated. Control knob in ABS white RAL 9010. Double seal on control stem with EPDM O-Rings. Maximum working temperature 100°C. Maximum working pressure 10 bar.

Series 221

Thermostatic valve for radiators suitable for thermo-electric and thermostatic control heads. Straight connections for steel pipes 3/8", 1/2" and 3/4". Radiator connection 3/8" and 1/2" M with tailpiece provided with EPDM seal, 3/4" with tailpiece without seal. Brass body. Chrome plated. Control knob in ABS white RAL 9010. Double seal on control stem with EPDM O-Rings. Maximum working temperature 100°C. Maximum working pressure 10 bar.

Series 222

Thermostatic valve for radiators suitable for thermo-electric and thermostatic control heads. Angled connections for copper and single and multilayer plastic pipes 23 p1,5 M. Radiator connection 1/2" M with tailpiece provided with EPDM seal. Brass body. Chrome plated. Control knob in ABS white RAL 9010. Double seal on control stem with EPDM O-Rings. Maximum working temperature 100°C. Maximum working pressure 10 bar.

Series 223

Thermostatic valve for radiators suitable for thermo-electric and thermostatic control heads. Straight connections for copper and single and multilayer plastic pipes 23 p1,5 M. Radiator connection 1/2" M with tailpiece provided with EPDM seal. Brass body. Chrome plated. Control knob in ABS white RAL 9010. Double seal on control stem with EPDM O-Rings. Maximum working temperature 100°C. Maximum working pressure 10 bar.

Series 224

Thermostatic valve for radiators suitable for thermo-electric and thermostatic control heads. Reverse connections for steel pipes 3/8" and 1/2" F. Radiator connection 3/8" and 1/2" M with tailpiece provided with EPDM seal. Brass body. Chrome plated. Control knob in ABS white RAL 9010. Double seal on control stem with EPDM O-Rings. Maximum working temperature 100°C. Maximum working pressure 10 bar.

Series 225

Thermostatic valve for radiators suitable for thermo-electric and thermostatic control heads. Double angled connections for steel pipes 3/8" and 1/2" F. Radiator connection 3/8" and 1/2" M, LH or RH with tailpiece provided with EPDM seal. Brass body. Chrome plated. Control knob in ABS white RAL 9010. Double seal on control stem with EPDM O-Rings. Maximum working temperature 100°C. Maximum working pressure 10 bar.

Series 227

Thermostatic valve for radiators suitable for thermo-electric and thermostatic control heads. Reverse connections for copper and single and multilayer plastic pipes 23 p1,5 M. Radiator connection 1/2" M with tailpiece provided with EPDM seal. Brass body. Chrome plated. Control knob in ABS white RAL 9010. Double seal on control stem with EPDM O-Rings. Maximum working temperature 100°C. Maximum working pressure 10 bar.

Series 200

Thermostatic control head for thermostatic and convertible radiator valves. Sensor incorporated with liquid-filled element. Maximum ambient temperature 50°C. Graduated scale from 0 to 5 corresponding to a temperature range of 0 to 28°C, with possibility of temperature restriction and locking. Frost protection cut-in at 7°C.

Series 201

Thermostatic control head for thermostatic and convertible radiator valves. Remote sensor incorporated with liquid-filled element. Maximum ambient temperature 50°C. Graduated scale from 0 to 5 corresponding to a temperature range of 0 to 28°C, with possibility of temperature restriction and locking. Frost protection cut-in at 7°C.

Series 203

Thermostatic control head with contact probe, for fluid temperature restriction. Setting temperature range 20–50°C (40–90°C). Maximum sensor temperature 100°C. Numbered scale, with possibility of temperature restriction and locking. Length of capillary 2 m.

Series 209

Tamper-proof and antitheft cap for thermostatic control head 200 series, for use in public places.

We reserve the right to change our products and their relevant technical data, contained in this publication, at any time and without prior notice.

