

# Convertible radiator valves

## Thermostatic control heads

**338 - 401 - 200 series**



01009/21 EN

replaces 01009/10 GB



### Function

The following series of convertible radiator valves are typically used shutting off the medium on the terminals of HVAC systems. These particular valves can be converted from manual to thermostatic by simply replacing the control knob with a thermostatic control head. In this way, it is possible to automatically keep the ambient temperature of the room in which they are installed constant at the set value.

The 202 series thermostatic control head enables regulating the ambient temperature and viewing its actual value on the front display of the control itself.

These valves are equipped with a special tailpiece with hydraulic rubber seal which allows quick and safe connection to the radiator without the aid of any other means of sealing.

### Product range

#### VALVES:

##### For copper, simple plastic and multi-layer pipes:

338 series	Angled convertible radiator valve	sizes 3/8", 1/2" radiator x 23 p.1.5 pipe size 1/2" radiator x 3/4" pipe
339 series	Straight convertible radiator valve	sizes 3/8", 1/2" radiator x 23 p.1.5 pipe size 1/2" radiator x 3/4" pipe
342 series	Angled lockshield valve for radiator	sizes 3/8", 1/2" radiator x 23 p.1.5 pipe size 1/2" radiator x 3/4" pipe
343 series	Straight lockshield valve for radiator	sizes 3/8", 1/2" radiator x 23 p.1.5 pipe size 1/2" radiator x 3/4" pipe

##### For steel pipes:

401 series	Angled convertible radiator valve	sizes 3/8", 1/2", 3/4", 1" (*)
402 series	Straight convertible radiator valve	sizes 3/8", 1/2", 3/4", 1" (*)
431 series	Angled lockshield valve for radiator	sizes 3/8", 1/2", 3/4", 1" (*)
432 series	Straight lockshield valve for radiator	sizes 3/8", 1/2", 3/4", 1" (*)

#### THERMOSTATIC CONTROL HEADS

Code 199000 CNT	Thermostatic control head with built-in sensor with liquid-filled element	adjustment scale *-5 corresponding to 7-28 °C
Code 199100	Thermostatic control head with remote sensor with liquid-filled element	adjustment scale *-5 corresponding to 7-28 °C
200 series	Thermostatic control head with built-in sensor with liquid-filled element	adjustment scale *-5 corresponding to 7-28 °C
201 series	Thermostatic control head with remote sensor with liquid-filled element	adjustment scale *-5 corresponding to 7-28 °C
202 series	Thermostatic control head with built-in sensor with temperature indicator	adjustment scale *-5 corresponding to 7-28 °C
203 series	Thermostatic control head with contact probe for medium temperature restriction	graduated scale 20-50 °C, 40-90 °C
Code 209000	Tamper-proof and anti-theft cap for public installations	
Code 209001	Special wrench for tightening tamperproof antitheft cap	

\* 3/4" and 1" with tailpiece without rubber seal

#### Technical specifications of valves and lockshield valves

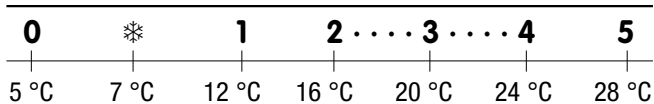
##### Material

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

##### Performance

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

#### Adjustment range of 199/200/201/202 series thermostatic control heads



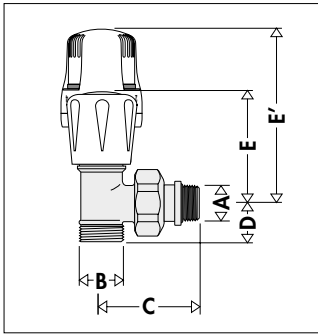
#### Technical specifications of 199/200/201/202 series thermostatic control heads

Adjustment scale:	*-5
Adjustment temperature range:	7-28 °C
Frost protection cut-in:	7 °C
Max. ambient temperature:	50 °C
Length of capillary pipe 201 series and code 199000:	2 m
Room temperature indicator 202 series:	16-26 °C

#### Technical specifications of 203 series thermo-electric actuators

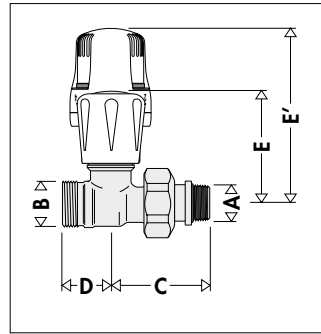
Adjustment scale:	- code 203502	20-50 °C
	- code 203702	40-90 °C
Maximum temperature of sensor:		100 °C
Maximum pressure of pocket:		10 bar
Length of capillary pipe:		2 m

## Dimensions



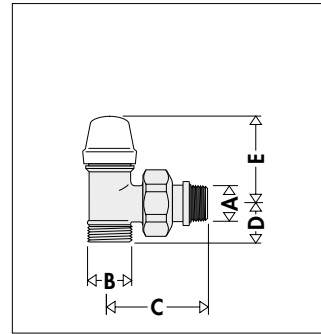
Code	A	B	C
338 302	3/8"	23 p.1,5	47,5
338 402	1/2"	23 p.1,5	53,5
338 452	1/2"	3/4"	53,5

Code	D	E	E'	Mass (kg)
338 302	20,5	51,5	100	0,178
338 402	20,5	51,5	100	0,210
338 452	22,5	51,5	100	0,220



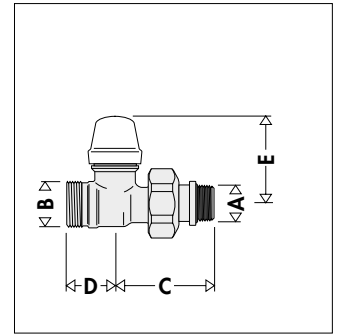
Code	A	B	C
339 302	3/8"	23 p.1,5	47,5
339 402	1/2"	23 p.1,5	53,5
339 452	1/2"	3/4"	53,5

Code	D	E	E'	Mass (kg)
339 302	24	55	103	0,178
339 402	24	55	103	0,210
339 452	24,5	55	103	0,220



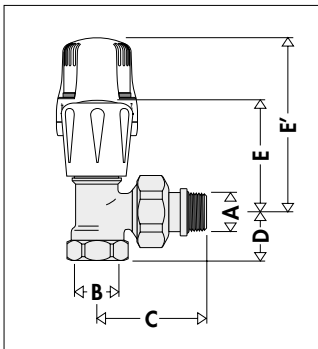
Code	A	B	C
342 302	3/8"	23 p.1,5	47,5
342 402	1/2"	23 p.1,5	53,5
342 452	1/2"	3/4"	53,5

Code	D	E	Mass (kg)
342 302	21,5	39	0,167
342 402	21,5	39	0,225
342 452	23,5	39	0,205



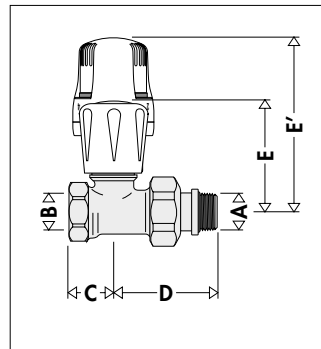
Code	A	B	C
343 302	3/8"	23 p.1,5	47,5
343 402	1/2"	23 p.1,5	53,5
343 452	1/2"	3/4"	53,5

Code	D	E	Mass (kg)
343 302	24	44,5	0,184
343 402	24	44,5	0,228
343 452	24,5	44,5	0,205



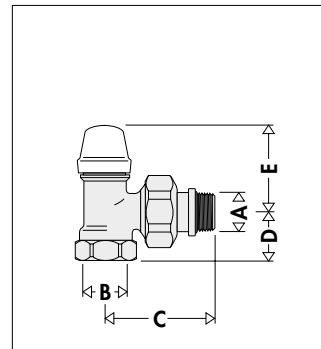
Code	A	B	C
401 302	3/8"	3/8"	47,5
401 402	1/2"	1/2"	53,5
401 500	3/4"	3/4"	62,5
401 603	1"	1"	70,5

Code	D	E	E'	Mass (kg)
401 302	20	51,5	100	0,188
401 402	23	51,5	100	0,242
401 500	25	60,5	108	0,190
401 603	30,5	77,5	125	0,590



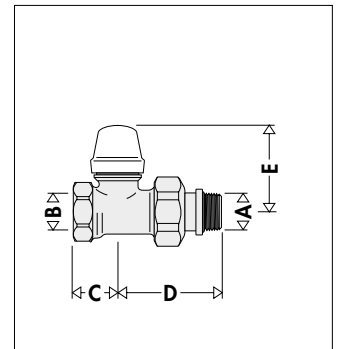
Code	A	B	C
402 302	3/8"	3/8"	21
402 402	1/2"	1/2"	22
402 500	3/4"	3/4"	30
402 603	1"	1"	38

Code	D	E	E'	Mass (kg)
402 302	46,5	55	103	0,188
402 402	52	55	103	0,242
402 500	59,5	66	112	0,190
402 603	63,5	81,5	127,5	0,640



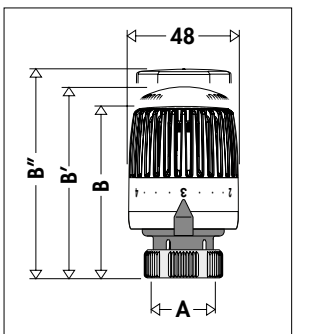
Code	A	B	C
431 302	3/8"	3/8"	47,5
431 402	1/2"	1/2"	53,5
431 503	3/4"	3/4"	62,5
431 603	1"	1"	70,5

Code	D	E	Mass (kg)
431 302	20	38	0,182
431 402	23	38	0,237
431 503	25	47	0,360
431 603	30,5	47,5	0,590

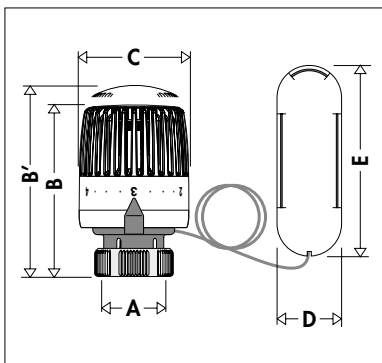


Code	A	B	C
432 302	3/8"	3/8"	21
432 402	1/2"	1/2"	22
432 503	3/4"	3/4"	30
432 603	1"	1"	38

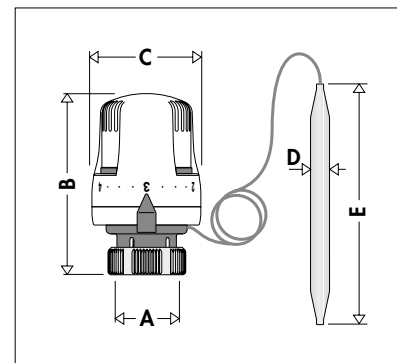
Code	D	E	Mass (kg)
432 302	46,5	44,5	0,192
432 402	52	44,5	0,242
432 503	59,5	49,5	0,190
432 603	63,5	51,5	0,560



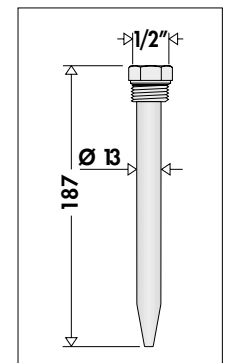
Code	A	B	B'	B''	Mass (kg)
199 000	30 p.1,5	74	-	-	0,165
200 000	30 p.1,5	-	80	-	0,165
202 000	30 p.1,5	-	-	85	0,168



Code	A	B	B'	C	D	E	Mass (kg)
199 100	30 p.1,5	74	-	48	33	95	0,340
201 000	30 p.1,5	-	80	48	33	95	0,340



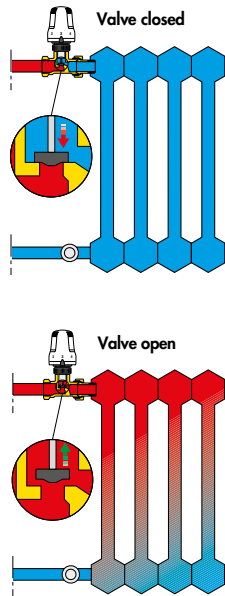
Code	A	B	C	D	E	Mass (kg)
203 502	30 p.1,5	80	48	∅ 11	158	0,300
203 702	30 p.1,5	80	48	∅ 9,5	134	0,300



Code	packet for code
475 002	203502
475 003	203702

**Operating principle of thermostatic control head**

The control device of the thermostatic radiator valve is a proportional temperature regulator, composed of a bellows containing a specific thermostatic fluid. As the temperature increases, the liquid increases in volume and causes the bellows to expand. As the temperature decreases, the inverse process occurs: the bellows contracts due to the thrust of the counter-spring. The axial movements of the sensitive element are transmitted to the valve actuator by means of the connecting stem, thereby adjusting the flow of medium in the heat emitter.



**Construction details**

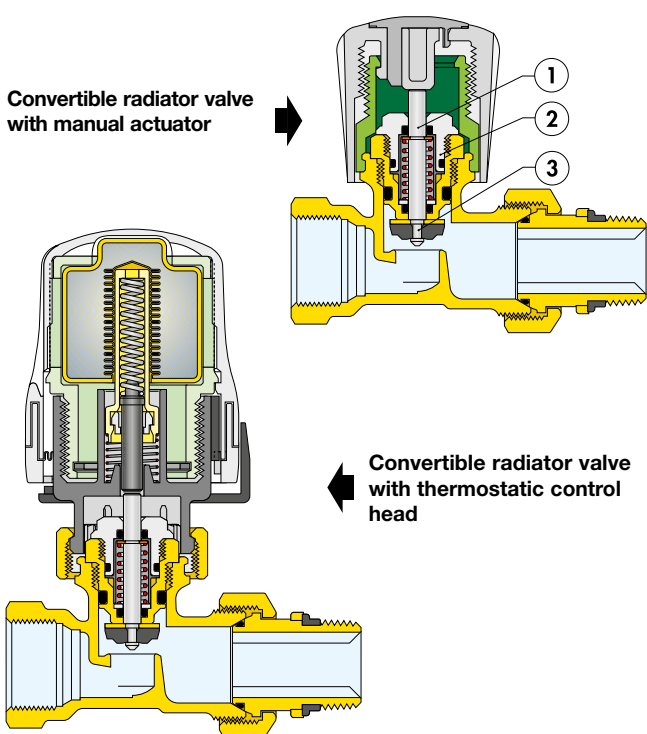
**Valve**

The stainless steel control stem (1) has a double EPDM O-Ring seal. In this way the upper portion of the headwork (2) can be replaced even with the system running.

If necessary, the entire headwork can be replaced with the special kit for convertible radiator valves and thermostatic valves, code 387200.

The obturator (3) is shaped so as to optimise the hydraulic characteristics of the valve during the progressive action of opening or closing in thermostatic operation. The wide passage between the seat and obturator causes reduced head losses in manual operation.

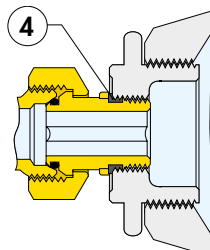
**Convertible radiator valve with manual actuator**



**Convertible radiator valve with thermostatic control head**

**Tailpiece with rubber seal**

The radiator connection thread union is equipped with a special shaped rubber ring (4). This system ensures a hydraulic seal without using additional sealing materials such as hemp or PTFE tape.



**202 series thermostatic control head with temperature indicator**

**Ambient temperature indicator**

The ambient temperature indicator, whose thermostatic control head is mounted on the front, is of the LCD type. It highlights the actual room temperature reading in green, to enable precise regulation of the temperature to the desired value.



Visible in sufficient light levels

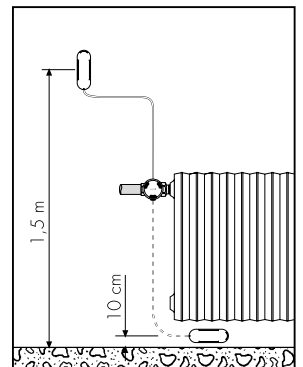
**Rocker system**

The indicator is equipped with a special rocker which keeps it in a vertical position at all times, for ease of reading.



**201 series remote probe control**

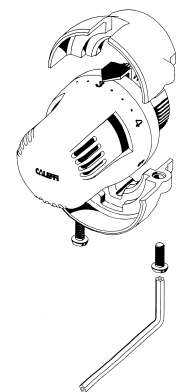
To use the thermostatic control head with remote sensor, it is necessary to install it in accordance with all the measures specified in the diagram.



**Tamper-proof and anti-theft cap**

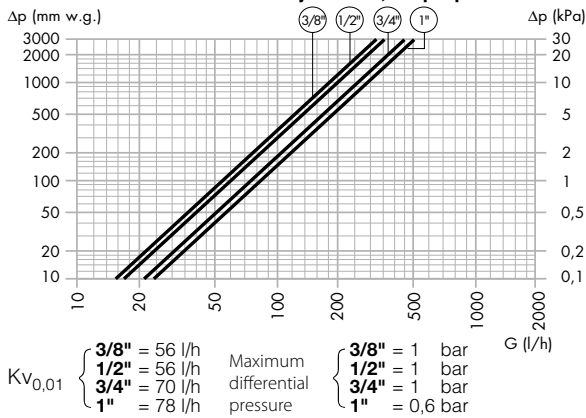
The tamper-proof and anti-theft version of the thermostatic control head is obtained by fitting on the knob the specific cap code 209000 as shown alongside. It is secured with two screws equipped with a special head that can only be tightened by using the special wrench code 209001.

For thermostatic control heads in series 200, 202 and code 199000 CNT.

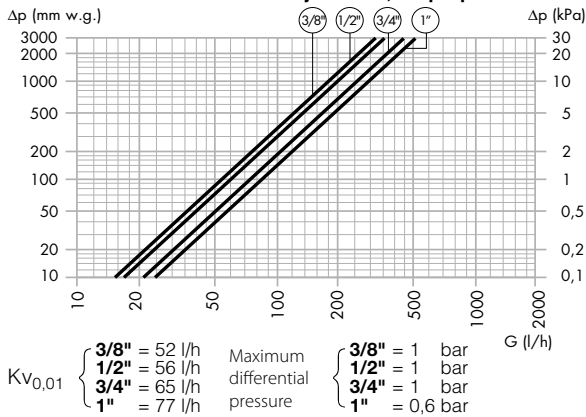


## Hydraulic characteristics

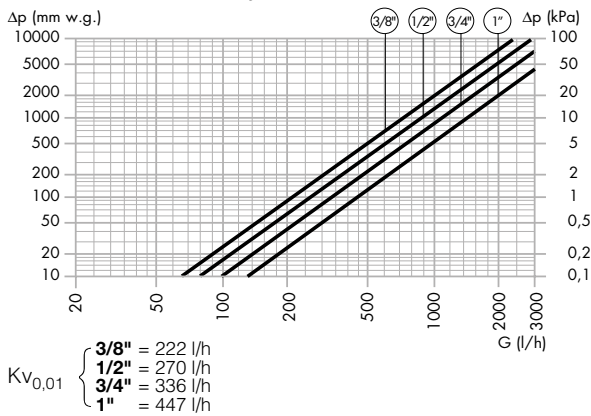
### Convertible radiator valves with angled connections, 338 and 401 series with thermostatic adjustment, 2K proportional band



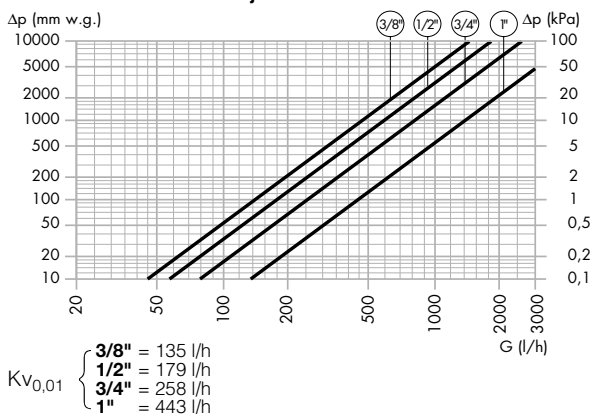
### Convertible radiator valves with straight connections, 339 and 402 series with thermostatic adjustment, 2K proportional band



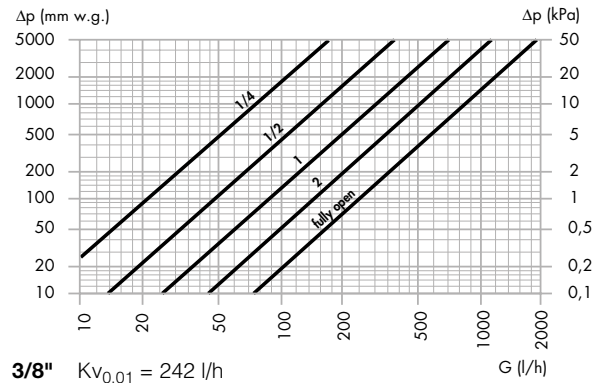
### Convertible radiator valves with angled connections, 338 and 401 series with manual adjustment



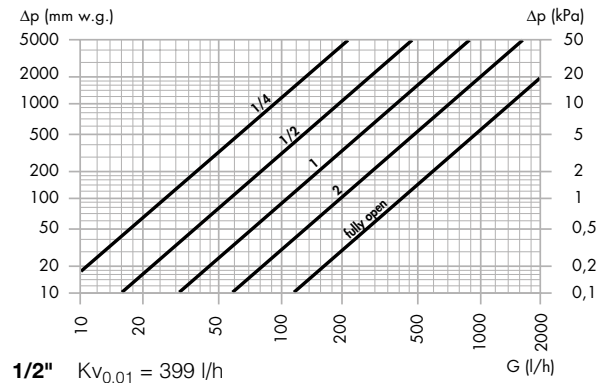
### Convertible radiator valves with straight connections, 339 and 402 series with manual adjustment



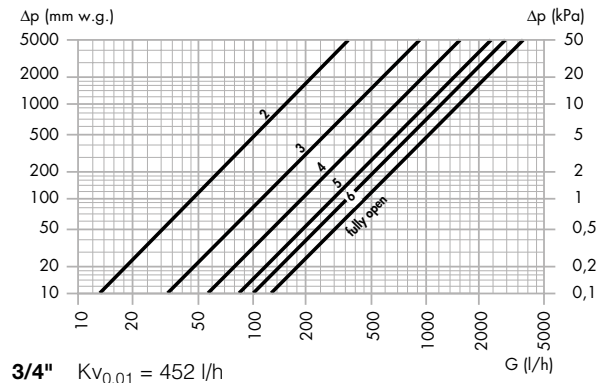
### Angled connections lockshield 3/8\", 342 and 431 series



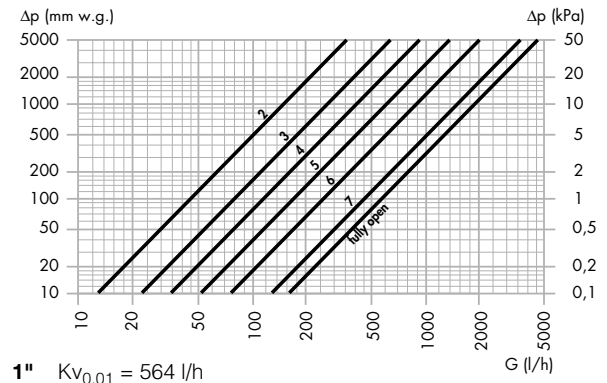
### Angled connections lockshield 1/2\", 342 and 431 series



### Angled connections lockshield 3/4\", 431 series



### Angled connections lockshield 1\", 431 series

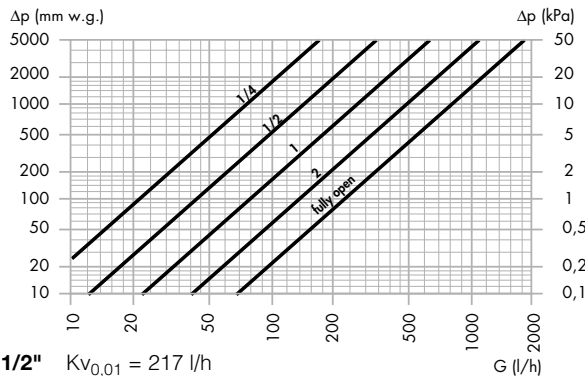


**Straight connections lockshield 3/8", 343 and 432 series**



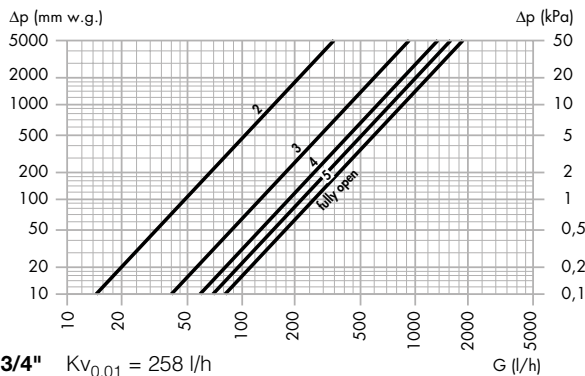
**3/8"**  $K_{V_{0,01}} = 132 \text{ l/h}$

**Straight connections lockshield 1/2", 343 and 432 series**



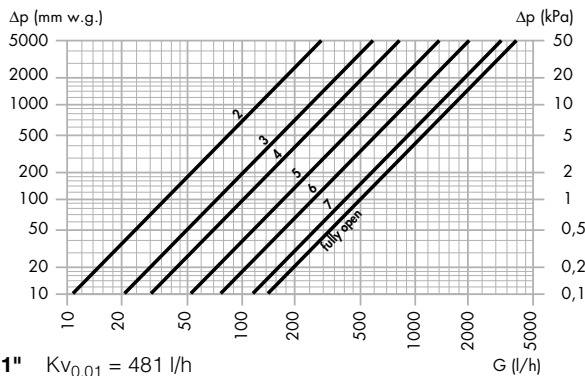
**1/2"**  $K_{V_{0,01}} = 217 \text{ l/h}$

**Straight connections lockshield 3/4", 432 series**



**3/4"**  $K_{V_{0,01}} = 258 \text{ l/h}$

**Straight connections lockshield 1", 432 series**



**1"**  $K_{V_{0,01}} = 481 \text{ l/h}$

**Nominal flow rates and equivalent lengths values**

COPPER PIPES							
TYPE	connection Rad.	connection Pipe	Øint/ext pipe (mm)	STRAIGHT		ANGLED	
				$K_{V_{0,01}}$ (l/h)	le (m)	$K_{V_{0,01}}$ (l/h)	le (m)
Convertible radiator valves with manual adjustment	3/8"	23 p. 1,5	8/10	135	0,8	222	0,3
Convertible radiator valves with manual adjustment	3/8"	23 p. 1,5	10/12	135	2,5	222	0,9
Convertible radiator valves with manual adjustment	3/8"	23 p. 1,5	12/14	135	6,6	222	2,4
Convertible radiator valves with manual adjustment	3/8"	23 p. 1,5	13/15	135	10,1	222	3,7
Convertible radiator valves with manual adjustment	3/8"	23 p. 1,5	14/16	135	14,8	222	5,5
Convertible radiator valves with manual adjustment	3/8"	23 p. 1,5	16/18	135	29,9	222	11,1
Convertible radiator valves with manual adjustment	1/2"	23 p. 1,5	8/10	179	0,5	270	0,2
Convertible radiator valves with manual adjustment	1/2"	23 p. 1,5	10/12	179	1,4	270	0,6
Convertible radiator valves with manual adjustment	1/2"	23 p. 1,5	12/14	179	3,7	270	1,6
Convertible radiator valves with manual adjustment	1/2"	23 p. 1,5	13/15	179	5,7	270	2,5
Convertible radiator valves with manual adjustment	1/2"	23 p. 1,5	14/16	179	8,4	270	3,7
Convertible radiator valves with manual adjustment	1/2"	23 p. 1,5	16/18	179	17,0	270	7,5

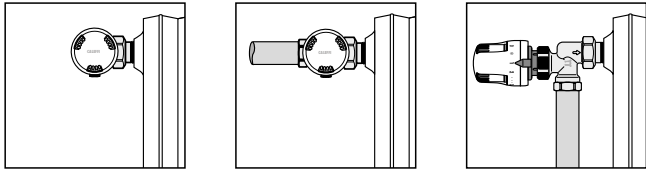
IRON PIPES							
TYPE	connection Rad.	connection Pipe	Øint/ext pipe (mm)	STRAIGHT		ANGLED	
				$K_{V_{0,01}}$ (l/h)	le (m)	$K_{V_{0,01}}$ (l/h)	le (m)
Convertible radiator valves with manual adjustment	3/8"	3/8"	12,7/16,7	135	7,2	222	2,7
Convertible radiator valves with manual adjustment	1/2"	1/2"	16,3/21,0	179	15,3	270	6,7
Convertible radiator valves with manual adjustment	3/4"	3/4"	21,7/26,4	258	33,2	336	19,6
Convertible radiator valves with manual adjustment	1"	1"	27,4/33,2	443	38,5	447	37,8

PLASTIC PIPES							
TYPE	connection Rad.	connection Pipe	Øint/ext pipe (mm)	STRAIGHT		ANGLED	
				$K_{V_{0,01}}$ (l/h)	le (m)	$K_{V_{0,01}}$ (l/h)	le (m)
Convertible radiator valves with manual adjustment	3/8"	23 p. 1,5	8/12	135	0,8	222	0,3
Convertible radiator valves with manual adjustment	3/8"	23 p. 1,5	10/15	135	2,5	222	0,9
Convertible radiator valves with manual adjustment	3/8"	23 p. 1,5	12/16	135	6,6	222	2,4
Convertible radiator valves with manual adjustment	3/8"	23 p. 1,5	13/18	135	10,1	222	3,7
Convertible radiator valves with manual adjustment	3/8"	23 p. 1,5	14/18	135	14,8	222	5,5
Convertible radiator valves with manual adjustment	1/2"	23 p. 1,5	8/12	179	0,5	270	0,2
Convertible radiator valves with manual adjustment	1/2"	23 p. 1,5	10/15	179	1,4	270	0,6
Convertible radiator valves with manual adjustment	1/2"	23 p. 1,5	12/16	179	3,7	270	1,6
Convertible radiator valves with manual adjustment	1/2"	23 p. 1,5	13/18	179	5,7	270	2,5
Convertible radiator valves with manual adjustment	1/2"	23 p. 1,5	14/18	179	8,4	270	3,7
Convertible radiator valves with manual adjustment	1/2"	3/4"	20 est	179	8,4	270	3,7



## Installation

The thermostatic control heads should be installed in a horizontal position, in accordance with the direction of flow indicated by the arrow on the valve body.

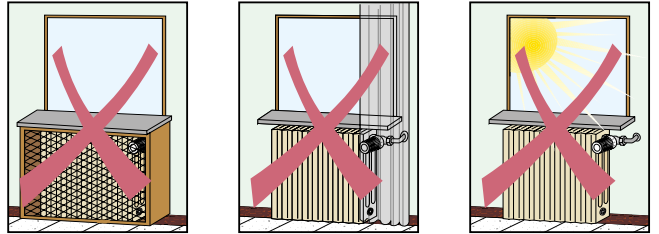


**Warnings:** In the event of incorrect installation of the valve complete with thermostatic control head, two possible problems may arise in the system:

- 1) Vibration similar to a hammer is due to the fact that the medium passes through the valve in the opposite direction to that indicated by the arrow on the body. To overcome this drawback it will be sufficient to restore the correct direction of flow.

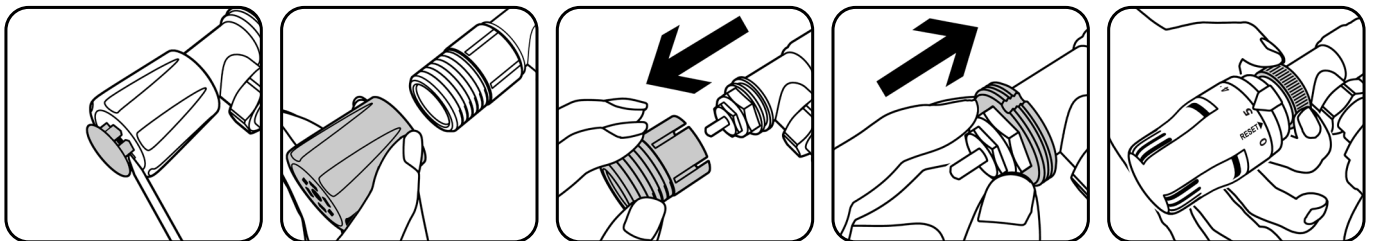
- 2) A sound or hissing noise during modulation is due to the fact that the valve is subjected to an excessive head. To overcome this drawback it will be sufficient to keep the plant pressure under control by making provision for devices such as variable speed pumps combined with differential pressure regulators, or using differential by-pass valves.

The sensitive element of the thermostatic control heads must never be installed in niches, radiator cabinets, behind curtains or exposed to direct sunlight, otherwise it may produce false readings.



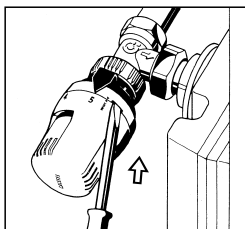
## Valve conversion from manual to thermostatic

Before installing the thermostatic control head, set the knob to No. 5

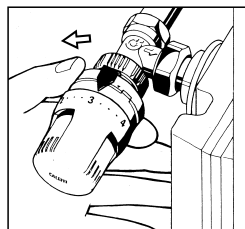


## Thermostatic control head temperature restriction and locking

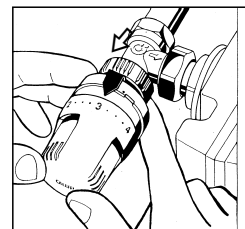
### Temperature restriction



1. Turn the knob to the fully-open position (Pos. 5). With the aid of a screwdriver, unhook the locking nut by pushing it towards the valve body fully.

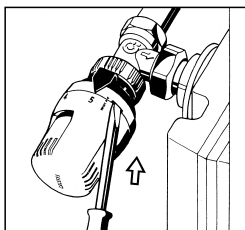


2. Turn the knob to the new desired fully open position (example pos. 3). Turn the locking nut fully **counter-clockwise**.

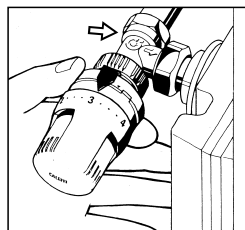


3. Hook back on the locking nut. At this point the valve will have a restriction to the working temperature range from 0 to the set value.

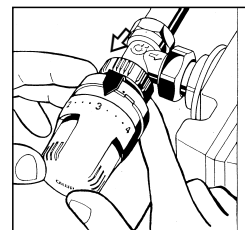
### Locking the temperature



1. Turn the knob to the fully-open position (Pos. 5). With the aid of a screwdriver, unhook the locking nut by pushing it towards the valve body fully.

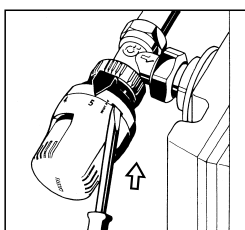


2. Position the valve at the desired temperature and turn the locking nut **clockwise** fully.

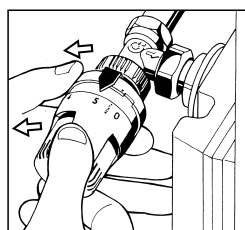


3. Hook back on the locking nut. At this point the valve will be locked on the new temperature setting.

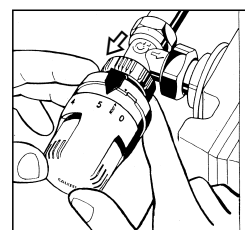
### Resetting the restriction and temperature locking



1. With the aid of a screwdriver, unhook the ring nut by pushing it towards the valve body fully.



2. Turn the knob to the new maximum aperture position, and the locking nut **counter-clockwise**, until it is snug. The **RESET** arrows will match.



3. Hook back on the locking nut. At this point the valve will no longer have a restriction or locking.

## SPECIFICATION SUMMARIES

### 338 series

Convertible radiator valve fitted for thermostatic control heads and thermo-electric actuators. Angled connections for copper, single-layer or multi-layer plastic pipes. Connections of pipe 23 p.1.5 and 3/4" M. Connection to radiator 3/8" and 1/2" M with tailpiece equipped with EPDM sealing gasket. Brass body. Chrome plated. Handwheel in ABS white RAL 9010, for manual control. Stainless steel control stem. Double seal on control stem with EPDM O-Ring. Temperature range 5–100 °C. Maximum working pressure 10 bar.

### 339 series

Convertible radiator valve fitted for thermostatic control heads and thermo-electric actuators. Straight connections for copper, single-layer or multi-layer plastic pipes. Connections of pipe 23 p.1.5 and 3/4" M. Connection to radiator 3/8" and 1/2" M with tailpiece equipped with EPDM sealing gasket. Brass body. Chrome plated. Handwheel in ABS white RAL 9010, for manual control. Stainless steel control stem. Double seal on control stem with EPDM O-Ring. Temperature range 5–100 °C. Maximum working pressure 10 bar.

### 342 series

Lockshield valve. Angled connections for copper, single-layer or multi-layer plastic pipes. Connections of pipe 23 p.1.5 and 3/4" M. Connection to radiator 3/8" or 1/2" M with tailpiece equipped with EPDM sealing gasket. Brass body. Chrome plated. ABS white RAL 9010 protective cap. Outward seal consisting of EPDM O-rings on the control stem. Temperature range 5–100 °C. Maximum working pressure 10 bar.

### 343 series

Lockshield valve. Straight connections for copper, single-layer or multi-layer plastic pipes. Connections of pipe 23 p.1.5 and 3/4" M. Connection to radiator 3/8" or 1/2" M with tailpiece equipped with EPDM sealing gasket. Brass body. Chrome plated. ABS white RAL 9010 protective cap. Outward seal consisting of EPDM O-rings on the control stem. Temperature range 5–100 °C. Maximum working pressure 10 bar.

### 401 series

Convertible radiator valve fitted for thermostatic control heads and thermo-electric actuators. Angled connections, for iron pipe 3/8", 1/2", 3/4" or 1" F. Connection to radiator 3/8" or 1/2" M with tailpiece supplied with EPDM sealing gasket, 3/4" and 1" M with tailpiece without rubber seal. Brass body. Chrome plated. Handwheel in ABS white RAL 9010, for manual control. Stainless steel control stem. Double seal on control stem with EPDM O-Ring. Temperature range 5–100 °C. Maximum working pressure 10 bar. Maximum differential pressure with thermostatic control head fitted 1 bar.

### 402 series

Convertible radiator valve fitted for thermostatic control heads and thermo-electric actuators. Straight connections, for iron pipe 3/8", 1/2", 3/4" or 1" F. Connection to radiator 3/8" or 1/2" M with tailpiece supplied with EPDM sealing gasket, 3/4" and 1" M with tailpiece without rubber seal. Brass body. Chrome plated. Handwheel in ABS white RAL 9010, for manual control. Stainless steel control stem. Double seal on control stem with EPDM O-Ring. Temperature range 5–100 °C. Maximum working pressure 10 bar. Maximum differential pressure with thermostatic control head fitted 1 bar.

### 431 series

Lockshield valve. Angled connections, for iron pipe 3/8", 1/2", 3/4" or 1" F. Connection to radiator 3/8" or 1/2" M with tailpiece supplied with EPDM sealing gasket, 3/4" and 1" M with tailpiece without rubber seal. Brass body. Chrome plated. ABS white RAL 9010 protective cap. Outward seal consisting of EPDM O-rings on the control stem. Temperature range 5–100 °C. Maximum working pressure 10 bar.

### 432 series

Lockshield valve. Straight connections, for iron pipe 3/8", 1/2", 3/4" or 1" F. Connection to radiator 3/8" or 1/2" M with tailpiece supplied with EPDM sealing gasket, 3/4" and 1" M with tailpiece without rubber seal. Brass body. Chrome plated. White protective cap RAL 9010 made of ABS. Outward seal consisting of EPDM O-rings on the control stem. Temperature range 5–100 °C. Maximum working pressure 10 bar.

### Code 199000 CNT

Thermostatic control head for convertible radiator valves and thermostatic valves. Built-in sensor with liquid-filled element. Maximum ambient temperature 50 °C. Graduated scale from \* to 5 corresponding to a working temperature range of 7 to 28 °C, with the possibility of locking and restricting the temperature. Frost protection cut-in 7 °C.

### Code 199100

Thermostatic control head for convertible radiator valves and thermostatic valves. Remote sensor with liquid-filled element. Length of capillary pipe 2 m. Maximum ambient temperature 50 °C. Graduated scale from \* to 5 corresponding to a working temperature range of 7 to 28 °C, with the possibility of locking and restricting the temperature. Frost protection cut-in 7 °C.

**200 series**

Thermostatic control head for convertible radiator valves and thermostatic valves. Built-in sensor with liquid-filled element. Maximum ambient temperature 50 °C. Graduated scale from \* to 5, corresponding to a working temperature range of 7 to 28 °C, with the possibility of locking and restricting the temperature. Frost protection cut-in 7 °C.

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**201 series**

Thermostatic control head for convertible radiator valves and thermostatic valves. Remote sensor with liquid-filled element. Length of capillary pipe 2 m. Maximum ambient temperature 50 °C. Graduated scale from \* to 5 corresponding to a working temperature range of 7 to 28 °C, with the possibility of locking and restricting the temperature. Frost protection cut-in 7 °C.

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**202 series**

Thermostatic control head for convertible radiator valves and thermostatic valves. Built-in sensor with liquid-filled element, with digital liquid crystal ambient temperature indicator. Maximum ambient temperature 50 °C. Graduated scale from \* to 5, corresponding to a working temperature range of 7 to 28 °C, with the possibility of locking and restricting the temperature. Frost protection cut-in 7 °C. Ambient temperature indicator from 16 °C to 26 °C. PATENT.

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**203 series**

Thermostatic control head for convertible radiator valves and thermostatic valves with contact probe, for restricting the fluid temperature. Adjustment temperature range 20–50 °C (40–90 °C). Maximum temperature of sensor 100 °C. Numbered scale, with the possibility of locking and restricting the temperature. Capillary length 2 m.

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**Code 209000**

Tamper-proof and anti-theft cap for thermostatic control head, for public installations.

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**Code 209001**

Special wrench for tightening tamperproof antitheft cap.

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