

For reversed flow direction



Thermostatic Radiator Valves
With and without presetting

*Engineering
GREAT Solutions*

For reversed flow direction

The thermostatic valve bodies for reversed flow direction can be used in two-pipe pump heating systems for interchangeable supply and return flow (hammering noises). The valve bodies can be mounted into the return flow connection of radiators in a raised position or tall radiators. This makes the thermostatic head more easily accessible.



Technical description

Applications:

Heating and cooling systems.

Function:

Control
Flow limitation (Eclipse)
Stepless presetting (V-exact II)
Shut-off
Prevents hammering noises with interchanged supply and return pipe

Dimensions:

DN 10-15

Pressure class:

PN 10

Temperature:

Max. working temperature: 120°C, with protection cap or actuator 100°C.
Min. working temperature: -10°C.

Flow range Eclipse:

The flow can be stepless pre-set within the range: 10-150 l/h.
Delivery setting 150 l/h.
(Max. nominal flow q_{mN} at 10 kPa respecting EN 215: 115 l/h)

Differential pressure (Δp_V) Eclipse:

Max. differential pressure:
60 kPa (<30 dB(A))
Min. differential pressure:
10 – 100 l/h = 10 kPa
100 – 150 l/h = 15 kPa

Materials:

Valve body: Corrosion resistant Gunmetal
O-rings: EPDM rubber
Valve disc: EPDM rubber
Return spring: Stainless steel
Valve insert: Brass, PPS
The complete thermostatic insert can be replaced using the fitting tool without draining the system.
Spindle: Niro-steel spindle with double O-ring sealing. The outer O-ring can be replaced under pressure (Standard, V-exact II).

Surface treatment:

Valve body and fittings are nickel-plated.

Marking:

THE, flow direction arrow, DN and II+ Designation.
Without presetting: protection cap black, stuffing box with black label.
With presetting: protection cap white.
Eclipse: Orange protection cap.

Pipe connection:

The female-threaded version is designed for connection to threaded pipe, or in conjunction with compression fittings, to copper precision steel or multi-layer pipe (only DN 15).

Connection to thermostatic head and actuator:

HEIMEIER M30x1,5

Construction

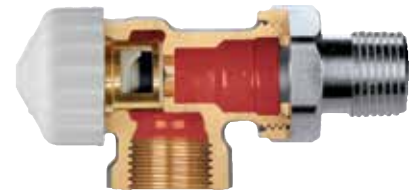
With automatic Eclipse flow limitation



Without presetting



With stepless V-exact II precision presetting



Application

The thermostatic valve bodies for reversed flow direction can be used in two-pipe pump heating systems for interchangeable supply and return flow (hammering noises).

If any questions arise regarding the increased or reduced output of the radiator in relation to through-flow, ask the radiator manufacturer for information.

The valve bodies can be mounted into the return flow connection of radiators in a raised position or tall radiators. This makes the thermostatic head more easily accessible.

Corresponding to the standards EnEV and DIN V 4701-10, they can be designed with a control difference from 1 K to 2 K thus enabling a broad flow spectrum.

The V-exact II model enables hydraulic balancing in order to provide all radiators with the required amount of hot water.

Eclipse

The required design flow for each radiator is set directly on the Eclipse valve. This automatic flow limitation is done with a twist and the adjusted flow will then not be exceeded. Even if there is an oversupply of pressure, due to load changes in the system, for example other valves closing or during morning start up, Eclipse will guarantee the requested flow.

Noise behaviour

To ensure low-noise performance, the following conditions must be met:

- On the basis of experience, the differential pressure over the thermostatic valves should not exceed about 20 kPa = 200 mbar = 0.2 bar. If in designing the system, higher transient differentials might be experienced in the part-load flow range, differential pressure control equipment such as a STAP Differential Pressure Controller or Hydrolux bypass valves can be used.
- Mass-flow must be correctly adjusted.
- The system must be completely deaerated.

Noise behaviour Eclipse

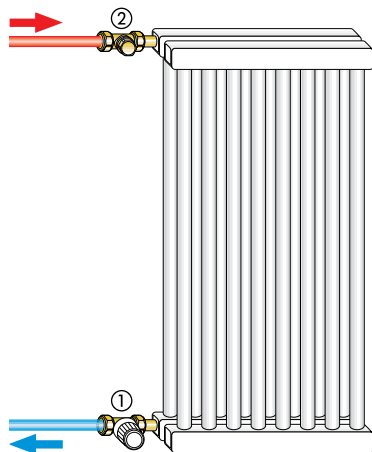
To ensure low-noise performance, the following conditions must be met:

- The differential pressure above Eclipse should not exceed 60 kPa = 600 mbar = 0,6 bar (<30 dB(A)).
- Flow must be correctly adjusted.
- The system must be completely deaerated.

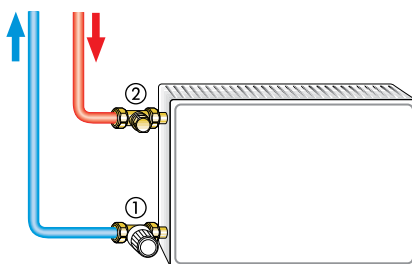
Sample application

Thermostatic valve in the reverse flow connection

Radiator, room high



Radiator, raised position

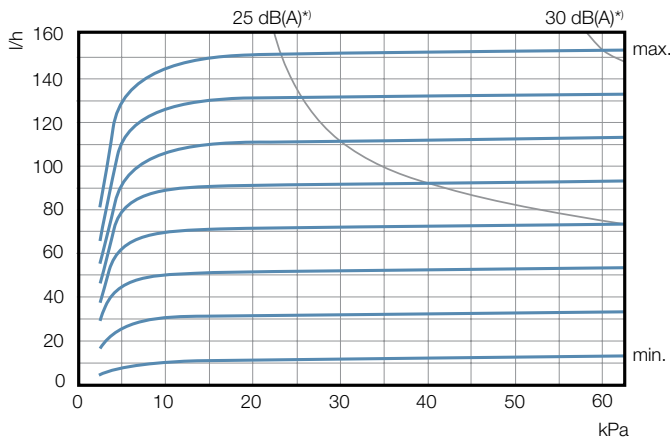


1. Thermostatic valve body for reversed flow direction
2. Regulux/Regutec lockshield

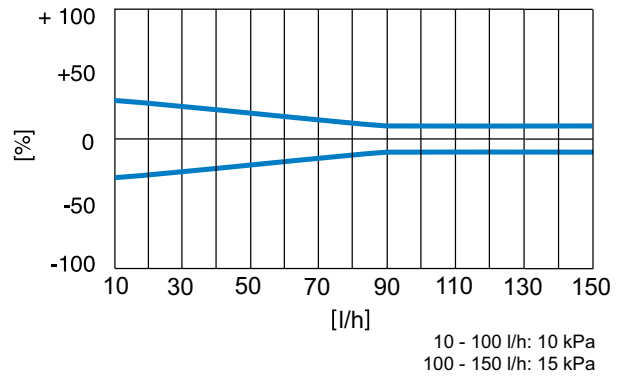
Notes

- To avoid damage and the formation of scale deposit in the hot-water heating system, the composition of the heat transfer medium should be in accordance with the VDI guideline 2035. For industrial and long-distance energy systems, see the applicable codes VdTÜV and 1466/AGFW FW 510. A heat transfer medium containing mineral oils, or any type of lubricant containing mineral oil can have extremely negative effects and usually lead to the disintegration of EPDM seals. When using nitrite-free frost and corrosion resistance solutions with an ethylene glycol base, pay close attention to the details outlined in the manufacturers' documentation, particularly concerning concentration and specific additives.
- Flush the system before changing thermostatic valves in heavy polluted existing systems.
- The thermostatic valve bodies can be used with all HEIMEIER thermostatic heads and HEIMEIER or TA thermal actuators or motorized. The optimal tuning of the components guarantees maximum safety. When using actuators from other manufacturers, make sure that the pressure power is appropriate for thermostatic valve bodies with soft sealing valve discs.

Technical data – Eclipse with automatic flow limitation



Lowest flow tolerances



*) P-band [xp] max. 2 K.

Setting	1	1	1	1	5	1	1	1	1	10	1	1	1	1	15
l/h	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

P-band [xp] max. 2 K.

P-band [xp] max. 1 K up to 90 l/h.

Setting values with different radiator performances and system differential temperatures

Q [W]	200	250	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400	3600	3800	4000	4800	5300	6500	6800				
Δt [K]																																	
10	2	2	3	3	4	5	6	7	8	9	10	12	14	15																			
15	1	1	2	2	3	3	4	5	5	6	7	8	9	10	12	13	14	15															
20	1	1	1	2	2	3	3	3	4	4	5	6	7	8	9	10	10	11	12	13	14	15											
30	1	1	1	1	1	2	2	2	3	3	3	4	5	5	6	6	7	8	8	9	9	10	10	11	12	14	15						
40		1	1	1	1	1	2	2	2	2	3	3	3	4	4	5	5	6	6	7	7	7	8	8	9	10	11	14	15				

Δp min. 10 - 100 l/h = 10 kPa
 Δp min. 100 - 150 l/h = 15 kPa

Q = Radiator performance

Δt = System differential temperature

Δp = Differential pressure

Sample:

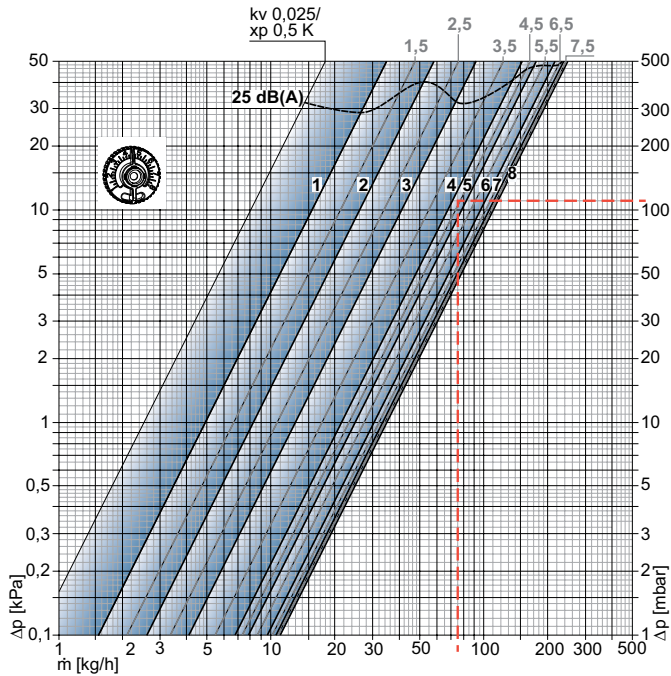
Q = 1000 W, Δt = 15 K

Setting value: **6** (\approx 60 l/h)

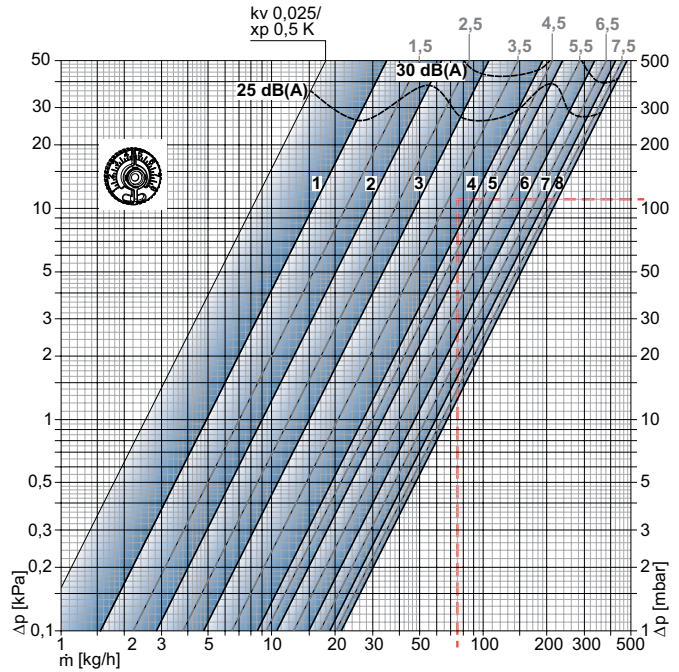
Technical data – V-exact II with precision presetting

Diagram, valve body with thermostatic head

P-band [xp] **1.0 K**



P-band [xp] **2.0 K**



Valve body (DN 10/15) with thermostatic head

		Presetting								Permitted differential pressure, during which the valve is kept closed Δp [bar]	
		1	2	3	4	5	6	7	8	Th.-head	EMO T-TM EMOtec EMO 3 TA-Slider 160
P-band [xp] 1.0K	Kv-value	0,049	0,082	0,130	0,215	0,246	0,303	0,335	0,343	1,0	3,5
P-band [xp] 2.0K	Kv-value	0,049	0,090	0,150	0,265	0,330	0,470	0,590	0,670		
	Kvs	0,049	0,102	0,185	0,313	0,420	0,565	0,740	0,860		
	Flow tolerance ± [%]	20	18	16	14	12	10	10	10		

$Kv/Kvs = m^3/h$ at a pressure drop of 1 bar.

Sample calculation

Target:
Setting range

Given:
Heat flow $Q = 1308 \text{ W}$
Temperature spread $\Delta T = 15 \text{ K}$ (65/50 °C)
Pressure loss, thermostatic valve $\Delta p_V = 110 \text{ mbar}$

Solution:
Mass flow $m = Q / (c \cdot \Delta T) = 1308 / (1,163 \cdot 15) = 75 \text{ kg/h}$

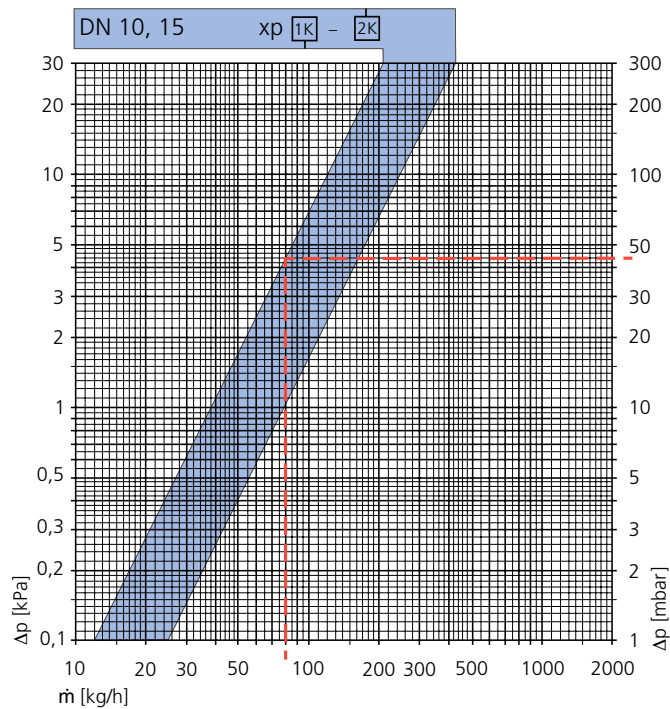
Setting range from Diagram:
With P-band **max. 1.0 K**: 4,5
With P-band **max. 2.0 K**: 4

$$Cv = \frac{Kv}{0,86}$$

$$Kv = Cv \cdot 0,86$$

Technical data – without presetting

Diagram DN 10 (3/8") to DN 15 (1/2"), valve body with thermostatic head



Valve body with thermostatic head	Kv P-band xp [K]			Kvs Angle	Kvs Straight	Permitted differential pressure, during which the valve is kept closed Δp [bar]	
	1,0	1,5	2,0			Th.-head	EMO T-TM EMOtec EMO 3 TA-Slider 160
DN 10 (3/8")	0,38	0,59	0,79	2,00	1,50	1,00	3,50
DN 15 (1/2")	0,38	0,59	0,79	2,00	2,00	1,00	3,50

$Kv/Kvs = m^3/h$ at a pressure drop of 1 bar.

Sample calculation

Target:

Pressure loss of thermostatic valve body DN 15 with a p-band of 1 K

Given:

Heat flow $Q = 1395 \text{ W}$

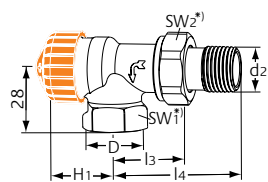
Temperature spread $\Delta t = 15 \text{ K (65/50}^\circ\text{C)}$

Solution:

Mass flow $m = Q / (c \cdot \Delta t) = 1395 / (1,163 \cdot 15) = 80 \text{ kg/h}$

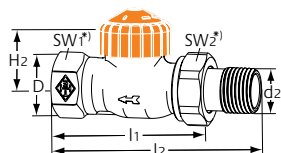
Pressure loss from diagram $\Delta p_v = 44 \text{ mbar}$

Articles – With Eclipse automatic flow limitation



Angle

DN	D	d2	l3	l4	H1	Flow range [l/h]	EAN	Article No
10 (3/8")	Rp3/8	R3/8	26	52	21,5	10-150	4024052931613	9113-01.000
15 (1/2")	Rp1/2	R1/2	29	58	21,5	10-150	4024052931712	9113-02.000



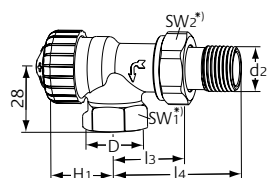
Straight

DN	D	d2	l1	l2	H2	Flow range [l/h]	EAN	Article No
10 (3/8")	Rp3/8	R3/8	59	85	21,5	10-150	4024052931811	9114-01.000
15 (1/2")	Rp1/2	R1/2	66	95	21,5	10-150	4024052931910	9114-02.000

*) SW1: DN 10 = 22 mm, DN 15 = 27 mm
 SW2: DN 10 = 27 mm, DN 15 = 30 mm

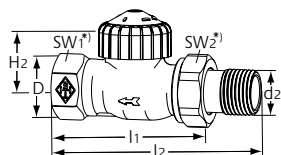
Values H1 and H2 are at the bearing surface thermostatic head or actuator.

Articles – With V-exact II stepless precision presetting



Angle

DN	D	d2	l3	l4	H1	Kv p-band max. 2 K	Kvs	EAN	Article No
10 (3/8")	Rp3/8	R3/8	26	52	21,5	0,025 – 0,670	0,86	4024052899012	9103-01.000
15 (1/2")	Rp1/2	R1/2	29	58	21,5	0,025 – 0,670	0,86	4024052899111	9103-02.000



Straight

DN	D	d2	l1	l2	H2	Kv p-band max. 2 K	Kvs	EAN	Article No
10 (3/8")	Rp3/8	R3/8	59	85	21,5	0,025 – 0,670	0,86	4024052899210	9104-01.000
15 (1/2")	Rp1/2	R1/2	66	95	21,5	0,025 – 0,670	0,86	4024052899319	9104-02.000

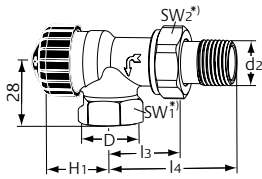
*) SW1: DN 10 = 22 mm, DN 15 = 27 mm
 SW2: DN 10 = 27 mm, DN 15 = 30 mm

Values H1 and H2 are at the bearing surface thermostatic head or actuator.

Kvs = m³/h at a pressure drop of 1 bar and fully open valve.

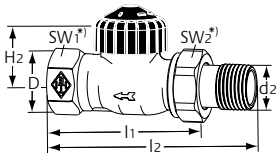
Kv [xp] max. 1 K / 2 K = m³/h at a pressure drop of 1 bar with thermostatic head.

Articles – Without presetting



Angle

DN	D	d2	l3	l4	H1	Kv [xp] 1 K / 2 K	Kvs	EAN	Article No
10 (3/8")	Rp3/8	R3/8	26	52	21,5	0,38 / 0,79	2,00	4024052284511	9101-01.000
15 (1/2")	Rp1/2	R1/2	29	58	21,5	0,38 / 0,79	2,00	4024052284610	9101-02.000



Straight

DN	D	d2	l1	l2	H2	Kv [xp] 1 K / 2 K	Kvs	EAN	Article No
10 (3/8")	Rp3/8	R3/8	59	85	21,5	0,38 / 0,79	1,50	4024052284719	9102-01.000
15 (1/2")	Rp1/2	R1/2	66	95	21,5	0,38 / 0,79	2,00	4024052284818	9102-02.000

*) SW1: DN 10 = 22 mm, DN 15 = 27 mm
SW2: DN 10 = 27 mm, DN 15 = 30 mm

Values H1 and H2 are at the bearing surface thermostatic head or actuator.

Kvs = m³/h at a pressure drop of 1 bar and fully open valve.

Kv [xp] max. 1 K / 2 K = m³/h at a pressure drop of 1 bar with thermostatic head.

Accessories



Setting key

for Eclipse. Color orange.

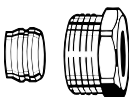
EAN	Article No
4024052937714	3930-02.142



Setting key

For V-exact II **from 2012**, Calypso exact, Calypso TRV-3 and Vekolux. Color grey.

EAN	Article No
4024052035823	3670-01.142



Compression fitting

for copper or precision steel pipe according to DIN EN 1057/10305-1/2. Female thread connection Rp3/8 – Rp3/4. Metal-to-metal joint. Brass nickel-plated. Support sleeves should be used for a pipe wall thickness of 0.8 – 1 mm. Follow the specifications of the pipe manufacturer.

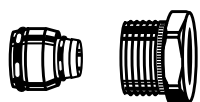
Ø Pipe	DN	EAN	Article No
12	10 (3/8")	4024052174614	2201-12.351
14	15 (1/2")	4024052174713	2201-14.351
15	15 (1/2")	4024052175017	2201-15.351
16	15 (1/2")	4024052175116	2201-16.351
18	20 (3/4")	4024052175215	2201-18.351



Support sleeve

for copper or precision steel pipe with a 1 mm wall thickness. Brass.

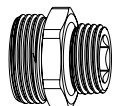
Ø Pipe	L	EAN	Article No
12	25,0	4024052127016	1300-12.170
15	26,0	4024052127917	1300-15.170
16	26,3	4024052128419	1300-16.170
18	26,8	4024052128815	1300-18.170


Compression fitting

for Alu/PEX multi-layer pipe according to DIN 16836.

Female thread connection Rp1/2.
Nickel-plated brass.

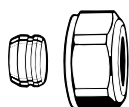
Ø Pipe	EAN	Article No
16 x 2	4024052138616	1335-16.351


Double connection fitting

For clamping plastic, copper, precision steel or multi-layer pipes.

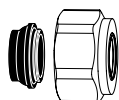
Brass, nickel-plated.

	L	EAN	Article No
G3/4 x R1/2	26	4024052308415	1321-12.083


Compression fitting

for copper or precision steel pipe according to DIN EN 1057/10305-1/2. Connection male thread G3/4 according to DIN EN 16313 (Eurocone). Metal-to-metal joint. Brass nickel-plated. With a pipe wall thickness of 0.8-1 mm insert supporting sleeves. Heed pipe manufacturer's technical advice.

Ø Pipe	EAN	Article No
12	4024052214211	3831-12.351
14	4024052214310	3831-14.351
15	4024052214617	3831-15.351
16	4024052214914	3831-16.351
18	4024052215218	3831-18.351


Compression fitting

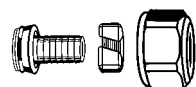
for copper or precision steel pipe according to DIN EN 1057/10305-1/2 and stainless steel pipe.

Connection male thread G3/4 according to DIN EN 16313 (Eurocone).

Soft sealed, max. 95°C.

Nickel-plated brass.

Ø Pipe	EAN	Article No
15	4024052515851	1313-15.351
18	4024052516056	1313-18.351


Compression fitting

for plastic pipe according to DIN 4726, ISO 10508.

PE-X: DIN 16892/16893, EN ISO 15875;

PB: DIN 16968/16969.

Connection male thread G3/4 according to DIN EN 16313 (Eurocone).

Nickel plated brass.

Ø Pipe	EAN	Article No
12x1,1	4024052136018	1315-12.351
14x2	4024052134618	1311-14.351
16x1,5	4024052136117	1315-16.351
16x2	4024052134816	1311-16.351
17x2	4024052134915	1311-17.351
18x2	4024052135110	1311-18.351
20x2	4024052135318	1311-20.351

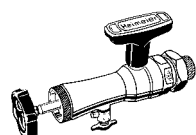

Compression fitting

for Alu/PEX multi-layer pipe according to DIN 16836.

Connection male thread G3/4 according to DIN EN 16313 (Eurocone).

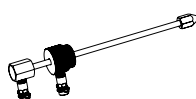
Nickel-plated brass.

Ø Pipe	EAN	Article No
16x2	4024052137312	1331-16.351
18x2	4024052137411	1331-18.351


Fitting tool

complete with case, box spanner and replacement seals, for replacing thermostatic inserts without draining off the heating system (for DN 10 to DN 20).

	EAN	Article No
Fitting tool	4024052298914	9721-00.000
Replacement seals	4024052299010	9721-00.514


Measuring spindle for fitting tool

for differential pressure measurement at thermostatic valve bodies with TA-SCOPE balancing instrument.

	EAN	Article No
	4024052942114	9790-01.890

Other accessories, see catalogue leaflet "Accessories and spare parts for thermostatic radiator valves".