Climate
Control

IMI Heimeier

RTL

Floor Heating Controller

Return temperature limiter with and without presetting

Breakthrough
engineering for
a better world

RTL

Among other things, the return temperature limiter RTL is used to limit the return temperatures of radiators or combined floor/radiator systems to equalize the temperature of smaller floor surfaces (up to ca. 15 m^2).

Key features

Models with presetting and automatic flow limitation (AFC)

Body made of corrosion-resistant gunmetal

Stainless spindle with double O-ring seal

Outer O-ring can be replaced while under pressure

Concealed limiting or blocking using stop clips

Technical description

Applications area:
Heating systems

Functions:
Maximum limitation of the return temperature.

Automatic flow limitation with Eclipse valves.

Stepless precision presetting with V-exact II valves.

Shut-off.

Temperature range is limited on both ends and can be blocked using covered stop clips.

Control behavior:
Proportional controller without auxilliary energy.

Dimensions:
DN 15

Pressure class:
PN 10

Temperature:
Max. working temperature: 120°C
Min. working temperature: 2°C

Maximum sensor temperature:
60° C

Specific extension:
0.10 mm/K,

Valve stroke limiter

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

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

Marking:
THE, flow direction arrow, DN,
II+ Designation.

Material:
RTL thermostatic head:
ABS, PA6.6GF30, brass, steel,
Thermostat filled with an expansible medium.
Valve body: corrosion resistant Gunmetal
O-rings: EPDM rubber
Valve disc: EPDM rubber
Return spring: Stainless steel
Valve insert: Brass, PPS and SPS (syndiotactic polystyrene)
Spindle: Niro-steel spindle with double O-ring sealing. The outer O-ring can be replaced under pressure.

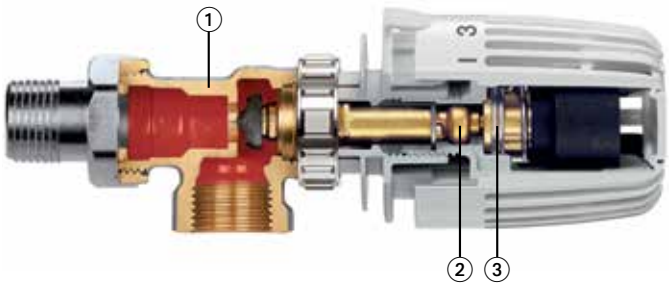
Colour:
White RAL 9016

Surface treatment:
Valve body and fittings are nickel-plated.

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).
The male-threaded version, in conjunction with the appropriate compression fittings, permits connection to plastic pipe.

Construction

RTL – return temperature limiter **without presetting**



1. Valve body
2. Sensor
3. Overstroke safety

Function

The return temperature limiter RTL is an automatic thermostatic controller. The temperature of the flowing medium is transferred to the sensor via conductivity. This keeps the specified value constant within a proportional band necessary for control. The valve only opens when the set limiting value has not been reached.

Application

Among other things, the return temperature limiter RTL is used to limit the return temperatures of radiators or combined floor/ radiator systems to equalize the temperature of smaller floor surfaces (up to ca. 15 m^2). The return temperature is constantly controlled.

With floor heating systems, it is important to note that the flow temperature controlled by the system is approp riate for the particular system installed.

Please make sure the setting value is not below the ambient temperature of the return temperature limiter, as this would then no longer open (carefully choose location of installation). This may also be the case if the return temperature limiter is influenced by transferred heat, e.g. by mounting a floor heating circuit distributor directly on the return collector.

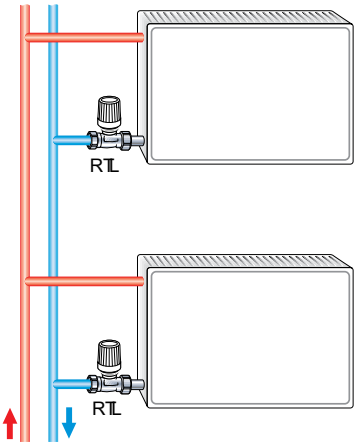
Eclipse
For RTL valves with automatic Eclipse flow limitation the required design flow for each radiator is set directly on the thermostatic valve. This automatic flow limitation is done with a twist and the adjusted flow will then not be exceeded. Even if there is an oversupply of pressure, due to load 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 (see diagram for noise characteristic curve).
- Mass-flow must be correctly adjusted.
- The system must be completely deaerated.

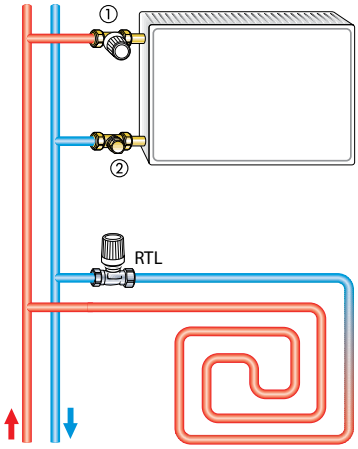
Noise behaviour Eclipse
To ensure low-noise performance, the following conditions must be met:
- The differential pressure above Eclipse should not exceed 60 kPa = 600 mbar = 0,6 bar (<30 dB(A)).
- Flow must be correctly adjusted.
- The system must be completely deaerated.

Sample application

Return temperature limiting on radiators



Floor heating



1. Thermostatic valve
2. Regulux lockshield

Note
The composition of the heat transfer medium should be one which avoids damage or the accumulation of stones in hot water heating systems, in accordance with VDI guide line 2035. For industrial and long-distance energy systems, see applicable codes VdTÜV and 1466/AGFW FW 510.
Heat transfer media containing mineral oils or lubricants containing mineral oil can have seriously negative effects on the source apparatus and usually lead to the disintigration 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 details concerning concentration and specific additives.

Functional heating
Carry out functional heating of heating screed conforming to standards in keeping with EN 1264-4.

Earliest start for functional heating:
– Cement screed: 21 days after laying
– Anhydrite screed 7 days after laying

Begin 20 °C - 25 °C flow temperature and maintain for 3 days. Then set maximum design temperature and maintain for 4 days. Flow temperature can be regulated by controlling the heat generator. Turn the protective cap anticlockwise to open valve or turn RTL head to Position 5.

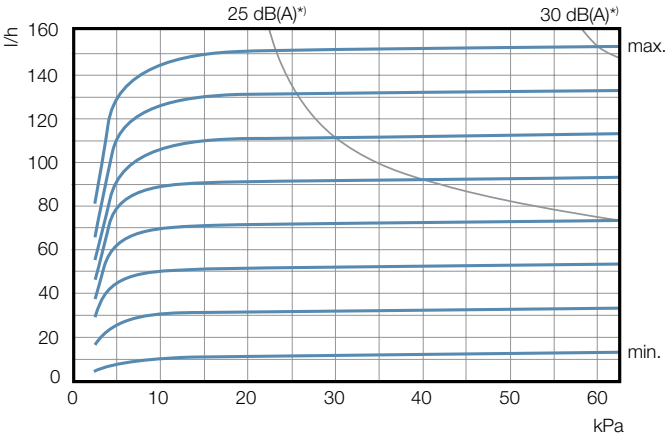
Refer to the screed manufacturer's information!

Do not exceed maximum floor temperature at the heating pipes:
– Cement and anhydrite screed: 55 °C
– Poured asphalt screed: 45 °C
– according to screed manufacturer's technical advice!

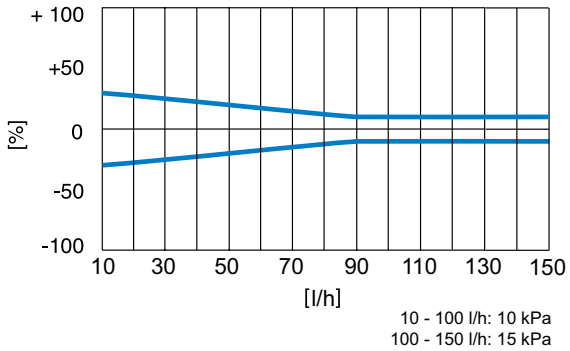
Settings

Number on dial	0	1	2	3	4	5
Return temperature t_R [°C]	0	10	20	30	40	50
Return temperature t_R [°F]	32	50	68	86	104	122

Technical data – RTL Eclipse with automatic flow limitation



Lowest flow tolerances



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

Setting	1	I	I	I	5	I	I	I	I	10	I	I	I	I	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 bis 90 l/h.

Setting values with different radiator performances and system differential temperatures

$\dot{Q}$ [W]	200	250	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000	2200	2400	2600
Δt [K]	l/h																	
5	3	4	5	7	9	10	12	14										
8	2	3	3	4	5	7	8	9	10	11	13	15						
10	2	2	3	3	4	5	6	7	8	9	10	12	14					
15	1	1	2	2	3	3	4	5	5	6	7	8	9	10	12	13	14	15

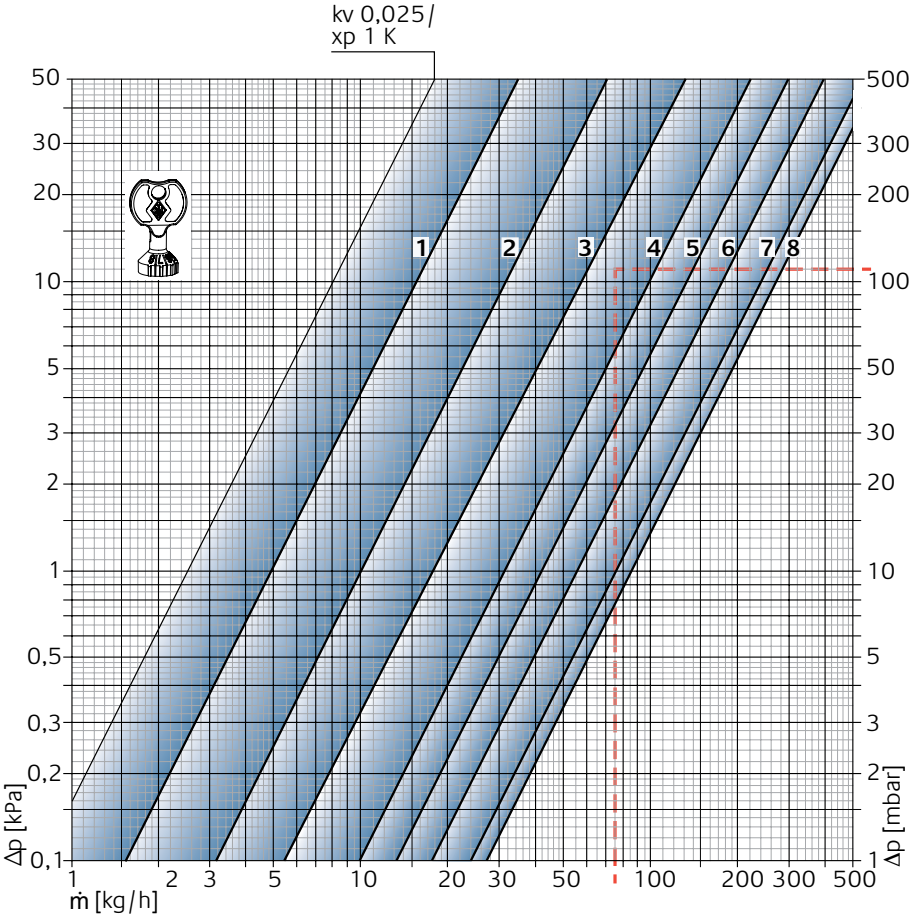
Δp min. 10 - 100 l/h = 10 kPa
Δp min. 100 - 150 l/h = 15 kPa

Q = Radiator performance
Δt = System differential temperature
Δp = Differential pressure

Sample:
Q = 1000 W, Δt = 8 K
Einstellwert: 11 (=110 l/h)

Technical data – RTL V-exact II with stepless precision presetting

Diagram, valve body with thermostatic head
P-band [xp] **2,0 K**



Thermostatic radiator valve (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	
Kvs	0,049	0,102	0,185	0,313	0,420	0,565	0,740	0,860	1
Flow tolerance ± [%]	20	18	16	14	12	10	10	10	

Kv/Kvs = m3/h at a pressure drop of 1 bar.

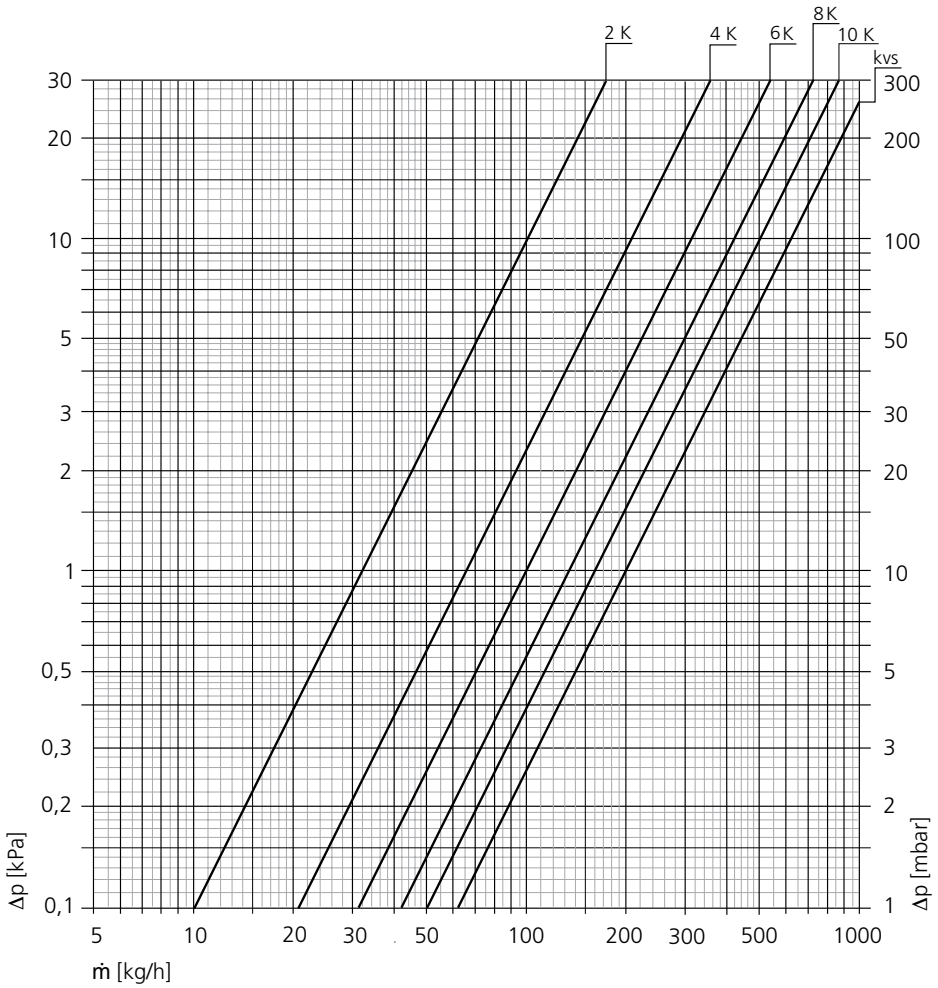
Sample calculation
Target:
Setting range

Given:
Heat flow Q = 1308 W
Temperature spread ΔT = 15 K (55/40 °C)
Pressure loss, thermostatic valve ΔpV = 110 mbar

Solution:
Mass flow m = Q / (c · ΔT) = 1308 / (1,163 · 15) = 75 kg/h

Setting range from Diagram: 4

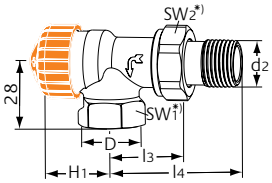
Technical data – RTL without presetting



Controller with valve body (axial, straight)

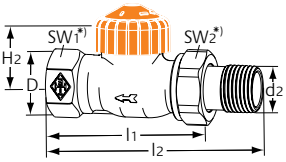
DN 15 (1/2”)	Kv P-band xp [K]					Kvs	Permitted differential pressure at which the return temperature limiter still closes Δp [bar]
	2	**4**	**6**	**8**	**10**	2,00	1
	0,32	0,66	1,00	1,34	1,60		

Articles – RTL with Eclipse automatic flow limitation



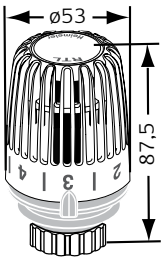
Axial

DN	D	d2	l3	l4	H1	Flow range [l/h]	EAN	Article No
15 (1/2”)	Rp1/2	R1/2	29	58	21,5	10-150	4024052931712	9113-02.000



Straight

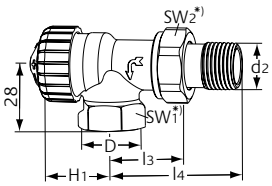
DN	D	d2	l1	l2	H2	Flow range [l/h]	EAN	Article No
15 (1/2”)	Rp1/2	R1/2	66	95	21,5	10-150	4024052931910	9114-02.000



RTL Thermostatic head for reverse-flow temperature
white RAL 9016. With heat transfer piece expecially for thermostatic radiator valves.

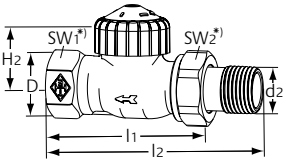
Setting range	EAN	Article No
0 °C - 50 °C	4024052595112	6510-00.500

Articles – RTL with V-exact II stepless precision presetting



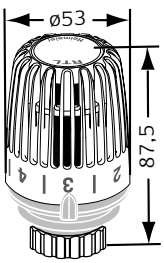
Axial

DN	D	d2	l3	l4	H1	Kv p-band max. 2 K	Kvs	EAN	Article No
15 (1/2”)	Rp1/2	R1/2	29	58	21,5	0,025 – 0,670	0,86	4024052899111	9103-02.000



Straight

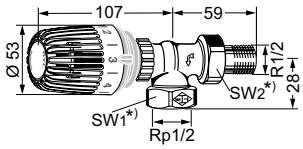
DN	D	d2	l1	l2	H2	Kv p-band max. 2 K	Kvs	EAN	Article No
15 (1/2”)	Rp1/2	R1/2	66	95	21,5	0,025 – 0,670	0,86	4024052899319	9104-02.000



RTL Thermostatic head for reverse-flow temperature
white RAL 9016. With heat transfer piece expecially for thermostatic radiator valves.

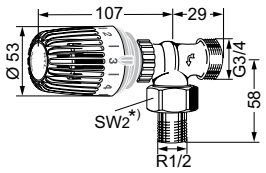
Setting range	EAN	Article No
0 °C - 50 °C	4024052595112	6510-00.500

Articles - RTL without presetting incl. RTL thermostatic head



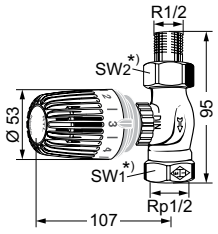
Axial

Connection	Kvs	EAN	Article No
R1/2	2,00	4024052285716	9173-02.800



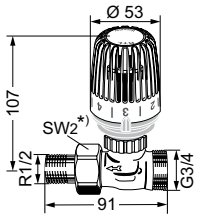
Axial

Connection	Kvs	EAN	Article No
G3/4	2,00	4024052285013	9153-02.800



Straight

Connection	Kvs	EAN	Article No
R1/2	2,00	4024052285914	9174-02.800



Straight

Connection	Kvs	EAN	Article No
G3/4	2,00	4024052285112	9154-02.800

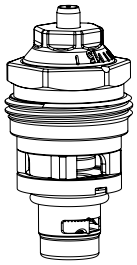
*) SW1: 27 mm; SW2: 30 mm

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

Kvs = m^3/h at a pressure drop of 1 bar and fully open valve.

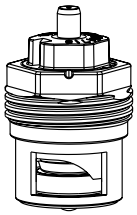
Attention: The RTL return temperature limiter without presetting is constructed from a special valve body and sensor element. Thermostatic valve bodies cannot be used.

Accessories



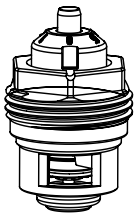
Thermostatic insert
Eclipse with automatic flow limitation
for thermostatic valve bodies
with II+ marking, from 2015.

Retrofitting/ Replacement inserts For DN valve	EAN	Article No
10, 15, 20	4024052940912	3930-02.300



Thermostatic insert
V-exact II with stepless precision presetting
for thermostatic valve bodies
with II marking, from 2012 and II+ marking, from 2015.

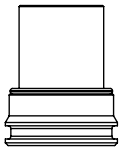
Retrofitting/ Replacement inserts For DN valve	EAN	Article No
10, 15, 20	4024052841417	3700-02.300



Thermostatic insert
V-exakt with precision presetting
for thermostatic valve bodies
with boss marking, from 1994 to end of 2011. With yellow label.
Also suitable for reversed flow direction.

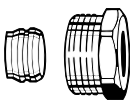
Retrofitting/ Replacement inserts For DN valve	EAN	Article No
10, 15	4024052737611	3502-24.300
(also for DN 20 V-exakt valve bodies)		

Note:
After retrofitting to thermostatic inserts with presetting the appropriate RTL thermostatic head Article No 6510-00.500 has to be used.



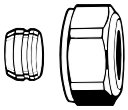
Replacement heat transfer piece
for RTL thermostatic head 6510-00.500.

	EAN	Article No
	4024052952113	6510-00.433



Compression fitting
for copper or precision steel pipe according to DIN EN 1057/10305-1/2.
Internal thread connection Rp1/2.
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	EAN	Article No
15	4024052175017	2201-15.351
16	4024052175116	2201-16.351

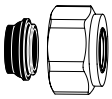


Compression fitting
for copper or precision steel pipe according to DIN EN 1057/10305-1/2.
Connection external thread G 3/4 according to DIN EN 16313 (Eurocone).
Metal-to-metal joint. Brass nickel-plated.
With a pipe wall thickness of 0.8-1 mm insert supporting sleeves. Heed pipe manufacturer's technical advice.

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

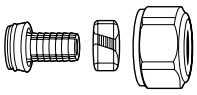
Support sleeve
for copper or precision steel pipe with a 1 mm wall thickness.
Brass.

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 copper or precision steel pipe according to DIN EN 1057/10305-1/2.
Connection external thread G 3/4 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

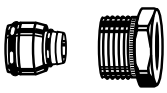


Compression fitting
for plastic pipe according to DIN 4726, ISO 10508.
PE-X: DIN 16892/16893,
EN ISO 15875; PB: DIN 16968/16969.
Connection external thread G 3/4 according to DIN EN 16313 (Eurocone).
Nickel plated brass.

Ø Pipe	EAN	Article No
14x2	4024052134618	1311-14.351
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 external thread G 3/4 according to DIN EN 16313 (Eurocone).
Nickel-plated brass.

Ø Pipe	EAN	Article No
16x2	4024052137312	1331-16.351

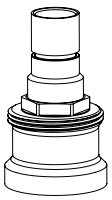


Compression fitting
for Alu/PEX multi-layer pipe according to DIN 16836. Internal thread connection Rp 1/2. Nickel-plated brass.

Ø Pipe	EAN	Article No
16x2	4024052138616	1335-16.351

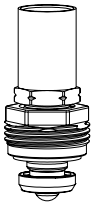
RTL thermostatic head
As spare part for return temperature limiter RTL without presetting.

Colour	EAN	Article No
white RAL 9016	4024052275311	6500-00.500



Spindle extension for RTL
Brass, nickel-plated.

L	EAN	Article No
20	4024052500215	9153-20.700



Insert for RTL
Since 2012 (II marking on the valve body). With 25 mm brass sleeve.

	EAN	Article No
	4024052909711	1305-02.300

3400-18.483 EN RTL ed.3 01.2023