

Multibox Mini



Floor heating controllers

Compact individual room control for floor heating systems

Multibox Mini

Multibox Mini is used for decentralized control of floor or wall heating systems or combined floor/radiator heating systems. For out-of-true installation offsetting up to 4° on each side. Cover with concealed screw connection. Adjustable fitting for all wall structures, 30 mm depth compensation.



Key features

- > **Compact design for space saving installation**
- > **Cover with concealed screw connection**
- > **For out-of-true installation offsetting up to 4° on each side**
- > **Adjustable fitting for all wall structures, 30 mm depth compensation**

Technical description

Applications:

Floor heating systems, wall heating systems, combined floor/radiator heating systems

Functions:

Multibox Mini DX:
Individual room temperature control, Presetting (V-exact II), Shut-off, Venting
Multibox Mini RTL:
Maximum limitation of the return temperature, Shut-off, Venting

Dimensions:

Valve body DN 15.
The flush box has an overall depth of 60 mm.
Flexible mounting thanks to variable spacing between flush box and cover of up to 30 mm.
The cover can compensate for slanted mounting of the flush box of up to 4° on each side.
See also Dimensions.

Pressure class:

PN 10

Temperature:

Max. working temperature: 90°C
Min. working temperature: 2°C
For all Multibox Mini models, ensure that the system supply temperature is suitable for setting up the floor heating system.
See also Information!

Setting range:

Thermostatic head DX:
6 °C to 28 °C
Return temperature limiter RTL:
0 °C to 50 °C

Pipe connection:

Pipe-side G3/4 adaptor with cone suitable for compression fittings for plastic, copper, precision steel and multi-layer pipe.

Material:

Valve body: Corrosion resistant Gunmetal
O-rings: EPDM rubber
Valve disc: EPDM rubber
Return spring: Stainless steel
Valve insert: Brass, PPS (polyphenylsulphide) and SPS (syndiotactic polystyrene)
Spindle: Niro-steel spindle with double O-ring sealing. The outer O-ring can be replaced under pressure.
Plastic parts of ABS and PA.
Sensor element: Thermostatic head DX with liquid filled sensor. Return temperature limiter (RTL) filled with an expansible medium.

Surface treatment:

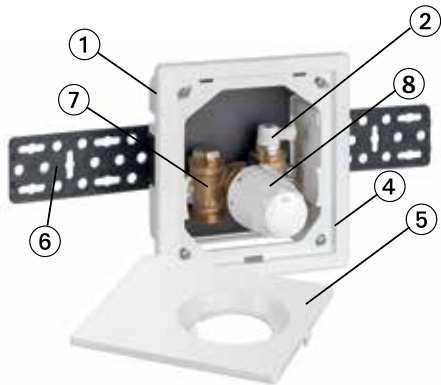
All models with cover and visible graduation cap in white RAL 9016.

Marking:

THE, flow direction arrows, II-Designation.

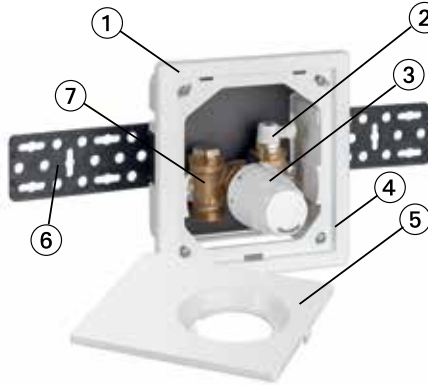
Construction

Multibox Mini DX



1. Flush box
2. Venting valve
3. Thermostatic head DX
4. Frame

Multibox Mini RTL



5. Cover plate
6. Fixing bar
7. Valve body of corrosion resistant gunmetal
8. Return temperature limiter (RTL)

Applications

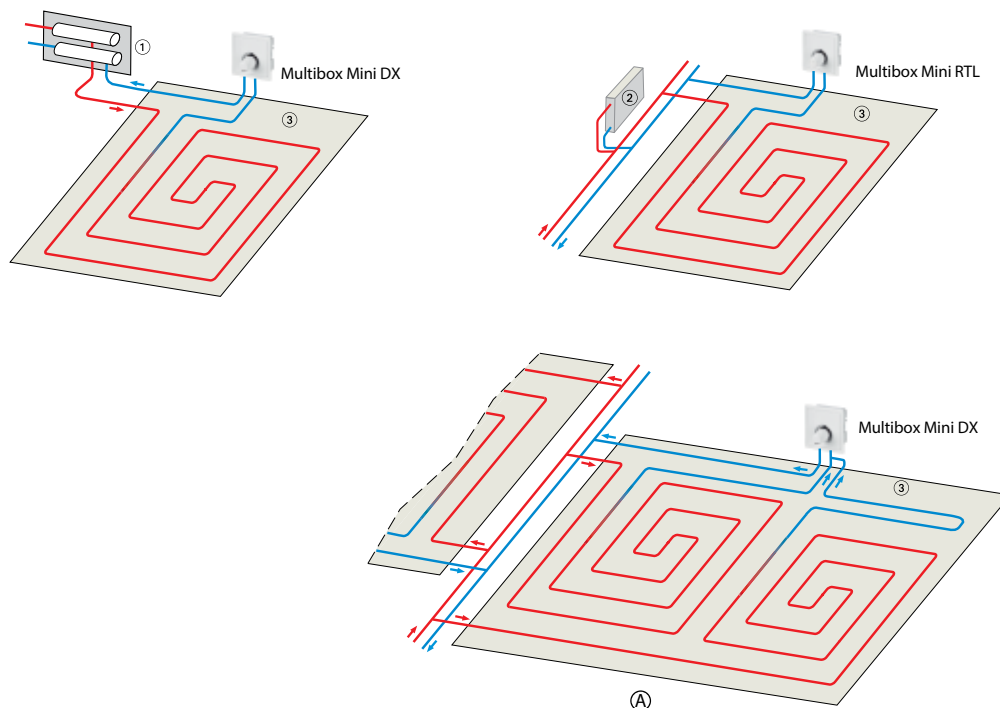
Multibox Mini DX

Multibox Mini DX is used for the individual room temperature control of, for instance, floor heating systems in association with low temperature heating systems. Multibox Mini DX is also used in wall heating systems. Use the V-exact II insert for hydraulic balancing.

Multibox Mini RTL

Multibox Mini RTL is used for maximum limitation of the return temperature with, for instance, combined floor/radiator heating systems for temperature control of floor areas. Only the return temperature is controlled.

Sample application



1. Manifold
2. Radiator
3. Floor heating area

A. Floor heating without central manifold with e.g. two equally long heating circuits per room and Multibox Mini (see Planning Information).

Temperature setting

Thermostatic head DX

| Cue number | * | 1 | 2 | 3 | 4 | 5 |
|-----------------------|---|----|----|----|----|----|
| Room temperature [°C] | 6 | 12 | 16 | 20 | 24 | 28 |

Return temperature limiter (RTL)

| Cue number | 0 | 1 | 2 | 3 | 4 | 5 |
|-------------------------|---|----|----|----|----|----|
| Return temperature [°C] | 0 | 10 | 20 | 30 | 40 | 50 |

(Opening temperature)

Function

Multibox Mini DX

From the control aspect, the thermostatic valve integrated in Multibox Mini DX is a constant proportional controller (P-controller) without any auxiliary power. It does not need any electrical connection or other outside power source.

The change of the room air temperature (controlled variable) is proportional to the change of the valve lift (correcting variable). A rise in the room air temperature e.g. from the sun's rays, results in an expansion of the liquid in the temperature sensor and it acts on the bellows. By means of the valve spindle, this cuts back on the supply of water in the floor heating circuit. The procedure is reversed given a falling room air temperature.

Multibox Mini RTL

From the control aspect, the return temperature limiter integrated in Multibox Mini RTL is a constant proportional controller (P-controller) without any auxiliary power. It does not need any electrical connection or other outside power source.

The temperature change of the fluid flowing through (controlled variable) is proportional to the change of the valve lift (correcting variable) and is transferred to the sensor by means of thermal conduction. Any rise in the return temperature due to, for instance, to lowered heating output of the floor heating system as a result of outside thermal effects causes the substance in the temperature sensor to expand and act on the diaphragm plunger. By means of the valve spindle, this cuts back on the supply of water in the floor heating circuit. The procedure is reversed given a falling fluid temperature. The valve opens when the set limiting figure is exceeded.

Information

Planning notes

- **For all Multibox Mini models, ensure that the system supply temperature is suitable for setting up the floor heating system.**
- **All Multibox Mini models are to be connected to the return pipe at the end of the floor heating circuit. Heed direction of flow (see Examples of use).**
- Depending on piping pressure loss, all Multibox Mini models are suitable for heating areas up to approx. 20 m².
- The length of 12 mm internal diameter pipe in any heating circuit should not exceed 100 m.
- With heating areas >20 m² and/or pipe lengths >100 m, a T-piece, for instance, should be used to connect two equally long heating circuits to the Multibox Mini. (see Examples of use).
- To ensure low-noise system operation, differential pressure over the valve should not exceed 0.2 bar.
- The floor heating pipe is to be laid spirally in the flooring screed (see Examples of use).
- The set value of the RTL should not be below ambient temperature - otherwise it will not open.

Thermal fluid

To stop any damage and scale in hot water heating systems, the composition of the thermal fluid is to conform to VDI Directive 2035. For industrial and longdistance energy systems, see applicable codes VdTÜV and 1466/AGFW FW 510.

Mineral oil in the thermal fluid and/or all kinds of lubricants containing mineral oil lead to considerable swelling and, in most cases, to the failure of EPDM seals.

When using nitrite-free antifreeze and anti-corrosive based on ethylene glycol, technical advice – especially on additive concentration – is to be taken from the anti-freeze/anti-corrosive manufacturer's documentation.

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

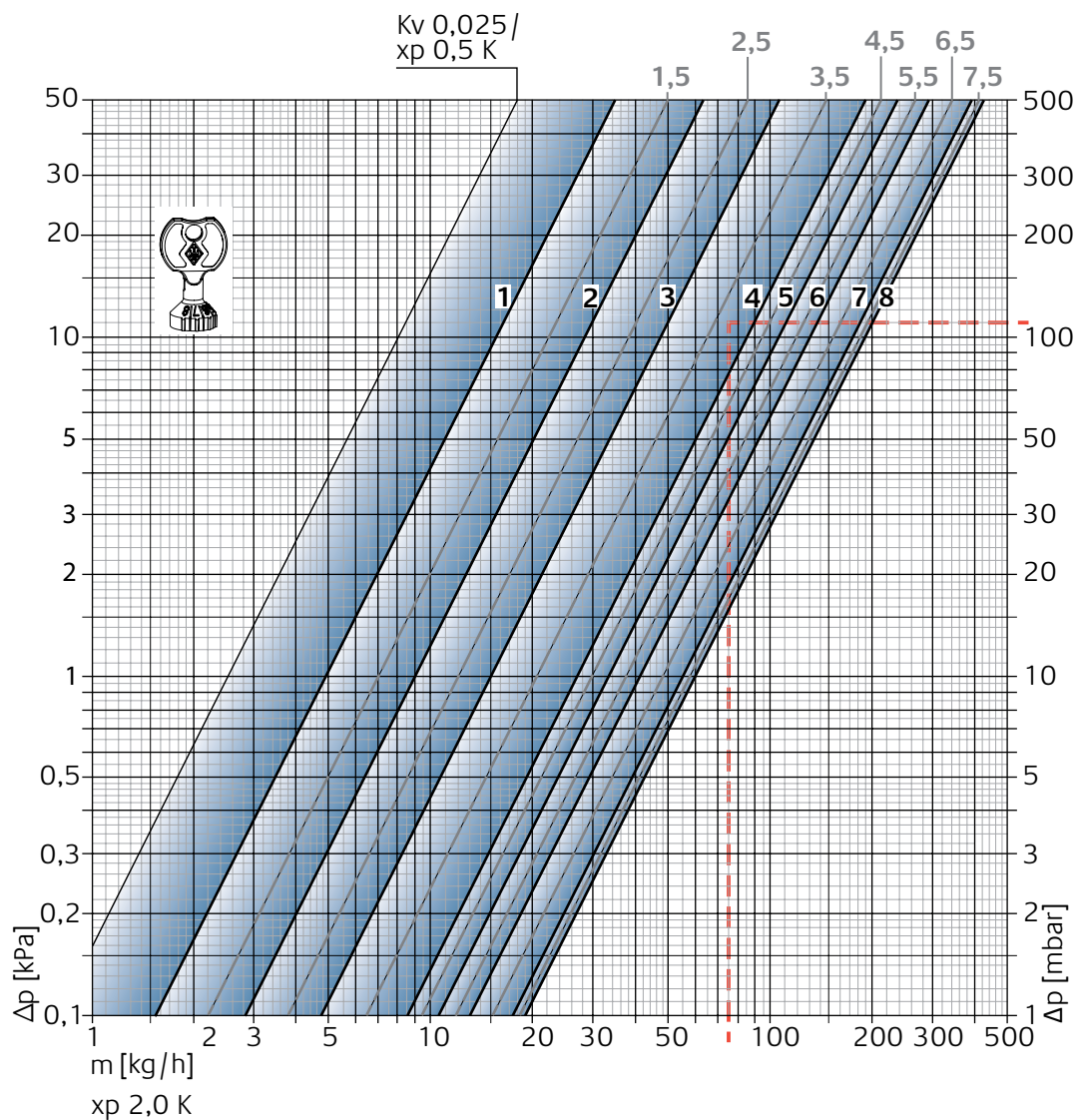
Begin 20 °C - 25 °C flow temperature and maintain for 3 days. Then set maximum design temperature and maintain for 4 days. Flow temperature can be regulated by controlling the heat generator. Turn the protective cap anticlockwise to open valve or turn RTL head to Position 5.

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!

Technical data – Multibox Mini DX



| Valve body with thermostatic head | | Presetting | | | | | | | |
|-----------------------------------|----------|------------|-------|-------|-------|-------|-------|-------|-------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| P-band [xP] 1.0K | Kv-value | 0,049 | 0,082 | 0,130 | 0,215 | 0,246 | 0,303 | 0,335 | 0,343 |
| P-band [xP] 2.0K | Kv-value | 0,049 | 0,090 | 0,150 | 0,265 | 0,330 | 0,409 | 0,560 | 0,600 |
| Kvs | | 0,049 | 0,102 | 0,185 | 0,313 | 0,332 | 0,518 | 0,619 | 0,670 |

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

Sample calculation

To be found:

Setting range

Given:

Heat flow $Q = 1308 \text{ W}$

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

Pressure loss Multibox Mini DX $\Delta p_V = 110 \text{ mbar}$

Solution:

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

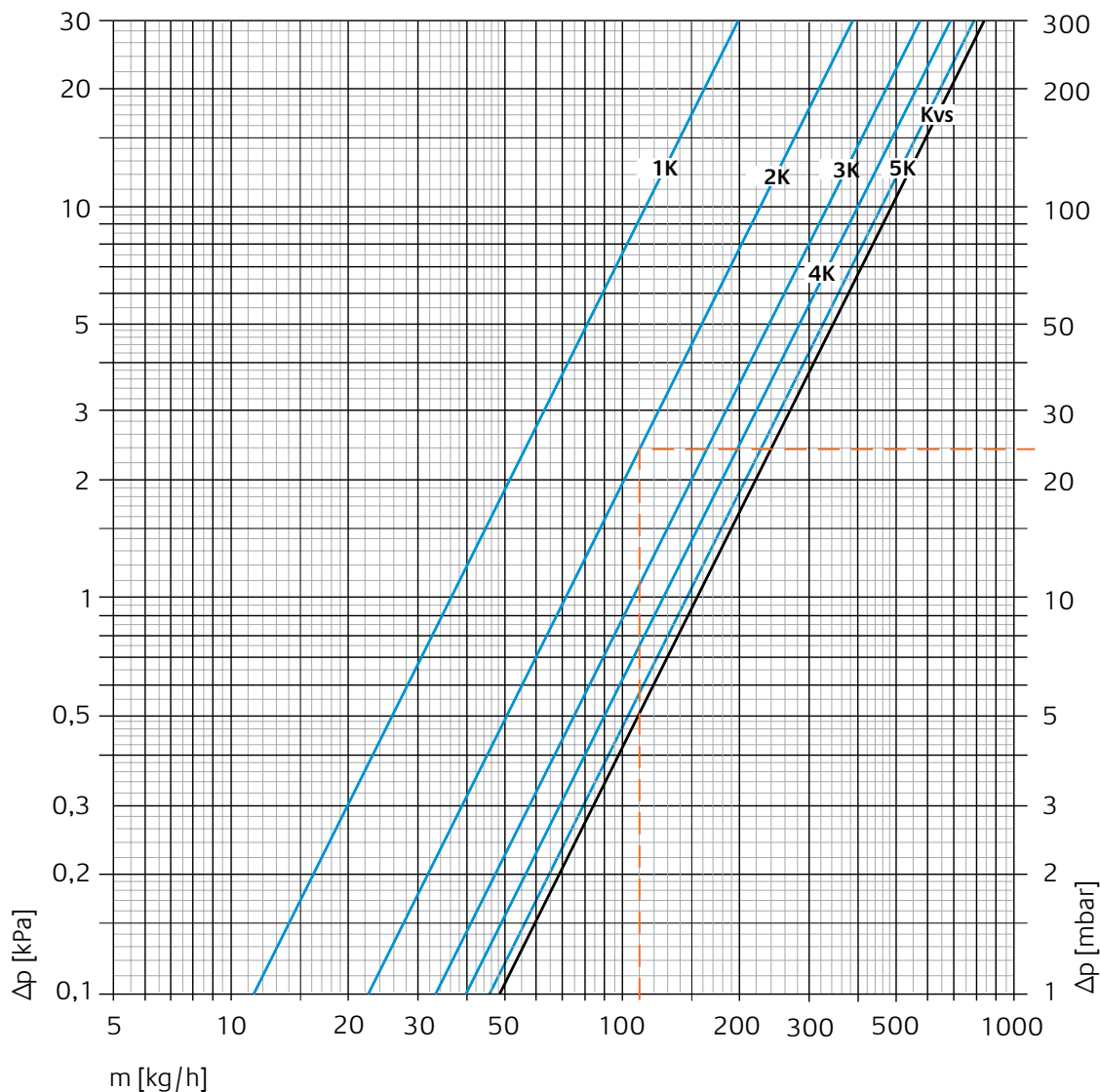
Setting range from Diagram:

With P-band **max. 2.0 K**: 4

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

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

Technical data – Multibox Mini RTL



| Controller with valve body | Kv-value Multibox Mini RTL | | | | | Kvs |
|----------------------------|-------------------------------|------|------|------|------|------|
| DN 15 | P-band xp [K] | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 1,55 |
| | 0,36 | 0,72 | 1,05 | 1,29 | 1,44 | |

$K_v/K_{vs} = m^3/h$ at a pressure drop of 1 bar.

Sample calculation

To be found:

Preset figure Multibox Mini RTL

Given:

Thermal flux $Q = 1025 \text{ W}$

Temperature spread $\Delta t = 8 \text{ K}$ (44/36° C)

Pressure loss Multibox Mini RTL $\Delta p_v = 24 \text{ mbar}$

Solution:

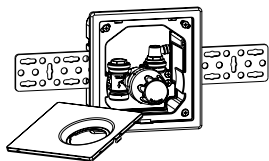
Mass flow $m = Q / (c \cdot \Delta t) = 1025 / (1,163 \cdot 8) = 110 \text{ kg/h}$

P-band from diagram: 2

$$C_v = \frac{K_v}{0,86}$$

$$K_v = C_v \cdot 0,86$$

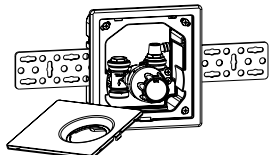
Articles



Multibox Mini DX

with thermostatic valve

| Colour | EAN | Article No |
|---|---------------|-------------|
| Cover and thermostatic head DX white RAL 9016 | 4024052907311 | 9305-00.800 |

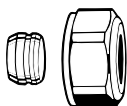


Multibox Mini RTL

with return temperature limiter (RTL)

| Colour | EAN | Article No |
|--|---------------|-------------|
| Cover and RTL thermostatic head white RAL 9016 | 4024052907410 | 9304-30.800 |

Accessories



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. Nickel-plated brass. With a pipe wall thickness of 0.8-1 mm insert supporting sleeves. Heed pipe manufacturer's technical advice.

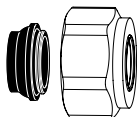
| Ø Pipe | EAN | Article No |
|--------|---------------|-------------|
| 12 | 4024052214211 | 3831-12.351 |
| 15 | 4024052214617 | 3831-15.351 |
| 16 | 4024052214914 | 3831-16.351 |
| 18 | 4024052215218 | 3831-18.351 |



Support sleeve

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

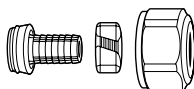
| Ø Pipe | L | EAN | Article No |
|--------|------|---------------|-------------|
| 12 | 25,0 | 4024052127016 | 1300-12.170 |
| 15 | 26,0 | 4024052127917 | 1300-15.170 |
| 16 | 26,3 | 4024052128419 | 1300-16.170 |
| 18 | 26,8 | 4024052128815 | 1300-18.170 |



Compression fitting

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



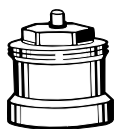
Compression fitting

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

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

Nickel-plated brass.

| Ø Pipe | EAN | Article No |
|--------|---------------|-------------|
| 16x2 | 4024052137312 | 1331-16.351 |



Spindle extension for DX thermostatic head with Multibox Mini DX

when maximum installation depth exceeded.

| L | EAN | Article No |
|----------------------------|---------------|-------------|
| Brass nickel-plated | | |
| 20 | 4024052528813 | 2201-20.700 |
| 30 | 4024052528912 | 2201-30.700 |
| Plastic, black | | |
| 15 | 4024052553310 | 2001-15.700 |
| 30 | 4024052165018 | 2002-30.700 |

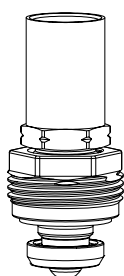


Spindle extension for RTL thermostatic head with Multibox Mini RTL

when maximum installation depth exceeded.

Brass nickel-plated.

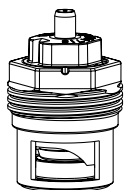
| L | EAN | Article No |
|----|---------------|-------------|
| 20 | 4024052500215 | 9153-20.700 |



Replacement insert for Multibox Mini RTL from 08.2013

for valve bodies with II-marking.

| EAN | Article No |
|---------------|-------------|
| 4024052909711 | 1305-02.300 |



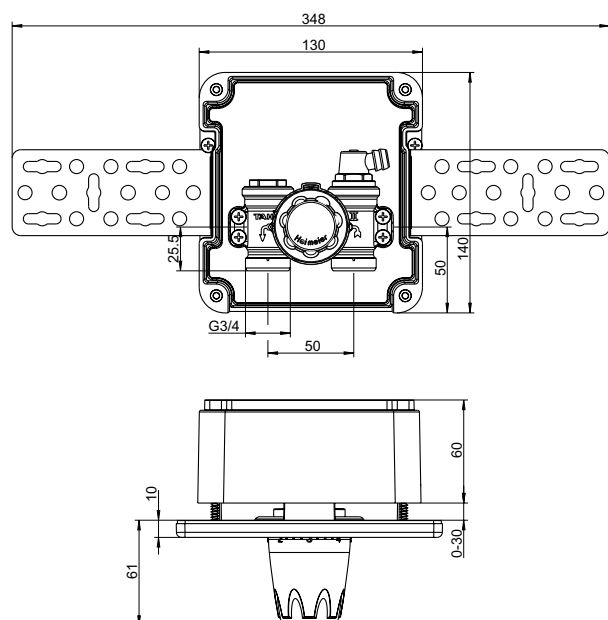
V-exact II replacement insert for Multibox Mini DX from 08.2013

for valve bodies with II-marking.

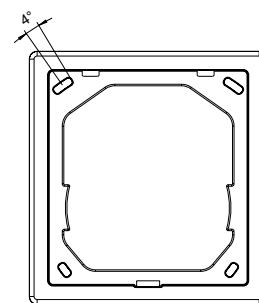
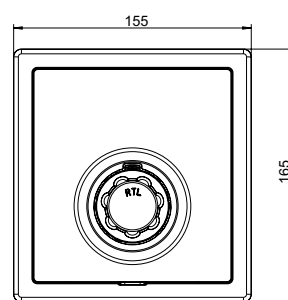
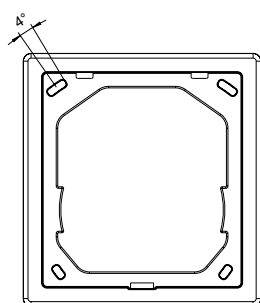
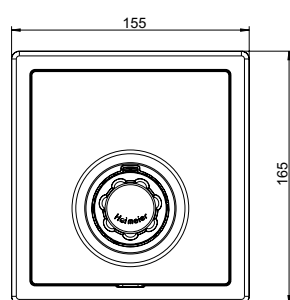
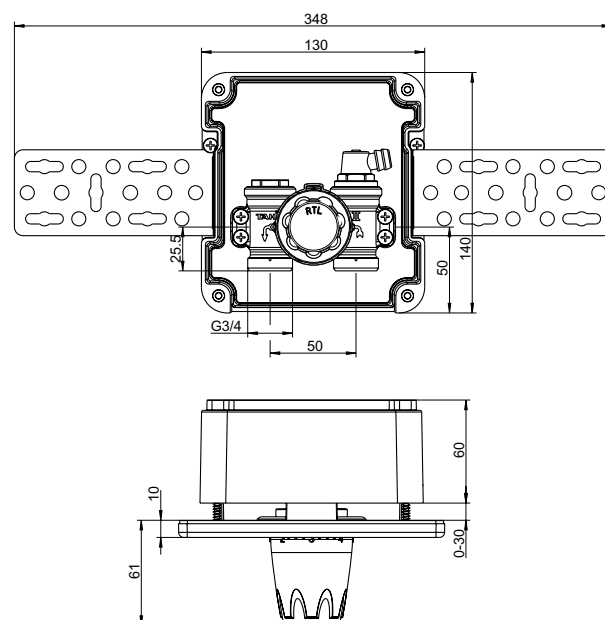
| EAN | Article No |
|---------------|-------------|
| 4024052841417 | 3700-02.300 |

Dimensions

Multibox Mini DX



Multibox Mini RTL



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