



### “Unibox” individual room temperature control and limitation of return temperature in surface heating systems

Technical information

#### Tender specification:

- Oventrop “Unibox” for surface heating systems
- for temperature balance of floor or wall surfaces by limiting the return temperature or
  - for individual room temperature control and limitation of return temperature

Max. working temperature: 100°C

Max. working pressure: 10 bar

Max. differential pressure: 1 bar

Depth: 57 mm

Installation set “**Unibox T**” for individual room temperature control with thermostatic valve (room temperature control) in surface heating systems consisting of:

Wall box unit with presettable thermostatic valve, integrated deaeration, flushing valve and cover plate; with thermostat “Uni LH” with ‘0’ setting, valve connection 3/4” for Oventrop compression fittings.

Temperature range: 7-28°C (room temperature)

0 = Complete shut off

\* = about 7°C, frost protection symbol

1 = about 12°C

2 = about 16°C

3 = about 20°C

4 = about 24°C

5 = about 28°C

The minor graduations between the figures 2-4 represent a change of the room temperature of about 1°C.

Item nos.: see table

Installation set “**Unibox RTL**” for temperature limitation of heating surfaces with return temperature limiter consisting of:

Wall box unit with RTLH valve (valve insert with double disc), integrated deaeration, flushing valve and cover plate; with thermostat “Uni RTLH” with ‘0’ setting, valve connection 3/4” for Oventrop compression fittings.

Temperature range: 10-40°C factory setting (return temperature) may be increased to 50°C by cancelling the limitation (40°C).

1 = about 10°C

2 = about 20°C

3 = about 30°C

4 = about 40°C

The minor graduations between the figures represent a change of the return temperature of about 5°C.

Item nos.: see table

Installation set “**Unibox plus**” for individual room temperature control with thermostatic valve and for temperature limitation of heating surfaces with return temperature limiter consisting of:

Wall box unit with presettable thermostatic valve and RTLH valve (valve insert with double disc), integrated deaeration, flushing valve and cover plate; with thermostats “Uni LH” and “Uni RTLH” with ‘0’ setting, valve connection 3/4” for Oventrop compression fittings.

Temperature range: 7-28°C (room temperature)

10-40°C factory setting (return temperature) may be increased to 50°C by cancelling the limitation (40°C).

Item nos.: see table

Installation set “**Unibox vario**” as basic model for temperature limitation of heating surfaces with return temperature limiter consisting of:

Wall box unit with RTLH valve (valve insert with double disc) and presettable AV6 valve insert, integrated deaeration, flushing valve and cover plate; with thermostat “Uni RTLH” with ‘0’ setting, valve connection 3/4” for Oventrop compression fittings.

Temperature range: 10-40°C factory setting (return temperature) may be increased to 50°C by cancelling the limitation (40°C).

Item no. 102 26 38 (white)

For room temperature control, the following items have to be ordered separately:

- Thermostat with remote control “Uni LH” (see catalogue “Products”, page 13.23)

or

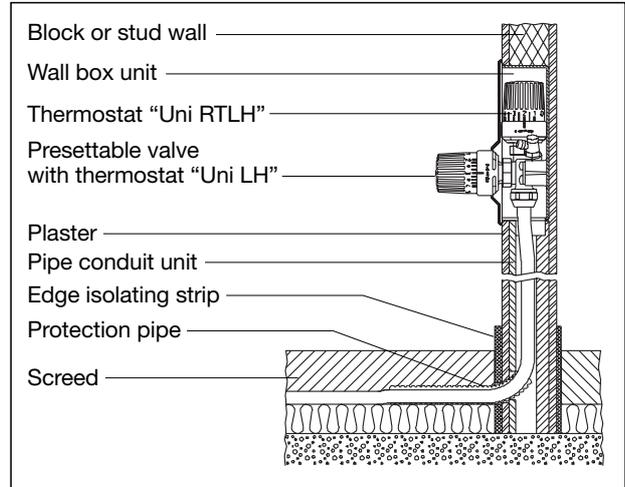
- **Room thermostat and actuator**

(see catalogue “Products”, pages 1.12, 1.13)

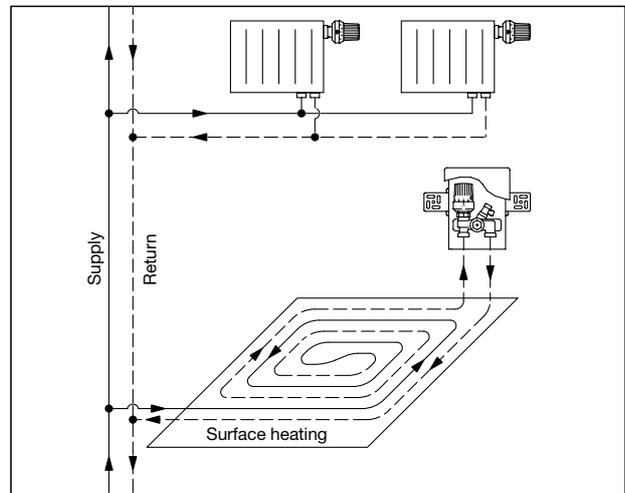
**Pipe conduit unit**, depth 100 cm, completely insulated, includes fixing material for “Unibox”, depth 57 mm:

Item no. 102 26 50

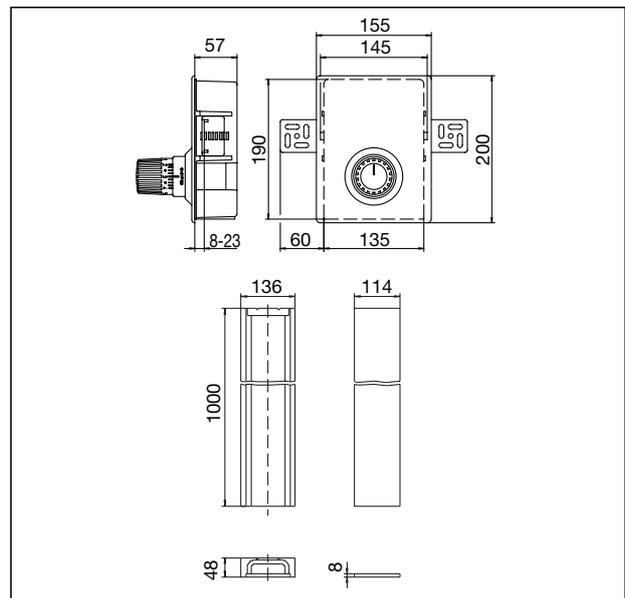
Compression fittings (see catalogue “Products”, page 1.45)



“Unibox plus”



Installation sketch individual room temperature control and limitation of return temperature



Dimensions “Unibox”, depth 57 mm and pipe conduit unit

### Application:

The different models of the “Unibox” are suitable for the operation of surface heating in a room with a heating surface up to 20 m<sup>2</sup>. They are designed for the connection of one heating circuit. Two circuits are required for larger heating surfaces. In this case, the pipes must be of the same length and have to be connected with the help of a T-piece or the “h” fitting, item no. 102 87 50 and the connection fitting, item no. 101 63 04 (see installation sketch on page 4) before entering the “Unibox”. The pressure loss can be reduced with the help of a larger sized return pipe. When installing heating pipes with an inner diameter of 12 mm, a pipe length of 100 m per heating circuit should not be exceeded. When laying the pipe, it is to be observed that the supply and the return pipe are alternately laid side by side. See e.g. spiral laying in the installation sketches. The examples of calculation mentioned below show some examples of laying.

The “Unibox RTL” allows the temperature limitation of heating surfaces. The room temperature is controlled via the radiators. Installation is carried out in combination with a radiator heating with a max. flow temperature of 70°C.

The “Unibox T” allows the control of the room temperature via the surface heating. It is used in combination with a low temperature heating installation with a max. flow temperature of 55°C.

The “Unibox plus” allows the individual room temperature control with a thermostatic valve and the temperature limitation of the heating surfaces with a return temperature limiter. As for the “Unibox RTL”, installation is carried out in combination with a radiator heating with a max. flow temperature of 70°C.

The “Unibox vario” is used like a “Unibox plus” when mounting a thermostat with remote control or a room thermostat and an actuator, and without these additions like a “Unibox RTL”.

### Function:

The “Unibox RTL” serves to limit the return temperature of surface heating. The “Unibox RTL” should be installed in such a position that the heating medium passes through the heating circuit first and then through the valve. On its way from the entry into the heating surface to the return temperature limiter, the heating medium cools down.

The flow is automatically controlled by the valve and the sensor element inside the thermostat “Uni RTLH”. The return temperature is set at the thermostat. The guidelines regarding heating up and initial operation are to be observed.

The temperature of the surface heating can be corrected by turning the handwheel.

Normally, the “Unibox RTL” is operated in a room with an additional radiator. The surface heating covers the basic heat demand whereas the radiator takes on the control of the room temperature.

The “Unibox T” may only be operated with a max. flow temperature of the surface heating of 55°C (low temperature heating). It offers a full individual room temperature control via the surface heating. It is recommended to install the “Unibox T” in such a position that the heating medium passes through the heating circuit first and then through the valve. This way, the automatic thermostat “Uni LH” controls the desired room temperature exactly. The hydronic balancing is carried out at the presettable valve insert.

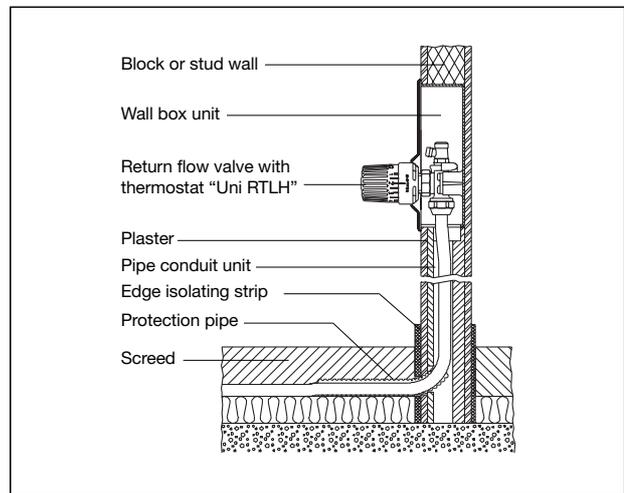
The “Unibox T” can be operated without an additional radiator provided that the heat output capacity of the surface heating is sufficient.

The “Unibox plus” serves to control the temperature of individual rooms via the surface heating and to limit the temperature of the heating surface with the help of the return temperature limiter at the same time.

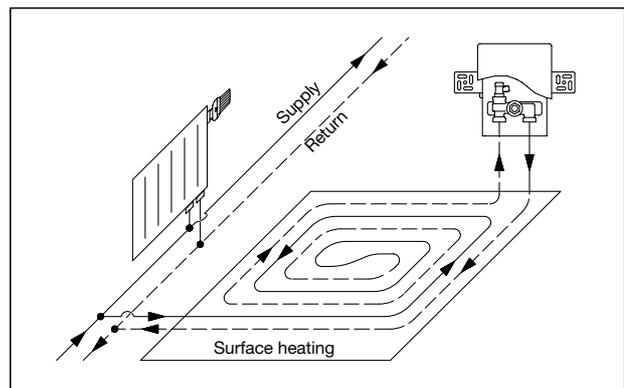
The “Unibox plus” is installed in the same position as the “Unibox RTL”. The heating medium has to pass through the heating circuit of the surface heating first and then through the valve. On its way from the entry into the heating surface to the return temperature limiter, the heating medium cools down.

The flow is automatically controlled by the valve and the sensor element inside the thermostat “Uni RTLH”.

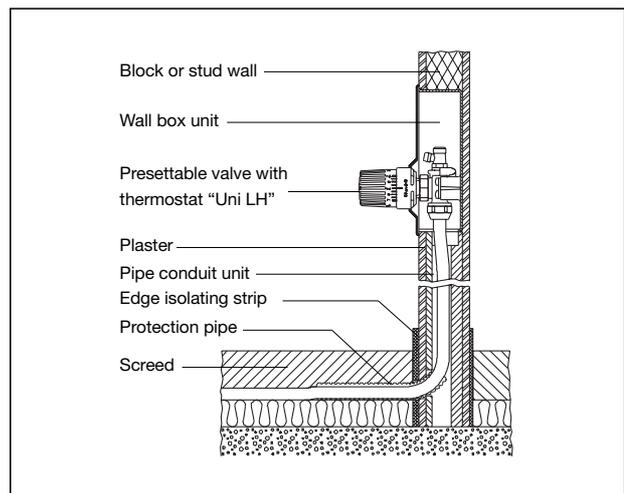
The return temperature is set at the thermostat.



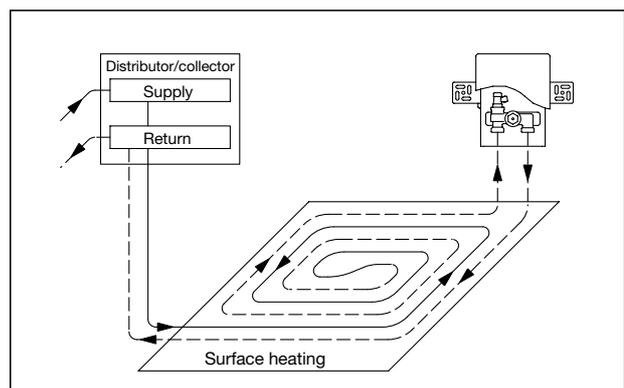
“Unibox RTL”



Installation sketch limitation of return temperature



“Unibox T”



Installation sketch individual room temperature control

The notes below regarding heating up and initial operation are to be observed.

The surface temperature can be corrected by turning the handwheel.

The automatic thermostat “Uni LH” controls the desired room temperature. The hydronic balancing is carried out at the pre-settable valve insert. The “Unibox plus” can be operated without an additional radiator, provided the heat output capacity of the surface heating is sufficient.

The “**Unibox vario**” offers the same function as the “Unibox plus” when mounting a thermostat with remote control or a room thermostat and an actuator.

The return temperature is limited with the help of the thermostat “Uni RTLH” (installation position at the front).

For use as a “Unibox vario”, return temperature control has to be added. This can be done by choosing one of the following options (to be ordered separately):

1. With room thermostat and actuator

The actuator is mounted on the vertical connection of the “Unibox vario”. (When using an electromotive actuator, the stem extension, item no. 102 26 98, is additionally required.)

The connecting cable towards the room thermostat can be led downwards out of the “Unibox vario”.

Electrical connections, especially in humid locations, must be carried out in accordance with the local Electricity Regulations and Standards.

Temperature range: 5-30°C (room temperature)  
 10-40°C factory setting (return temperature) may be increased to 50°C by cancelling the limitation (40°C).

2. With thermostat with remote control “Uni LH”

The control is mounted on the vertical valve connection inside the “Unibox vario”.

The capillary towards the room temperature sensor can be led downwards out of the “Unibox vario”. Laying through an empty pipe is advantageous.

Temperature range: 7-28°C (room temperature)  
 10-40°C factory setting (return temperature) may be increased to 50°C by cancelling the limitation (40°C).

Without these additions, control corresponds to the “Unibox RTL”. Hydronic balance can additionally be carried out with the help of the AV 6 valve insert.

Temperature range: 10-40°C factory setting (return temperature) may be increased to 50°C by cancelling the limitation (40°C).

**RTLH valve insert:**

The “Unibox RTL” and the “Unibox plus” are equipped with a valve insert with double disc. The maximum flow is reached at medium piston stroke (approx. 1.5 mm = approx. one turn of the protection cap starting from the shut off position). If the thermostat “Uni RTLH” or the protection cap are removed, the double disc provokes an automatic closing of the valve to a low residual flow. Frost protection is guaranteed, inadvertent overheating of the screed is avoided.

**Installation and assembly:**

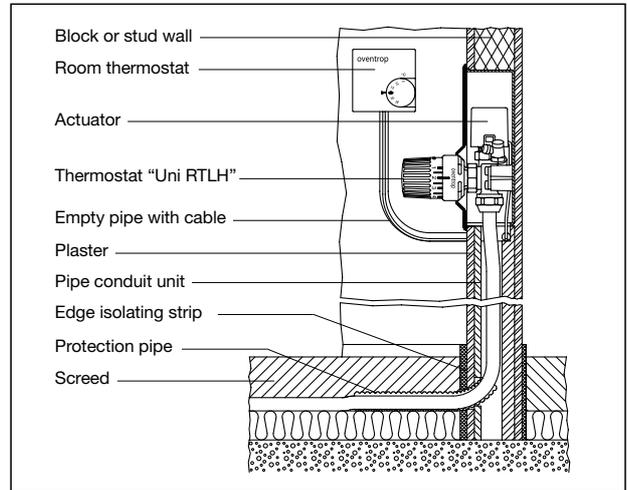
If the surface heating is installed as an underfloor heating, the lower edge of the “Unibox” should be at least 20 cm above the finished floor, the front edge should be on a level with the finished wall. The thickness of plaster and tiles has to be observed. A comfortable operation is given if it is installed at the height of light switches.

The thermostat should not be influenced by other heat sources.

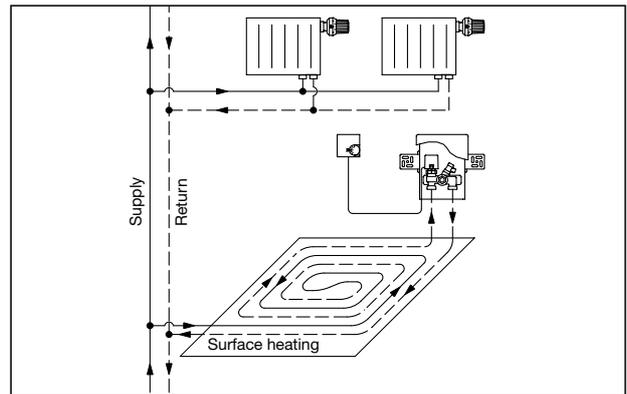
- Do not install near other heat sources, e.g. additional radiators.
- Avoid direct sunlight to the thermostat.
- Do not install at a location exposed to draught.

The wall box unit is to be installed with the hole pointing downwards. Alignment and fixing are made by use of the enclosed elbows. They can be fixed at the side of the wall box unit in different positions.

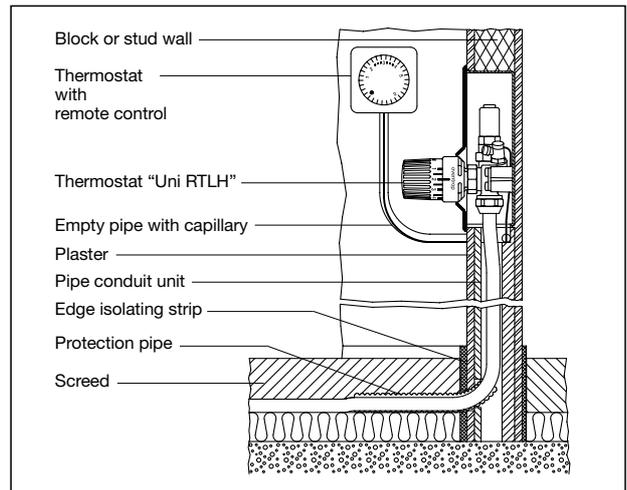
The wall box unit is sealed in the wall. The valve is protected by a cover made of corrugated cardboard.



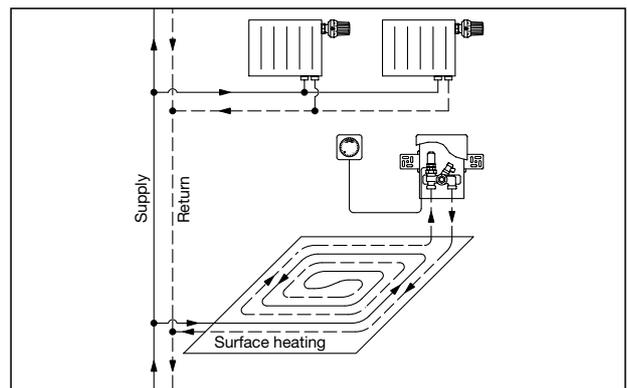
“Unibox vario” with room thermostat and actuator



Installation sketch “Unibox vario” with room thermostat and actuator



“Unibox vario” with thermostat with remote control “Uni LH”



Installation sketch “Unibox vario” with thermostat with remote control “Uni LH”

For a simple installation of the vertical pipework, place the pipe conduit unit, item no. 102 26 50, into the wall below the wall box unit, shorten if required. Later, the front of the pipe conduit unit will be under plaster.

If required, lay an empty pipe for the cable between room thermostat and actuator or respectively the capillary of the thermostat with remote control.

If the "Unibox vario" is equipped with an electric room thermostat and an actuator in bathrooms, electrical connections must be carried out in accordance with the local Electricity Regulations and Standards.

When designing the floor as a surface heating, the construction e.g. regarding thermal and sound insulation, has to comply with the valid rules, standards and regulations.

When installing the pipework, the correct sequence has to be observed to ensure a perfect function of the "Unibox":

- Provide derivation from the supply pipe of the two pipe heating system.
- Laying of the heating circuit. When installing a "Unibox" with limitation of return temperature, the pipes have to be laid spiral patterned (see installation sketch). A constant temperature distribution is achieved.
- Connection of the pipework to the "Unibox", marked direction of flow has to be observed. **Valve always behind the heating circuit.** Remove the protection cover of the "Unibox" as well as the front cover of the pipe conduit unit.
- Installation of the connecting pipe to the return pipe of the two pipe heating system.

The surface heating can be installed with any standard pipe material.

The Oventrop programme includes suitable compression fittings. The corresponding installation instructions are to be observed. **Insert the copper pipe a maximum of 5 mm deeper than the fitting.** An open ring spanner 30 mm, e.g. Oventrop item no. 140 10 91, is recommended to tighten the fittings.

The installation is filled and bled, e.g. at the valve. Then carry out leakage test and remount protection cover of the "Unibox" and front cover of the pipe conduit unit.

#### Important note for heating up:

After all plastering is finished, a heating screed complying with standards has to be laid. The concrete and anhydrite screed have to be heated up according to EN 1264-4 or ZVSHK documentations FBH-D1 to D4.

Start heating up:

- at the earliest 21 days after having laid the concrete floor
- at the earliest 7 days after having laid the anhydrite concrete floor

Heat up slowly!

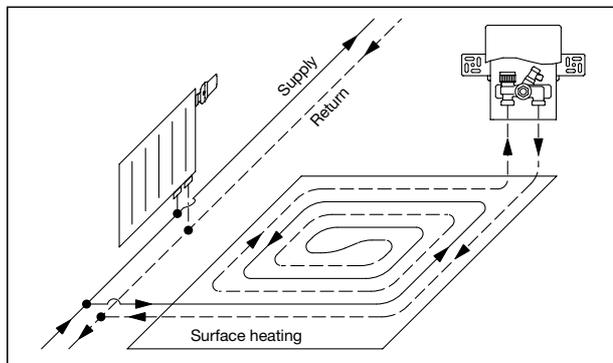
3 days with a flow temperature of about 25°C and then

4 days with a flow temperature of about 55°C

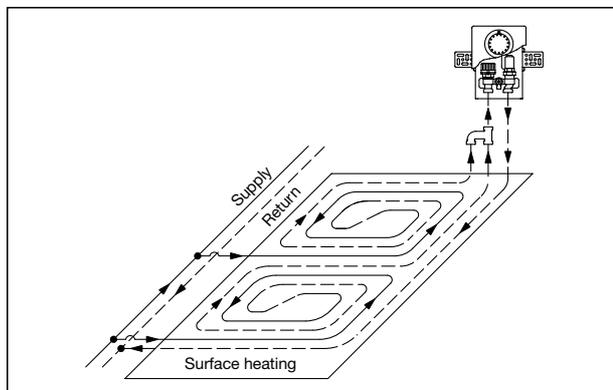
Flow temperature is only controlled by the boiler control. Open valve inserts of the "Unibox" by turning the protection cap about 1 turn. For the "Unibox plus", the thermostat "Uni RTLH" is set to position 3.

Instructions of the concrete manufacturers are to be observed. After having completed all building work, the protection cover is removed and the Oventrop thermostat "Uni LH" or "Uni RTLH" is mounted. For the "Unibox vario", mount the thermostat "Uni LH" with remote control or an actuator on the vertical valve insert.

Mount and adjust the white or chrome plated cover (front cover).



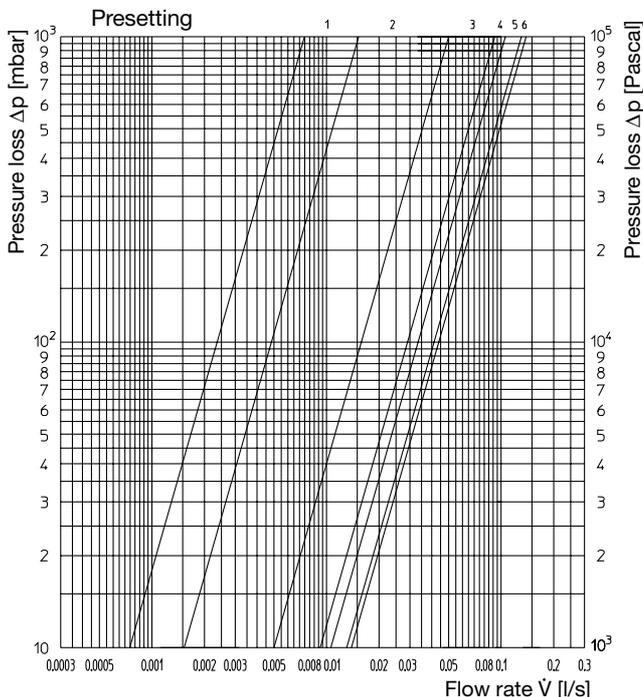
Installation sketch "Unibox vario", basic model



Installation sketch "Unibox" with two heating circuits of equal length

The different models of the "Unibox" are suitable for the operation of a surface heating in a room with a heating surface up to 20 m<sup>2</sup>. They are designed for the connection of one heating circuit. Two circuits are required for larger heating surfaces. In this case, the pipes must be of the same length and have to be connected with the help of a T-piece or the "h" fitting, item no. 102 87 50 and the connection fitting, item no. 101 63 04 before entering the "Unibox". The pressure loss can be reduced with the help of a larger sized return pipe. When installing heating pipes with an inner diameter of 12 mm, a pipe length of 100 m per heating circuit should not be exceeded. When laying the pipe, it is to be observed that the supply and the return pipe are alternately led through the screed side by side. See e.g. spiral laying in the installation sketches.

#### Pressure loss chart for "Unibox vario", basic model with two point actuator, AV 6 insert completely opened and RTLH insert at 4 K P-deviation



**Important note for putting the system into operation:**

The recommended temperature range of the thermostat “Uni RTLH” is between position 2.5 (25°C) and 4 (40°C).  
 The temperature range of the thermostat “Uni RTLH” is limited at works to position 4 to avoid any operating errors.  
 The maximum permissible concrete temperature near the heating pipes may not be exceeded:  
 – 55°C for concrete and anhydrite concrete  
 – 45°C for mastic asphalt concrete  
 – or according to the instructions of the concrete manufacturer  
 Should the “Unibox” have been installed too deep, the stem extensions (20 mm), item nos. 102 26 98 or 102 26 99, may be used.

**Examples of calculation:**

“Unibox RTL” or “Unibox plus”  
 Application: Bathroom  
 Pipe material: Composition pipe “Copipe” 16 x 2 mm  
 Conditions:  
 Room temperature: 24°C  
 Room temperature of the room below: 20°C  
 Max. heating surface temperature: 33°C  
 $R_{\lambda} = 0.01 \text{ m}^2\text{K/W}$  (tiles)  
 Set return temperature: 35°C

Laying distance [mm]	Pipe length [m]	Heating surface [m <sup>2</sup> ]	Spec. heat output [W/m <sup>2</sup> ]	Pressure loss pipework [mbar]	Flow rate [l/s]
75	100	7,5	99	26	0.0167
150	100	15	91	109	0.0258
225	89	20	74	114	0.0283
300	67	20	61	62	0.0233

“Unibox T”  
 Application: Living area  
 Pipe material: Composition pipe “Copipe” 16 x 2 mm  
 Conditions:  
 Room temperature: 20°C  
 Room temperature of the room below: 20°C  
 Max. heating surface temperature: 29°C  
 $R_{\lambda} = 0.1 \text{ m}^2\text{K/W}$  (parquet)  
 Flow temperature: 50°C

Laying distance [mm]	Pipe length [m]	Heating surface [m <sup>2</sup> ]	Spec. heat output [W/m <sup>2</sup> ]	Pressure loss pipework [mbar]	Flow rate [l/s]
75	100	7,5	85	29	0.0125
150	100	15	73	77	0.0214
225	89	20	63	87	0.0247
300	67	20	54	51	0.0211

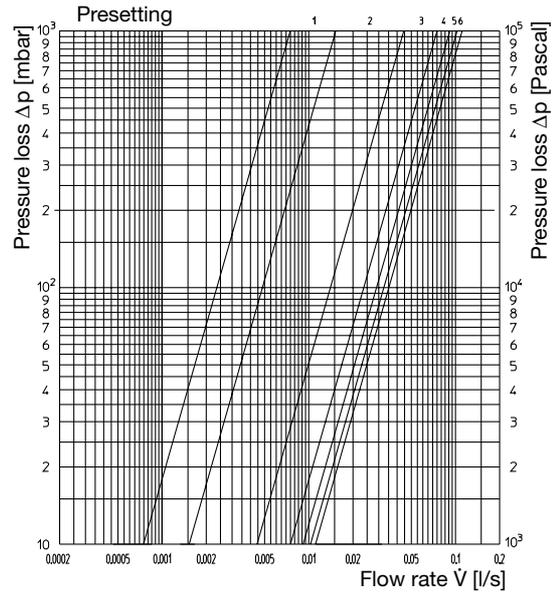
For the design of the installation it has to be observed that the pressure loss of the pipe and the valve may not exceed a sum of 300 mbar.

The models

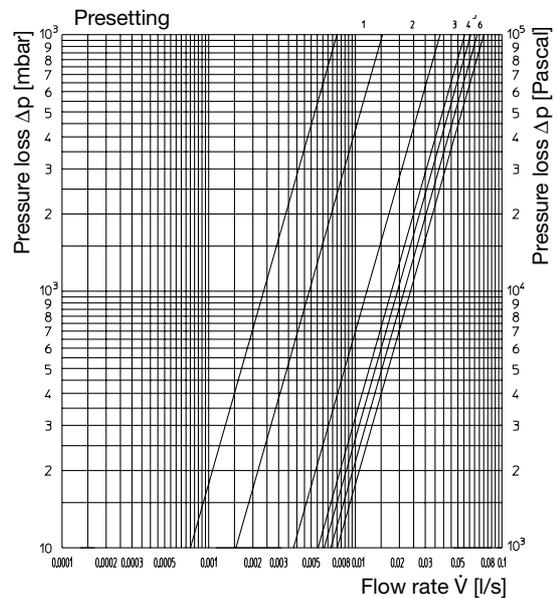
- “Unibox plus”
- “Unibox T”
- “Unibox RTL” (if temperature limitation of a heating surface and the thermostatically controlled radiator are located in the same room)

comply with the Decree for Energy Saving valid since February 2002 (EnEV § 12).

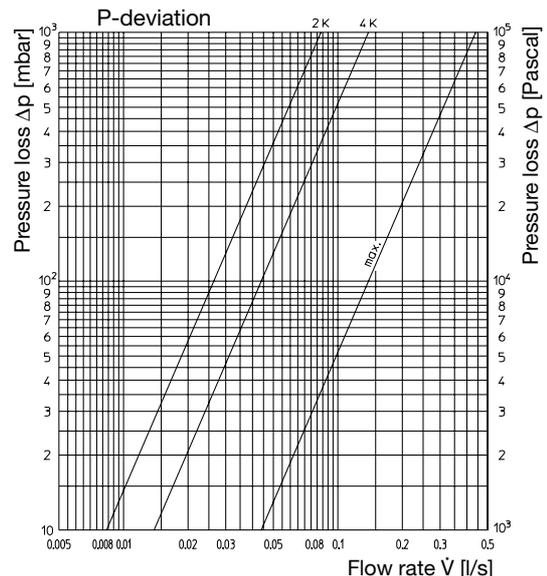
**Pressure loss chart for “Unibox plus” and “Unibox vario” with thermostat with remote control “Uni LH”, AV 6 insert at 2 K P-deviation and RTLH insert at 4 K P-deviation**



**Pressure loss chart as above, AV 6 insert at 1 K p-deviation**



**Pressure loss chart for “Unibox RTL”**



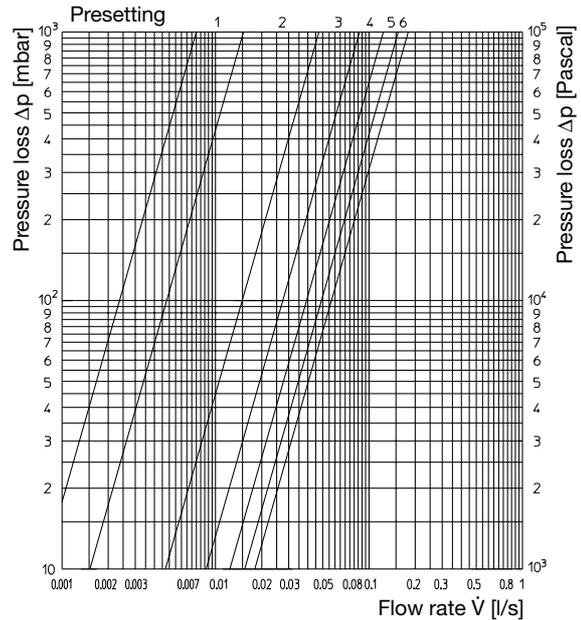
**Advantages:**

- simple installation
- stylish unit
- comfortable height for use of control
- smart optical integration into the wall
- cover plate in modern colours white RAL 9010 and chrome plated
- rotating plastic cover plate which can be fitted without screws
- the strong pipe conduit unit also serves as insulation
- suitable for the connection to any standard pipes for surface heating systems
- no auxiliary energy (current) required
- economical installation of a surface heating
- higher living comfort
- optimum control even of combined installations (surface heating/radiator connection)
- integrated deaeration
- stem extension (20 mm) available

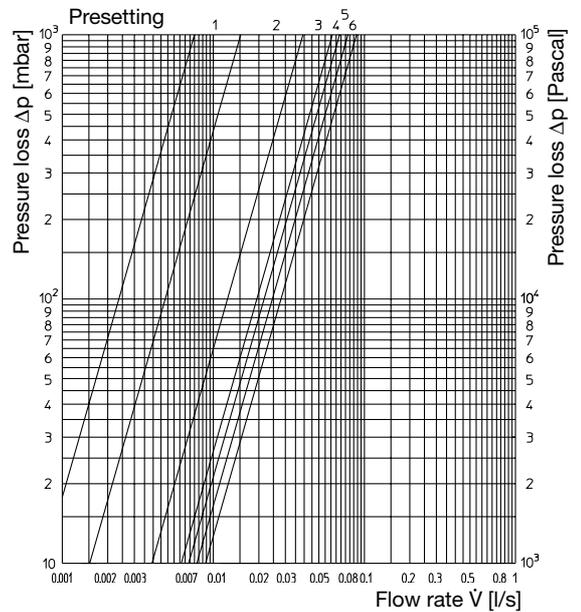
**Performance data "Unibox T" and "Unibox plus"**

Presetting	1	2	3	4	5	6
$k_v$ value at 1K P-deviation	0.055	0.141	0.221	0.247	0.28	0.32
$k_v$ value at 1.5K P-deviation	0.055	0.170	0.296	0.370	0.42	0.49
$k_v$ value at 2K P-deviation	0.055	0.170	0.313	0.446	0.56	0.65
$k_{vs}$						0.9

**Pressure loss chart for "Unibox T" at 2 K P-deviation and "Unibox plus", RTLH insert completely opened**



**Pressure loss chart for "Unibox T" at 1 K P-deviation and "Unibox plus", RTLH insert completely opened**



	Item no.	Thermostat			Cover		Visible thermostat	
		"Uni LH"	"Uni RTLH"	"Uni LH" + "Uni RTLH"	white	chrome plated	white	chrome plated
"Unibox T"	102 26 36	X			X		X	
	102 26 46	X				X		X
"Unibox RTL"	102 26 35		X		X		X	
	102 26 45		X			X		X
"Unibox plus"	102 26 37			X	X		X	
	102 26 47			X				X
"Unibox vario"	102 26 38		X		X		X	

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