

“Unibox E BV” Individual room temperature control with
bypass for underfloor heating systems without distributor/collector
according to DIN EN 1264

“Unibox RLA” Isolating box

“Floorbox” for the connection of an underfloor heating system
without distributor/collector in
multi-storey buildings

Product range



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Please also see product range “Unibox Individual room temperature control and return temperature limitation in surface heating systems”.

Summary

During the last few years, the underfloor heating system has become more and more important.

Legal requirements and increasing demands on construction physics and thermal insulation in buildings lead to a lower heat demand and thus to lower flow temperatures in the heating system.

Underfloor heating is “the” best possible solution for low temperature heating systems:

- energy-saving
- economical
- comfortable
- no air pollution
- environmentally friendly
- long service life

The individual room temperature controls working with and without auxiliary energy required in the Decree for Energy Saving are part of a modern underfloor heating system complying with DIN EN 1264 standard.

“Unibox” Underfloor heating system

The known and proven Oventrop wall box units “Unibox” are available in different models and designs.

The elegant installation sets allow an individual room temperature control with thermostatic valve (“Unibox T” / “Unibox ET”), a temperature limitation of heating surfaces with return temperature limiter (“Unibox RTL” / “Unibox E RTL”) or a combination of both (“Unibox plus” / “Unibox E plus” / “Unibox vario” / “Unibox E vario”).

New model “Unibox E BV”

The “Unibox E BV” is a new model with a patented bypass for an underfloor heating installation without distributor/collector according to DIN EN 1264 standard.

Advantages:

- comfortable individual room temperature control working without auxiliary energy (no electric smog!) according to the Decree for Energy Saving with max. flow temperatures of 55°C suitable for underfloor heating systems according to DIN EN 1264 standard
- no distributor/collector (supply/return) required (space for cabinet is not required)
- no electric installation e.g. room thermostats or actuators
- simple and intelligible operation of the room temperature controller of the “Unibox E BV” with variable adjustable bypass guaranteeing a constant minimum flow in the heating circuit (improves regulation comfort – inertia of the room temperature control is reduced and the floor temperature is maintained at a minimum setting, see page 4).
- optically balanced solution of room temperature control in modern living areas

1 Valve insert of “Unibox E BV”

2 Simple and intelligible operation of the temperature controller of the “Unibox”, analogue to the control of a radiator thermostat

3, 4 Nowadays, elegant home interiors with windows at ground level leave almost no space for radiators. The underfloor heating system without distributor/collector offers itself.

(Photo: bauhaus münchen)



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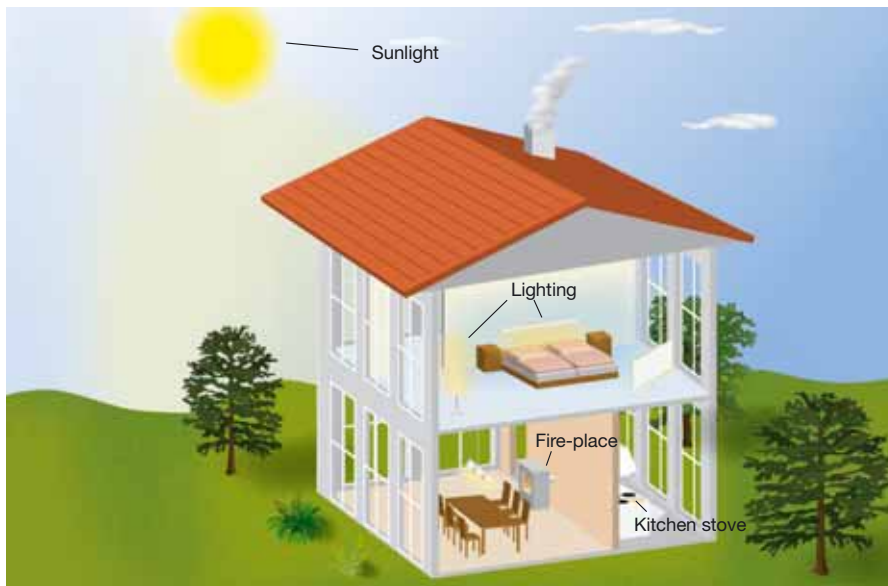
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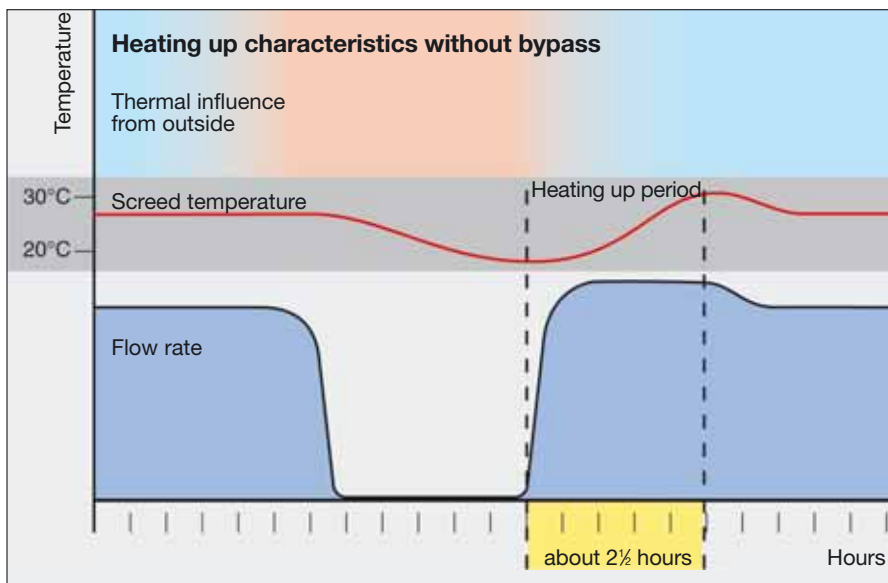
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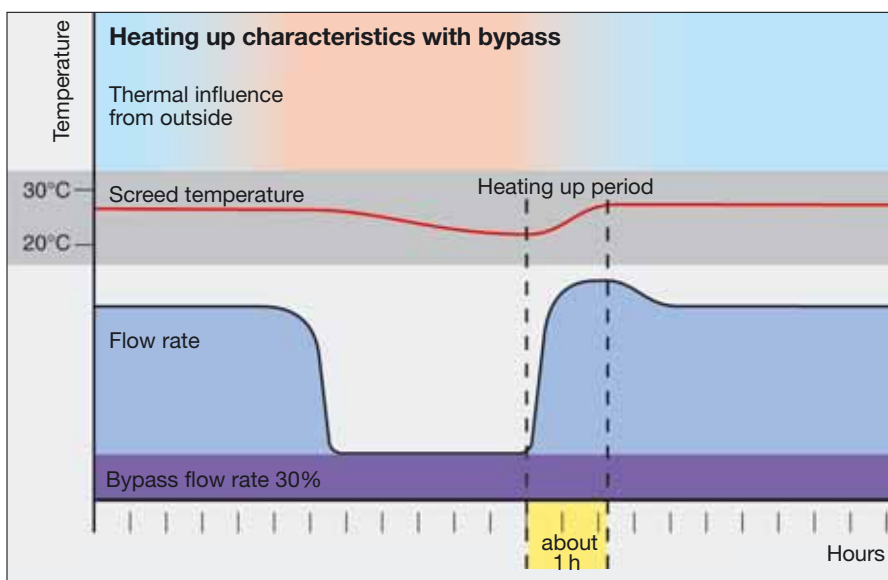
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Control capability is the capability of the heating system to react to room temperature modifications.

The inertia or regulation time thus describes the time a heating system requires from the modification of the room temperature to actually reaching the desired room temperature.

As is generally known, the legislator prescribes:

- flow temperature control building by building via a control dependent on the outer temperature
- room by room regulation by thermostatic control of the water quantity

This means in practice:

If the room temperature is increased by other heat sources, the heating system has to reduce the heat supply automatically so that the desired temperature is maintained.

In the reverse case, a reduction of the room temperature must result in an increase of the heat supply.

What are other heat sources?

- sunlight (outside)
- lighting (inside)
- kitchen stove, refrigerator
- computer
- tiled stove, fire-place
- etc.

Application range of the “Unibox E BV”

To minimise the inertia of an underfloor heating system, the Oventrop “Unibox E BV” is equipped with a patented bypass which maintains a defined flow volume within the underfloor heating circuit and thus ensures a basic heat load, i.e. a minimum surface temperature is guaranteed.

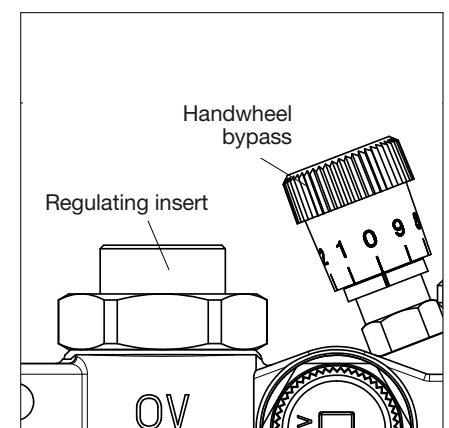
A complete cooling-down of the heating surface is avoided if the thermostatically controlled part of the system is closed by the influence of other heat sources.

A permanent heating up of the surface supporting the “self-regulating effect” and minimising the inertia of the surface in case of changing room temperatures is achieved.

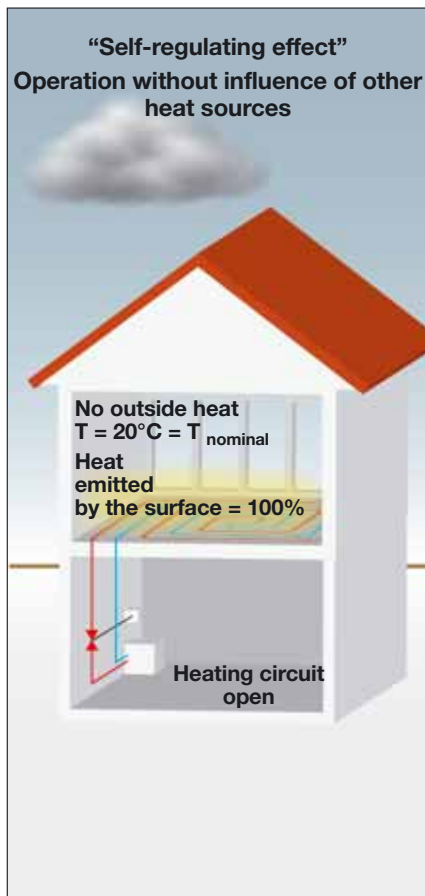
1 Possible influence of other heat sources on the regulation behaviour of the underfloor heating

2,3 Performance of the underfloor heating with and without bypass

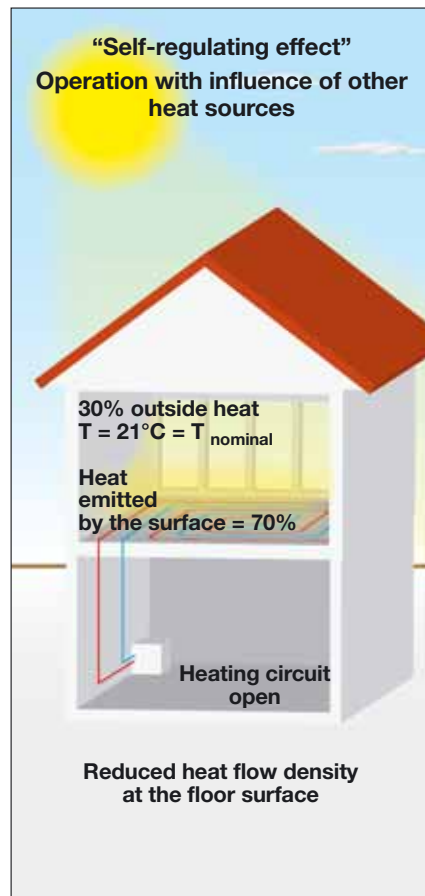
4 Adjustable regulating inserts of the “Unibox E BV”



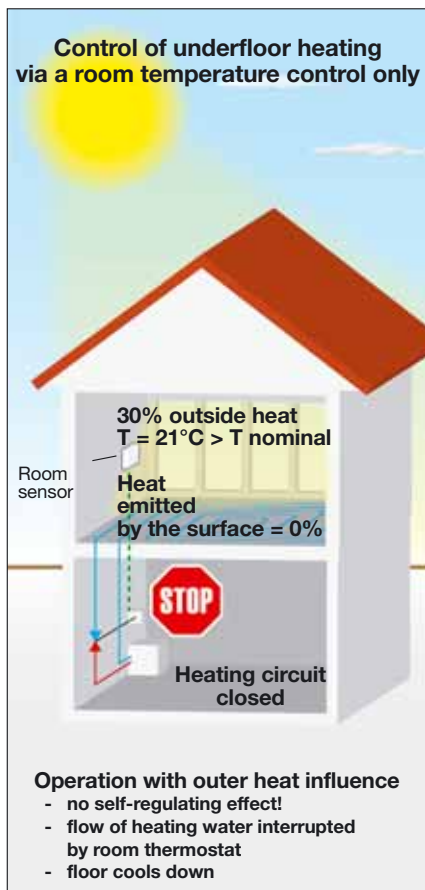
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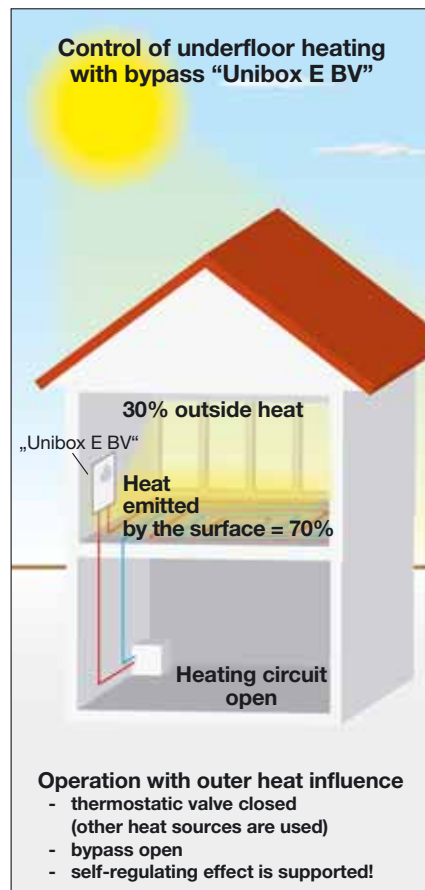
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Thermal comfort and “self-regulating effect”

Underfloor heating is a low temperature heating system, i.e. it works with lower flow temperatures than a radiator heating system.

At the same time, underfloor heating systems have much higher storage capacities and the heat is transmitted via larger surfaces in the form of mild radiant heat.

This way, not only is the subjective heat sensation greater but thermal and living comfort are increased, too.

The temperature difference between room and surface leads to a physical effect, the so-called “self-regulating effect” which is based on the interaction of the radiant heat emitted to the air with the heat emitted to the room by other heat sources (e.g. sunlight, fire-place, lightning etc.).

If the temperature rises e.g. due to sunlight, the heat flow may no longer circulate via the surface of the underfloor heating and is reduced correspondingly. In the technical literature, this characteristic is described by the following formula for the heat flow density:

$$q = 8.92 (\theta_{F,m} - \theta_i)^{1,1}$$

During the heating period, the “Federal Association Surface Heating” (BVF) presupposes the following temperatures for a building insulated according to the valid Decree for Energy Saving:

A room to be heated to $\theta_i = 20^{\circ}\text{C}$ requires a floor surface temperature of $\theta_{F,i} = 23^{\circ}\text{C}$.

Examples:

1 Operation without influence of other heat sources/no outside heat:

According to the a.m. formula, a heat flow density of $q = 30 \text{ W/m}^2$ is to be expected, i.e. a heat output of 100%. The heating circuit is completely open.

2 Operation with influence of other heat sources

In case of influence of other heat sources (e.g. sunlight) in the room, the balance between heat supply and consumption is no longer kept.

If the room temperature increases to 21°C , the heat flow density at the floor surface is reduced by one third (from 30 W/m^2 to 20 W/m^2) with the heating circuit completely open.

3 Control of the underfloor heating system via a room temperature control only

If heat is emitted by other heat sources, the “self-regulating effect” does not occur if, e.g. thermostatic valves or two point actuators are used for room temperature control.

The room thermostat closes the valve, the flow of heating water is interrupted (heating circuit is closed) and thermal comfort is disturbed.

4 Control of the underfloor heating system by use of the “Unibox E BV”

The patented Oventrop connection box with presettable bypass “Unibox E BV” supports the “self-regulating effect”. The bypass guarantees a residual flow rate, a complete cooling-down of the floor is avoided and a quicker heating up is achieved if required. This way, the “Unibox E BV” contributes considerably to thermal comfort.



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Under point 4.2.4.2 “Isolating valves and balancing devices” the surface heating standard DIN EN 1264-4 says :

“Each heating circuit must be equipped with two valves and one balancing device. The isolating and balancing devices must be independent of each other.”

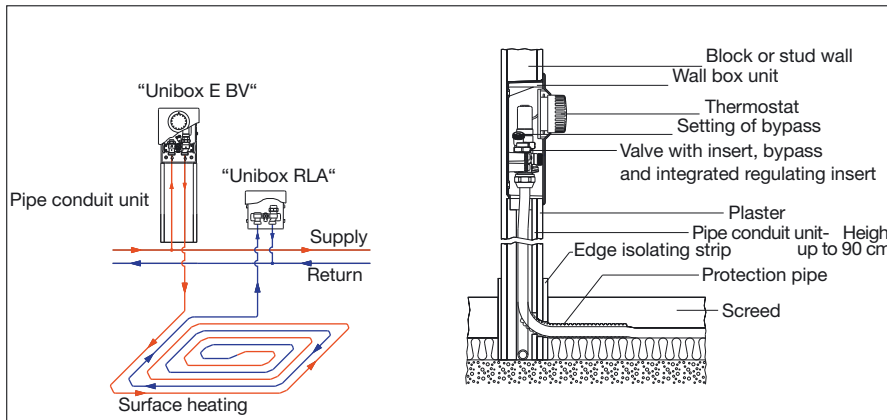
1 Oventrop offers the “Unibox RLA” complying with this standard.

The “Unibox RLA” consists of a wall box unit with cover plate, a valve with 3/4” male thread for compression fittings, isolating and regulating functions as well as a venting valve.

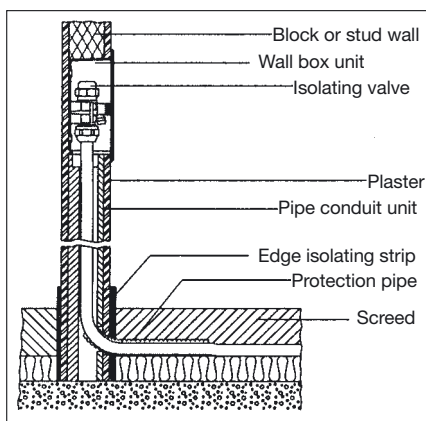
The isolating box may also be installed at a hidden, non visible location, e.g. under the wallpaper.

2,3 The “Unibox RLA” for isolation is to be installed in the return of the surface heating (see installation sketch illustr. 2).

- Branch off from the main supply pipe. Connect pipework to the “Unibox E BV”. To do so, remove protection cover of the “Unibox E BV” as well as the front cover of the pipe conduit unit.
- Laying of the underfloor heating circuit.
- Connection of the pipework to the “Unibox RLA”.
- Wall mounting of the “Unibox” can be carried out by use of the pipe conduit unit offered by Oventrop.
- The “Unibox RLA” has to be included in the leakage test according to DIN EN 1264.

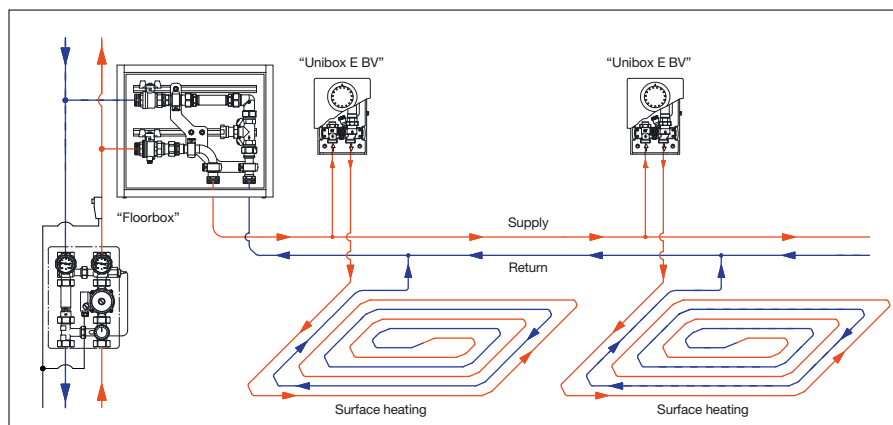


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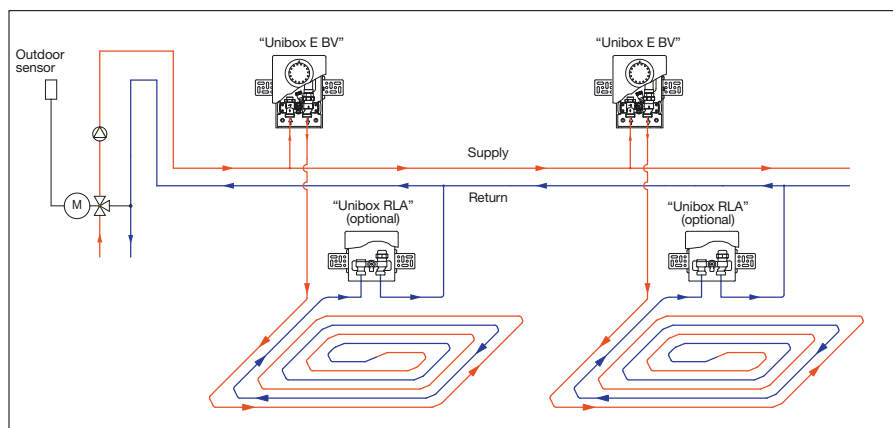


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Model:	Item no.:	Performance data:
“Unibox E BV”	102 26 62	Max. working pressure 10 bar Max. differential pressure 1 bar Max. working temperature: 100 °C Control range 7-28 °C
“Unibox RLA”	102 26 63	Max. working pressure 10 bar Max. differential pressure 1 bar Max. working temperature: 100 °C
“Floor-Box”	102 26 68 (lateral conn.) 102 26 69 (lower conn.)	Max. working pressure 10 bar Max. differential pressure 1 bar Max. working temperature: 100 °C
Mounting channel	102 26 52	Height: 275 up to 350 mm
Duo connection piece	102 26 55	1 x 3/4" collar nut 2 x 3/4" M

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Installation without distributor/collector

Today, a central distributor/collector is renounced in buildings for many reasons, aesthetic, required space etc. Oventrop offers the “Floorbox” for the connection without distributor/collector, especially in multi-storey buildings.

Together with the “Unibox RLA”, it serves to connect flat by flat the underfloor heating and its suitable flow temperatures. The time-consuming and expensive electrical installation of actuators and room thermostats can be renounced. The “Floorbox” is “the” central device for the isolation, regulation and measurement of heat consumption per flat. A lateral or lower connection is possible (illustr. 1). After installation of the “Floorbox”, the supply pipe is laid from one room to the other. The “Unibox E BV” and the surface heating circuits are connected to the supply pipe via branch offs.

In an installation without “Floorbox”, the return pipe connection for the complete isolation of the heating circuit is made via the “Unibox RLA” with isolation function (illustr. 2).

1 System illustration:

“Floorbox” installation without distributor/collector in multi-storey buildings (lateral connection)

2 System illustration:

Installations without distributor/collector for small systems

3 Item numbers/Performance data

4 Mounting channel for “Unibox”

Made of steel sheet, with gypsum plaster board
Depth: 57 mm, Width: 130 mm
Height: extendible from 275 to 350 mm

5 Duo connection piece

For the connection of two heating circuits.
1 x 3/4" collar nut 2 x 3/4" M

Further information on the “Unibox E BV”, the “Unibox RLA” and the “Floorbox” can be found on the internet (www.oventrop.de) under product range 13 or contact Oventrop.

Please see also product range “Unibox Individual room temperature control and return temperature limitation in surface heating systems”.

Subject to technical modification without notice.

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