

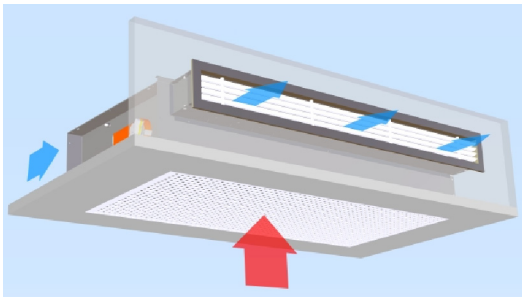
Technical Brochure

LTG Air-Water Systems

LTG Induction

Induction units HFF *suite*

silent
suite



For hotel bedrooms, ceiling installation

Technical brochure

Induction units HFF suite for hotel bedrooms, ceiling installation

| |
|----------------------------|
| LTG Comfort Air Technology |
| Air-Water-Systems |
| Air Diffusers |
| Air Distribution |

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Notes

Dimensions stated in this brochure are in mm.

Dimensions stated in this brochure are subject to General Tolerances according to DIN ISO 2768-vL.

For the outlet grille special tolerances stated in the drawing apply.

Straightness and twist tolerances for extruded aluminium profiles according to DIN EN 12020-2.

The surface finish is designed to meet the requirements for applications in buildings - room climate according to DIN 1946 part 2. Other requirements on request.

The actual specifications are available as a word document at your local distributor or at www.LTG-AG.com.

Technical brochure

Induction units HFFsuite for hotel bedrooms, ceiling installation

View of unit



Application

The HFFsuite hotel induction unit is a ceiling induction unit that ventilates a hotel bedroom in accordance with using the induction principle, i.e. without fan, using treated outside air, and ensures individualized ensuring individual temperature control.

Installation, placement

The unit can be installed in the entrance lobby of the hotel bedroom, inside a ceiling paneling or integrated casing.

If requested, panelling for the unit will also be supplied by the manufacturer. This panelling comprises, depending on requirements, all or any part of the casing.

If only the basic unit is installed inside an existing ceiling box, it is essential that the intake grille underneath the heat exchanger has at least a minimum free area 50 % of unobstructed cross-section and that the distance between heat exchanger and intake grille is at least 30 mm.

For maintenance reasons, the intake grille must be arranged to permit removal.

All services connections are on the rear of the unit.

Since the induction unit is also available as a condensing version, this version must also be provided by others with a condensate drain-off.

Function

The primary air flow rate is 100 % pre-treated outside air from a central AHU. It assures basic ventilation with outside air, e.g. in accordance with the recommendations of DIN EN 13779 or DIN EN 15251.

The primary air is diffused using nozzles, spread evenly along the length of the unit, into an air passage designed as an injector and into which the secondary volume flow is induced. This secondary air flow is cooled or heated in a 2-pipe heat exchanger depending on the room needs.

With the 2-pipe unit it is possible to have cooling only, or cooling/reheating with a change-over circuit.

The supply air is diffused into the room via permanently pre-adjusted baffle plates as a ceiling (Coanda)jet.

The active induction check (optional) allows the unit to be "switched off". Only the centrally set primary air flow rate then provides basic ventilation for the necessary air change.

Advantages

- **Low primary pressures**
 - Low-noise operation (< 30 dB(A))
 - High secondary (water-side) capacity with low primary pressure (rated as standard at 100 Pa)
- **Rear-side arrangement of media connections**
 - Simple water and air connections
- **Flexible nozzle design**
 - Design depending on required primary air volume flow and primary pressure
 - Non-inflammable nozzles (metal)
- **Efficient injector and heat exchanger**
 - High specific secondary capacity with low primary volume flow
 - High cooling capacity with low cold water supply temperatures (e.g. 16 °C to suit application and good practice)
- **Active induction check**
 - The secondary air can if required be "switched off" and the supply air quantity to the primary air flow reduced
- **Easy-to-maintain design**
 - Secondary air grille easily removable to permit inspection
 - Heat exchanger readily accessible and cleanable
 - No air filter required to protect the heat exchanger
- **Low-draught room flow**
 - Optimized air diffusion by stable inductive ceiling jet with divergent setting

Design

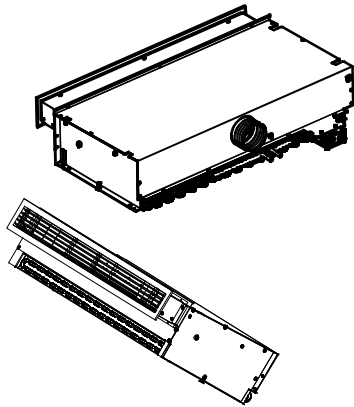
- 2-pipe-system for cooling or heating
- 2-pipe-system for cooling or heating with electrical heating element
- 4-pipe system for cooling and heating

Technical brochure

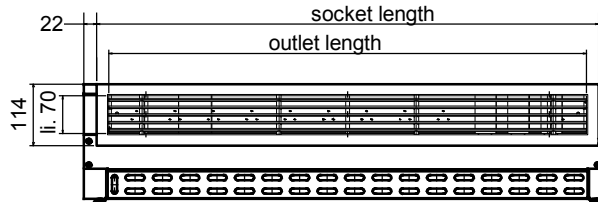
Induction units HFF suite for hotel bedrooms, ceiling installation

Dimensions without condensate tray, 2-pipe system, standard

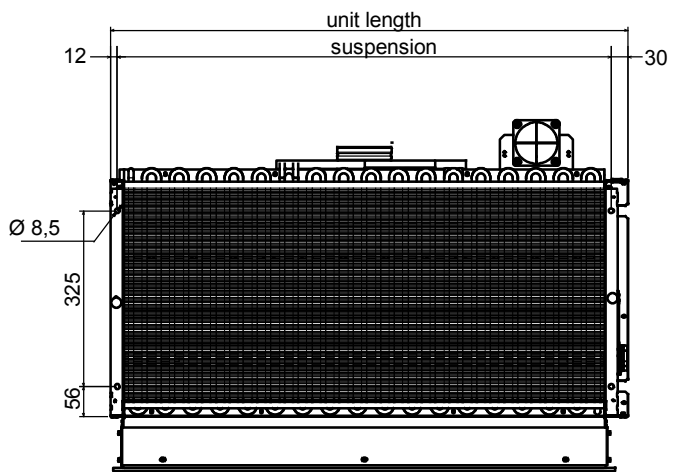
Isometric views



Front view

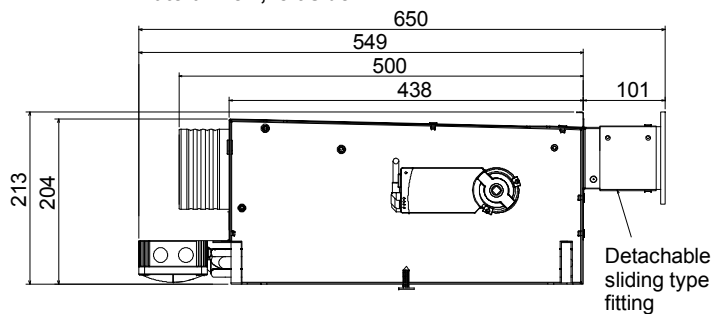


View from below

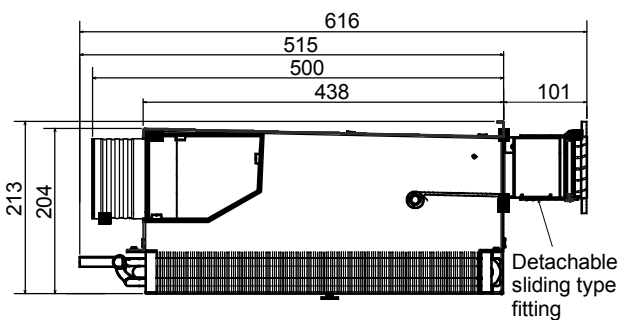


| Size | 900 | 1200 |
|---|-----|-------|
| Socket length | 915 | 1215 |
| Outlet length | 871 | 1171 |
| Unit length | 942 | 1242 |
| Suspension | 900 | 1200 |
| Heat exchanger connection (12 mm copper tube) | 382 | 532.5 |
| Air connection left | 462 | 612 |
| Air connection right | 480 | 630 |

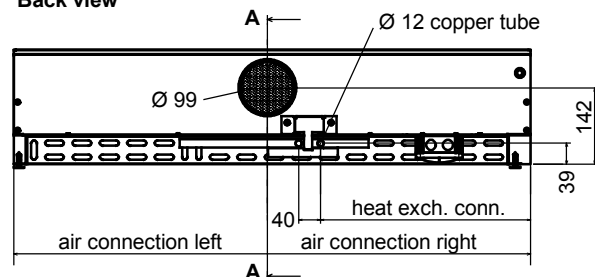
Lateral view, left side



Cut A-A



Back view

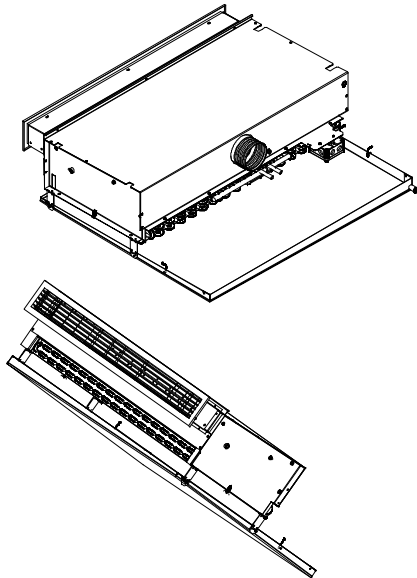


Technical brochure

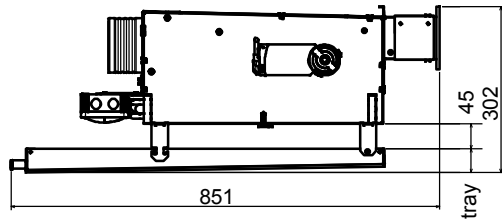
Induction units *HFF suite* for hotel bedrooms, ceiling installation

Dimensions with condensate tray, 2-pipe system

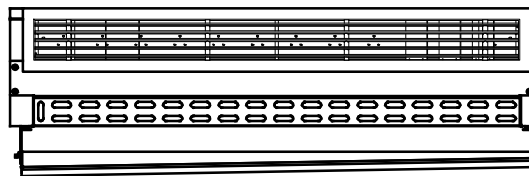
Isometric views



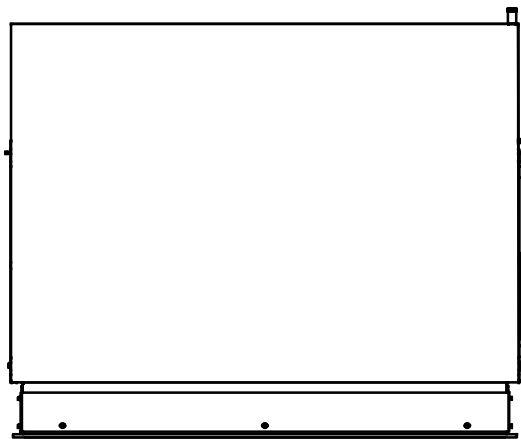
Lateral view



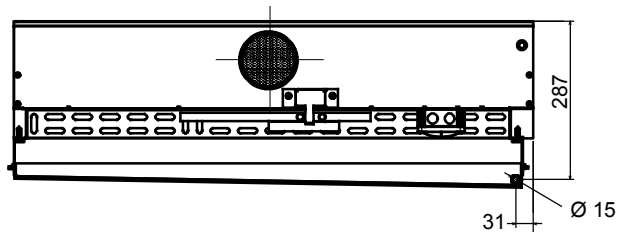
Front view



View from below



Back view



| Size | 900 | 1200 |
|------|-----|------|
| Tray | 44 | 49 |

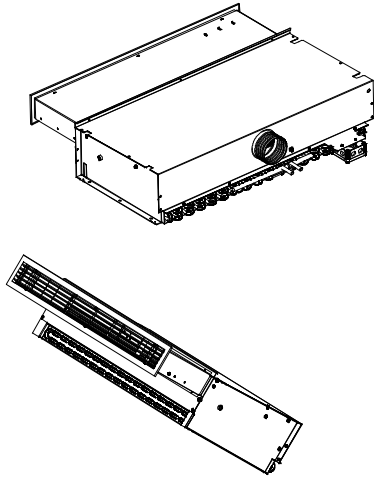
All other dimensions
 refer to the the unit without
 condensate tray (page 4)

Technical brochure

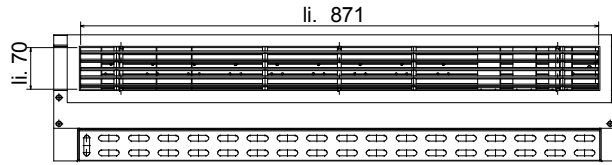
Induction units HFF suite for hotel bedrooms, ceiling installation

Dimensions size 900, without condensate tray, with electrical heating element, 2-pipe system

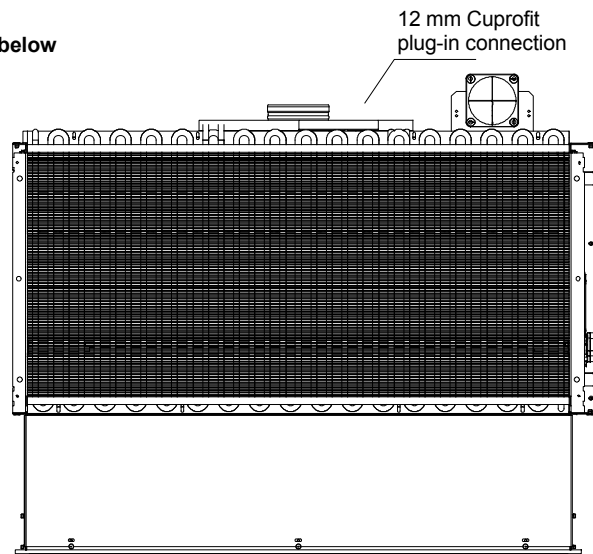
Isometric views



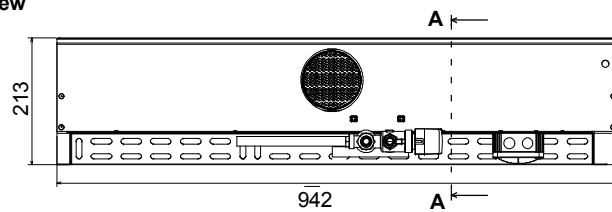
Front view



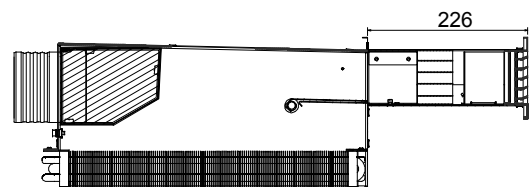
View from below



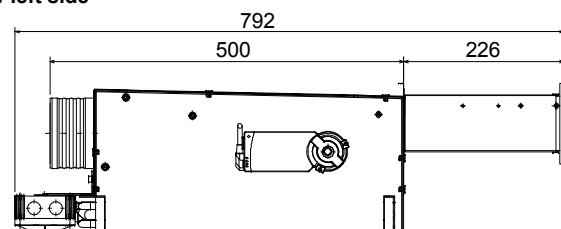
Back view



Cut A - A



Lateral view left side



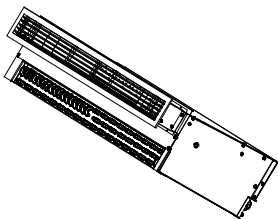
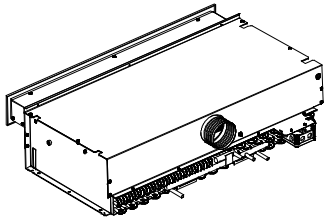
All other dimensions
 refer to 2-pipe unit without
 condensate tray (page 4)

Technical brochure

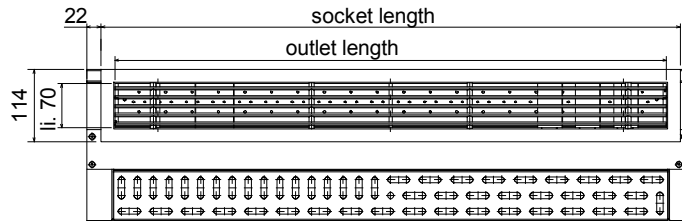
Induction units HFF suite for hotel bedrooms, ceiling installation

Dimensions without condensate tray, 4-pipe system

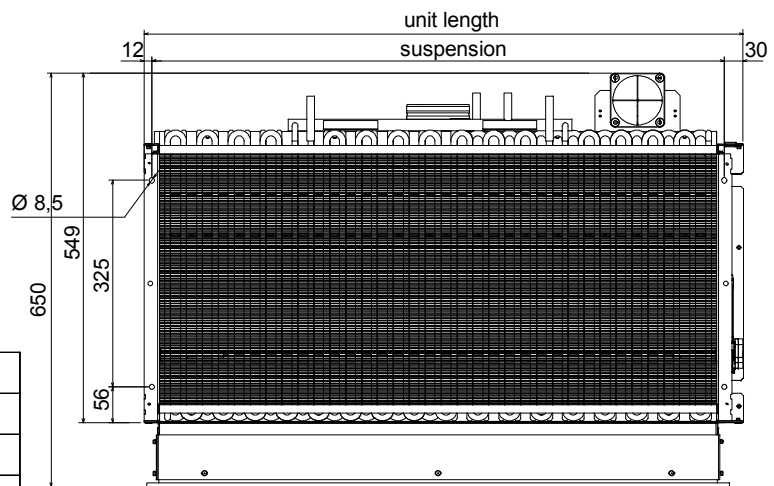
Isometrische Ansichten



Front view

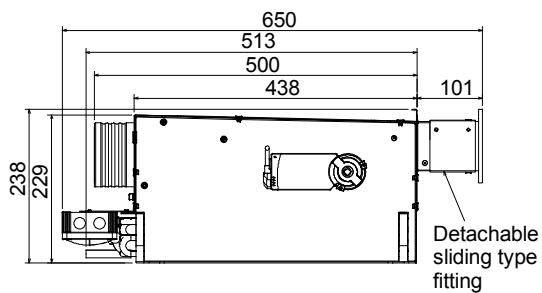


View from below

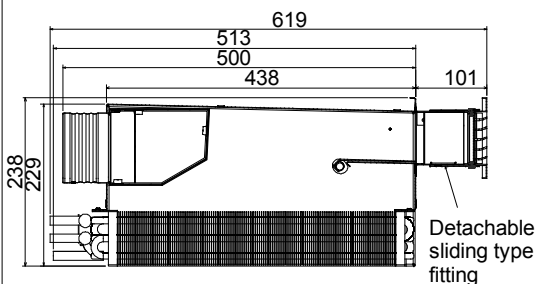


| Size | 900 | 1200 | |
|--|-----|------------|------|
| Socket length | 915 | 1215 | |
| Outlet length | 871 | 1171 | |
| Unit length | 942 | 1242 | [mm] |
| Suspension | 900 | 1200 | |
| Air connection left | 462 | 612 | |
| Air connection right | 480 | 630 | |
| Heat exchanger connection (12 mm copper tube) | | | |
| W1 | 370 | On request | |
| W2 | 305 | | |
| W3 | 375 | | |

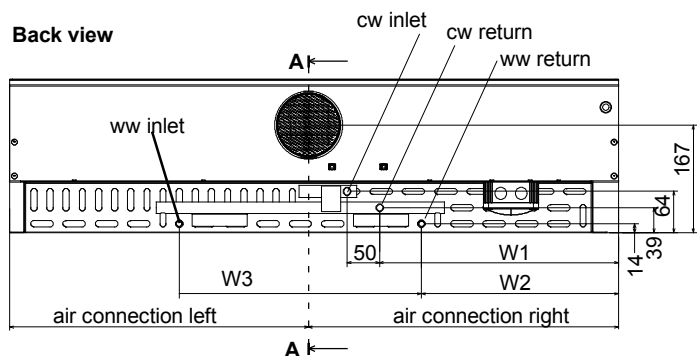
Lateral view left side



Cut A - A



Back view

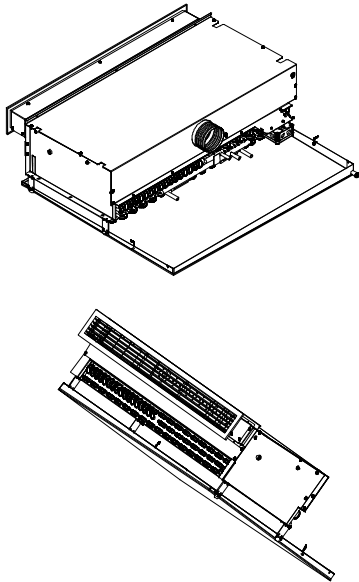


Technical brochure

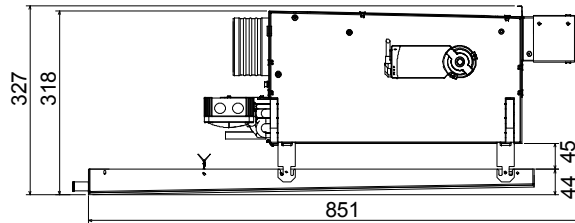
Induction units *HFF suite* for hotel bedrooms, ceiling installation

Dimensions with condensate tray, 4-pipe system

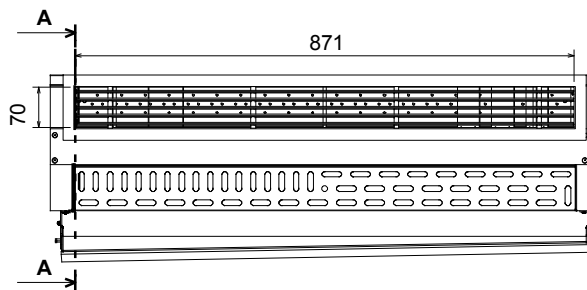
Isometric views



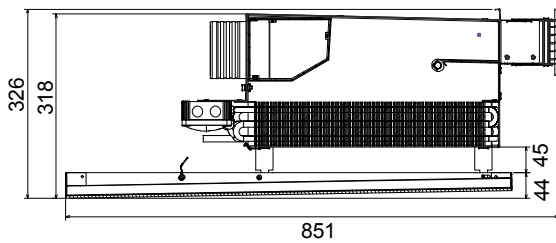
Lateral view left side



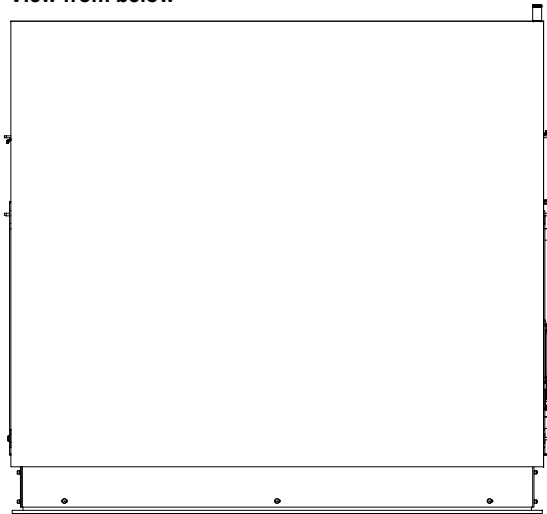
Front view



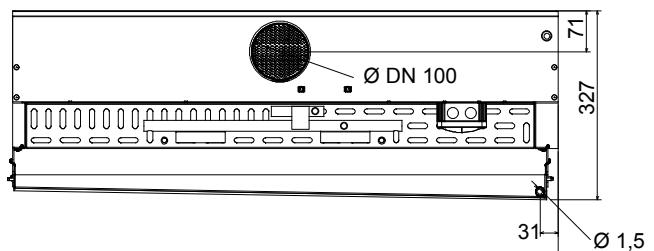
Cut A - A



View from below



Back view



| Size | 900 | 1200 |
|------|-----|------|
| Tray | 44 | 49 |

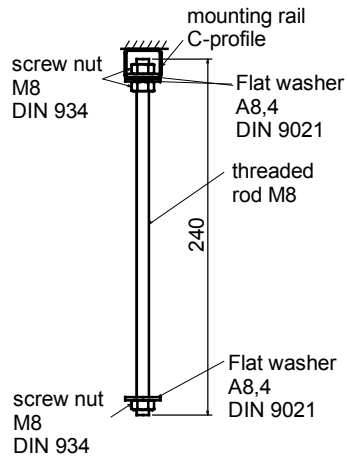
All other dimensions
 refer to 4-pipe unit without
 condensate tray (page 7)

Technical brochure

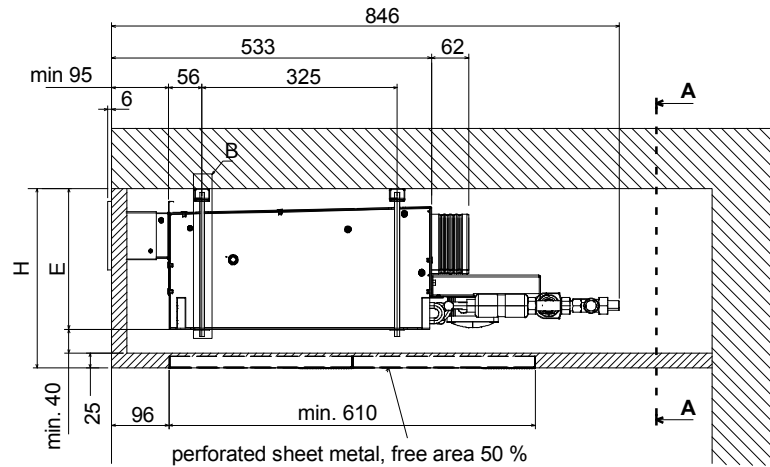
Induction units **HFF suite** for hotel bedrooms, ceiling installation

Installation ex. size 900, without condensate tray, with valve assembly V3T, 2-/4-pipe system

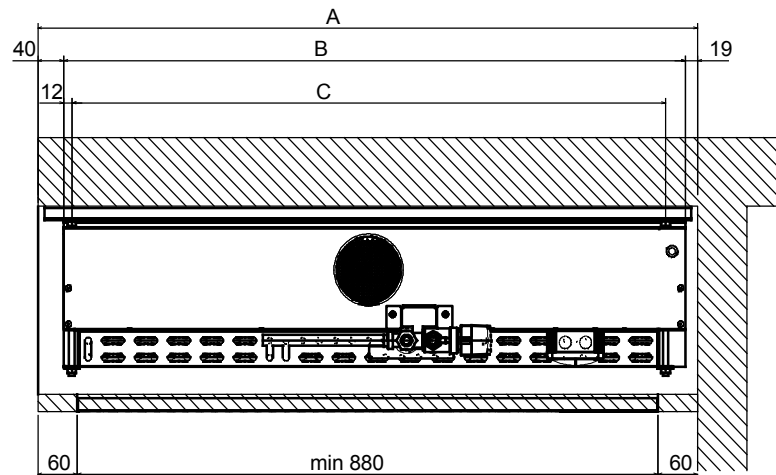
Detail B



Lateral view right side

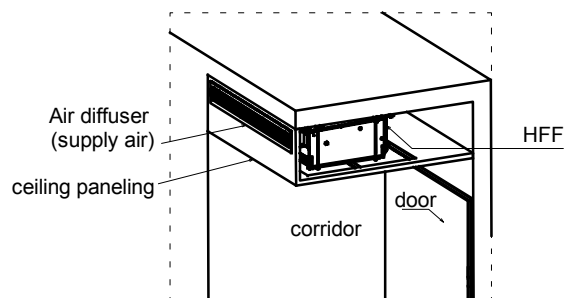


Cut A - A



| Size | | 900 | 1200 |
|-----------------------------|------|------|------|
| A (corridor width) | | 1000 | 1300 |
| B (unit length) | [mm] | 942 | 1242 |
| C (susp. length) | | 900 | 122 |
| H (ceiling paneling height) | | | |
| 2-pipe system | [mm] | 300 | 300 |
| 4-pipe system | | 325 | 325 |
| E (suspension height) | | | |
| 2-pipe system | [mm] | 235 | 235 |
| 4-pipe system | | 260 | 260 |

Isometric view

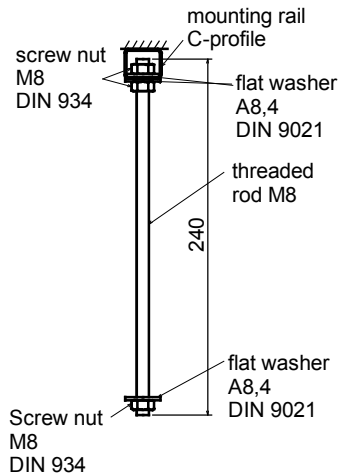


Technical brochure

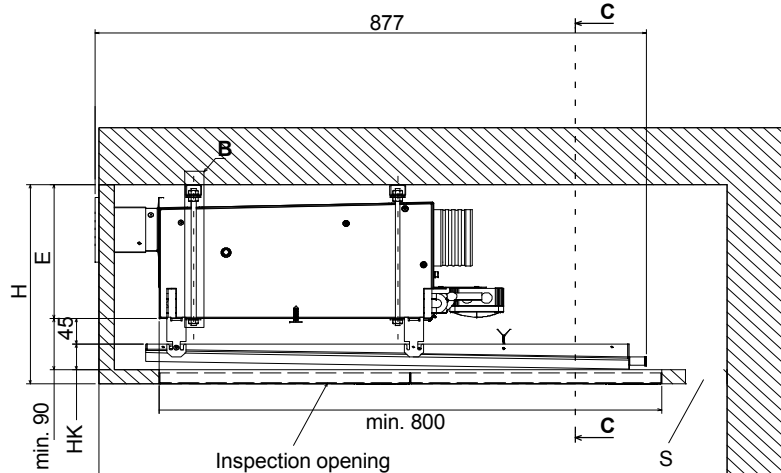
Induction units **HFF suite** for hotel bedrooms, ceiling installation

Installation example size 900, with condensate tray, 2-pipe and 4-pipe system

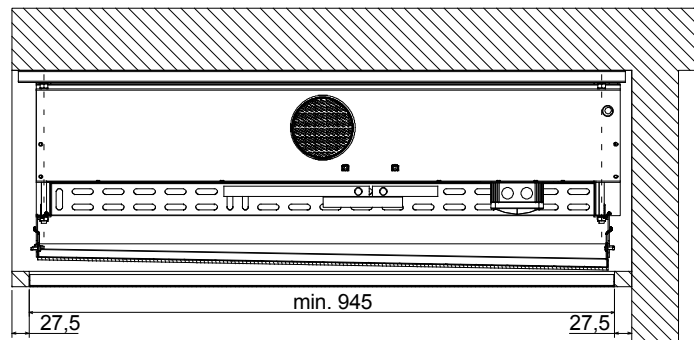
Detail B



Lateral view right side



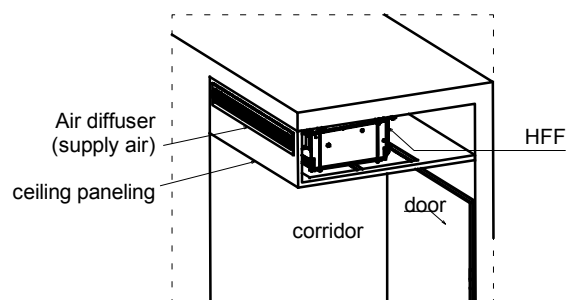
Cut C - C



| Size | 900 | 1200 |
|-----------------------------|-------------------|------|
| H (ceiling paneling height) | | |
| 2-pipe system | [mm] | 350 |
| 4-pipe system | | 375 |
| E (suspension) | | |
| 2-pipe system | [mm] | 235 |
| 4-pipe system | | 260 |
| HK (tray) | | |
| 2-pipe system | [mm] | 45 |
| 4-pipe system | | 50 |
| S (shadow gap) | | |
| Min. free area | [m ²] | 0.14 |
| | | 0.19 |

All other dimensions
refer to size 900 without
condensate tray (page 9)

Isometric view



Technical brochure

Induction units HFF suite for hotel bedrooms, ceiling installation

Technical data size 900, 2-pipe system, non condensing

| Nozzle type | Δp [Pa] | V_p [m ³ /h] | L_{pA} [dB(A)] | L_{wA} [dB(A)] | $Q_p/\Delta t_p$ [W/K] | $Q_k/\Delta t$ [W/K] | $Q_h/\Delta t$ [W/K] | | Q_k [W] | Q_p [W] | $Q_{k\text{ges}}$ [W] | $Q_{h\text{ges}}$ [W] | $W_{ok}/\Delta p_w$ [kg/h]/[kPa] | $W_{oh}/\Delta p_w$ [kg/h]/[kPa] |
|-------------|-----------------|---------------------------|------------------|------------------|------------------------|----------------------|----------------------|--|-----------|-----------|-----------------------|-----------------------|----------------------------------|----------------------------------|
| | | | | | | (5) | (5) | | (1)(5) | (2) | (1)(2)(5) | (3) | | |
| G | 100 | 45 | 24.5 | 28 | 15 | 64 | 64 | | 640 | 150 | 790 | 2112 | 200 / 14 | 150 / 10 |
| K | 100 | 60 | 25.5 | 29 | 20 | 65 | 65 | | 650 | 200 | 850 | 2145 | | |
| M | 100 | 80 | 27.5 | 31 | 27 | 66 | 66 | | 660 | 270 | 930 | 2178 | | |
| H | 100 | 100 | 27.5 | 31 | 33 | 67 | 67 | | 670 | 330 | 1000 | 2211 | | |
| G | 150 | 55 | 32.5 | 36 | 18 | 77 | 77 | | 770 | 180 | 950 | 2541 | | |
| K | 150 | 74 | 34.5 | 38 | 25 | 79 | 79 | | 790 | 250 | 1040 | 2607 | | |
| M | 150 | 97 | 32.5 | 36 | 32 | 79 | 79 | | 790 | 320 | 1110 | 2607 | | |
| H | 150 | 127 | 33.5 | 37 | 42 | 82 | 82 | | 820 | 420 | 1240 | 2706 | | |
| G | 200 | 62 | 37.5 | 41 | 20 | 86 | 86 | | 860 | 200 | 1060 | 2838 | | |
| K | 200 | 85 | 39.5 | 43 | 28 | 89 | 89 | | 890 | 280 | 1170 | 2937 | | |
| M | 200 | 111 | 40.5 | 44 | 37 | 89 | 89 | | 890 | 370 | 1260 | 2937 | | |
| H | 200 | 148 | 41.5 | 45 | 50 | 92 | 92 | | 920 | 500 | 1420 | 3036 | | |

Technical data size 900, 2-pipe system, condensing

| Nozzle type | Δp [Pa] | V_p [m ³ /h] | L_{pA} [dB(A)] | L_{wA} [dB(A)] | $Q_p/\Delta t_p$ [W/K] | $Q_k/\Delta t$ [W/K] | $Q_h/\Delta t$ [W/K] | $Q_{k\text{sens}}$ [W] | Q_k [W] | Q_p [W] | $Q_{k\text{ges}}$ [W] | $Q_{h\text{ges}}$ [W] | $W_{ok}/\Delta p_w$ [kg/h]/[kPa] | $W_{oh}/\Delta p_w$ [kg/h]/[kPa] |
|-------------|-----------------|---------------------------|------------------|------------------|------------------------|----------------------|----------------------|------------------------|-----------|-----------|-----------------------|-----------------------|----------------------------------|----------------------------------|
| | | | | | | (5) | (5) | (4) | (1)(5) | (2) | (1)(2)(5) | (3) | | |
| G | 100 | 45 | 24.5 | 28 | 15 | 62 | 62 | 1000 | 1240 | 150 | 1390 | 2046 | 200 / 14 | 150 / 10 |
| K | 100 | 60 | 25.5 | 29 | 20 | 63 | 63 | 1034 | 1260 | 199 | 1459 | 2079 | | |
| M | 100 | 80 | 27.5 | 31 | 27 | 64 | 64 | 1052 | 1280 | 266 | 1546 | 2112 | | |
| H | 100 | 100 | 27.5 | 31 | 33 | 65 | 65 | 1080 | 1300 | 332 | 1632 | 2145 | | |
| G | 150 | 55 | 32.5 | 36 | 18 | 75 | 75 | 1220 | 1500 | 180 | 1680 | 2475 | | |
| K | 150 | 74 | 34.5 | 38 | 25 | 77 | 77 | 1260 | 1540 | 250 | 1790 | 2541 | | |
| M | 150 | 97 | 32.5 | 36 | 32 | 77 | 77 | 1260 | 1540 | 320 | 1860 | 2541 | | |
| H | 150 | 127 | 33.5 | 37 | 42 | 80 | 80 | 1300 | 1600 | 420 | 2020 | 2640 | | |
| G | 200 | 62 | 37.5 | 41 | 20 | 83 | 83 | 1360 | 1660 | 200 | 1860 | 2739 | | |
| K | 200 | 85 | 39.5 | 43 | 28 | 86 | 86 | 1408 | 1720 | 280 | 2000 | 2838 | | |
| M | 200 | 111 | 40.5 | 44 | 37 | 86 | 86 | 1410 | 1720 | 370 | 2090 | 2838 | | |
| H | 200 | 148 | 41.5 | 45 | 49 | 89 | 89 | 1450 | 1780 | 490 | 2270 | 2937 | | |

- (1) Secondary cooling capacity (heat exchanger, non condensing),
 $t_{\text{room}} = 26 \text{ }^\circ\text{C}$, $t_{\text{KWVL}} = 16 \text{ }^\circ\text{C}$ (cold water supply)
- (2) Primary cooling capacity,
 $t_{\text{room}} = 26 \text{ }^\circ\text{C}$, $t_{\text{prim}} = 16 \text{ }^\circ\text{C}$
- (3) Heating capacity (heat exchanger),
 $t_{\text{room}} = 22 \text{ }^\circ\text{C}$, $t_{\text{WWVL}} = 55 \text{ }^\circ\text{C}$ (warm water supply),
 $t_{\text{prim}} = 22 \text{ }^\circ\text{C}$
- (4) Cooling capacity (heat exchanger, condensing),
 $t_{\text{room}} = 26 \text{ }^\circ\text{C}$, $t_{\text{KWVL}} = 6 \text{ }^\circ\text{C}$ (cold water supply)
- (5) Cooling capacity 7 % less with electrical heating element

Legend

- Δp - static pressure at the primary air connection
 V_p - primary air flow rate ($\pm 3 \%$)
 L_{pA} - sound pressure level with room absorption 3.5 dB
 L_{wA} - sound power level ($\pm 3 \text{ dB}$)
 Q_p - air-side cooling capacity (primary air $\pm 3 \%$)
 Δt_p - temperature difference between room air and primary air
 Q_k - water-side cooling capacity (secondary $\pm 6 \%$)
 Q_h - water-side heating capacity (secondary $\pm 6 \%$)
 Δt - temperature difference between air inlet and cold water supply
 $Q_{k\text{ges}}$ - total cooling capacity
 $Q_{h\text{ges}}$ - total heating capacity
 W_{ok} - standard water flow rate (cooling)
 Δp_w - water-side pressure loss
 $Q_{k\text{sens}}$ - sensible secondary cooling capacity
 $Q_{k\text{tot}}$ - total secondary cooling capacity
 W_{oh} - standard water flow rate (heating)

Nozzle type size 900 see page 13.

Technical brochure

Induction units HFF suite for hotel bedrooms, ceiling installation

Technical data size 1200, 2-pipe system, non condensing

| Düsen- typ | Δp [Pa] | V_p [m ³ /h] | L_{pA} [dB(A)] | L_{wA} [dB(A)] | $Q_p/\Delta t_p$ [W/K] | $Q_k/\Delta t$ [W/K] | $Q_h/\Delta t$ [W/K] | | Q_k [W] | Q_p [W] | Q_{kges} [W] | Q_{hges} [W] | $W_{ok}/\Delta p_w$ [kg/h]/[kPa] | $W_{oh}/\Delta p_w$ [kg/h]/[kPa] |
|---------------|--------------------|------------------------------|---------------------|---------------------|---------------------------|-------------------------|-------------------------|--|--------------|--------------|-------------------|-------------------|-------------------------------------|-------------------------------------|
| | | | | | | (5) | (5) | | (1)(5) | (2) | (1)(2)(5) | (3) | | |
| G | 100 | 60 | <22 | <25 | 15 | 79 | 79 | | 790 | 200 | 990 | 2607 | 270 / 32 | 200 / 17 |
| K | 100 | 80 | <22 | <25 | 20 | 79 | 79 | | 790 | 270 | 1060 | 2607 | | |
| M | 100 | 112 | 22.5 | 26 | 27 | 79 | 79 | | 790 | 370 | 1160 | 2607 | | |
| H | 100 | 130 | 23.5 | 27 | 33 | 80 | 80 | | 800 | 430 | 1230 | 2640 | | |
| G | 150 | 74 | 25.5 | 29 | 25 | 92 | 92 | | 920 | 250 | 1170 | 3036 | | |
| K | 150 | 97 | 26.5 | 30 | 32 | 92 | 92 | | 920 | 320 | 1240 | 3036 | | |
| M | 150 | 136 | 28.5 | 32 | 45 | 93 | 93 | | 930 | 450 | 1380 | 3069 | | |
| H | 150 | 158 | 28.5 | 32 | 53 | 94 | 94 | | 940 | 530 | 1470 | 3102 | | |
| G | 200 | 85 | 29.5 | 33 | 28 | 103 | 103 | | 1030 | 280 | 1310 | 3399 | | |
| K | 200 | 111 | 30.5 | 34 | 37 | 103 | 103 | | 1030 | 370 | 1400 | 3399 | | |
| M | 200 | 154 | 32.5 | 36 | 51 | 104 | 104 | | 1040 | 510 | 1550 | 3432 | | |
| H | 200 | 180 | 32.5 | 36 | 60 | 104 | 104 | | 1040 | 600 | 1640 | 3432 | | |

Technical data size 1200, 2-pipe system, condensing

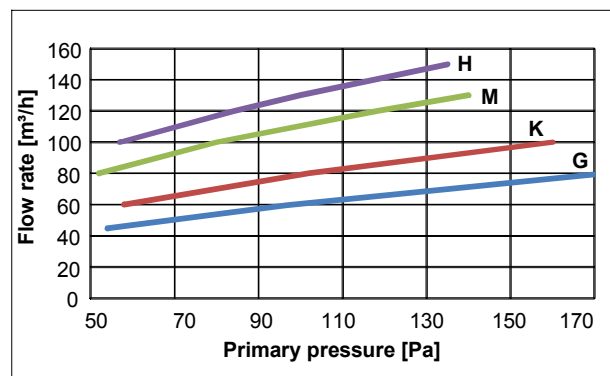
| Düsen- typ | Δp [Pa] | V_p [m ³ /h] | L_{pA} [dB(A)] | L_{wA} [dB(A)] | $Q_p/\Delta t_p$ [W/K] | $Q_k/\Delta t$ [W/K] | $Q_h/\Delta t$ [W/K] | $Q_{k,sens}$ [W] | Q_k [W] | Q_p [W] | Q_{kges} [W] | Q_{hges} [W] | $W_{ok}/\Delta p_w$ [kg/h]/[kPa] | $W_{oh}/\Delta p_w$ [kg/h]/[kPa] |
|---------------|--------------------|------------------------------|---------------------|---------------------|---------------------------|-------------------------|-------------------------|---------------------|--------------|--------------|-------------------|-------------------|-------------------------------------|-------------------------------------|
| | | | | | | (5) | (5) | (4) | (1)(5) | (2) | (1)(2)(5) | (3) | | |
| G | 100 | 60 | <22 | <25 | 15 | 77 | 77 | 1240 | 1540 | 200 | 1740 | 2541 | 270 / 32 | 200 / 17 |
| K | 100 | 80 | <22 | <25 | 20 | 77 | 77 | 1260 | 1540 | 270 | 1810 | 2541 | | |
| M | 100 | 112 | 22.5 | 26 | 27 | 77 | 77 | 1260 | 1540 | 370 | 1910 | 2541 | | |
| H | 100 | 130 | 23.5 | 27 | 33 | 78 | 78 | 1230 | 1560 | 430 | 1990 | 2574 | | |
| G | 150 | 74 | 25.5 | 29 | 25 | 89 | 89 | 1500 | 1800 | 250 | 2050 | 2937 | | |
| K | 150 | 97 | 26.5 | 30 | 32 | 89 | 89 | 1500 | 1820 | 320 | 2140 | 2937 | | |
| M | 150 | 136 | 28.5 | 32 | 45 | 90 | 90 | 1520 | 1840 | 450 | 2290 | 2970 | | |
| H | 150 | 158 | 28.8 | 32 | 53 | 91 | 91 | 1530 | 1850 | 530 | 2380 | 3003 | | |
| G | 200 | 85 | 29.5 | 33 | 28 | 100 | 100 | 1680 | 1930 | 280 | 2210 | 3300 | | |
| K | 200 | 111 | 30.5 | 34 | 37 | 100 | 100 | 1690 | 2040 | 370 | 2410 | 3300 | | |
| M | 200 | 154 | 32.5 | 36 | 51 | 101 | 101 | 1700 | 2050 | 510 | 2560 | 3333 | | |
| H | 200 | 180 | 32.5 | 36 | 60 | 101 | 101 | 1710 | 2070 | 600 | 2670 | 3333 | | |

- (1) Secondary cooling capacity
(heat exchanger, non condensing),
 $t_{room} = 26\text{ °C}$, $t_{KWWL} = 16\text{ °C}$ (cold water supply)
- (2) Primary cooling capacity,
 $t_{room} = 26\text{ °C}$, $t_{prim} = 16\text{ °C}$
- (3) Heating capacity (heat exchanger),
 $t_{room} = 22\text{ °C}$, $t_{WWVL} = 55\text{ °C}$ (warm water supply),
 $t_{prim} = 22\text{ °C}$
- (4) Cooling capacity (heat exchanger, condensing),
 $t_{room} = 26\text{ °C}$, $t_{KWWL} = 6\text{ °C}$ (cold water supply)
- (5) Cooling capacity 7 % less with electrical heating element

Legend see page 11

Nozzle type size 1200

The nozzle type defines air volume and pressure curve



Technical brochure

Induction units *HFF suite* for hotel bedrooms, ceiling installation

Technical data size 900, 4-pipe system, non condensing

| Nozzle type | Δp [Pa] | V_p [m ³ /h] | L_{pA} [dB(A)] | L_{wA} [dB(A)] | $Q_p/\Delta t_p$ [W/K] | $Q_k/\Delta t$ [W/K] | $Q_h/\Delta t$ [W/K] | | Q_k [W] | Q_p [W] | Q_{kges} [W] | Q_{hges} [W] | $W_{ok}/\Delta p_w$ [kg/h]/[kPa] | $W_{oh}/\Delta p_w$ [kg/h]/[kPa] |
|-------------|-----------------|---------------------------|------------------|------------------|------------------------|----------------------|----------------------|--|-----------|-----------|----------------|----------------|----------------------------------|----------------------------------|
| | | | | | | | | | (1) | (2) | (1)(2) | (3) | | |
| G | 100 | 45 | 24.5 | 28 | 15 | 63 | 33 | | 630 | 150 | 780 | 1090 | 200 / 14 | 150 / 10 |
| K | 100 | 60 | 25.5 | 29 | 20 | 64 | 33 | | 640 | 200 | 840 | 1090 | | |
| M | 100 | 80 | 27.5 | 31 | 27 | 64 | 33 | | 640 | 270 | 910 | 1090 | | |
| H | 100 | 100 | 27.5 | 31 | 33 | 68 | 33 | | 680 | 330 | 1010 | 1090 | | |
| G | 150 | 55 | 32.5 | 36 | 18 | 74 | 43.1 | | 740 | 180 | 920 | 1420 | | |
| K | 150 | 74 | 34.5 | 38 | 25 | 76 | 42.8 | | 760 | 250 | 1010 | 1410 | | |
| M | 150 | 97 | 32.5 | 36 | 32 | 75 | 42.8 | | 750 | 320 | 1070 | 1410 | | |
| H | 150 | 127 | 33.5 | 37 | 42 | 80 | 43 | | 800 | 420 | 1220 | 1420 | | |
| G | 200 | 62 | 37.5 | 41 | 20 | 83 | 47.7 | | 830 | 200 | 1030 | 1570 | | |
| K | 200 | 85 | 39.5 | 43 | 28 | 86 | 48 | | 860 | 280 | 1140 | 1580 | | |
| M | 200 | 111 | 40.5 | 44 | 37 | 85 | 48 | | 850 | 370 | 1220 | 1580 | | |
| H | 200 | 148 | 41.5 | 45 | 50 | 90 | 48 | | 900 | 500 | 1400 | 1580 | | |

Technical data size 900, 4-pipe system, condensing

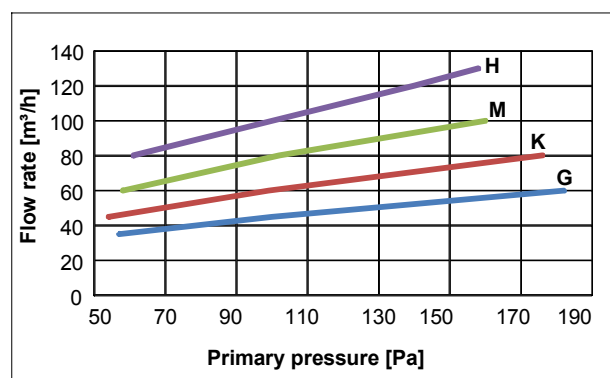
| Nozzle type | Δp [Pa] | V_p [m ³ /h] | L_{pA} [dB(A)] | L_{wA} [dB(A)] | $Q_p/\Delta t_p$ [W/K] | $Q_k/\Delta t$ [W/K] | $Q_h/\Delta t$ [W/K] | $Q_{k,sens}$ [W] | Q_k [W] | Q_p [W] | Q_{kges} [W] | Q_{hges} [W] | $W_{ok}/\Delta p_w$ [kg/h]/[kPa] | $W_{oh}/\Delta p_w$ [kg/h]/[kPa] |
|-------------|-----------------|---------------------------|------------------|------------------|------------------------|----------------------|----------------------|------------------|-----------|-----------|----------------|----------------|----------------------------------|----------------------------------|
| | | | | | | | | (4) | (1) | (2) | (1)(2) | (3) | | |
| G | 100 | 45 | 23.5 | 27 | 15 | 60 | 32 | 970 | 1240 | 150 | 1390 | 1090 | 200 / 14 | 150 / 10 |
| K | 100 | 60 | 26.5 | 30 | 20 | 61 | 32 | 1000 | 1230 | 199 | 1429 | 1090 | | |
| M | 100 | 80 | 27.5 | 31 | 27 | 62 | 32 | 1000 | 1300 | 266 | 1566 | 1090 | | |
| H | 100 | 100 | 27.5 | 31 | 33 | 64 | 32 | 1040 | 1320 | 332 | 1652 | 1090 | | |
| G | 150 | 55 | 32.5 | 36 | 18 | 72 | 42 | 1200 | 1500 | 180 | 1680 | 1390 | | |
| K | 150 | 74 | 34.5 | 38 | 25 | 74 | 42 | 1210 | 1530 | 250 | 1780 | 1390 | | |
| M | 150 | 97 | 35.5 | 39 | 32 | 73 | 42 | 1200 | 1500 | 320 | 1820 | 1390 | | |
| H | 150 | 127 | 35.5 | 39 | 42 | 78 | 42 | 1280 | 1610 | 420 | 2030 | 1390 | | |
| G | 200 | 62 | 37.5 | 41 | 20 | 81 | 46 | 1320 | 1660 | 200 | 1860 | 1500 | | |
| K | 200 | 85 | 39.5 | 43 | 28 | 84 | 47 | 1360 | 1715 | 280 | 1995 | 1550 | | |
| M | 200 | 111 | 40.5 | 44 | 37 | 83 | 47 | 1340 | 1755 | 370 | 2125 | 1550 | | |
| H | 200 | 148 | 41.5 | 45 | 49 | 88 | 47 | 1430 | 1801 | 490 | 2291 | 1550 | | |

- (1) Secondary cooling capacity (heat exchanger, non condensing),
 $t_{room} = 26\text{ °C}$, $t_{KWVL} = 16\text{ °C}$ (cold water supply)
- (2) Primary cooling capacity,
 $t_{room} = 26\text{ °C}$, $t_{prim} = 16\text{ °C}$
- (3) Heating capacity (heat exchanger),
 $t_{room} = 22\text{ °C}$, $t_{WWVL} = 55\text{ °C}$ (warm water supply),
 $t_{prim} = 22\text{ °C}$
- (4) Cooling capacity (heat exchanger, condensing),
 $t_{room} = 26\text{ °C}$, $t_{KWVL} = 6\text{ °C}$ (cold water supply)

Legend see page 14

Nozzle type size 900

The nozzle type defines air volume and pressure curve.



Technical brochure

Induction units *HFF suite* for hotel bedrooms, ceiling installation

Technical data size 1200, 4-pipe system, non condensing

| Nozzle type | Δp [Pa] | V_p [m ³ /h] | L_{pA} [dB(A)] | L_{wA} [dB(A)] | $Q_p/\Delta t_p$ [W/K] | $Q_k/\Delta t$ [W/K] | $Q_h/\Delta t$ [W/K] | | Q_k [W] | Q_p [W] | $Q_{k\text{ges}}$ [W] | $Q_{h\text{ges}}$ [W] | $W_{ok}/\Delta p_w$ [kg/h]/[kPa] | $W_{oh}/\Delta p_w$ [kg/h]/[kPa] |
|-------------|-----------------|---------------------------|------------------|------------------|------------------------|----------------------|----------------------|--|-----------|-----------|-----------------------|-----------------------|----------------------------------|----------------------------------|
| | | | | | | | | | (1) | (2) | (1)(2) | (3) | | |
| G | 100 | 60 | <22 | <25 | 15 | 77 | 43 | | 770 | 200 | 970 | 1419 | 270 / 32 | 200 / 17 |
| K | 100 | 80 | <22 | <25 | 20 | 78 | 42 | | 780 | 270 | 1050 | 1386 | | |
| M | 100 | 112 | 21.5 | 25 | 27 | 78 | 43 | | 780 | 370 | 1150 | 1419 | | |
| H | 100 | 130 | 21.5 | 25 | 33 | 79 | 42 | | 790 | 430 | 1220 | 1386 | | |
| G | 150 | 74 | 25.5 | 29 | 25 | 92.6 | 50 | | 926 | 250 | 1176 | 1650 | | |
| K | 150 | 97 | 26.5 | 30 | 32 | 94.6 | 51 | | 946 | 320 | 1266 | 1683 | | |
| M | 150 | 136 | 28.5 | 32 | 45 | 94.7 | 51 | | 947 | 450 | 1397 | 1683 | | |
| H | 150 | 158 | 28.5 | 32 | 53 | 95.1 | 51 | | 951 | 530 | 1481 | 1683 | | |
| G | 200 | 85 | 29.5 | 33 | 28 | 104 | 57 | | 1040 | 280 | 1320 | 1881 | | |
| K | 200 | 111 | 30.5 | 34 | 37 | 105 | 57 | | 1050 | 370 | 1420 | 1881 | | |
| M | 200 | 154 | 32.5 | 36 | 51 | 106 | 57 | | 1060 | 510 | 1570 | 1881 | | |
| H | 200 | 180 | 32.5 | 36 | 60 | 106 | 57 | | 1060 | 600 | 1660 | 1881 | | |

Technical data size 1200, 4-pipe system, condensing

| Nozzle type | Δp [Pa] | V_p [m ³ /h] | L_{pA} [dB(A)] | L_{wA} [dB(A)] | $Q_p/\Delta t_p$ [W/K] | $Q_k/\Delta t$ [W/K] | $Q_h/\Delta t$ [W/K] | $Q_{k\text{sens}}$ [W] | Q_k [W] | Q_p [W] | $Q_{k\text{ges}}$ [W] | $Q_{h\text{ges}}$ [W] | $W_{ok}/\Delta p_w$ [kg/h]/[kPa] | $W_{oh}/\Delta p_w$ [kg/h]/[kPa] |
|-------------|-----------------|---------------------------|------------------|------------------|------------------------|----------------------|----------------------|------------------------|-----------|-----------|-----------------------|-----------------------|----------------------------------|----------------------------------|
| | | | | | | | | (4) | (1) | (2) | (1)(2) | (3) | | |
| G | 100 | 60 | <22 | <25 | 15 | 75 | 42 | 1200 | 1500 | 200 | 1700 | 1386 | 270 / 32 | 200 / 17 |
| K | 100 | 80 | <22 | <25 | 20 | 76 | 41 | 1220 | 1520 | 270 | 1790 | 1353 | | |
| M | 100 | 112 | 21.5 | 25 | 27 | 76 | 42 | 1220 | 1520 | 370 | 1890 | 1386 | | |
| H | 100 | 130 | 21.5 | 25 | 33 | 77 | 41 | 1230 | 1540 | 430 | 1970 | 1353 | | |
| G | 150 | 74 | 25.5 | 29 | 25 | 90 | 49 | 1470 | 1800 | 250 | 2050 | 1617 | | |
| K | 150 | 97 | 26.5 | 30 | 32 | 92 | 49 | 1490 | 1820 | 320 | 2140 | 1617 | | |
| M | 150 | 136 | 28.5 | 32 | 45 | 92 | 49 | 1500 | 1840 | 450 | 2290 | 1617 | | |
| H | 150 | 158 | 28.5 | 32 | 53 | 92 | 49 | 1510 | 1850 | 530 | 2380 | 1617 | | |
| G | 200 | 85 | 29.5 | 33 | 28 | 101 | 55 | 1650 | 1930 | 280 | 2210 | 1815 | | |
| K | 200 | 111 | 30.5 | 34 | 37 | 102 | 55 | 1670 | 2040 | 370 | 2410 | 1815 | | |
| M | 200 | 154 | 32.5 | 36 | 51 | 103 | 55 | 1670 | 2050 | 510 | 2560 | 1815 | | |
| H | 200 | 180 | 32.5 | 36 | 60 | 103 | 55 | 1690 | 2070 | 600 | 2670 | 1815 | | |

- (1) Secondary cooling capacity (heat exchanger, non condensing),
 $t_{\text{room}} = 26\text{ °C}$, $t_{\text{KWVL}} = 16\text{ °C}$ (cold water supply)
- (2) Primary cooling capacity,
 $t_{\text{room}} = 26\text{ °C}$, $t_{\text{prim}} = 16\text{ °C}$
- (3) Heating capacity (heat exchanger),
 $t_{\text{room}} = 22\text{ °C}$, $t_{\text{WWVL}} = 55\text{ °C}$ (warm water supply),
 $t_{\text{prim}} = 22\text{ °C}$
- (4) Cooling capacity (heat exchanger, condensing),
 $t_{\text{room}} = 26\text{ °C}$, $t_{\text{KWVL}} = 6\text{ °C}$ (cold water supply)

Legend

- Δp - static pressure at the primary air connection
- V_p - primary air flow rate ($\pm 3\%$)
- L_{pA} - Sound pressure level with room absorptio 3.5 dB
- L_{wA} - sound power level ($\pm 3\text{ dB}$)
- Q_p - air-side cooling capacity (primary air $\pm 3\%$)
- Δt_p - temperature difference between room air and primary air
- Q_k - water-side cooling capacity (secondary $\pm 6\%$)
- Q_h - water-side heating capacity (secondary $\pm 6\%$)
- Δt - temperature difference between air inlet and cold water supply
- $Q_{k\text{ges}}$ - total cooling capacity
- $Q_{h\text{ges}}$ - total heating capacity
- W_{ok} - standard water flow rate (cooling)
- Δp_w - water-side pressure loss
- $Q_{k\text{sens}}$ - sensible secondary cooling capacity
- $Q_{k\text{tot}}$ - total secondary cooling capacity
- W_{oh} - standard water flow rate (heating)

Nozzle type size 1200 see page 12

Technical brochure

Induction units HFFsuite for hotel bedrooms, ceiling installation

Accessories

3-way valve with T-bypass V3TM

DN 15, with electro-thermal actuator for water-side open/closed regulation (2-point response), with a shut-off screw union with presetting and a ball valve and a valve keeper.

- Nominal pressure 16 bar
- Valve bodies made of red brass Rg5
- DN 10, DN 15 and DN 20
- External thread fittings G...B
- Nominal stroke 2.5 mm
- Manual knob
- Fittings ALG... with flat gasket available by L&S
- SERTO-clamp ring fittings SO 21... available by specialized trade
- Can be combined with electromotoric or thermostatic actuators

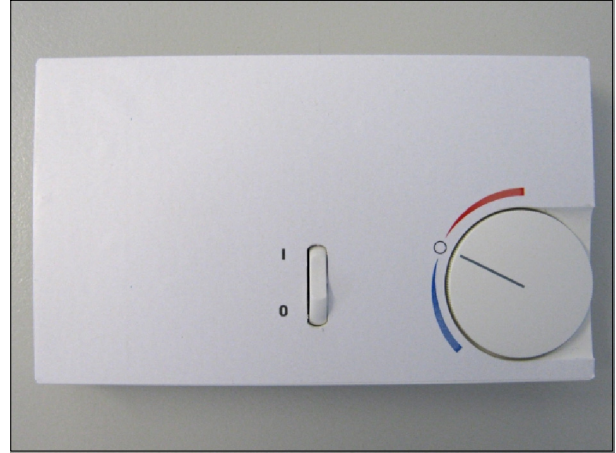
Radiator valve VDN115 (straight-way valve)

DN 15, with electro-thermal actuator for water-side open/closed regulation (2-point response).

Thermal valve actuator AA2004, 2-point

- Voltage AC 230 V (AA2004) or AC 24 V (AA4004)
- Normally closed
- PWM (pulse-width modulation)
- Actuating force 100 N
- Degree of protection IP54
- Up-side down installation possible
- Position indication
- Maintenance free
- Snap-on installation on adaptor
- Anti-theft protection

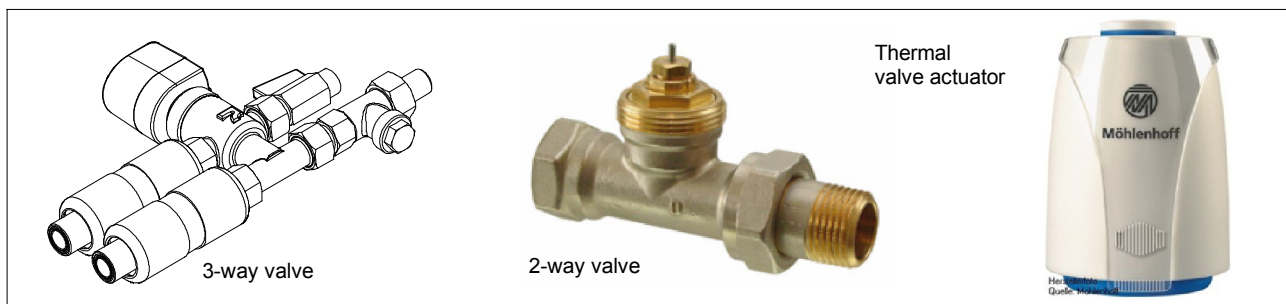
Room temperature controller type RRT5



- Room controls with integrated temperature sensor IP30
- Input voltage 230 VAC
- Setting range 21 °C ± 5 K
- c.o switch output for heating and cooling 230 VAC (max. 300 mA = valves)
- Change-over function using potential free contact from BMS
- Internal protection with 2 A
- Manual switch for Auto Standby

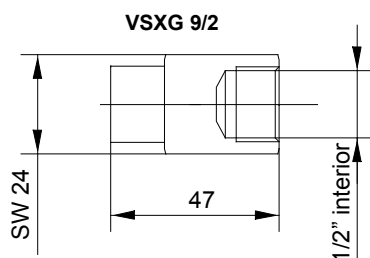
Using the room temperature controller the following parameters are set:

- Operating mode OFF (standby operation)
- Operating mode ON (automatic operation)
- Setpoint value, setting range 21 °C ± 5 K

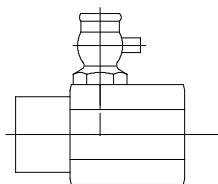


Transition piece

Direct transition from bare pipe connection to thread (1/2" interior)



VSXG 10/2 EH (with ventilation)



wrench width 24
on request with small
air-drain valve 1/8"

Technical brochure

Induction units HFF suite for hotel bedrooms, ceiling installation

Control 2-pipe system

The unit has only one heat exchanger through which chilled water flows for cooling and hot water for heating. Thus, it is only possible to either heat or cool in a single water circuit.

Water-side control is designed as an OPEN/CLOSED control system (2-point response).

Settings using the room temperature controller

Operating mode ON (automatic operation)

The room temperature controller is switched on, room air is induced, the valves are controlled acc. to the set-point temperature.

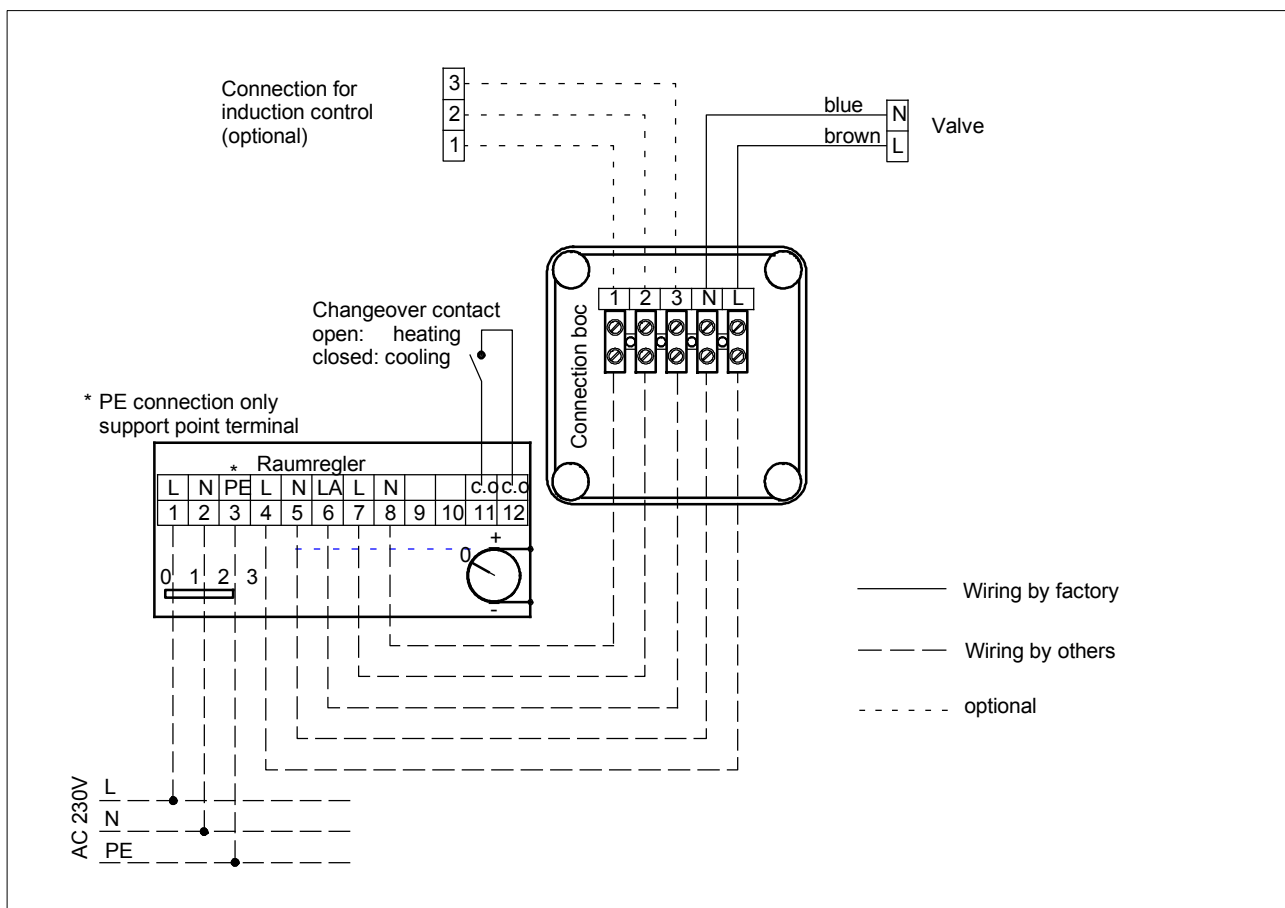
Operating mode OFF (standby operation)

The room temperature controller is switched off, the induction is disabled and all valves close. Only the centrally set primary air flow rate then provides basic ventilation for the necessary air change.

Set-point value setter

The temperature set-point may be adjusted from 18...28 °C. Position 0 correlates to $T_{SET} = 21\text{ °C}$.

Wiring diagram



Technical brochure

Induction units *HFF suite* for hotel bedrooms, ceiling installation

Control 2-pipe system with electr. heating element (750 W) and change-over

The unit has only one heat exchanger through which chilled water flows for cooling and hot water for heating. Thus, it is only possible to either heat or cool in a single water circuit.

The change-over between heating and cooling is made using the change-over contact, to which 230 V is applied.

Water-side control is designed as an OPEN/CLOSED control system (2-point response).

Change-over between heating/cooling

Heating (winter mode)

The change-over contact is open, hot water is flowing through the heat exchanger and the room temperature control is operating in heating mode.

If the ACTUAL temperature is below the SET temperature ($t_{ACT} < t_{SET}$), the valves are open. Hot water is flowing through the heat exchanger.

If the ACTUAL temperature rises above the SET temperature ($t_{ACT} > t_{SET}$), the valves are closed. Water is no longer flowing through the heat exchanger.

Cooling (summer mode)

230 V is applied to the change-over contact, cold water is flowing through the heat exchanger and the room temperature control is operating in cooling mode.

If the ACTUAL temperature is above the SET temperature ($t_{ACT} > t_{SET}$), the valves are open. Cold water is flowing through the heat exchanger.

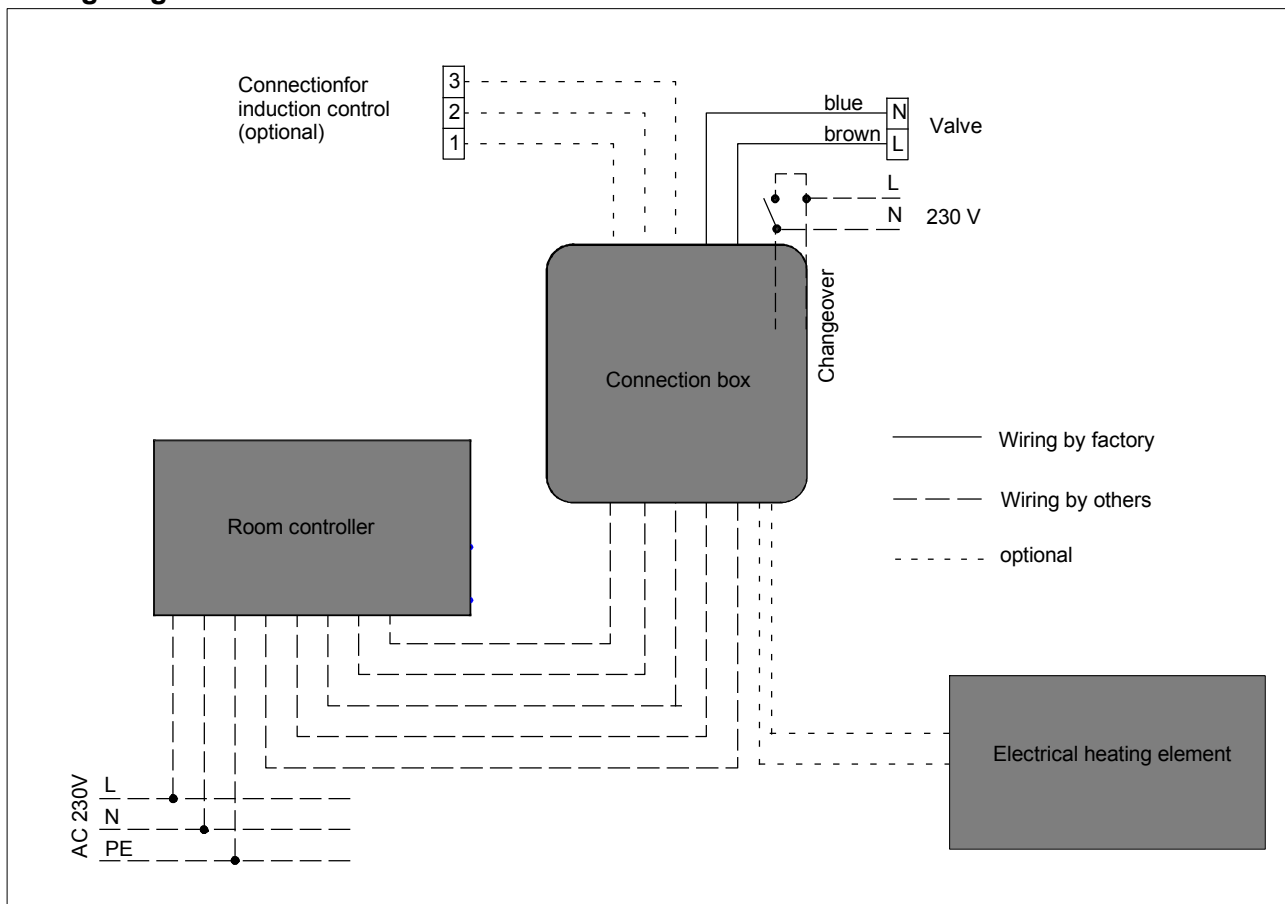
If the ACTUAL temperature drops below the SET temperature ($t_{ACT} < t_{SET}$), the valves are closed. Water is no longer flowing through the heat exchanger.

Heating in summer mode

The electric heating element can also be heated when the control has been set to summer mode and only cold water is flowing through the heat exchanger.

If the required set temperature ($t_{SET} > t_{ACT}$) is set at the room temperature control, the latter closes the valve at the water inlet so that no more cold water is flowing, and switches on the heating coil until the required set temperature has been reached.

Wiring diagram



Technical brochure

Induction units *HFF suite* for hotel bedrooms, ceiling installation

Nomenclature

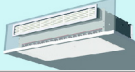

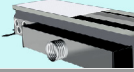

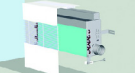
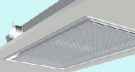
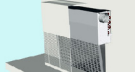

HFF - 2 / 0 / 900 / M / OW / IK

(1) (2) (3) (4) (5) (6) (7)


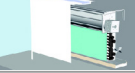

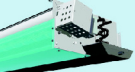
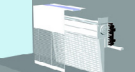
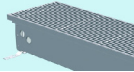
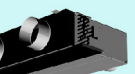
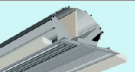
| | | |
|--------------------------------------|-------------|--|
| (1) Series | HFF | = HFF |
| (2) Heat exchanger | 2 | = 2-pipe |
| | 4 | = 4-pipe |
| | 2E | = 2-pipe with electrical heating element |
| (3) Surface heat exchanger | O | = standard, untreated |
| | S | = coated black |
| (4) Size | 900 | = 900 |
| | 1200 | = 1200 |
| (5) Nozzle type (pages 12/13) | G | = little |
| | K | = low |
| | M | = medium |
| | H | = high |
| (6) Condensate tray | OW | = without condensate tray |
| | MW | = with condensate tray |
| (7) Induction check (page 3) | OK | = without induction check |
| | IK | = with induction check |

Product Overview LTG Air-Water Systems

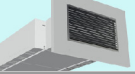


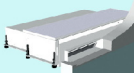
LTG Induction – Induction Units

| Ceiling installation | Sill Installation | Floor Installation |
|---|---|---|
|  HFF <i>suite</i> SilentSuite |  HFV / HFV <i>sf</i> System SmartFlow |  HFB / HFB <i>sf</i> System SmartFlow |
|  LHG System Indivent® |  HFG | |
|  HDF / HDF <i>sf</i> System SmartFlow |  QHG | |
|  HDC | | |

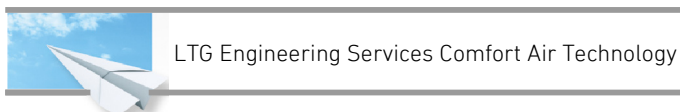
LTG FanPower – Fan Coil Units

| Ceiling Installation | Sill Installation | Floor Installation |
|--|---|---|
|  LVC System Indivent® |  VFC |  VKB |
|  VKH |  QVC |  SKB |
|  VKE | | |
|  KFA <i>cool wave</i> ® | | |

LTG Decentral – Decentralised Ventilation Units

| Ceiling Installation | Sill Installation | Floor Installation |
|--|---|---|
|  FVS Univent® |  FVM |  FVD |
| | |  FVP <i>pulse</i> System PulseVentilation |

Engineering Services





Comfort Air Technology

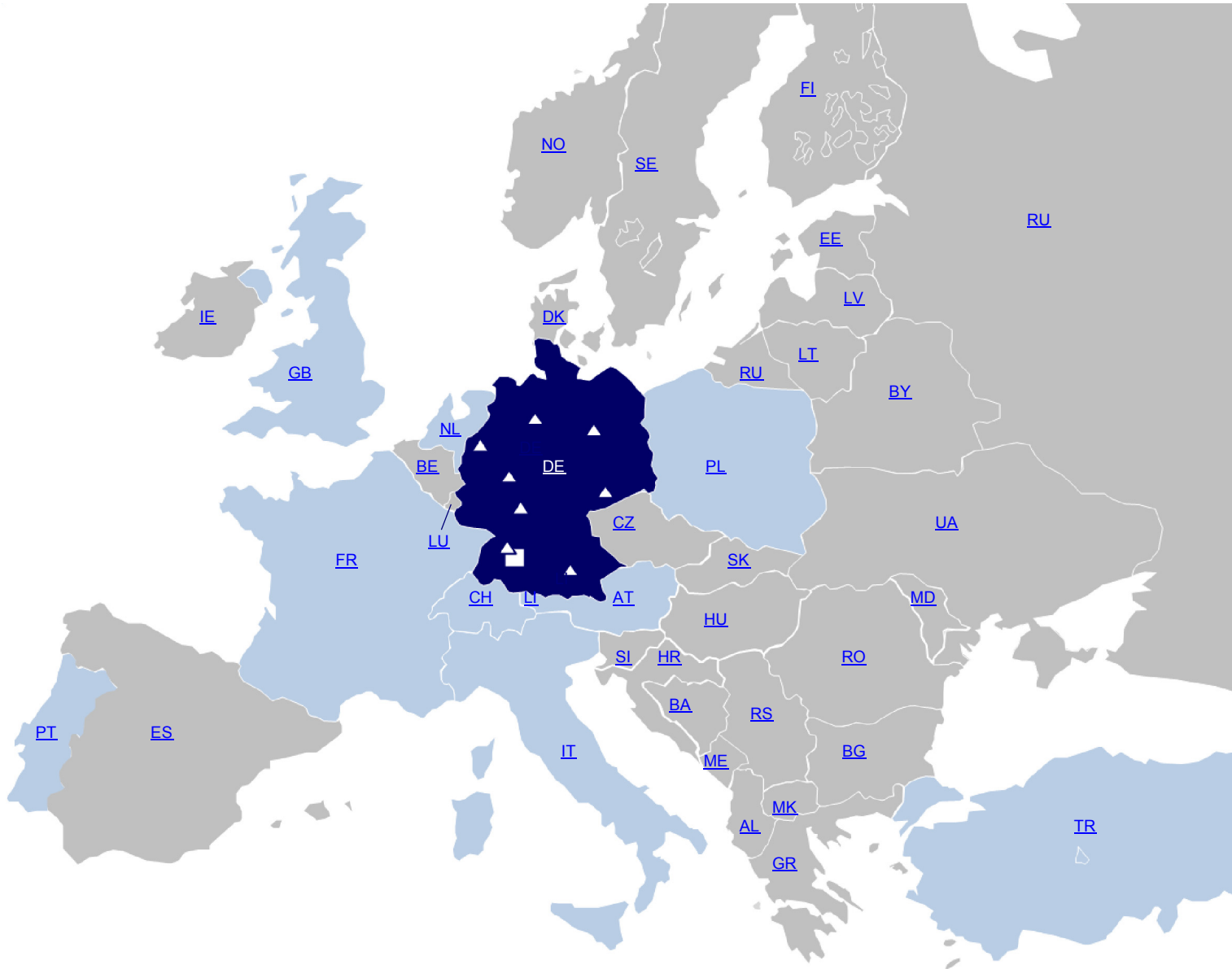
Air-Water Systems
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