

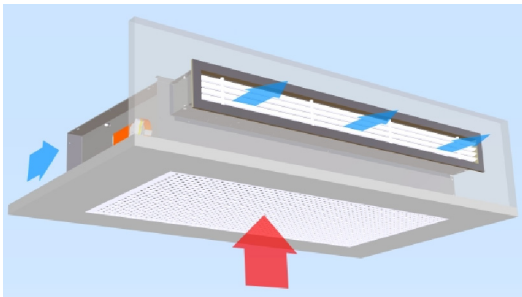
Technical Brochure

# 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

Content	Page
View of unit, application, installation/placement, function, advantages, design, accessories	3
Dimensions	4
Installation examples	9
Technical data	11
Accessories	15
Control, wiring diagram	16
Nomenclature	19
Specifications/schedules of prices	

## 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](http://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

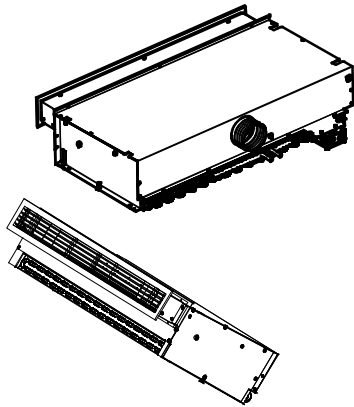
- 2-pipe-system for cooling or heating
- 2-pipe-system for cooling or heating with electrical heating element
- 4-pipe system for cooling and heating

Technical brochure

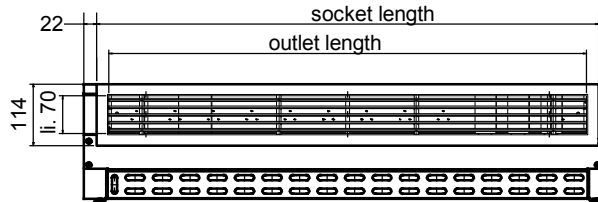
**Induction units HFF suite for hotel bedrooms, ceiling installation**

**Dimensions without condensate tray, 2-pipe system, standard**

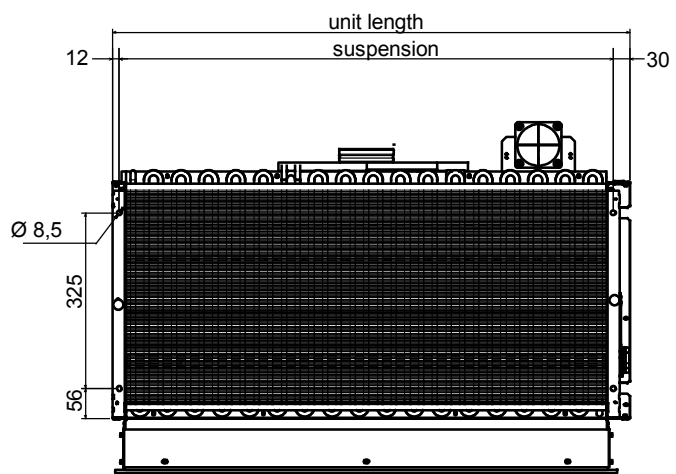
Isometric views



Front view

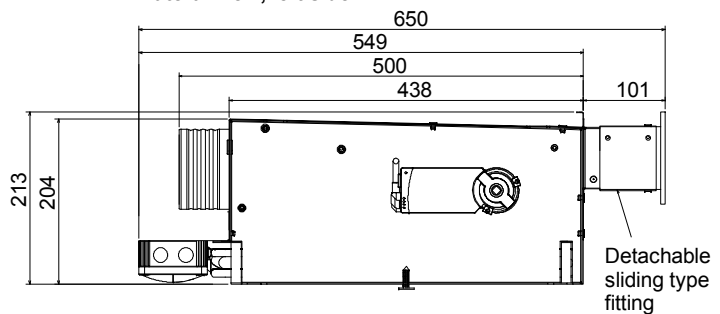


View from below

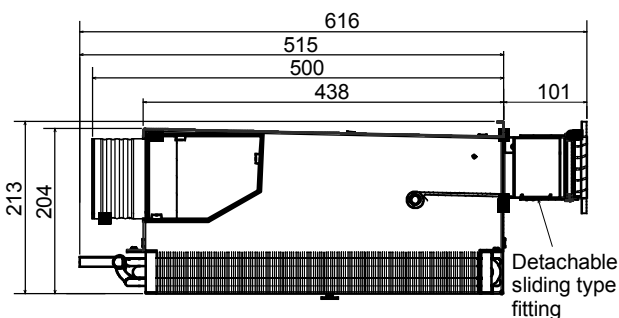


Size	900	1200
Socket length	915	1215
Outlet length	871	1171
Unit length	942	1242
Suspension	900	1200
Heat exchanger connection (12 mm copper tube)	382	532.5
Air connection left	462	612
Air connection right	480	630

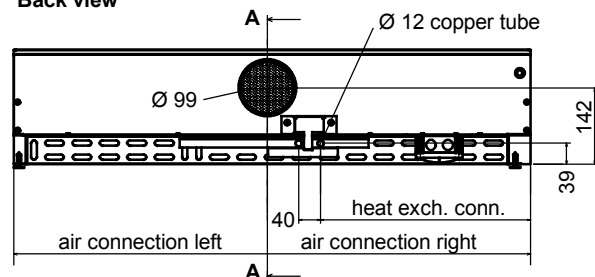
Lateral view, left side



Cut A-A



Back view

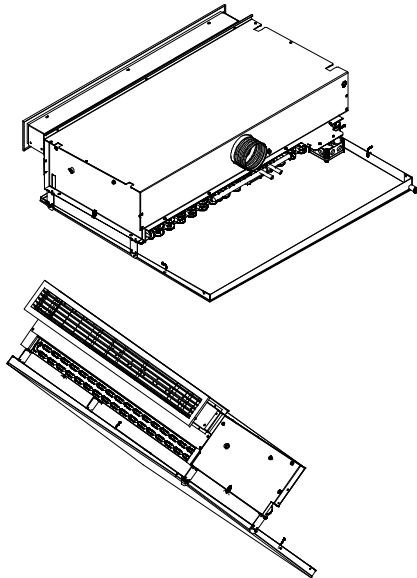


# Technical brochure

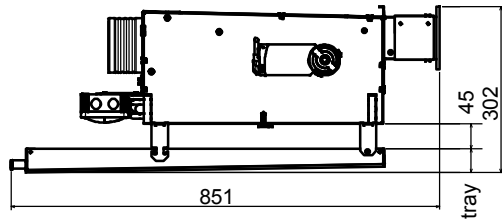
## Induction units HFF suite for hotel bedrooms, ceiling installation

### Dimensions with condensate tray, 2-pipe system

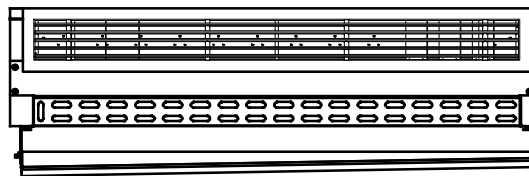
#### Isometric views



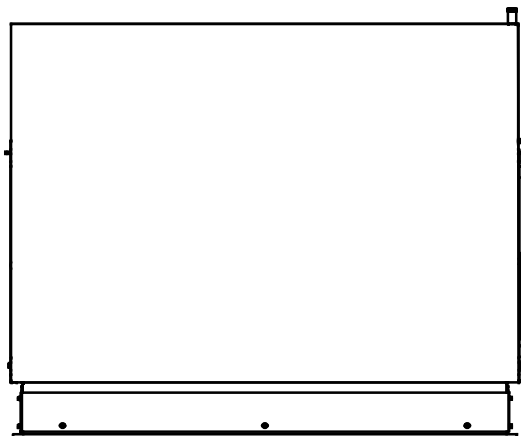
#### Lateral view



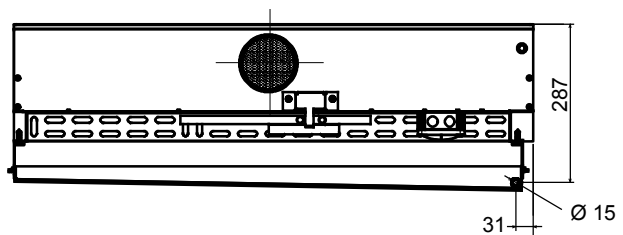
#### Front view



#### View from below



#### Back view



Size	900	1200
Tray	44	49

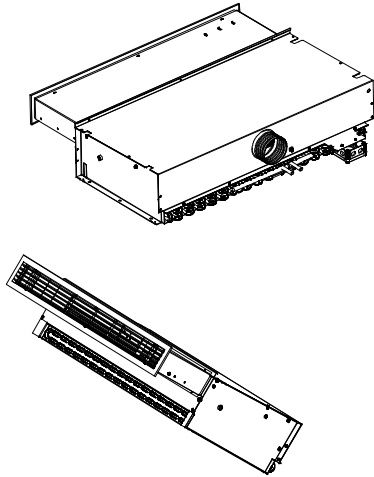
**All other dimensions**  
 refer to the the unit without  
 condensate tray (page 4)

Technical brochure

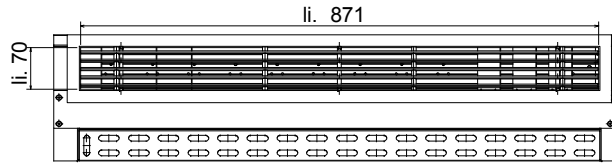
**Induction units HFF suite for hotel bedrooms, ceiling installation**

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

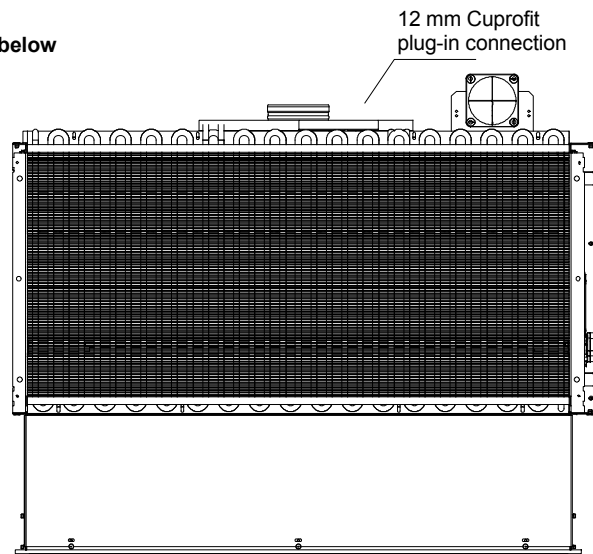
Isometric views



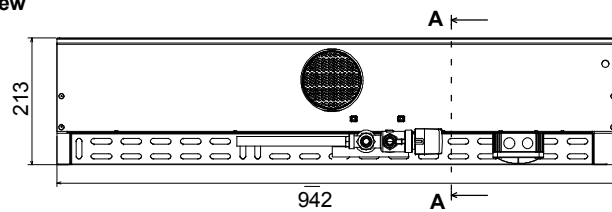
Front view



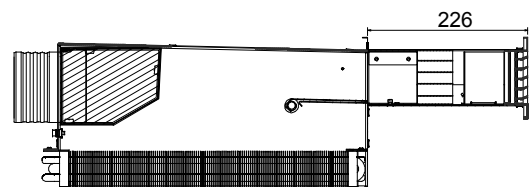
View from below



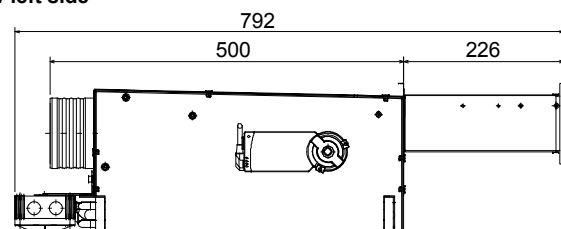
Back view



Cut A - A



Lateral view left side



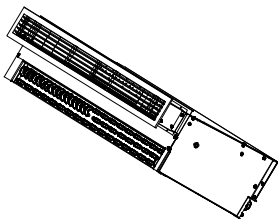
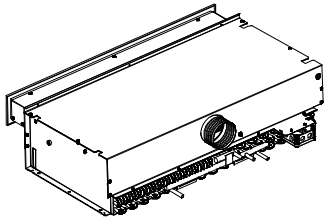
**All other dimensions**  
 refer to 2-pipe unit without  
 condensate tray (page 4)

Technical brochure

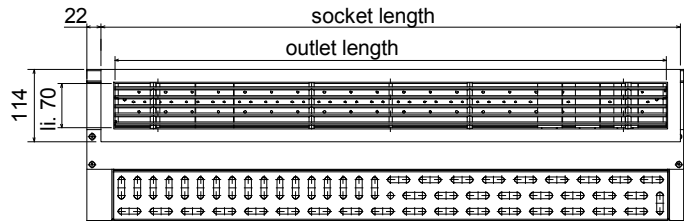
**Induction units HFF suite for hotel bedrooms, ceiling installation**

**Dimensions without condensate tray, 4-pipe system**

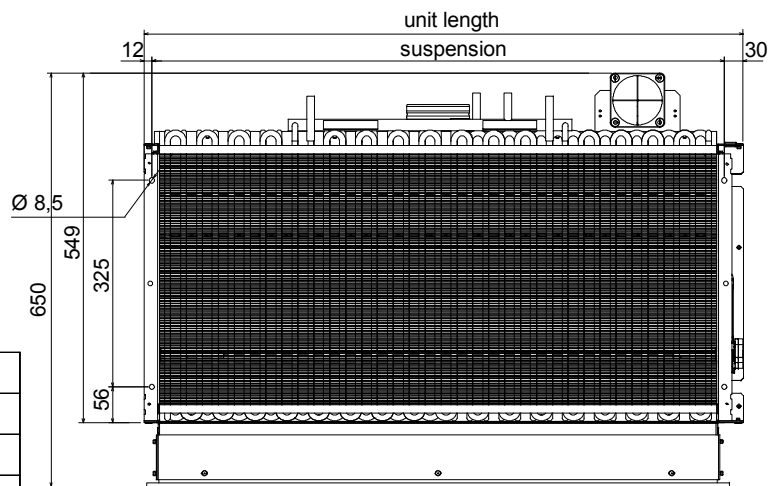
Isometrische Ansichten



Front view

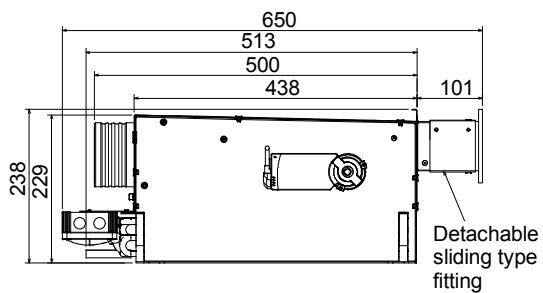


View from below

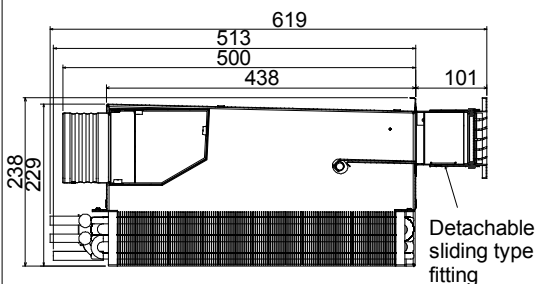


Size	900	1200
Socket length	915	1215
Outlet length	871	1171
Unit length	942	1242
Suspension	900	1200
Air connection left	462	612
Air connection right	480	630
Heat exchanger connection (12 mm copper tube)		
W1	370	On request
W2	305	
W3	375	

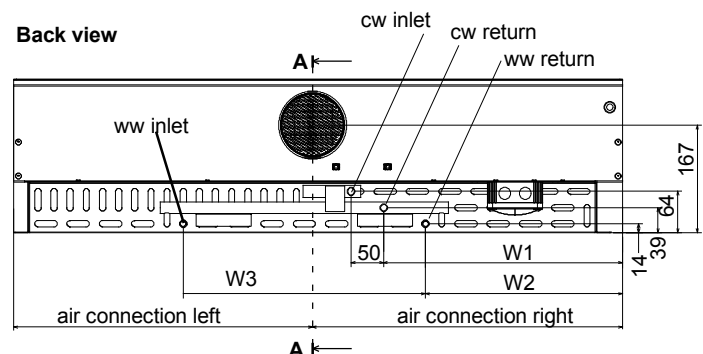
Lateral view left side



Cut A - A



Back view

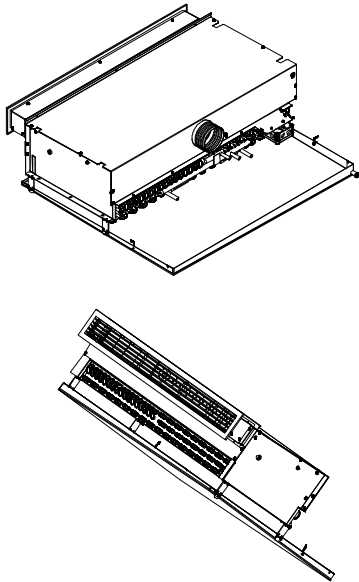


# Technical brochure

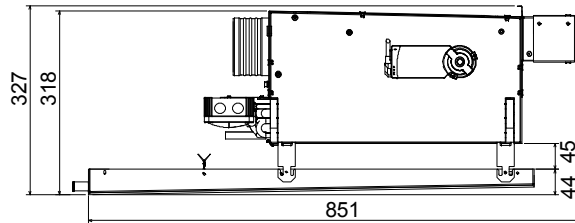
## Induction units HFF suite for hotel bedrooms, ceiling installation

### Dimensions with condensate tray, 4-pipe system

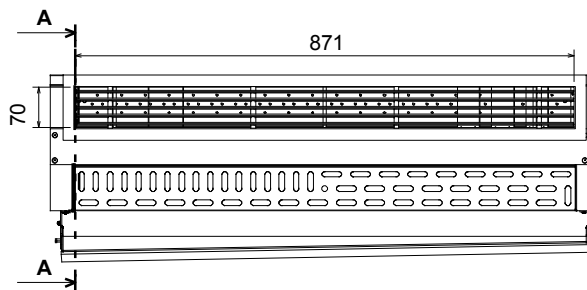
Isometric views



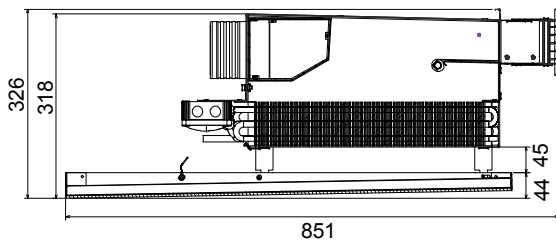
Lateral view left side



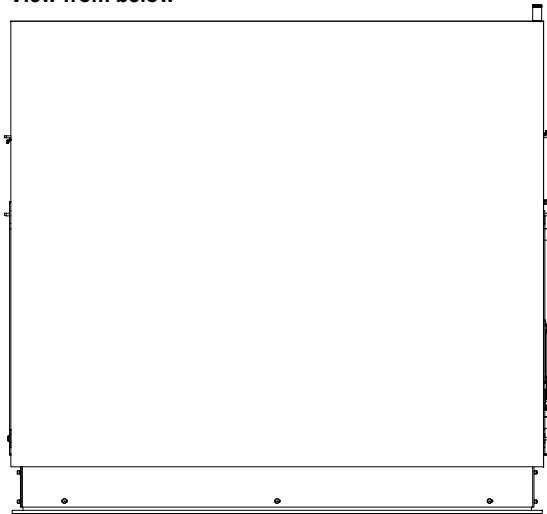
Front view



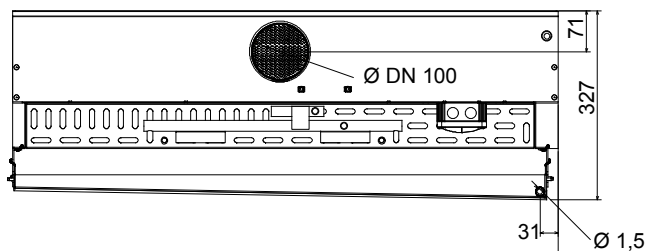
Cut A - A



View from below



Back view



Size	900	1200
Tray	44	49

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

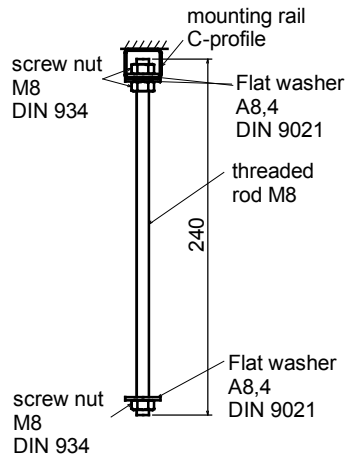


Technical brochure

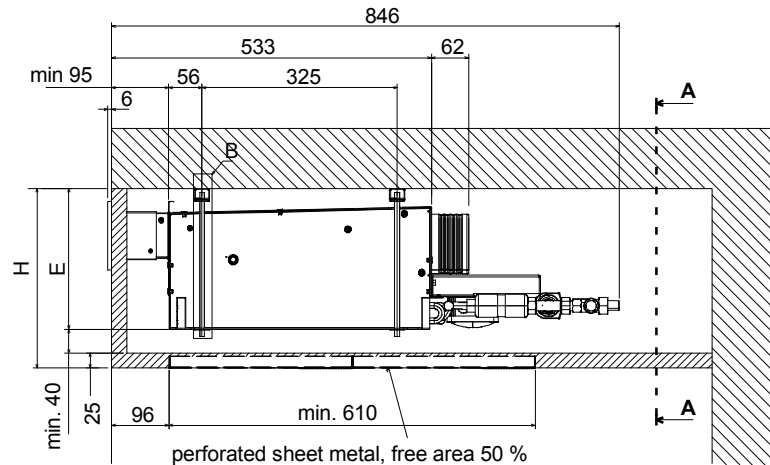
Induction units **HFF suite** for hotel bedrooms, ceiling installation

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

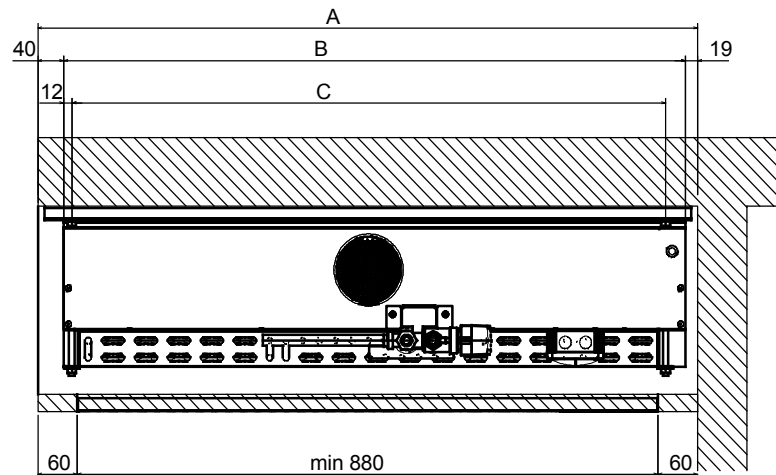
Detail B



Lateral view right side

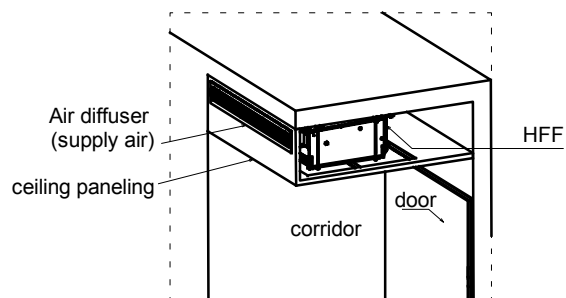


Cut A - A



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

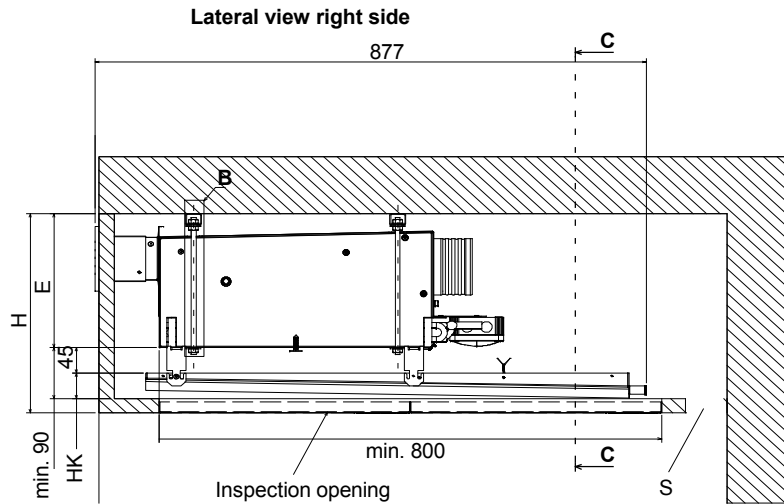
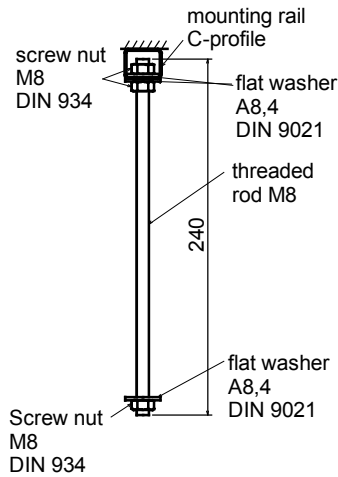


Technical brochure

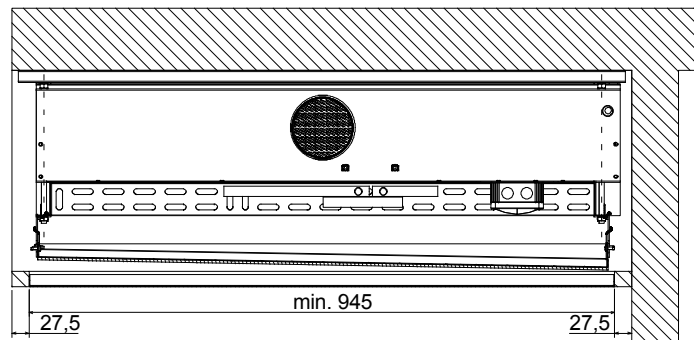
Induction units *HFF suite* for hotel bedrooms, ceiling installation

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

**Detail B**



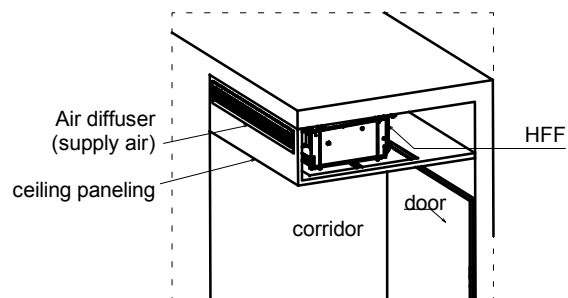
**Cut C - C**



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 <sup>2</sup> ]	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	$\Delta p$ [Pa]	$V_p$ [m <sup>3</sup> /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	$\Delta p$ [Pa]	$V_p$ [m <sup>3</sup> /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),  
 $t_{\text{room}} = 26\text{ °C}$ ,  $t_{\text{KWVL}} = 16\text{ °C}$  (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)
- (5) Cooling capacity 7 % less with electrical heating element

#### Legend

- $\Delta p$  - 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  $\pm 3\%$ )
- $\Delta t_p$  - temperature difference between room air and primary air
- $Q_k$  - water-side cooling capacity (secondary  $\pm 6\%$ )
- $Q_h$  - water-side heating capacity (secondary  $\pm 6\%$ )
- $\Delta t$  - 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)
- $\Delta p_w$  - 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	$\Delta p$ [Pa]	$V_p$ [m <sup>3</sup> /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

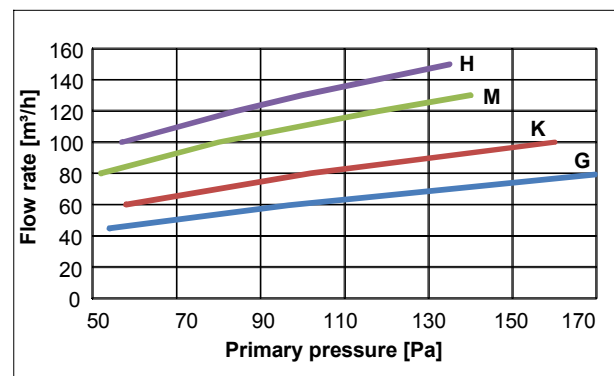
Düsen- typ	$\Delta p$ [Pa]	$V_p$ [m <sup>3</sup> /h]	$L_{pA}$ [dB(A)]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]	$Q_{k sens}$ [W]	$Q_k$ [W]	$Q_p$ [W]	$Q_{k ges}$ [W]	$Q_{h ges}$ [W]	$W_{ok}/\Delta p_w$ [kg/h]/[kPa]	$W_{oh}/\Delta p_w$ [kg/h]/[kPa]
						(5)	(5)	(4)	(1)(5)	(2)	(1)(2)(5)	(3)		
G	100	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	$\Delta p$ [Pa]	$V_p$ [m <sup>3</sup> /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

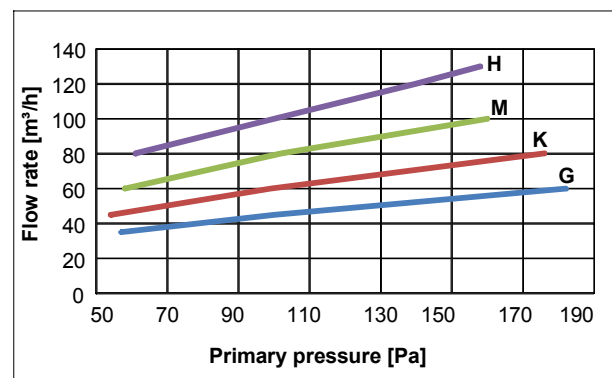
Nozzle type	$\Delta p$ [Pa]	$V_p$ [m <sup>3</sup> /h]	$L_{pA}$ [dB(A)]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]	$Q_{k,sens}$ [W]	$Q_k$ [W]	$Q_p$ [W]	$Q_{kges}$ [W]	$Q_{hges}$ [W]	$W_{ok}/\Delta p_w$ [kg/h]/[kPa]	$W_{oh}/\Delta p_w$ [kg/h]/[kPa]
								(4)	(1)	(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	$\Delta p$ [Pa]	$V_p$ [m <sup>3</sup> /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	$\Delta p$ [Pa]	$V_p$ [m <sup>3</sup> /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

- $\Delta p$  - 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  $\pm 3\%$ )
- $\Delta t_p$  - temperature difference between room air and primary air
- $Q_k$  - water-side cooling capacity (secondary  $\pm 6\%$ )
- $Q_h$  - water-side heating capacity (secondary  $\pm 6\%$ )
- $\Delta t$  - 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)
- $\Delta p_w$  - 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

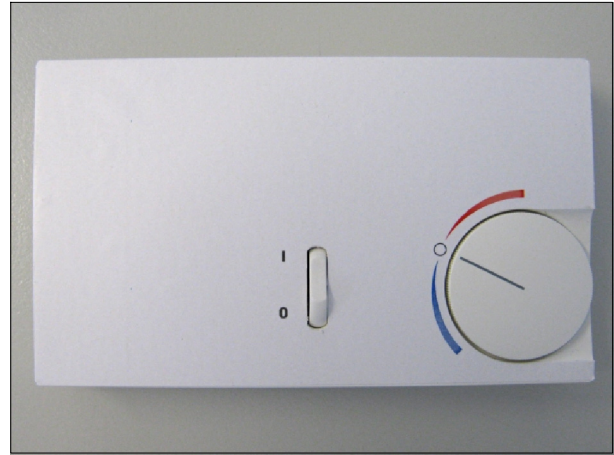
#### Radiator valve VDN115 (straight-way valve)

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

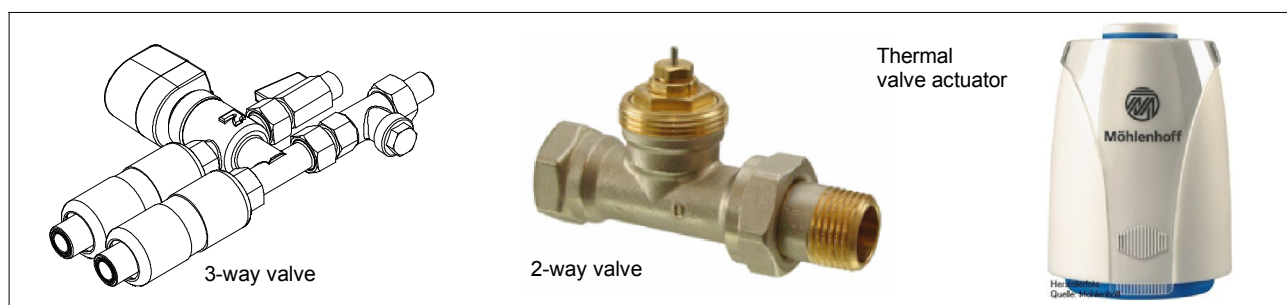
#### Room temperature controller type RRT5



- 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

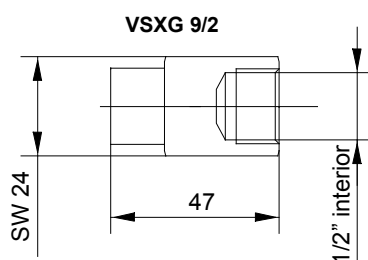
Using the room temperature controller the following parameters are set:

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

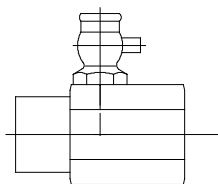


### Transition piece

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.

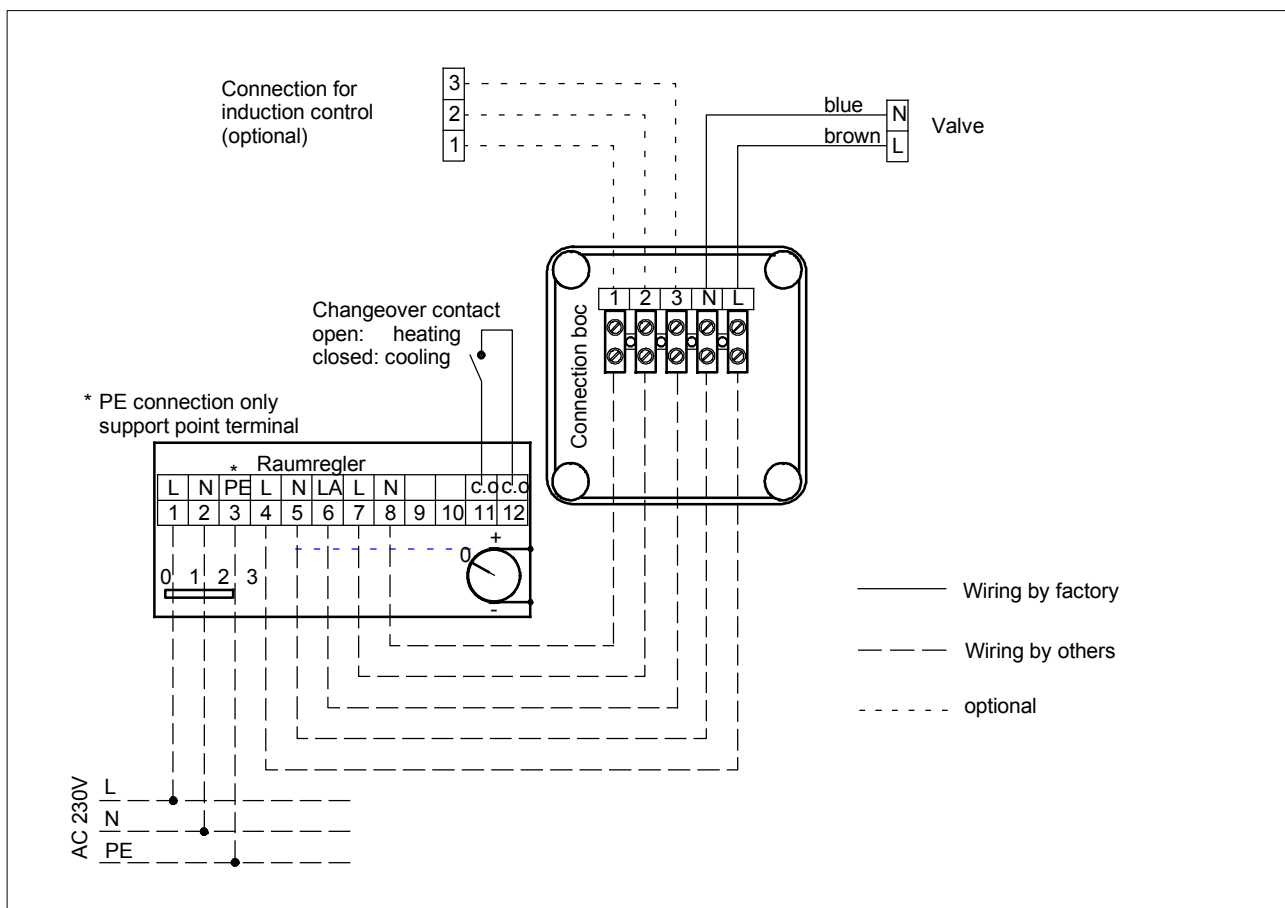
#### Operating mode OFF (standby operation)

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.

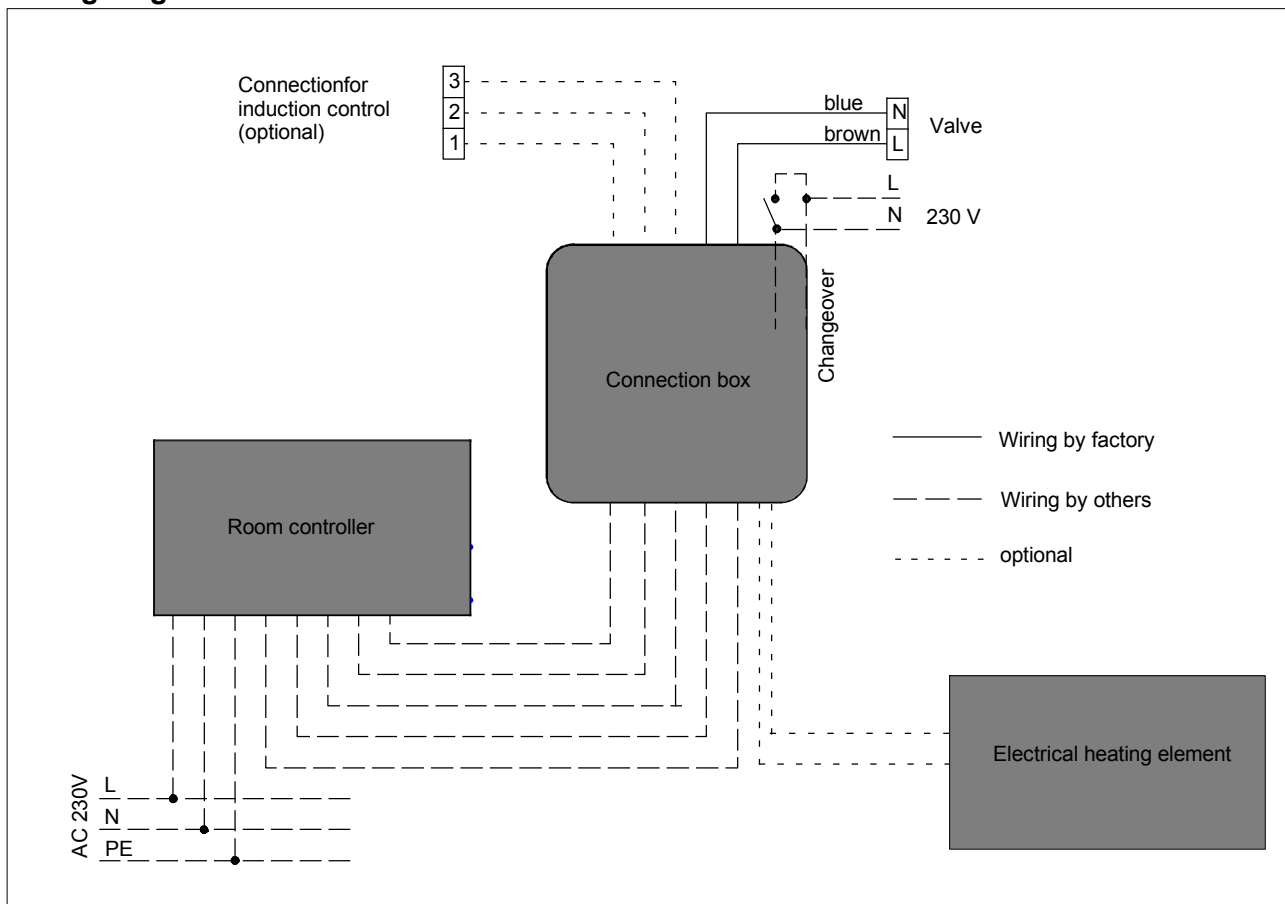
If the ACTUAL temperature drops below the SET temperature ( $t_{ACT} < t_{SET}$ ), the valves are closed. Water is no longer flowing through the heat exchanger.

#### 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

### Control 4-pipe system

The unit has two separate water systems, one for heating, the other for cooling. Thus, chilled and hot water will always remain separate.

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

The SET temperature is set using a room temperature controller (see page 15).

#### Heating

If the ACTUAL temperature drops below the SET temperature ( $t_{ACT} < t_{SET}$ ), the warm water valves open and the cold water valves close.

#### Cooling

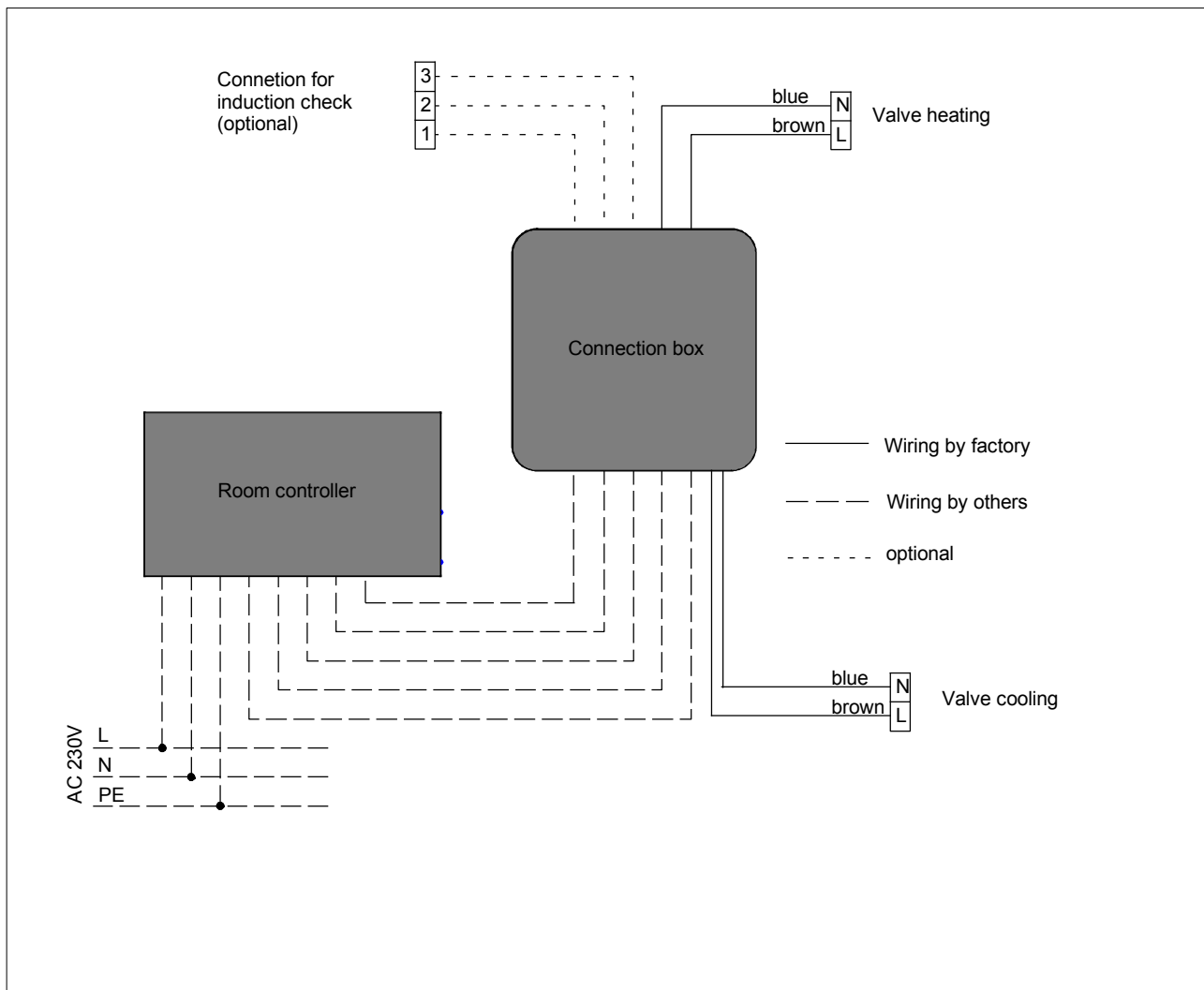
If the ACTUAL temperature rises above the SET temperature ( $t_{ACT} > t_{SET}$ ), the cold water valves open and the warm water valves close.

#### Induction check

If the induction check is switched off, all valves close.

If the 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.

### Wiring diagram



## Technical brochure

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

### Nomenclature

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

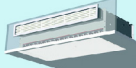

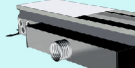
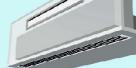
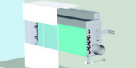
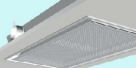
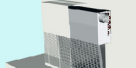

(1) (2) (3) (4) (5) (6) (7)

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

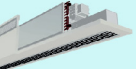
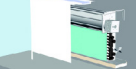

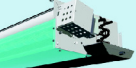
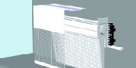
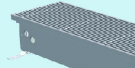
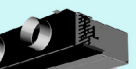
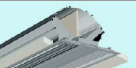


## Product Overview LTG Air-Water Systems

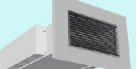


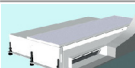
### LTG Induction – Induction Units

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

