

Technical Documentation  
**Induction Units**  
for perimeter installation



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# Klimavent® induction units for perimeter installation

Content	Page
Klimavent® induction units	3
Type HFG-0 2-pipe system	5
Type HFG-0 4-pipe system	7
Type HFK-0 4-pipe system	9
Type HFS 4-pipe system	11
Type HFG with bypass 2-pipe system	14
Type HFL 4-pipe system	16
Type HFH 4-pipe system	18
Type QHG perimeter displacement induction unit	20
Capacity charts	23
Example for selection	27
Connection of units	28
Damper actuators	29
Specifications and schedules of prices	

## Notes

Dimensions stated in this brochure are in mm.

For the dimensions given in this brochure, the General Tolerances according to DIN EN 12020-2 apply.  
For the outlet grille special tolerances stated in the drawing apply.

Straightness and twist tolerances for extruded aluminum 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 tender documentations are at the end of this document.

They are available in word format at your local dealership or at [www.LTG-AG.de](http://www.LTG-AG.de).

## Klimavent® induction units for perimeter installation

LTG offer air diffusion by various techniques:

- Mixed/displacement flow from the sill
- tangential flow from the sill
- Indivent® flow from the ceiling
- air displacement from the sill

LTG-Klimavent® units are induction units for medium/high-pressure air conditioning systems.

The medium/high-pressure air conditioning system is a combined air and water system:

- The air system ensures air replenishment and room air moisture control.
- The water system, which is particularly economical for the transportation of energy, additionally heats or cools the air using heat exchangers.

This provides the two most significant features of the high-pressure induction unit: energy-saving mode of operation and low space requirements.



*Klimavent® induction units with casing*

### Types and sizes

LTG offers different types and sizes for any application. The main distinctive feature of the LTG induction units is the way the temperature is controlled.

Each of the LTG induction units is available in five sizes: 500 - 630 - 800 - 1000 - 1250.

### Two-pipe system

The induction 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.

### Four-pipe system

The induction unit has two separate water systems, one for heating, the other for cooling. Thus, chilled and hot water will always remain separate. The four-pipe system fulfills all requirements on varying loads and small control zones.

### Valve control (water-side control)

The heating or cooling output of the heat exchanger is controlled by modifying the water flow.

### Damper control (air-side control)

The heating or cooling output is controlled by modifying the flow of secondary air. Adjustable dampers guide the air current through the air cooler or the air heater or they divert the secondary air through a bypass avoiding the heat exchanger.

## Advantages

- **High cooling and heating capacity**  
due to ultra efficient heavy-duty heat exchanger
- **Low energy consumption**  
due to high capacity natural convection
- **Low noise**  
due to special design and arrangement of nozzles.
- **Flexible nozzle assembly**  
due to the availability of several sets of nozzles which may also be combined, resulting in a particularly advantageous room flow to meet any demand.
- **No sequence overlaps**  
The actuator of the air-side controlled damper is designed to make a simultaneous heating and cooling of the unit impossible.
- **High operational reliability**  
The air dampers are mounted on robust shafts on low-friction ball bearings.
- **Maintenance-free actuators**  
The electric and pneumatic actuators for all control types are maintenance-free and safe to operate.
- **High induction ratio**  
due to optimum aerodynamic energy conversion of the primary air.
- **Wide range of models**  
The wide selection of models includes units to meet most demands:
  - for air-side (damper) or water-side (valve) control
  - for two-pipe or four-pipe systems
  - each unit is available in different sizes.
- **Optimized selection**  
Klimavent® induction units are dimensioned using special LTG computer programs.
- **Fire safety**  
due to primary air nozzles of aluminum and primary air sockets of sheet steel (on request).

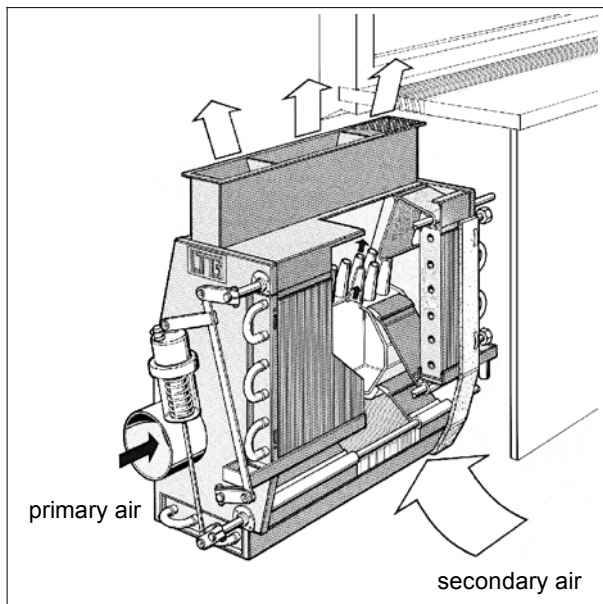
## Klimavent<sup>®</sup> induction units for perimeter installation

### Mode of operation

The primary air (usually the fresh air requirement) from the central air conditioning unit is discharged through nozzles at high speed. Simultaneously, it draws back-in secondary air from the room.

The secondary air flows into the unit through a heat exchanger and is thus being heated or cooled.

Then, the primary air is mixed with the heated or cooled secondary air inside the unit and flows into the room through an outlet grille or diffuser.



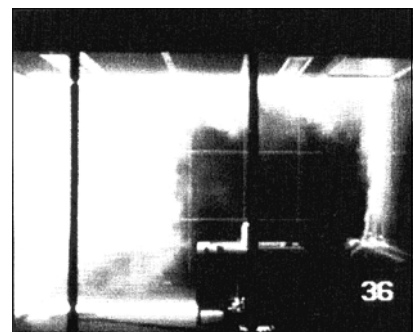
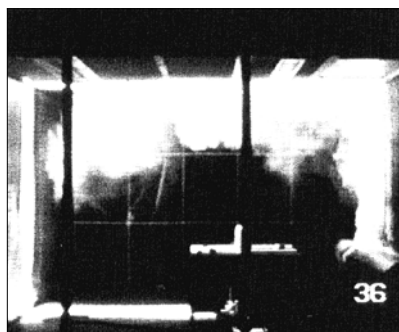
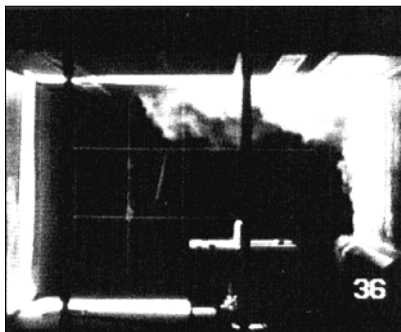
Mode of operation of LTG induction unit type HFH

### Accessories, special versions

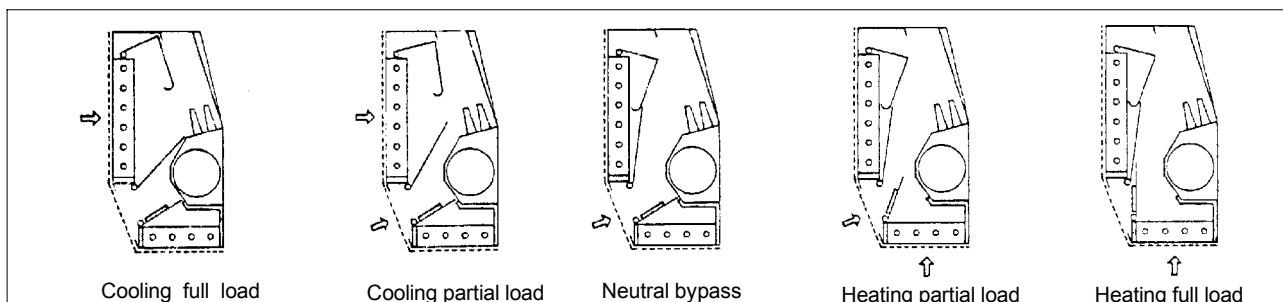
(see brochure: Accessories for LTG A/C systems)

- Units without secondary air filter and safety grille on the outlet (standard version with filter and grille).
- Condensate receiver with drainage socket.
- Primary air throttle for the primary air socket.
- For water-side connection of the unit:  
screw fitting 3/8" or 1/2"  
or vent screw connection,  
flexible connecting hoses with and without ventilation.
- Aluminum outlet grille.
- Straight discharge spigot (length 70 or 110 mm).
- Air connection from below (standard: lateral).
- Primary air nozzles of aluminum, primary air socket of sheet steel for increased fire safety.
- Various installation types: wall mounting or floor stands.
- Air outlet grille and frame.
- Thermostat connection with probe holder inside the pipe.
- Controls

### Room airflow



Room airflow of induction units with a tangential air flow (smoke pictures in three time intervals)



Control of induction unit type HFH, mode of operation

# Klimavent® induction units for perimeter installation Type HFG-0, two-pipe system – cooling or heating

## Specification

Induction unit with one heat exchanger for heating or cooling the secondary air.  
Central water-side control.  
Vertical or horizontal installation.  
Air connection on the right, left or from below.  
Water connection on the right or left.

## Dimensions

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
500	497	467	529	623	585
630	642	612	674	718	730
800	797	767	829	873	885
1000	997	967	1029	1073	1085
1250	1242	1212	1274	1318	1335

## Design

The technical specifications on the following page are valid under the following conditions:

- Selection of unit: - for standard flow rates  
- with filter  
- with rubber nozzles  
- with air outlet neck  
- without casing

Corrections for other flow rates, see page 23.

Without filter: output increased by 5%.

With aluminum nozzles: sound power level plus 2 - 3 dB(A).

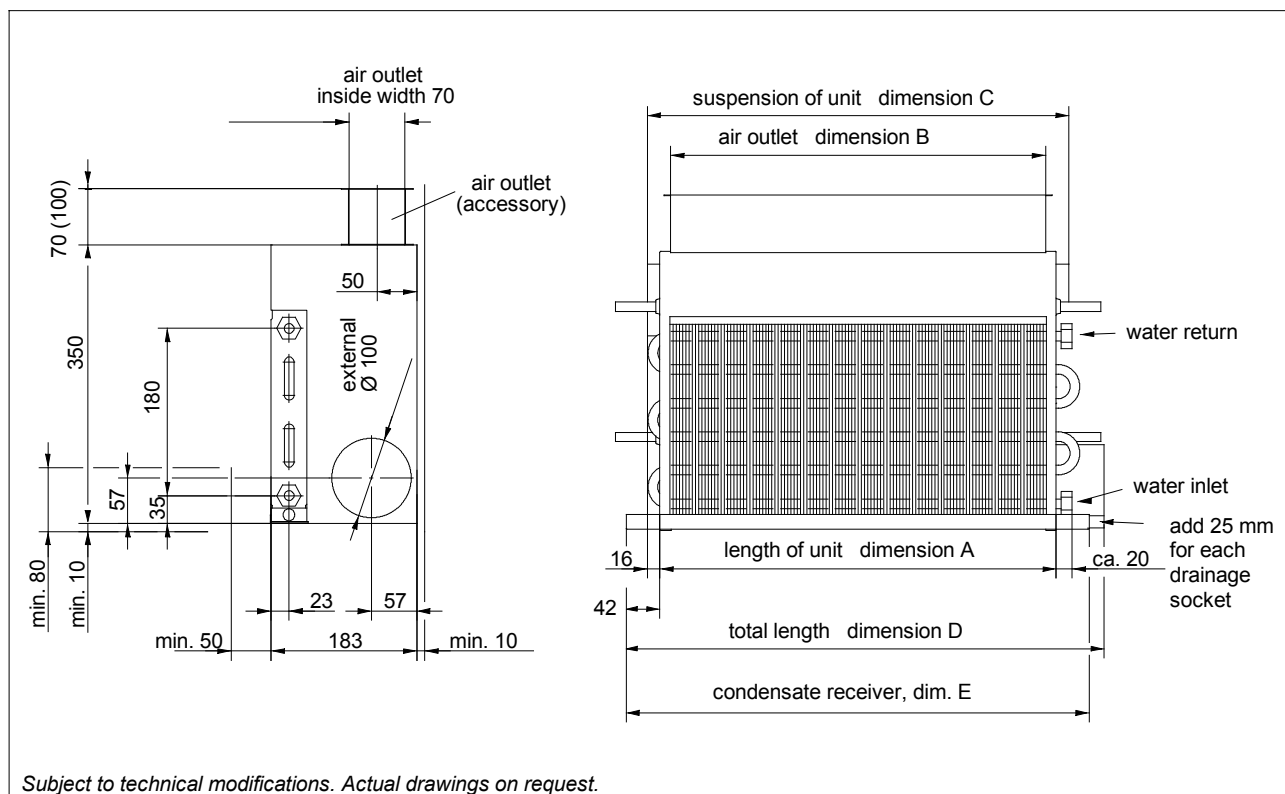
According to equipment, sound pressure level reduced by 2 - 7 dB(A).

The stated performance data may vary in case of other conditions.

The heating performance data for natural convection  $Q_{Ek}$  are based on the following:

Room air temperature 20 °C (standard flow rate)

Water supply temperature 70 °C →  $\Delta t = 50$  K





# Klimavent® induction units for perimeter installation

## Type HFG-0, two-pipe system – cooling or heating

### Technical data size 500

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	30	26	10	29	29
	40	25	13	33	33
	50	28	17	35	35
250	30	28	10	30	30
	40	27	13	34	34
	50	29	17	37	37
300	30	29	10	31	31
	40	32	13	36	36
	50	30	17	39	39
	60	33	20	41	41

$Q_{Ek}$  = 419 W  
 $m$  = 11 kg  
 $w_{ok} / \Delta p_w$  = 200 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 200 / 18 [kg/h] / [kPa]

### Technical data size 530

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	40	27	13	38	38
	50	26	17	42	42
	60	28	20	45	45
250	40	29	13	40	40
	50	31	17	45	45
	60	29	20	48	48
300	40	31	13	41	41
	50	33	17	46	46
	60	31	20	50	50
	70	33	23	52	52

$Q_{Ek}$  = 503 W  
 $m$  = 13,5 kg  
 $w_{ok} / \Delta p_w$  = 250 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 250 / 18 [kg/h] / [kPa]

### Technical data size 800

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	50	28	17	47	47
	65	28	22	54	54
	80	31	27	58	58
250	50	30	17	49	49
	65	33	22	57	57
	80	32	27	61	61
300	50	32	17	51	51
	65	34	22	59	59
	80	33	27	63	63
	90	35	30	66	66

$Q_{Ek}$  = 593 W  
 $m$  = 16,5 kg  
 $w_{ok} / \Delta p_w$  = 300 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 300 / 18 [kg/h] / [kPa]

### Technical data size 1000

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	65	30	22	60	60
	80	30	27	66	66
	100	33	33	71	71
250	65	32	22	62	62
	80	31	27	69	69
	100	34	33	75	75
300	65	33	22	64	64
	80	36	27	72	72
	100	35	33	78	78
	110	37	37	80	80

$Q_{Ek}$  = 719 W  
 $m$  = 19,5 kg  
 $w_{ok} / \Delta p_w$  = 350 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 350 / 18 [kg/h] / [kPa]

### Technical data size 1250

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	80	32	27	76	76
	100	32	33	85	85
	125	36	42	92	92
250	80	33	27	79	79
	100	36	33	89	89
	125	37	42	96	96
300	80	34	27	82	82
	100	37	33	92	92
	125	38	42	100	100
	150	41	50	106	106

$Q_{Ek}$  = 872 W  
 $m$  = 23 kg  
 $w_{ok} / \Delta p_w$  = 420 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 420 / 18 [kg/h] / [kPa]

### Legend

- $\Delta p$  - static pressure at the primary air socket
- $V_p$  - primary air flow rate ( $\pm 10\%$ )
- $L_{wA}$  - sound power level ( $\pm 3$  dB)
- $Q_p$  - cool. capacity of primary air (fresh air) ( $\pm 5\%$ )
- $Q_k$  - cool. capacity, secondary (heat exch.) ( $\pm 5\%$ )
- $Q_h$  - heating capacity, secondary ( $\pm 5\%$ )
- $Q_{Ek}$  - heating capacity with natural convection
- $m$  - weight
- $w_{ok}$  - standard water flow rate at cooling capacity
- $w_{oh}$  - standard water flow rate at heating capacity
- $\Delta t$  - temperature difference between suction air temperature before entering the heat exchanger and water supply
- $\Delta t_p$  - temperature difference between room air and primary air
- $\Delta p_w$  - water-side pressure loss

# Klimavent<sup>®</sup> induction units for perimeter installation Type HFG-0, four-pipe system – cooling and heating

## Specification

Induction unit with one heat exchanger for heating and cooling the secondary air, for high outputs at low flow rates.  
Water-side control by valves.  
Vertical or horizontal installation.  
Air connection on the right, left or from below.  
Water connection on the right or left.

## Dimensions

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
500	497	467	529	652	585
630	642	612	674	797	730
800	797	767	829	952	885
1000	997	967	1029	1152	1085
1250	1242	1212	1274	1402	1335

## Design

he technical specifications on the following page are valid under the following conditions:

Selection of unit: - for standard flow rates  
- with filter  
- with rubber nozzles  
- with air outlet neck  
- without casing

Corrections for other flow rates, see page 25.

Without filter: output increased by 5%.

With aluminum nozzles: sound power level + 2-3 dB(A).

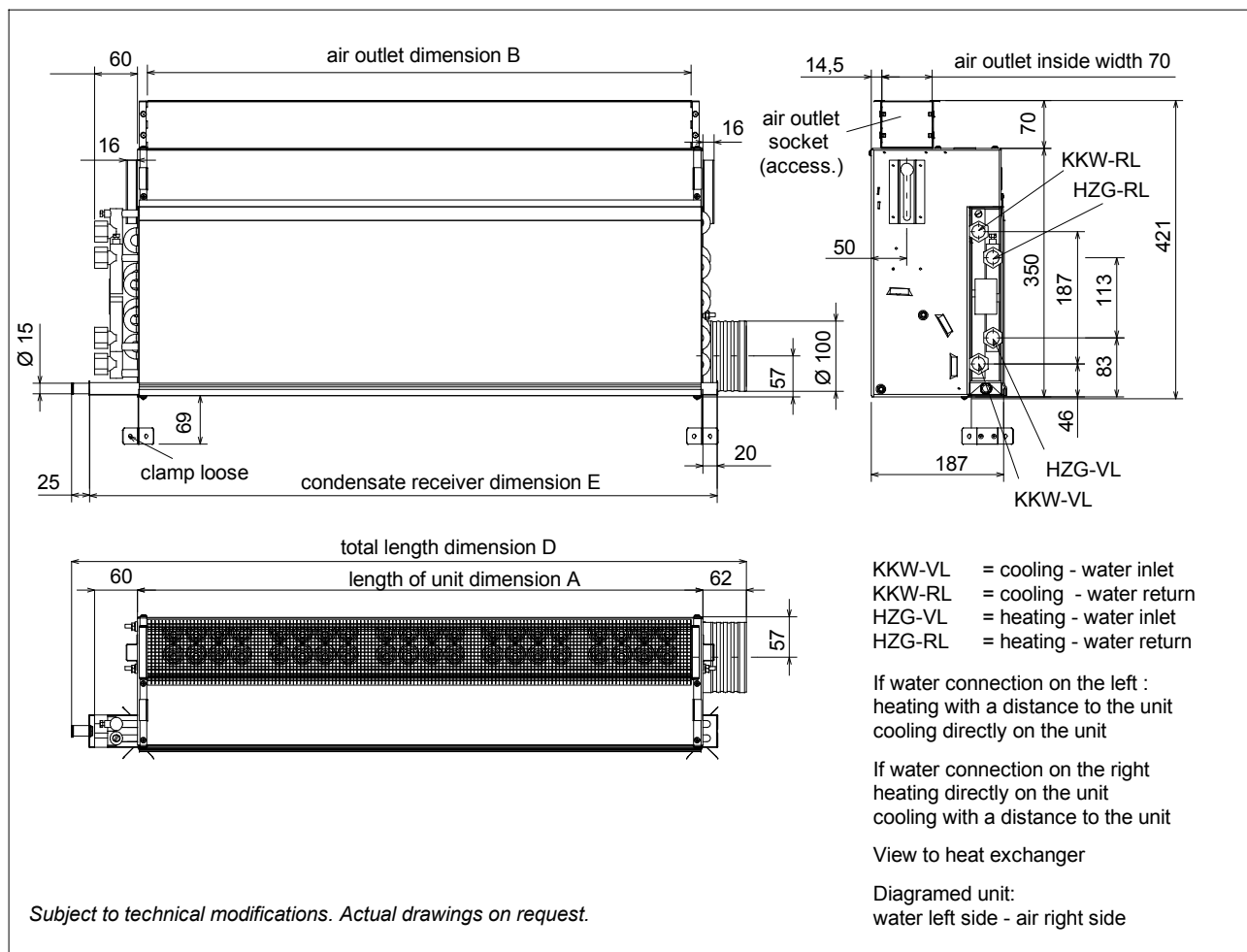
According to equipment, sound pressure level reduced by 2 - 7 dB(A).

The stated performance data may vary in case of other conditions.

The heating performance data for natural convection  $Q_{Ek}$  are based on the following:

Room air temperature +20 °C (standard flow rate)

Water supply temperature +70 °C →  $\Delta t = 50$  K



# Klimavent® induction units for perimeter installation

## Type HFG-0, four-pipe system – cooling and heating

### Technical data size 500

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	30	26	10	23	19
	40	25	13	26	22
	50	28	17	28	24
250	30	28	10	23	20
	40	27	13	27	22
	50	29	17	29	25
300	30	29	10	25	21
	40	32	13	29	25
	50	30	17	32	27
	60	33	20	33	28

$Q_{Ek}$  = 343 W  
 $m$  = 11 kg  
 $w_{ok} / \Delta p_w$  = 80 / 1,8 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 80 / 1 [kg/h] / [kPa]

### Technical data size 1000

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	65	30	22	50	42
	80	30	27	55	46
	100	33	33	60	50
250	65	32	22	51	42
	80	31	27	56	47
	100	34	33	61	51
300	65	33	22	55	46
	80	36	27	60	51
	100	35	33	67	56
	110	37	37	73	60

$Q_{Ek}$  = 585 W  
 $m$  = 19,5 kg  
 $w_{ok} / \Delta p_w$  = 150 / 10 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 150 / 6 [kg/h] / [kPa]

### Technical data size 630

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	40	27	13	30	25
	50	26	17	33	28
	60	28	20	36	30
250	40	29	13	31	26
	50	31	17	34	29
	60	29	20	37	31
300	40	31	13	33	27
	50	33	17	37	31
	60	31	20	40	34
	70	33	23	42	35

$Q_{Ek}$  = 412 W  
 $m$  = 13,5 kg  
 $w_{ok} / \Delta p_w$  = 100 / 3 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 100 / 2 [kg/h] / [kPa]

### Technical data size 1250

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	80	32	27	64	53
	100	32	33	71	59
	125	36	42	78	65
250	80	33	27	64	54
	100	36	33	73	61
	125	37	42	79	66
300	80	34	27	71	59
	100	37	33	80	67
	125	38	42	87	72
	150	41	50	92	77

$Q_{Ek}$  = 715 W  
 $m$  = 23 kg  
 $w_{ok} / \Delta p_w$  = 180 / 16 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 180 / 10 [kg/h] / [kPa]

### Technical data size 800

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	50	28	17	37	32
	65	28	22	43	36
	80	31	27	46	39
250	50	30	17	39	33
	65	33	22	44	37
	80	32	27	47	40
300	50	32	17	43	35
	65	34	22	47	39
	80	33	27	51	43
	90	35	30	54	46

$Q_{Ek}$  = 486 W  
 $m$  = 16,5 kg  
 $w_{ok} / \Delta p_w$  = 120 / 5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 120 / 3,3 [kg/h] / [kPa]

### Legend

- $\Delta p$  - static pressure at the primary air socket
- $V_p$  - primary air flow rate ( $\pm 10\%$ )
- $L_{wA}$  - sound power level ( $\pm 3$  dB)
- $Q_p$  - cool. capacity of primary air (fresh air) ( $\pm 5\%$ )
- $Q_k$  - cool. capacity, secondary (heat exch.) ( $\pm 5\%$ )
- $Q_h$  - heating capacity, secondary ( $\pm 5\%$ )
- $Q_{Ek}$  - heating capacity with natural convection
- $m$  - weight
- $w_{ok}$  - standard water flow rate at cooling capacity
- $w_{oh}$  - standard water flow rate at heating capacity
- $\Delta t$  - temperature difference between suction air temperature before entering the heat exchanger and water supply
- $\Delta t_p$  - temperature difference between room air and primary air
- $\Delta p_w$  - water-side pressure loss



## Klimavent® induction units for perimeter installation Type HFK-0, four-pipe system – cooling and heating

### Specification

Induction unit with one heat exchanger for heating and cooling the secondary air, for high outputs at low flow rates.  
Water-side control by valves.  
Vertical or horizontal installation.  
Air connection on the right, left or from below.  
Water connection on the right or left.

### Dimensions

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
630	642	612	674	797	730
800	797	767	829	952	885
1000	997	967	1029	1152	1085
1250	1242	1212	1274	1402	1335

### Design

The technical specifications on the following page are valid under the following conditions:

Selection of unit: - for standard flow rates  
- with filter  
- with rubber nozzles  
- with air outlet neck  
- without casing

Corrections for other flow rates, see page 24 and 26.

Without filter: output increased by 5%.

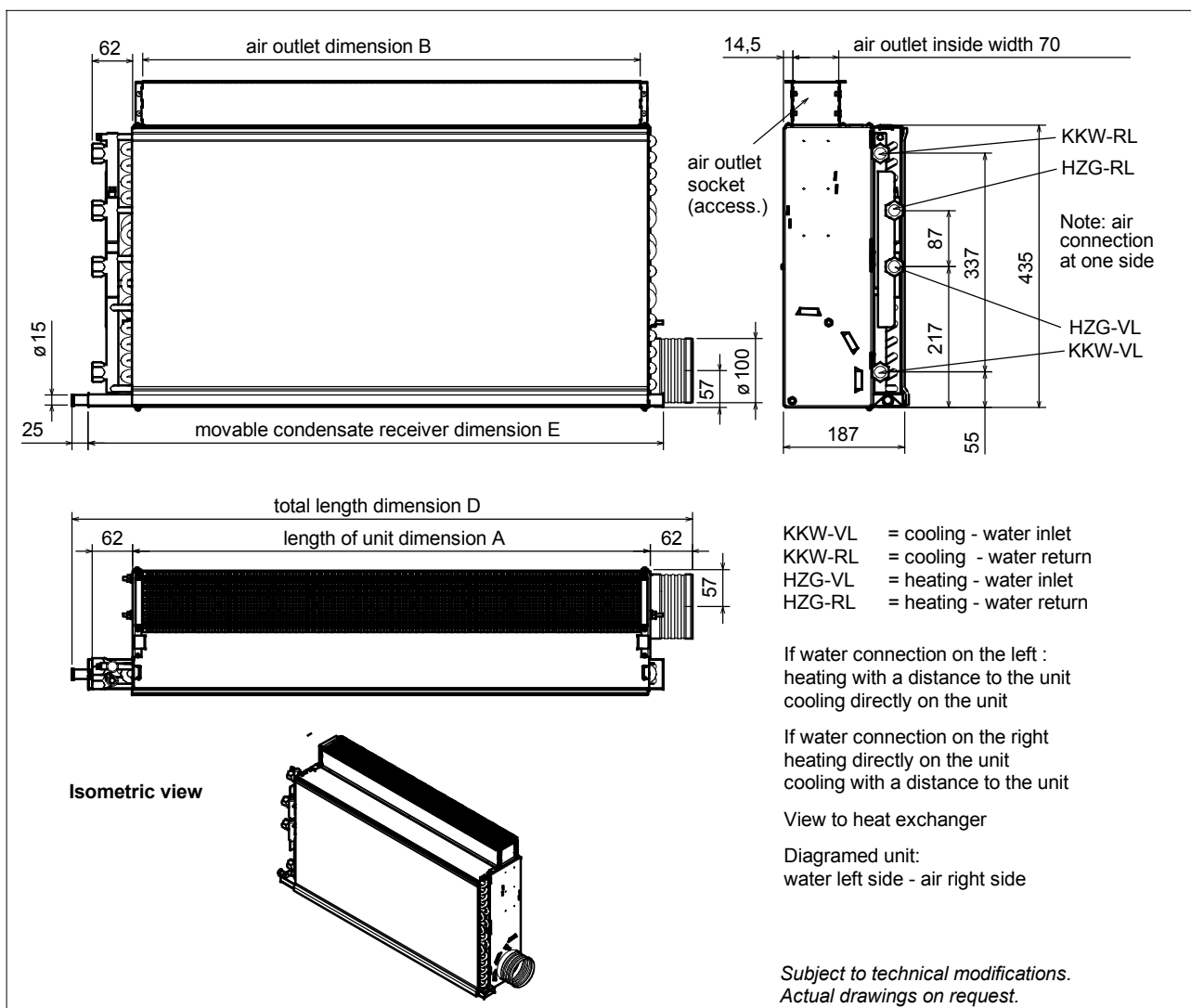
With aluminum nozzles: sound power level plus 2 - 3 dB(A).  
According to equipment, sound pressure level reduced by 2 - 7 dB(A).

The stated performance data may vary in case of other conditions.

The heating performance data for natural convection  $Q_{Ek}$  are based on the following:

Room air temperature +20 °C (standard flow rate)

Water supply temperature +70 °C →  $\Delta t = 50$  K



# Klimavent® induction units for perimeter installation

## Type HFK-0, four-pipe system – cooling and heating

### Technical data size 630

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t^1$ [W/K]	$Q_h/\Delta t^2$ [W/K]
150	40	27	13	34	19
	50	27	17	37	20
	60	28	20	38	22
200	40	27	13	35	20
	50	28	17	39	21
	60	29	20	42	22
250	40	28	13	37	20
	50	29	17	41	22
	60	30	20	44	23
300	50	29	13	42	23
	60	30	17	46	24
	70	31	20	48	25

$$Q_{Ek}^{3)} = 428 \quad W$$

$$m = 14 \quad kg$$

$$w_{ok} / \Delta p_w = 120 / 2,6 \quad [kg/h] / [kPa]$$

$$w_{oh} / \Delta p_w = 100 / 1,9 \quad [kg/h] / [kPa]$$

### Technical data size 800

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t^1$ [W/K]	$Q_h/\Delta t^2$ [W/K]
150	50	27	17	43	24
	65	28	22	47	25
	80	29	27	49	25
200	50	27	17	44	25
	65	29	22	49	26
	80	30	27	53	27
250	50	29	17	48	26
	65	30	22	52	27
	80	32	27	55	29
300	65	31	22	53	28
	80	33	27	57	30
	90	34	30	59	31

$$Q_{Ek}^{3)} = 544 \quad W$$

$$m = 21 \quad kg$$

$$w_{ok} / \Delta p_w = 150 / 4,1 \quad [kg/h] / [kPa]$$

$$w_{oh} / \Delta p_w = 125 / 2,8 \quad [kg/h] / [kPa]$$

- 1) with 16 °C water supply temperature, 26 °C room temp.  
at a height of 1,1 m and non-condensing operation
- 2) with 16 °C primary air temp. and 26 °C air inlet temp.
- 3) with 70 °C water supply temp. and 20 °C air inlet temp.

Values are given for the following conditions:

- Standard water flow rate
- Unit with filter Gs/K80z
- With primary air nozzles of plastic
- With discharge duct 70 mm
- Without casing

Reduced capacity (depending on exact operating point)

- without air outlet socket ca. 5 %
- without filter < 5 %
- with mixed/displacement flow deflector in the discharge duct up to approx. 20 %

### Technical data size 1000

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t^1$ [W/K]	$Q_h/\Delta t^2$ [W/K]
150	60	28	20	54	29
	75	29	26	58	30
	90	30	30	60	33
200	60	28	20	55	31
	75	29	26	61	33
	90	31	30	67	35
250	60	30	20	60	32
	75	31	26	65	34
	90	33	30	70	35
300	75	32	26	66	36
	90	34	30	71	37
	100	36	33	73	38

$$Q_{Ek}^{3)} = 560 \quad W$$

$$m = 25 \quad kg$$

$$w_{ok} / \Delta p_w = 180 / 6,5 \quad [kg/h] / [kPa]$$

$$w_{oh} / \Delta p_w = 145 / 3,6 \quad [kg/h] / [kPa]$$

### Technical data size 1250

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t^1$ [W/K]	$Q_h/\Delta t^2$ [W/K]
150	60	27	20	68	32
	80	28	27	74	35
	100	30	33	80	36
200	60	28	20	72	33
	80	29	27	79	36
	100	31	33	85	38
250	60	29	20	75	35
	80	30	27	82	38
	100	32	33	89	42
300	80	31	27	84	40
	100	33	33	93	41
	120	36	41	95	42

$$Q_{Ek}^{3)} = 681 \quad W$$

$$m = 28 \quad kg$$

$$w_{ok} / \Delta p_w = 240 / 12 \quad [kg/h] / [kPa]$$

$$w_{oh} / \Delta p_w = 170 / 5 \quad [kg/h] / [kPa]$$

### Legend

- $\Delta p$  - static pressure at the primary air socket
- $V_p$  - primary air flow rate ( $\pm 10 \%$ )
- $L_{wA}$  - sound power level ( $\pm 3 \text{ dB}$ )
- $Q_p$  - cooling capacity of primary air (fresh air) ( $\pm 5 \%$ )
- $Q_k$  - cooling capacity, secondary (heat exch.) ( $\pm 5 \%$ )
- $Q_h$  - heating capacity, secondary ( $\pm 5 \%$ )
- $Q_{Ek}$  - heating capacity with natural convection
- $m$  - weight
- $w_{ok}$  - standard water flow rate at cooling capacity
- $w_{oh}$  - standard water flow rate at heating capacity
- $\Delta t$  - temperature difference between suction air temp. before entering heat exchanger, and water supply
- $\Delta t_p$  - temperature difference between room air and primary air
- $\Delta p_w$  - water-side pressure loss

# Klimavent<sup>®</sup> induction units for perimeter installation Type HFS, four-pipe system – cooling and heating

## Specification

Space-saving induction unit with an extremely low installation height (149 mm).  
With one heat exchanger for heating and cooling the secondary air, for high outputs at low flow rates (two-pipe unit for cooling only on request).  
Water-side control by valves.  
Vertical installation.  
Air connection on the right or left.  
Water connection on the right or left.

## Dimensions

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
500	497	467	529	623	585
630	642	612	674	718	730
800	797	767	829	873	885
1000	997	967	1029	1073	1085
1250	1242	1212	1274	1318	1335

## Design

The technical specifications given on the following page are valid under the following conditions:

Selection of unit:

- for standard flow rates
- with filter
- with rubber nozzles
- with air outlet neck
- without casing

Corrections for other flow rates, see page 25.

Without filter: output increased by 5%.

With aluminum nozzles: sound power level plus 2 - 3 dB(A).

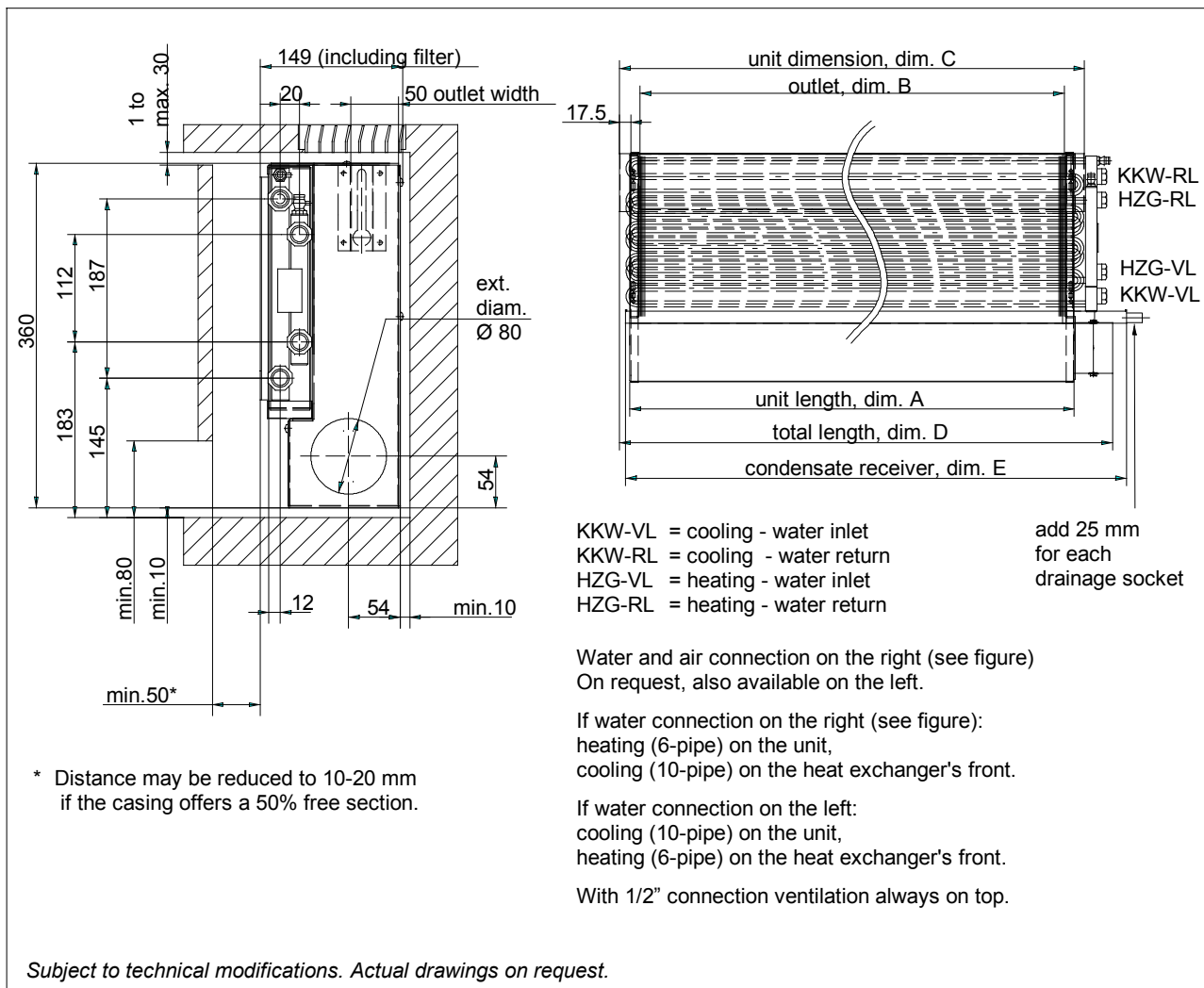
According to equipment, sound pressure level reduced by 2 - 7 dB(A).

The stated performance data may vary in case of other conditions.

The heating performance data for natural convection  $Q_{Ek}$  are based on the following:

Room air temperature +20 °C (standard flow rate)

Water supply temperature +70 °C →  $\Delta t = 50$  K



# Klimavent® induction units for perimeter installation

## Type HFS, four-pipe system – cooling and heating

### Technical data size 500

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	25	26	8	19	15
	40	29	13	22	18
	55*	33	18	24	19
250	25	27	8	20	16
	40	30	13	24	19
	55*	34	18	27	22
300	25	28	8	22	17
	40	31	13	28	22
	55*	35	18	31	25
	60*	36	20	33	26

$Q_{Ek}$  = 343 W  
 $m$  = 11 kg  
 $w_{ok} / \Delta p_w$  = 80 / 1,8 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 80 / 1 [kg/h] / [kPa]

### Technical data size 630

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	30	27	10	23	18
	45	29	15	27	21
	60*	33	20	32	25
250	30	28	10	24	19
	45	30	15	28	22
	60*	34	20	34	27
300	30	29	10	25	20
	45	31	15	30	24
	60*	35	20	37	29
	75*	37	25	41	32

$Q_{Ek}$  = 412 W  
 $m$  = 13,5 kg  
 $w_{ok} / \Delta p_w$  = 100 / 3 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 100 / 2 [kg/h] / [kPa]

### Technical data size 800

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	40	28	13	32	25
	55	30	18	38	30
	75*	34	25	43	34
250	40	29	13	32	26
	55	31	18	40	32
	75*	35	25	46	37
300	40	30	13	34	27
	55	32	18	42	33
	75*	36	25	49	39
	90*	38	30	53	42

$Q_{Ek}$  = 715 W  
 $m$  = 23 kg  
 $w_{ok} / \Delta p_w$  = 180 / 16 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 180 / 10 [kg/h] / [kPa]

### Technical data size 1000

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	50	29	17	47	37
	65	30	22	53	42
	80*	36	27	56	44
250	50	30	17	49	39
	65	32	22	55	44
	80*	37	27	60	48
300	50	31	17	52	41
	65	33	22	58	46
	80*	38	27	62	49
	100*	40	33	65	52

$Q_{Ek}$  = 585 W  
 $m$  = 19,5 kg  
 $w_{ok} / \Delta p_w$  = 150 / 10 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 150 / 6 [kg/h] / [kPa]

### Technical data size 1250

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	65	31	22	63	50
	80	32	27	66	53
	100*	36	33	71	56
250	65	32	22	65	52
	80	34	27	69	55
	100*	39	33	74	59
300	65	33	22	67	53
	80	35	27	72	57
	100*	40	33	78	62
	125*	42	42	83	66

$Q_{Ek}$  = 715 W  
 $m$  = 23 kg  
 $w_{ok} / \Delta p_w$  = 180 / 16 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 180 / 10 [kg/h] / [kPa]

### Legend

- $\Delta p$  - static pressure at the primary air socket
- $V_P$  - primary air flow rate ( $\pm 10\%$ )
- $L_{wA}$  - sound power level ( $\pm 3$  dB)
- $Q_P$  - cool. capacity of prim. air (fresh air) ( $\pm 5\%$ )
- $Q_k$  - cool. capacity, second. (heat exch.) ( $\pm 5\%$ )
- $Q_h$  - heating capacity, secondary ( $\pm 5\%$ )
- $Q_{Ek}$  - heating capacity with natural convection
- $m$  - weight
- $w_{ok}$  - standard water flow rate at cooling capacity
- $w_{oh}$  - standard water flow rate at heating capacity
- $\Delta t$  - temp. diff. between suction air temp. before entering the heat exchanger and water supply
- $\Delta t_P$  - temp. diff. between room air / primary air
- $\Delta p_w$  - water-side pressure loss

\* Air flow rate only possible with the use of alu nozzles.

# Klimavent® induction units for perimeter installation Type HFS, four-pipe system – cooling and heating

## Series connection

If for reasons of space the induction units cannot be connected individually through an air distribution line, several units with low primary air flow rates may be air-supplied in series, the maximum number of units depending on the primary air flow rate.

The first unit in direction of air flow being applied air receives the full air flow rate, i.e. in case of a flow rate of 40 m<sup>3</sup>/h per unit, e.g. a total flow rate of 200 m<sup>3</sup>/h for 5 units.

Therefore, the air speed when entering the first unit is high and will cause the flow noises decisive for the overall sound level.

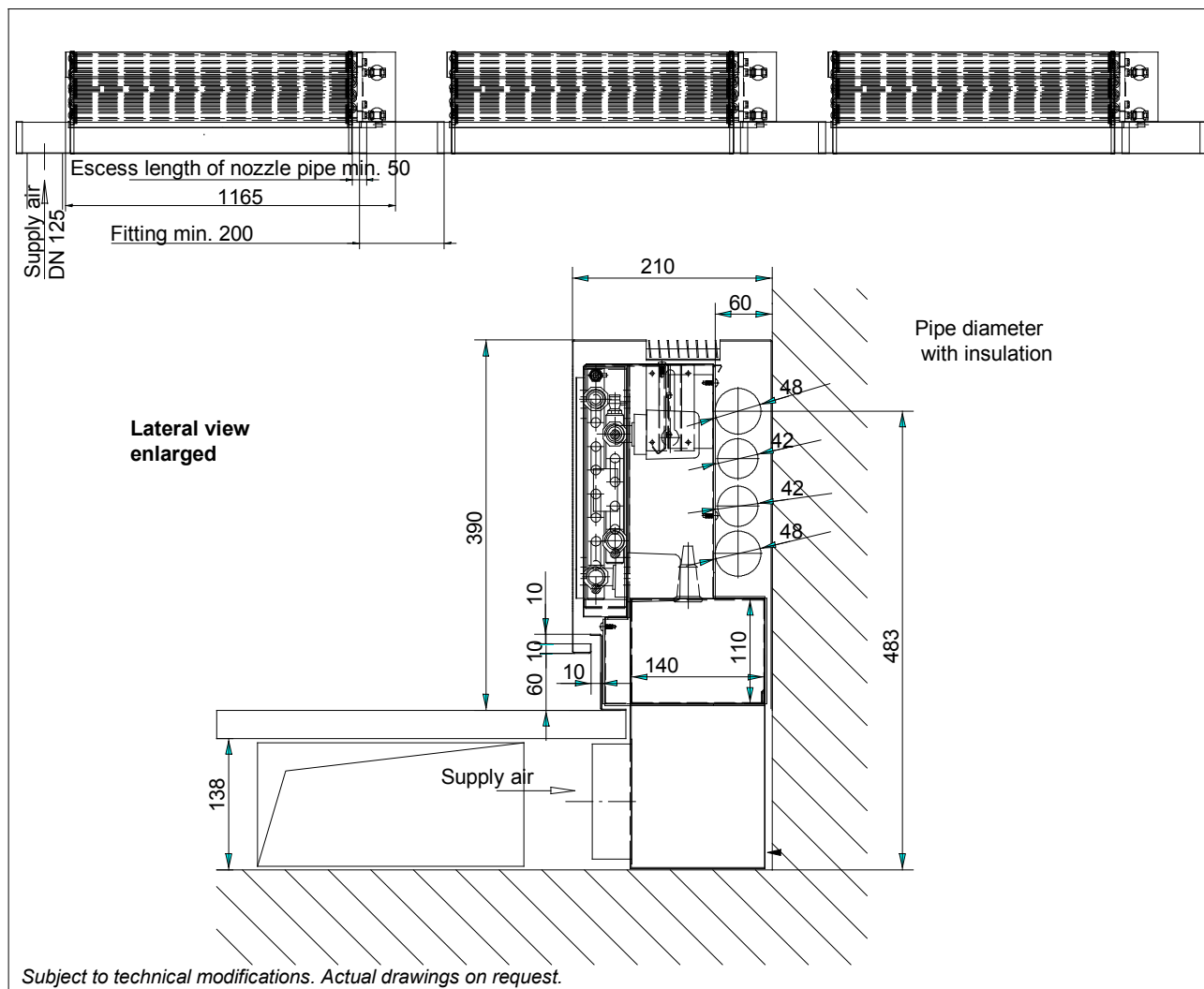
There is only a minor pressure loss between the units.

The sound power increase depends on the primary air flow rate, the nozzle pressure, the number of units and the unit size.

## Design example

Air flow rate per unit	40	m <sup>3</sup> /h
Total flow rate	200	m <sup>3</sup> /h
Sound power per unit	28	dB(A)

Increase of sound power level due to increased air speed	32 dB(A) per unit
Total sound power level (5 units):	39 dB(A)



Installation example of series connection: 5 HFS 1000 connected in series. Units with duct connection in the false floor.

# Klimavent<sup>®</sup> induction units for perimeter installation

## Type HFG with bypass, two-pipe system - cooling and heating

### Specification

Induction unit with one heat exchanger for heating or cooling the secondary air, for installation in window sills.  
Adjustment of the bypass dampers for air-side control by a built-in pneumatic or electric actuator.  
Air connection on the right, left or from below.  
Water connection on the right or left.

### Dimensions

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
500	497	467	529	692	585
630	642	612	674	837	730
800	797	767	829	992	885
1000	997	967	1029	1192	1085
1250	1242	1212	1274	1437	1335

### Design

The technical specifications on the following page are valid under the following conditions:

Selection of unit: - for standard flow rates  
- with filter  
- with rubber nozzles  
- with air outlet neck  
- without casing

Corrections for other flow rates, see page 23.

Without filter: output increased by 5%.

With aluminum nozzles: sound power level plus 2 - 3 dB(A).

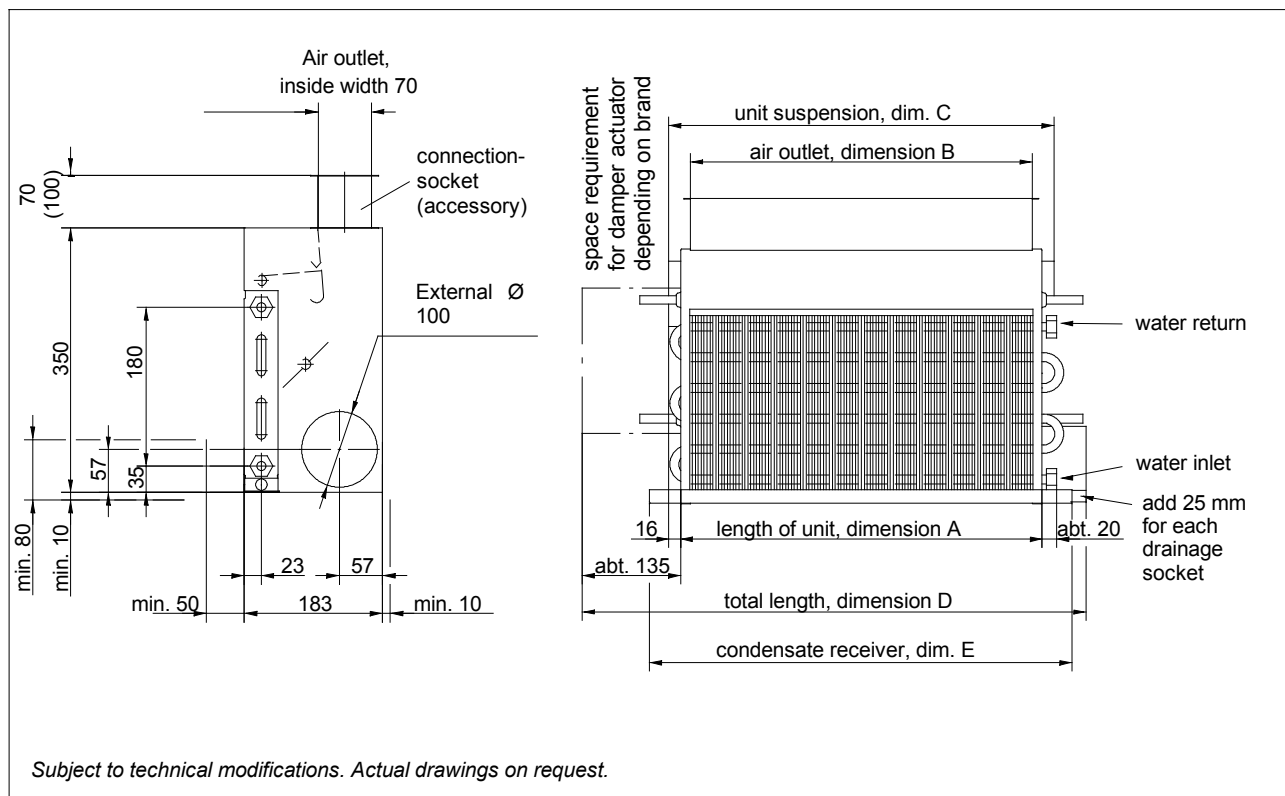
According to equipment, sound pressure level reduced by 2 - 7 dB(A).

The stated performance data may vary in case of other conditions.

The heating performance data for natural convection  $Q_{Ek}$  are based on the following:

Room air temperature +20 °C (standard flow rate)

Water supply temperature +70 °C →  $\Delta t = 50$  K





# Klimavent® induction units for perimeter installation

## Type HFG with bypass, two-pipe system – cooling or heating

### Technical data size 500

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	30	26	10	28	28
	40	25	13	33	33
	50	28	17	35	35
250	30	28	10	30	30
	40	27	13	34	34
	50	29	17	37	37
300	30	29	10	31	31
	40	32	13	36	36
	50	30	17	39	39
	60	33	20	41	41

$Q_{Ek}$  = 238 W  
 $m$  = 11 kg  
 $w_{ok} / \Delta p_w$  = 200 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 200 / 18 [kg/h] / [kPa]

### Technical data size 630

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	40	27	13	38	38
	50	26	17	42	42
	60	28	20	45	45
250	40	29	13	39	39
	50	31	17	45	45
	60	29	20	48	48
300	40	31	13	41	41
	50	33	17	46	46
	60	31	20	50	50
	70	33	23	52	52

$Q_{Ek}$  = 285 W  
 $m$  = 13,5 kg  
 $w_{ok} / \Delta p_w$  = 250 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 250 / 18 [kg/h] / [kPa]

### Technical data size 800

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	50	28	17	47	47
	65	28	22	54	54
	80	31	27	58	58
250	50	30	17	49	49
	65	33	22	57	57
	80	32	27	61	61
300	50	32	17	51	51
	65	34	22	59	59
	80	33	27	63	63
	90	35	30	66	66

$Q_{Ek}$  = 334 W  
 $m$  = 16,5 kg  
 $w_{ok} / \Delta p_w$  = 300 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 300 / 18 [kg/h] / [kPa]

### Technical data size 1000

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	65	30	22	60	60
	80	30	27	66	66
	100	33	33	71	71
250	65	32	22	62	62
	80	31	27	70	70
	100	34	33	75	75
300	65	33	22	64	64
	80	36	27	72	72
	100	35	33	78	78
	110	37	37	80	80

$Q_{Ek}$  = 403 W  
 $m$  = 19,5 kg  
 $w_{ok} / \Delta p_w$  = 350 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 350 / 18 [kg/h] / [kPa]

### Technical data size 1250

$\Delta p$ [Pa]	$V_p$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_p/\Delta t_p$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	80	32	27	76	76
	100	32	33	85	85
	125	36	42	92	92
250	80	33	27	79	79
	100	36	33	89	89
	125	37	42	96	96
300	80	34	27	82	82
	100	37	33	92	92
	125	38	42	100	100
	150	41	50	106	106

$Q_{Ek}$  = 488 W  
 $m$  = 23 kg  
 $w_{ok} / \Delta p_w$  = 420 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 420 / 18 [kg/h] / [kPa]

### Legend

- $\Delta p$  - static pressure at the primary air socket
- $V_p$  - primary air flow rate ( $\pm 10\%$ )
- $L_{wA}$  - sound power level ( $\pm 3$  dB)
- $Q_p$  - cool. capacity of primary air (fresh air) ( $\pm 5\%$ )
- $Q_k$  - cool. capacity, secondary (heat exch.) ( $\pm 5\%$ )
- $Q_h$  - heating capacity, secondary ( $\pm 5\%$ )
- $Q_{Ek}$  - heating capacity with natural convection
- $m$  - weight
- $w_{ok}$  - standard water flow rate at cooling capacity
- $w_{oh}$  - standard water flow rate at heating capacity
- $\Delta t$  - temperature difference between suction air temperature before entering the heat exchanger and water supply
- $\Delta t_p$  - temperature difference between room air and primary air
- $\Delta p_w$  - water-side pressure loss

# Klimavent® induction units for perimeter installation Type HFL, four-pipe system – cooling and heating

## Specification

Induction unit with two separate heat exchangers for heating and cooling the secondary air.  
Adjustment of the bypass dampers for air-side control by a built-in pneumatic or electric actuator.  
Vertical or horizontal installation.  
Air connection on the right, left or from below.  
Water connection on the right or left (opposite to the air connection).

## Dimensions

Size	A [mm]	B [mm]	C [mm]	D [mm]
500	497	467	529	689
630	642	612	674	834
800	797	767	829	989
1000	997	967	1029	1189
1250	1242	1212	1274	1434

## Design

The technical specifications given on the following page are valid under the following conditions:

Selection of unit: - for standard flow rates  
- with filter  
- with rubber nozzles  
- with air outlet neck  
- without casing

Corrections for other flow rates, see pages 23 and 24.

Without filter: output increased by 5%.

With aluminum nozzles: sound power level plus 2 - 3 dB(A).

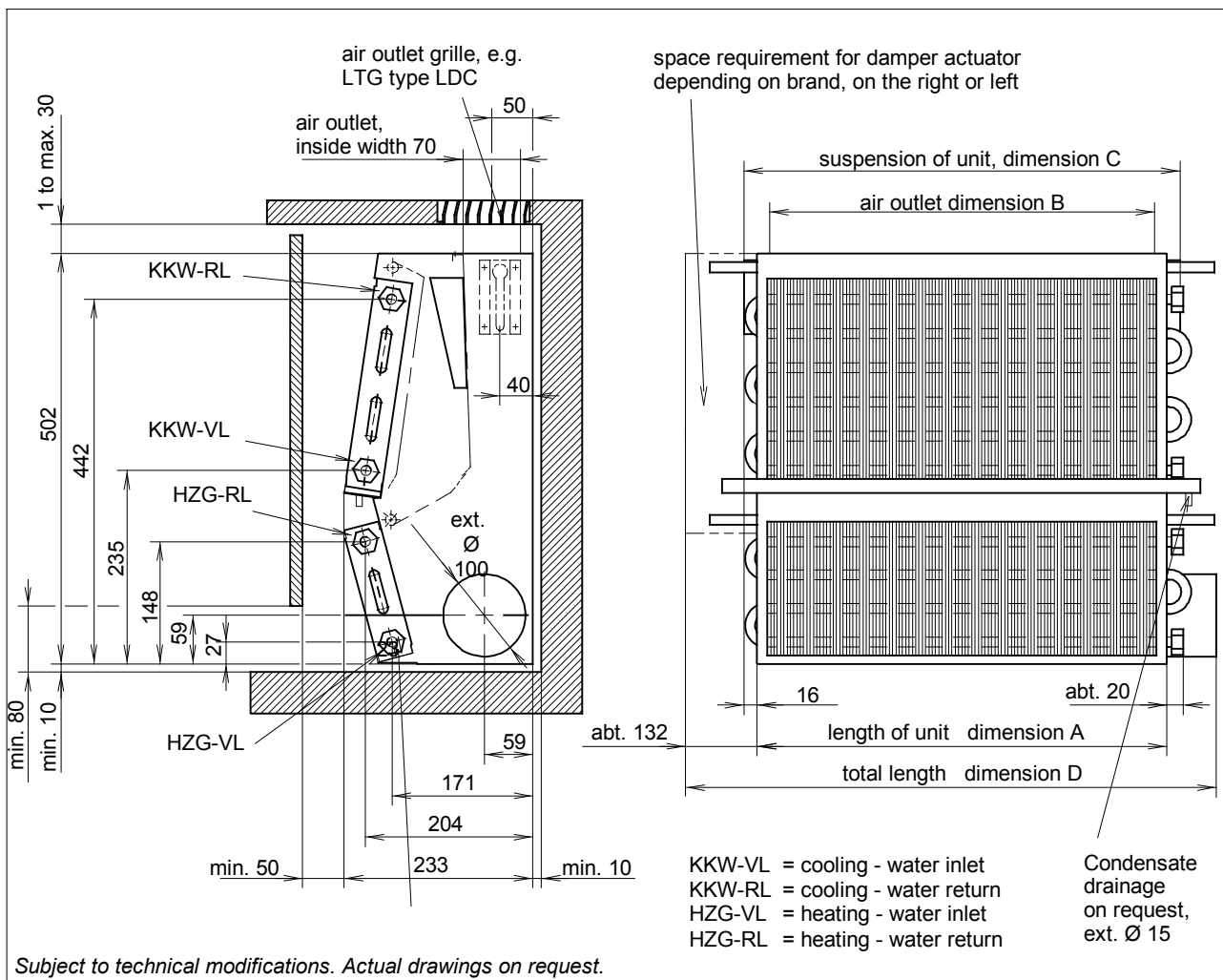
According to equipment, sound pressure level reduced by 2 - 7 dB(A).

The stated performance data may vary in case of other conditions.

The heating performance data for natural convection  $Q_{Ek}$  are based on the following:

Room air temperature +20 °C (standard flow rate)

Water supply temperature +70 °C →  $\Delta t = 50$  K



# Klimavent® induction units for perimeter installation

## Type HFL, four-pipe system – cooling and heating

### Technical data size 500

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	30	26	10	24	18
	40	25	13	27	20
	50	28	17	29	22
250	30	28	10	26	19
	40	27	13	29	21
	50	29	17	32	23
300	30	29	10	27	19
	40	32	13	30	21
	50	30	17	33	23
	60	33	20	35	25

$Q_{Ek}$  = 251 W  
 $m$  = 15 kg  
 $w_{ok} / \Delta p_w$  = 200 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 70 / 1,4 [kg/h] / [kPa]

### Technical data size 630

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	40	27	13	32	24
	50	26	17	35	26
	60	28	20	38	28
250	40	29	13	34	25
	50	31	17	38	27
	60	29	20	41	29
300	40	31	13	36	26
	50	33	17	39	28
	60	31	20	43	29
	70	33	23	45	31

$Q_{Ek}$  = 297 W  
 $m$  = 17 kg  
 $w_{ok} / \Delta p_w$  = 250 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 80 / 1,4 [kg/h] / [kPa]

### Technical data size 800

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	50	28	17	40	30
	65	28	22	45	33
	80	31	27	48	36
250	50	30	17	43	31
	65	33	22	48	34
	80	32	27	52	37
300	50	32	17	45	32
	65	34	22	50	35
	80	33	27	55	37
	90	35	30	57	39

$Q_{Ek}$  = 348 W  
 $m$  = 20 kg  
 $w_{ok} / \Delta p_w$  = 300 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 95 / 1,4 [kg/h] / [kPa]

### Technical data size 1000

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	65	30	22	50	38
	80	30	27	54	41
	100	33	33	60	44
250	65	32	22	53	39
	80	31	27	58	42
	100	34	33	63	46
300	65	33	22	56	40
	80	36	27	61	43
	100	35	33	67	47
	110	37	37	69	48

$Q_{Ek}$  = 420 W  
 $m$  = 24 kg  
 $w_{ok} / \Delta p_w$  = 350 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 110 / 1,4 [kg/h] / [kPa]

### Technical data size 1250

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	80	32	27	64	48
	100	32	33	70	52
	125	36	42	77	57
250	80	33	27	68	50
	100	36	33	75	53
	125	37	42	82	58
300	80	34	27	72	51
	100	37	33	78	56
	125	38	42	87	59
	150	41	50	91	63

$Q_{Ek}$  = 506 W  
 $m$  = 29 kg  
 $w_{ok} / \Delta p_w$  = 420 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 130 / 1,4 [kg/h] / [kPa]

### Legend

- $\Delta p$  - static pressure at the primary air socket
- $V_P$  - primary air flow rate ( $\pm 10\%$ )
- $L_{wA}$  - sound power level ( $\pm 3$  dB)
- $Q_P$  - cool. capacity of primary air (fresh air) ( $\pm 5\%$ )
- $Q_k$  - cool. capacity secondary (heat exch.) ( $\pm 5\%$ )
- $Q_h$  - heating capacity, secondary ( $\pm 5\%$ )
- $Q_{Ek}$  - heating capacity with natural convection
- $m$  - weight
- $w_{ok}$  - standard water flow rate at cooling capacity
- $w_{oh}$  - standard water flow rate at heating capacity
- $\Delta t$  - temp. difference between suction air temp. before entering the heat exchanger and water supply
- $\Delta t_P$  - temp. difference. between room air and primary air
- $\Delta p_w$  - water-side pressure loss

# Klimavent® induction units for perimeter installation Type HFH, four-pipe system – cooling and heating

## Specification

Induction unit with two separate heat exchangers for heating and cooling the secondary air.  
Adjustment of the bypass dampers for air-side control by a built-in pneumatic or electric actuator.  
High heating capacity for natural convection.  
Vertical or horizontal installation.  
Water and air connection separately, on the right or left.

## Dimensions

Size	A [mm]	B [mm]	C [mm]	D [mm]
500	497	467	529	692
630	642	612	674	837
800	797	767	829	992
1000	997	967	1029	1192
1250	1242	1212	1274	1437

## Design

The technical specifications given on the following page are valid under the following conditions:

- Selection of unit: - for standard flow rates  
- with filter  
- with rubber nozzles  
- with air outlet neck  
- without casing

Corrections for other flow rates, see pages 23 and 24.

Without filter: output increased by 5%.

With aluminum nozzles: sound power level plus 2 - 3 dB(A).

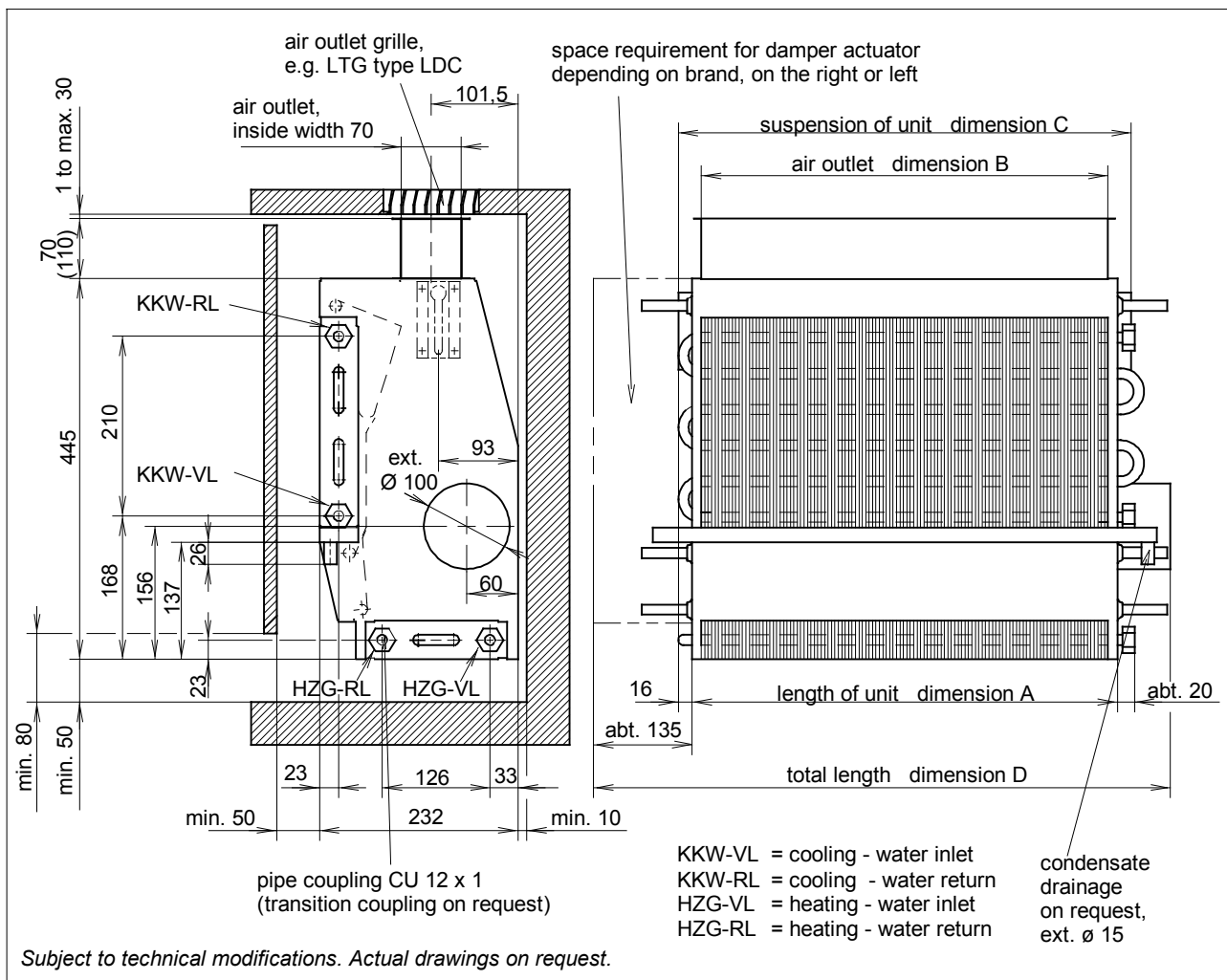
According to equipment, sound pressure level reduced by 2 - 7 dB(A).

The stated performance data may vary in case of other conditions.

The heating performance data for natural convection  $Q_{Ek}$  are based on the following:

Room air temperature +20 °C (standard flow rate)

Water supply temperature +70 °C →  $\Delta t = 50$  K



# Klimavent® induction units for perimeter installation

## Type HFH, four-pipe system – cooling and heating

### Technical data size 500

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	30	26	10	27	17
	40	25	13	30	20
	50	28	17	33	23
250	30	28	10	29	19
	40	27	13	32	21
	50	29	17	35	23
300	30	29	10	30	20
	40	32	13	34	22
	50	30	17	37	24
	60	33	20	39	25

$Q_{Ek}$  = 353 W  
 $m$  = 16 kg  
 $w_{ok} / \Delta p_w$  = 200 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 70 / 1,4 [kg/h] / [kPa]

### Technical data size 630

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	40	27	13	36	25
	50	26	17	39	27
	60	28	20	42	29
250	40	29	13	39	26
	50	31	17	42	27
	60	29	20	45	29
300	40	31	13	41	27
	50	33	17	45	28
	60	31	20	47	30
	70	33	23	50	32

$Q_{Ek}$  = 418 W  
 $m$  = 19 kg  
 $w_{ok} / \Delta p_w$  = 250 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 80 / 1,4 [kg/h] / [kPa]

### Technical data size 800

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	50	28	17	46	31
	65	28	22	50	34
	80	31	27	54	37
250	50	30	17	49	32
	65	33	22	54	35
	80	32	27	57	38
300	50	32	17	51	33
	65	34	22	56	36
	80	33	27	60	38
	90	35	30	63	40

$Q_{Ek}$  = 491 W  
 $m$  = 22 kg  
 $w_{ok} / \Delta p_w$  = 300 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 95 / 1,4 [kg/h] / [kPa]

### Technical data size 1000

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	65	30	22	56	38
	80	30	27	61	42
	100	33	33	66	46
250	65	32	22	60	40
	80	31	27	65	43
	100	34	33	70	47
300	65	33	22	64	41
	80	36	27	69	44
	100	35	33	74	48
	110	37	37	76	50

$Q_{Ek}$  = 594 W  
 $m$  = 26 kg  
 $w_{ok} / \Delta p_w$  = 350 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 110 / 1,4 [kg/h] / [kPa]

### Technical data size 1250

$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{wA}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
200	80	32	27	73	49
	100	32	33	79	53
	125	36	42	85	58
250	80	33	27	78	51
	100	36	33	84	54
	125	37	42	90	59
300	80	34	27	82	53
	100	37	33	89	56
	125	38	42	96	60
	150	41	50	102	65

$Q_{Ek}$  = 719 W  
 $m$  = 31 kg  
 $w_{ok} / \Delta p_w$  = 420 / 21,5 [kg/h] / [kPa]  
 $w_{oh} / \Delta p_w$  = 130 / 1,4 [kg/h] / [kPa]

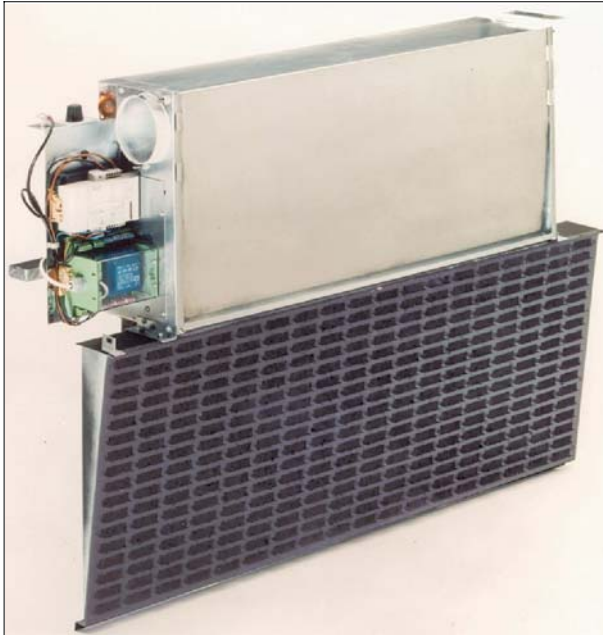
### Legend

- $\Delta p$  - static pressure at the primary air socket
- $V_P$  - primary air flow rate ( $\pm 10\%$ )
- $L_{wA}$  - sound power level ( $\pm 3$  dB)
- $Q_P$  - cool. capacity of primary air (fresh air) ( $\pm 5\%$ )
- $Q_k$  - cool. capacity, secondary (heat exch.) ( $\pm 5\%$ )
- $Q_h$  - heating capacity, secondary ( $\pm 5\%$ )
- $Q_{Ek}$  - heating capacity with natural convection
- $m$  - weight
- $w_{ok}$  - standard water flow rate at cooling capacity
- $w_{oh}$  - standard water flow rate at heating capacity
- $\Delta t$  - temperature difference between suction air temperature before entering the heat exchanger and water supply
- $\Delta t_P$  - temperature difference between room air and primary air
- $\Delta p_w$  - water-side pressure loss



## Klimavent® induction units for perimeter installation Perimeter displacement induction unit type QHG

### View of unit



LTG perimeter displacement induction unit type QHG  
(example of a version with complete control unit (optional))

The LTG perimeter displacement induction unit type QHG consists of a two-row heat exchanger for heating and cooling and an air distributing box in various sizes to fit different sill geometries.

### Advantages

#### • Comfort

- Most comfortable room climate due to perimeter displacement effect.
- Improved room air quality as pollutants are removed from the occupied zone by ascending convection currents.
- Quick decay of temperature differences.

#### • Economy

- Saving of cooling energy by directing the air flow from the floor upwards.
- Heating and cooling in one unit.
- Easy installation.

#### • Flexibility

- Centralized zone control.
- Outlet can be adapted to suit various casing heights and widths.

#### • Dimensioning

- The dimensioning of the units is performed using LTG computer-aided programs.

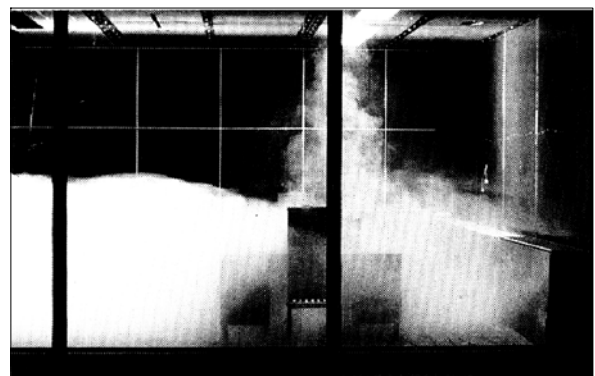
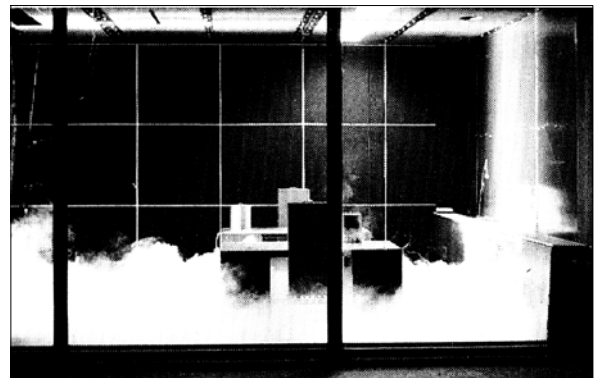
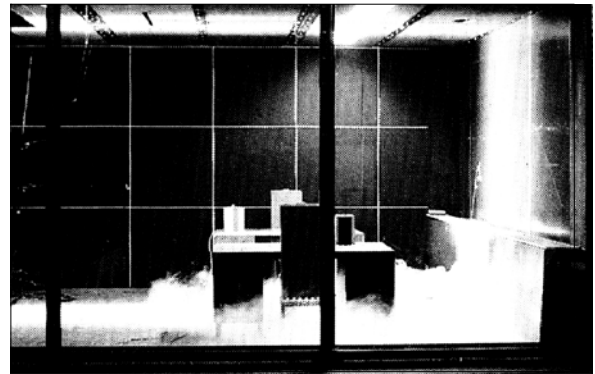
*Perimeter displacement in the case of sill installation.  
(smoke picture in three time intervals)*

### Functional principle

Primary air, which is discharged from the nozzles at high speed, draws secondary air from the room through the heat exchanger due to the induction effect. According to the water temperature in the heat exchanger, the air is heated or cooled. The secondary air then enters the perimeter displacement distributing box along with the primary air.

Uniformity of discharge over the entire outlet height and width is guaranteed by specially arranged guiding vanes in the distributing box. An additional inductive effect is achieved by the special arrangement of the outlet apertures, resulting in a quick decrease of temperature differences.

When designing the sill, the notes (see page 21) will have to be considered to ensure a trouble free operation of the ventilation system. The LTG Engineering Services are at your disposal to discuss any technical details.





# Klimavent® induction units for perimeter installation

## Perimeter displacement induction unit type QHG

### Design

Torsion-resistant casing of galvanized sheet steel. Heat exchanger designed for high output, consisting of copper tubing with press-fitted aluminum fins. Maximum operating pressure (standard version): 10 bar. Replaceable primary air nozzles of plastic, designed to produce induction and to provide a high grade of efficiency at low noise and an effective reflection of the primary sound.

Lateral connection of hot and cold water, condensate and primary air.

Primary air socket of plastic with an outer diameter of 100 mm.

Condensate receiver of galvanized sheet steel with a 15 mm diameter drainage socket on request.

Also on request, self-extinguishing easily replaceable secondary air filter of synthetically bonded polyamide fibers.

Easily detachable distribution box with guide vanes for air flow deflection at low pressure loss for uniform discharge and a secondary induction effect, adjustable to varying sill heights and widths.

### Product range

Size: 500 630 800 1000 1250  
Outlet width: 800 1000 1200 1400 1600

The above mentioned outlet widths are standard and may be adjusted to the sill, if required (\*).

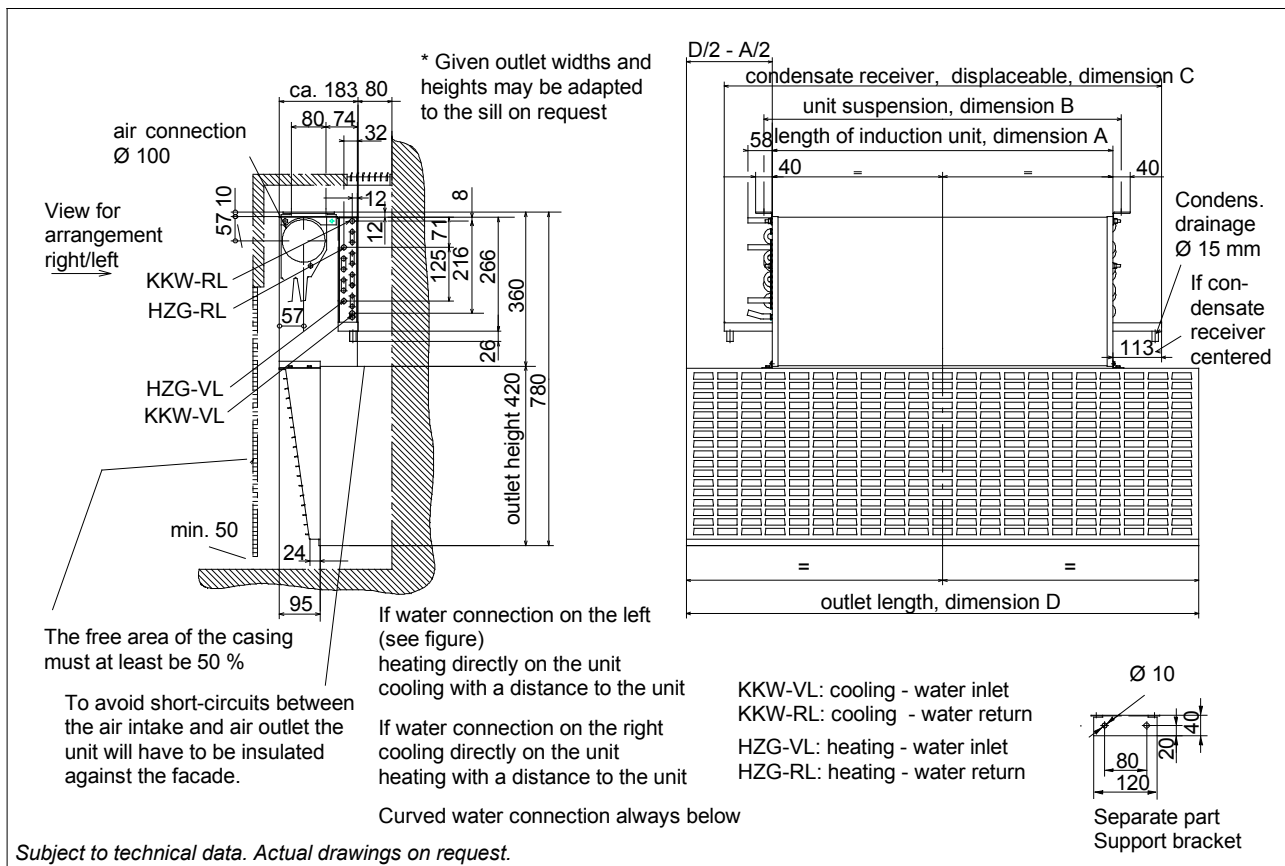
The standard outlet height is 420 mm.

### Accessories, special versions

- On request as a two-pipe induction unit, for heating or alternatively cooling only.
- Galvanized condensate receiver with drainage socket.
- Primary air flow damper.
- Non-combustible aluminum nozzles and primary air sockets of sheet steel for improved fire safety.
- Easy-to-replace self-extinguishing secondary air filter.
- Full-way valve with 3 point control (24 V)
- Master/slave control.

### Dimensions

Size	A [mm]	B [mm]	C [mm]	D* [mm]	Weight [kg]
500	497	537	585	800	15
630	642	682	730	1000	19
800	797	837	885	1200	22
1000	997	1037	1085	1400	27
1250	1242	1282	1335	1600	33



# Klimavent® induction units for perimeter installation

## Perimeter displacement induction unit type QHG

### Technical data size 500

nozzle	$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{A18}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
Y	200	17	19	7	20	15
	300	21	25	9	24	18
	400	24	28	10	26	19
A	200	25	21	10	23	17
	300	30	25	13	26	20
	400	35	29	15	29	22
B	200	35	22	15	26	19
	300	42	27	18	29	22
	400	48	31	20	31	24

$$\begin{aligned}
 Q_{Ek} &= 125 \text{ W} \\
 w_{ok} / \Delta p_w &= 80 / 2 \text{ [kg/h] / [kPa]} \\
 w_{oh} / \Delta p_w &= 80 / 2 \text{ [kg/h] / [kPa]}
 \end{aligned}$$

### Technical data size 630

nozzle	$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{A18}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
Y	200	23	20	10	26	19
	300	28	26	12	30	22
	400	32	30	13	32	24
A	200	33	22	14	29	22
	300	41	28	17	34	25
	400	47	31	20	37	27
B	200	46	24	19	32	24
	300	56	29	23	37	27
	400	65	33	27	40	30

$$\begin{aligned}
 Q_{Ek} &= 160 \text{ W} \\
 w_{ok} / \Delta p_w &= 100 / 3 \text{ [kg/h] / [kPa]} \\
 w_{oh} / \Delta p_w &= 100 / 2 \text{ [kg/h] / [kPa]}
 \end{aligned}$$

### Technical data size 800

nozzle	$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{A18}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
Y	200	28	22	12	32	24
	300	35	28	15	38	28
	400	40	31	17	41	31
A	200	42	24	18	37	28
	300	51	29	21	43	32
	400	59	33	25	47	35
B	200	57	26	24	41	31
	300	70	32	29	47	35
	400	81	35	34	51	38

$$\begin{aligned}
 Q_{Ek} &= 200 \text{ W} \\
 w_{ok} / \Delta p_w &= 120 / 5 \text{ [kg/h] / [kPa]} \\
 w_{oh} / \Delta p_w &= 120 / 3 \text{ [kg/h] / [kPa]}
 \end{aligned}$$

Secondary outputs are based on the following:

- units with standard flow rates (for corr. ref. to page 25)
- units without secondary air filter (with filter x 0.9).

### Technical data size 1000

nozzle	$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{A18}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
Y	200	34	24	14	40	30
	300	42	29	18	47	35
	400	48	33	20	52	39
A	200	50	26	21	46	35
	300	61	31	25	53	40
	400	70	35	29	58	43
B	200	69	29	29	51	38
	300	84	34	35	58	44
	400	97	38	40	63	47

$$\begin{aligned}
 Q_{Ek} &= 250 \text{ W} \\
 w_{ok} / \Delta p_w &= 150 / 10 \text{ [kg/h] / [kPa]} \\
 w_{oh} / \Delta p_w &= 150 / 6 \text{ [kg/h] / [kPa]}
 \end{aligned}$$

### Technical data size 1200

nozzle	$\Delta p$ [Pa]	$V_P$ [m³/h]	$L_{A18}$ [dB(A)]	$Q_P/\Delta t_P$ [W/K]	$Q_k/\Delta t$ [W/K]	$Q_h/\Delta t$ [W/K]
Y	200	46	27	19	51	38
	300	56	32	23	59	44
	400	64	35	27	64	48
A	200	66	29	28	57	43
	300	81	34	34	66	50
	400	94	38	39	73	54
B	200	91	33	38	64	48
	300	112	38	47	73	55
	400	129	42	54	79	59

$$\begin{aligned}
 Q_{Ek} &= 310 \text{ W} \\
 w_{ok} / \Delta p_w &= 170 / 16 \text{ [kg/h] / [kPa]} \\
 w_{oh} / \Delta p_w &= 170 / 9 \text{ [kg/h] / [kPa]}
 \end{aligned}$$

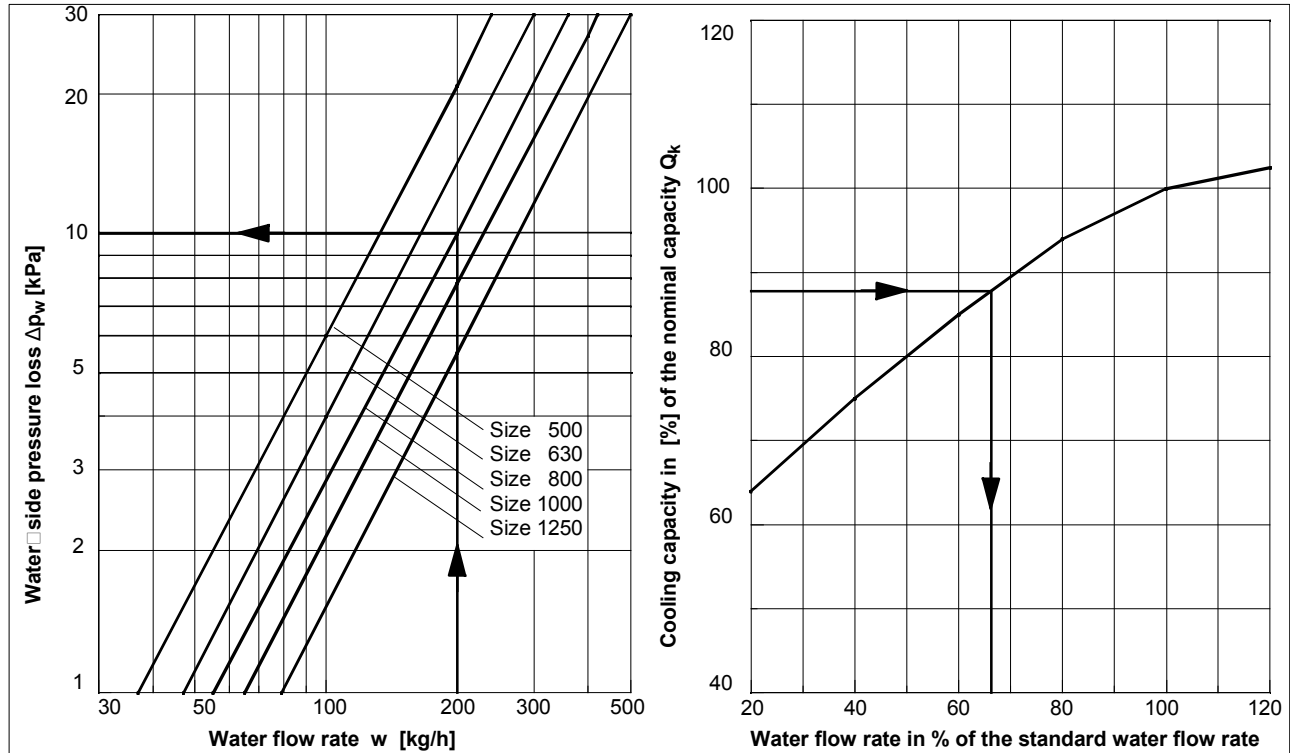
### Legend

- $\Delta p$  - static pressure at the primary air socket
- $V_P$  - primary air flow rate ( $\pm 10\%$ )
- $L_{A18}$  - sound power level at 18 m² Sabine
- $Q_P$  - cool. capacity of primary air (fresh air) ( $\pm 5\%$ )  
(therm. room load  $\mu_T = 0,8$ )
- $Q_k$  - cool. capacity, secondary (heat exch.) ( $\pm 5\%$ )
- $Q_h$  - heating capacity, secondary ( $\pm 5\%$ )
- $Q_{Ek}$  - heating capacity with natural conv.  $\Delta t = 50 \text{ K}$
- $w_{ok}$  - standard water flow rate at cooling capacity
- $w_{oh}$  - standard water flow rate at heating capacity
- $\Delta t$  - temp. diff. between suction air temp. before entering heat exchanger and water supply
- $\Delta t_P$  - temperature difference between room air and primary air

## Klimavent<sup>®</sup> induction units for perimeter installation

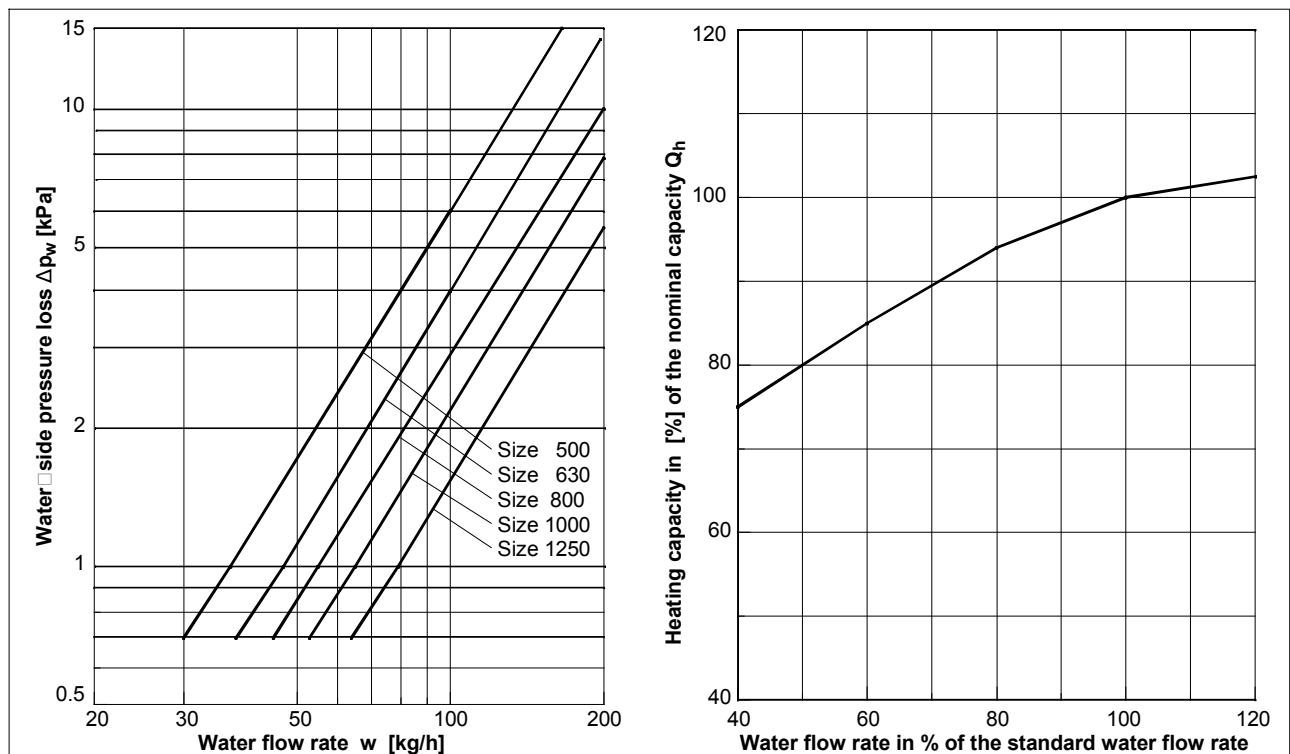
### Water-side pressure loss and cooling capacity with different water flow rates

Induction units type HFG with bypass, HFG-0 (2-pipe system), HFL, HFH – 6-tube cooler



### Water-side pressure loss and heating capacity with different water flow rates

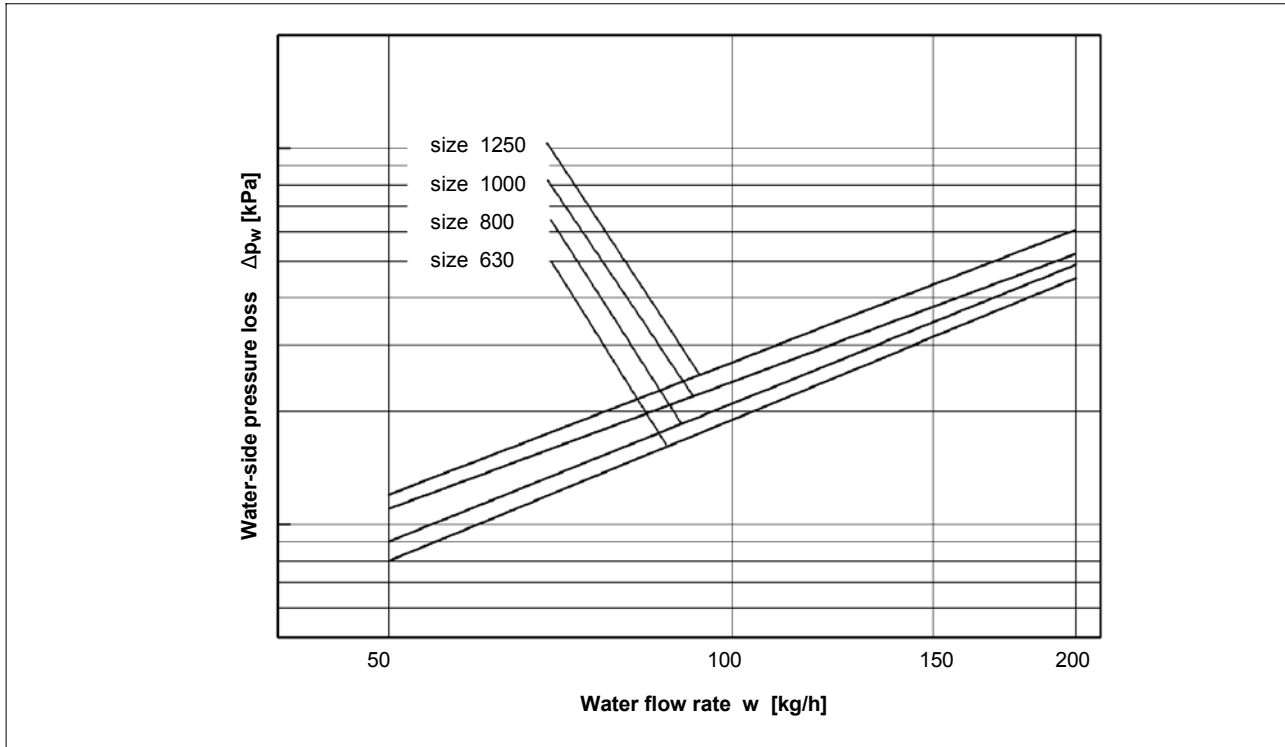
Induction units type HFG with bypass, HFG-0 (2-pipe system), HFL, HFH – 6-tube heater



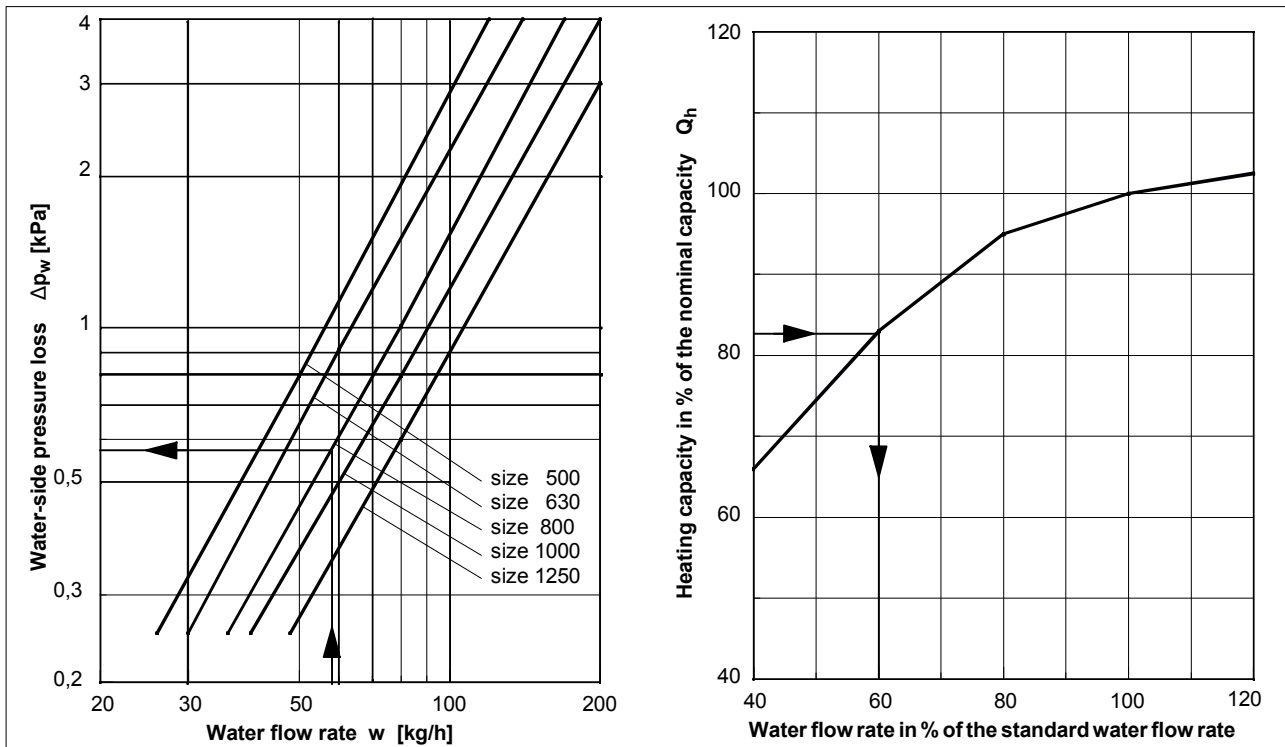
**Note:** The minimum water flow rate must not be lower than 20% of the standard flow rate for cooling, and 40% for heating, considering the water-side pressure compensation.

## Klimavent<sup>®</sup> induction units for perimeter installation

### Water-side pressure loss and cooling capacity with different water flow rates Type HFK-0 – 4-tube cooler



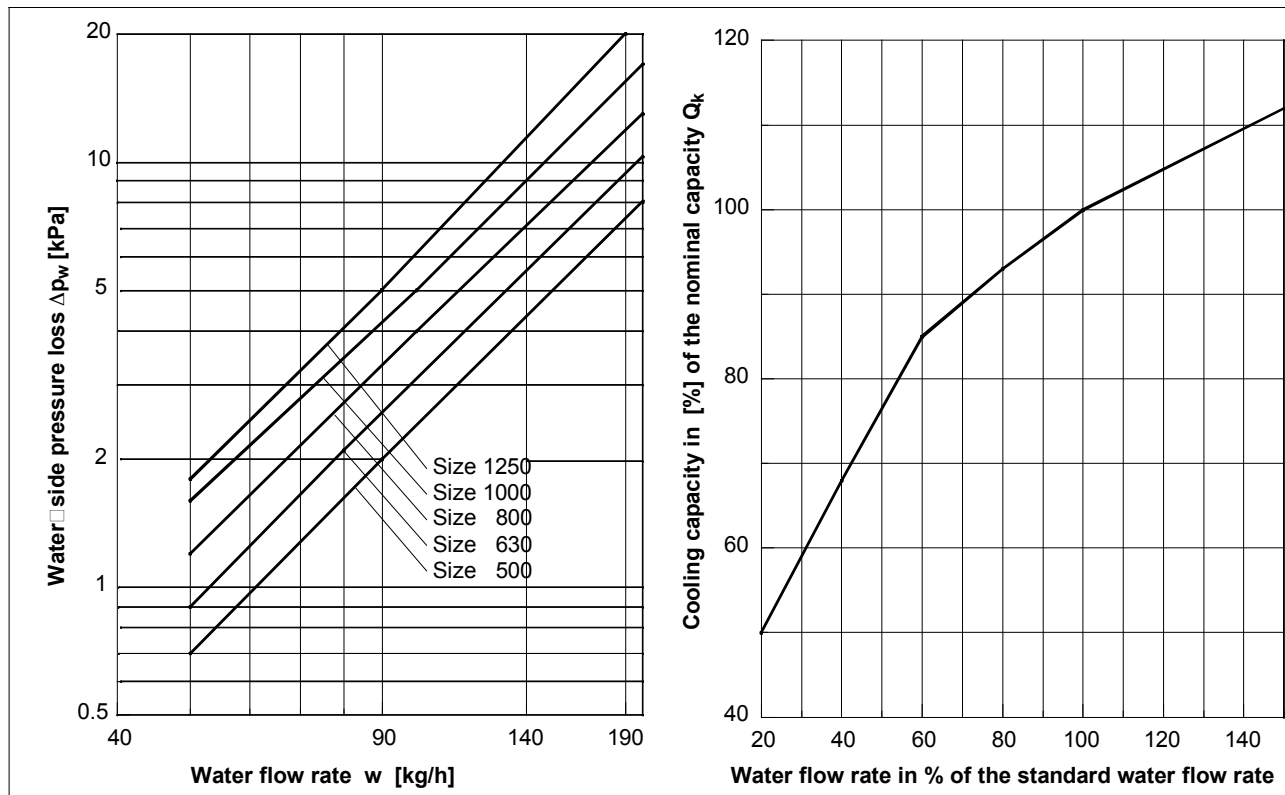
### Water-side pressure loss and heating capacity with different water flow rates Type HFL, HFH – 4-tube heater



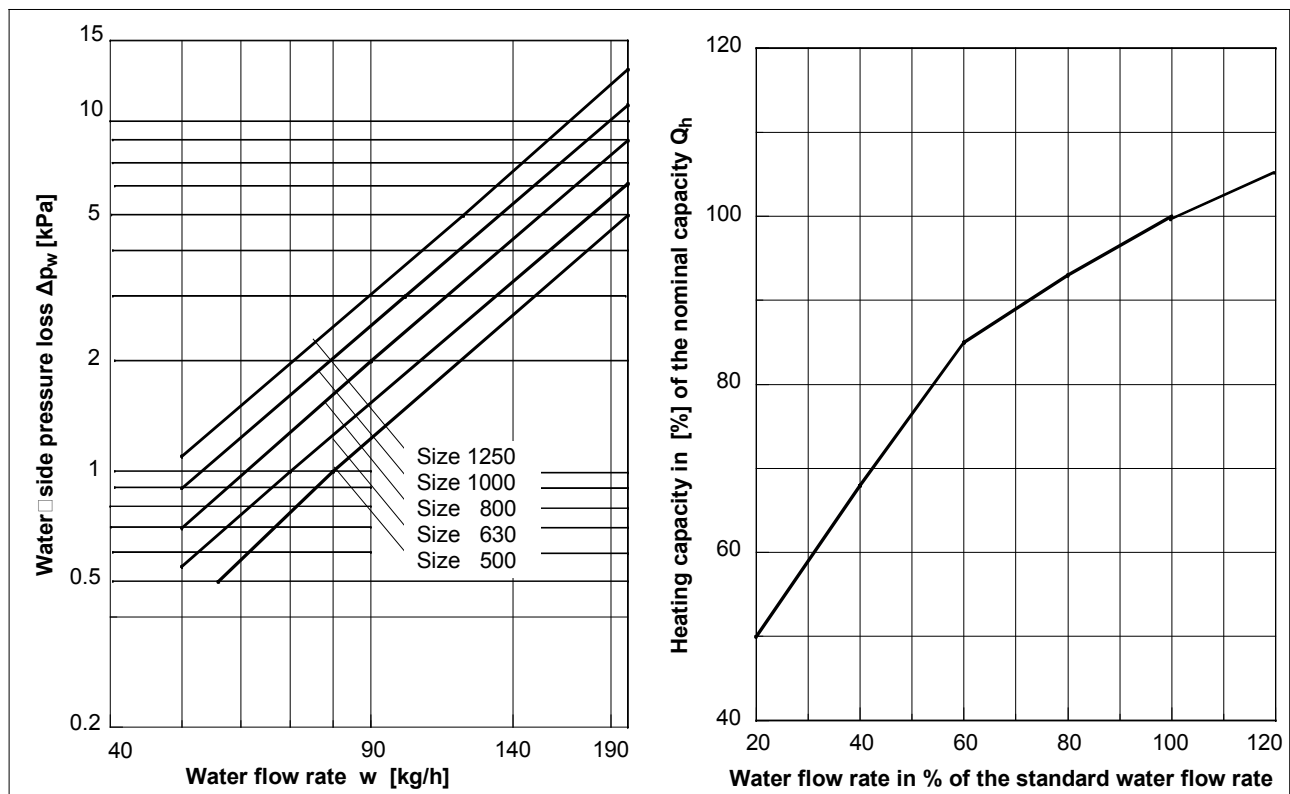
**Note:** The minimum water flow rate must not be lower than 20% of the standard flow rate for cooling, and 40% for heating, considering the water-side pressure compensation.

## Klimavent<sup>®</sup> induction units for perimeter installation Type HFG-0 (4-tube system), HFS, QHG

### Water-side pressure loss and cooling capacity with different water flow rates



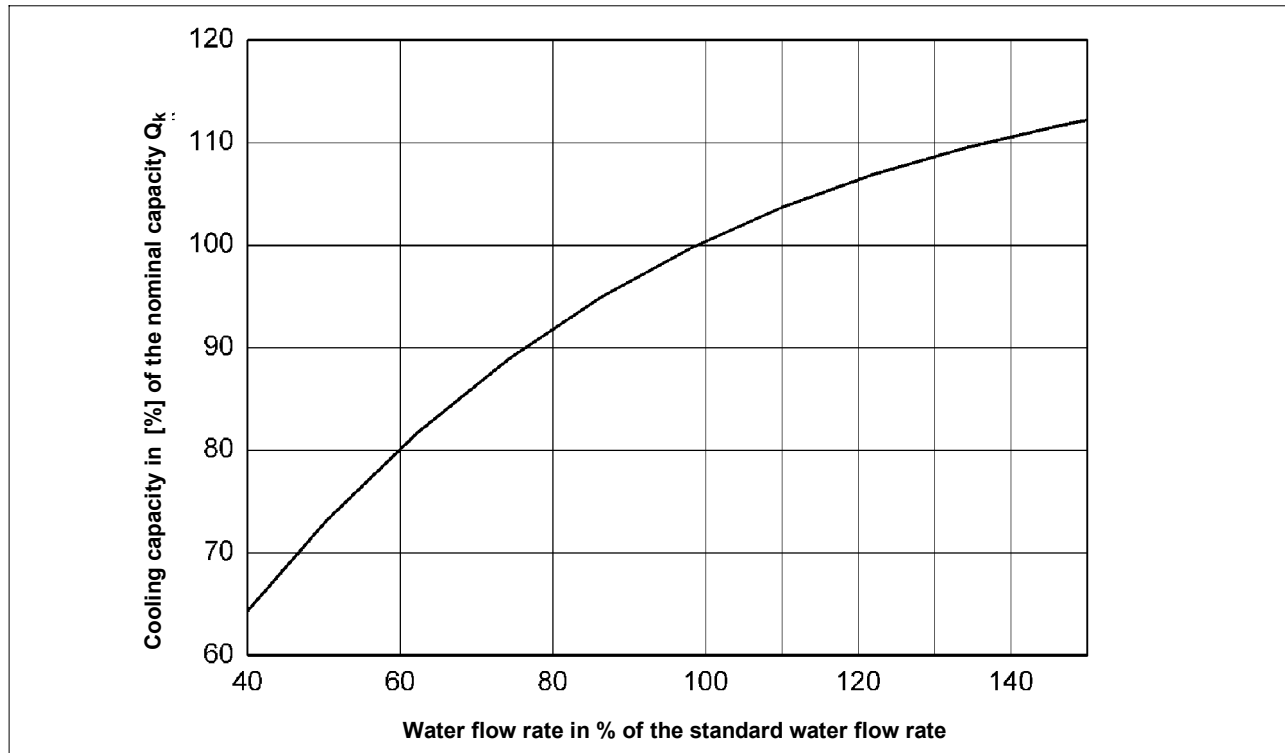
### Water-side pressure loss and heating capacity with different water flow rates



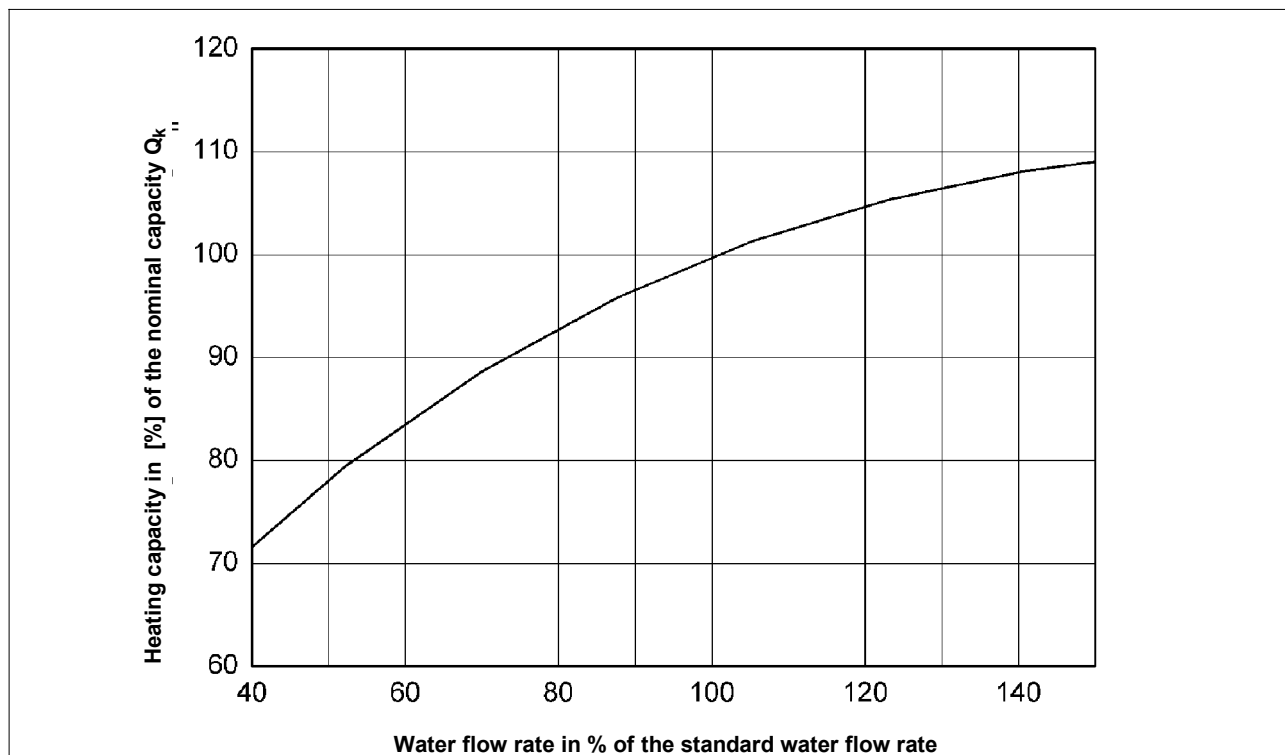
**Note:** The minimum water flow rate must not be lower than 20% of the standard flow rate for cooling, and 40% for heating, considering the water-side pressure compensation.

## Klimavent<sup>®</sup> induction units for perimeter installation

### Water-side pressure loss and cooling capacity with different water flow rates Type HFK-0, 4-pipe system



### Water-side pressure loss and heating capacity with different water flow rates Type HFK-0, 4-pipe system



**Note:** The minimum water flow rate must not be lower than 20% of the standard flow rate for cooling, and 40% for heating, considering the water-side pressure compensation.



# Klimavent<sup>®</sup> induction units for perimeter installation

## Example for selection

### Set values

For this example for dimensioning, the following unit was selected:

- type/size		<b>HFL 800</b> (see pages 16/17)
- primary air volume	$V_P$	<b>65 m<sup>3</sup>/h</b>
- static pressure at the primary air socket	$\Delta p$	<b>250 Pa</b>

### Performance data

For the induction unit type HFL 800, the following values result from the table on page 17:

- sound power level	$L_{wA}$	<b>33 dB(A)</b>
- specific cooling capacity of primary air	$Q_P/\Delta t_P$	<b>22 W/K</b>
- specific cooling capacity of secondary air with a standard water flow rate of 300 kg/h	$Q_K/\Delta t$	<b>48 W/K</b>
- specific heating capacity of secondary air with a standard water flow rate of 95 kg/h	$Q_H/\Delta t$	<b>34 W/K</b>
- natural convection	$Q_{Ek}$	<b>348 W</b>

### Cooling

Set values:

- room temperature in summer / suction air temperature before entering the heat exchanger (values may vary)	$t_R/t_A$	<b>26 °C</b>
- temperature of primary air	$t_P$	<b>16 °C</b>
⇒	$\Delta t_P$	$t_R - t_P = 26^\circ\text{C} - 16^\circ\text{C} = \mathbf{10\ K}$
- temperature of cooling water system	$t_{KWV}$	<b>17 °C</b>
⇒	$\Delta t$	$t_A - t_{KWV} = 26^\circ\text{C} - 17^\circ\text{C} = \mathbf{9\ K}$
- wanted cooling capacity	$Q_{K\text{ soll}}$	<b>600 W</b>

resulting in:

- primary cooling capacity	$Q_P$	$22\ \text{W/K} \cdot 10\ \text{K} = \mathbf{220\ W}$
- required secondary cooling capacity ( $Q_{K\text{ soll}} - Q_P$ )	$Q_{K\text{ erf}}$	$600\ \text{W} - 220\ \text{W} = \mathbf{380\ W}$
- potential secondary cooling capacity	$Q_K$	$48\ \text{W/K} \cdot 9\ \text{K} = \mathbf{432\ W}$
- reduction of the capacity is necessary		$380\ \text{W} / 432\ \text{W} = \mathbf{88\ \%}$
- (see diagram on page 23) ⇒ 67 % of the standard water flow rate		$300\ \text{kg/h} \cdot 0.67 = \mathbf{201\ kg/h}$
- cooling water return temperature	$t_{KWR}$	<b>18.6 K</b>
calculated from: $Q = m \cdot c \cdot \Delta t$		
$t_{KWR} = Q_{K\text{ erf}} / (m \cdot c) + t_{KWV} = 380 / (201 \cdot 1,16) + 17\ [\text{K}]$		
- water-side pressure loss (see diagram on page 32)	$\Delta p_W$	<b>10 kPa</b>

### Heating

Set values:

- room temperature in winter / suction air temperature before entering the heat exchanger (values may vary)	$t_R/t_A$	<b>22 °C</b>
- temperature of primary air	$t_P$	<b>16 °C</b>
⇒	$\Delta t_P$	$t_R - t_P = 22^\circ\text{C} - 16^\circ\text{C} = \mathbf{6\ K}$
- temperature of heating water system	$t_{HVV}$	<b>70 °C</b>
⇒	$\Delta t$	$t_{HVV} - t_R = 70^\circ\text{C} - 22^\circ\text{C} = \mathbf{48\ K}$
- nominal heating capacity	$Q_{h\text{ soll}}$	<b>1.200 W</b>

resulting in:

- primary capacity	$Q_P$	$22\ \text{W/K} \cdot 6\ \text{K} = \mathbf{132\ W}$
- required secondary heating cap. ( $Q_{h\text{ soll}} + Q_P$ )	$Q_{h\text{ erf}}$	$1.200\ \text{W} + 132\ \text{W} = \mathbf{1.332\ W}$
- potential secondary heating capacity	$Q_H$	$34\ \text{W/K} \cdot 48\ \text{K} = \mathbf{1.632\ W}$
- reduction of the standard capacity is necessary		$1.332\ \text{W} / 1.632\ \text{W} = \mathbf{82\ \%}$
- (see diagram on page 33) ⇒ 60 % of the standard water flow rate		$95\ \text{kg/h} \cdot 0.6 = \mathbf{57\ kg/h}$
- heating water return temperature	$t_{HWR}$	<b>50 °C</b>
resulting from: $Q = m \cdot c \cdot \Delta t$		
$t_{HWR} = t_{HVV} - [Q_{h\text{ erf}} / (m \cdot c)] = 70 - [1332 / (57 \cdot 1,16)]\ [\text{K}]$		
- water-side pressure loss (see diagram on page 33)	$\Delta p_W$	<b>0.6 kPa</b>

# Klimavent<sup>®</sup> induction units for perimeter installation

## Connection of units

The following table states possible arrangements for the a/c units presented in our brochure:

Arrange- ment	Water connection	Primary air connection	Damper actuator	(VAV) flute actuator	Type
I II	R L	R L	L R	- -	HFG <sup>*)**</sup> ), HFH, HFK, HFL <sup>*)</sup> , HFS, QHG
III	R	L	L	-	HFG, HFH, HFK, HFL, HFS, QHG
IV	L	R	R	-	HFG, HFH, HFK, HFL, HFS, QHG
V VI VII VIII	R L R L	R L L R	R L R L	- - - -	HFG, HFK, QHG

### Legend:

L = left

R = right

Direction of view: decisive is the view onto the sill when the unit is installed.

<sup>\*)</sup> Connection of primary air from below in the center (special version) only possible for HFG, HFL.

<sup>\*\*) HFG with bypass: no lateral wall suspension possible.</sup>

## Actuators for damper-controlled units

The following damper actuators are available for damper-controlled LTG induction units:

**HF.-B: Belimo actuator:** 0 - 10 V, continuous

**HF.-L: Siemens, Landis & Stäfa:** 0 - 10 V, continuous; 3-point

**HF.-P: LTG pneumatic actuator:** 0.2 - 1.0 bar

## Klimavent<sup>®</sup> induction units for perimeter installation

### Damper actuators for LTG A/C units:

The following actuators are available for damper-controlled LTG induction units:

No.	Actuator type	Product name	Product description	Method of control	Operating voltage
1	pneumatic	LTG SMA	hoisting motor	0.2 - 1.0 bar (on request 0.6 - 1.0 bar)	
2	electric	Belimo LH 24 SR	hoisting motor	DC 2 - 10 V, continuous	AC 24 V
3	electric	Belimo LM 24 SR	rotating motor	DC 2 - 10 V, continuous	AC 24 V
4	electric	Landis & Gyr GDB 131.2E	hoisting motor	3-point	AC 24 V
5	electric	Landis & Gyr GDB 131.1E	rotating motor	3-point	AC 24 V
6	electric	Landis & Gyr GDB 161.2E	hoisting motor	DC 0 - 10 V, continuous	AC 24 V
7	electric	Landis & Gyr GDB 161.1E	rotating motor	DC 0 - 10 V, continuous	AC 24 V

Control:

Unit types	Possible actuators (see above)	Full load Heating	Neutral Bypass	Full load Cooling
HFL, HFH	1 2.6 4.5	0.2 bar 2 V (0 V) 3-point	0.5 - 0.6 bar 5 - 6 V 3-point	1.0 bar 10 V 3-point
HFG*** Heater  Cooler	1 3.7 5	0.2 bar 2 V (0 V) 3-point	1.0 bar 10 V 3-point	  0.2 bar 2 V (0 V) 3-point

- \* For design reasons, primary air connection and damper actuator are not allowed to be on the same unit side.  
If the pneumatic/electric actuator is fully triggered (1.0 bar or 10 V), the unit will only in the cooling mode operate through the primary air flow (second nozzle row open, heat exchanger and bypass closed).
- \*\* Dampers and flute are driven by separate motors being installed on alternate sides of the unit. If the flute drive is fully triggered, the second nozzle row is open (full load cooling).
- \*\*\* Upright units: With the smallest control signal the heat exchanger is completely open with possibility for maximum cooling or heating load (bypass with the signal > 0.2 bar or > 0 V).



## Specification and Schedule of Prices

### Klimavent® induction unit type HFG-0/2 for perimeter installation

Edition 10.8.2011, page 1 of 3

Qty.	Description	Unit price in €	Total price in €
	<p><b>Klimavent® induction unit type HFG-0/2, for 2-pipe systems, with water-side control by valves.</b></p> <p>Induction unit for A/C systems with one heat exchanger for heating or cooling, output control via valve, with electric actuator (separate accessory),</p> <p><u>consists of:</u></p> <ul style="list-style-type: none"> <li>- Torsion-resistant <u>housing</u> of galvanized sheet steel.</li> <li>- <u>Heat exchanger</u> with a high caloric output, made of copper tubing with press-fitted aluminum fins for a maximum operating pressure of 10 bar. Water connections with ½" internal thread.</li> <li>- <u>Primary air chamber</u> with tie rod and seals for a high tightness class, with non-flammable metal nozzles, designed for induction with a high level of performance, low flow noise and optimum reflection of the primary sound.</li> <li>- Lateral <u>primary air inlet socket</u> of sheet steel, 100 mm outer diameter. Water and primary air connections on the right or left, as required.</li> <li>- <u>Drain tray</u> of galvanized sheet steel without drainage socket.</li> <li>- Easily replaceable self-extinguishing <u>secondary air filter</u> of polyamide fibres, synthetic resin bonded.</li> <li>-</li> <li>- Air outlet with galvanized <u>dirt-trap grille</u>, mesh width 5 mm.</li> </ul> <p><u>Size</u></p> <p>o 500      o 630      o 800      o 1000      o 1250</p> <p><b>Manufacturer: LTG Aktiengesellschaft</b>  <b>Series: Klimavent® induction units</b>  <b>Type: HFG-0/2</b></p>		

## Specification and Schedule of Prices

### Klimavent® induction unit type HFG-0/2 for perimeter installation

Edition 10.8.2011, page 2 of 3

Qty.	Description	Unit price in €	Total price in €
	<p><b><u>Accessories, special versions</u></b> (optional, at extra charge)</p> <ul style="list-style-type: none"> <li>o Integrated throttling element KLI 100/1</li> <li>o Unit with secondary air filter</li> <li>o Drain tray with drainage socket</li> <li>o Discharge socket, straight      o 70 mm      o 110 mm</li> <li>o Spreading vanes for improved room air flow</li> <li>o Primary air throttling element KLX 100/1</li> <li>o Air connection socket from below</li> <li>o Primary air nozzles of plastic, exchangeable</li> </ul> <p><b>Water connections</b></p> <ul style="list-style-type: none"> <li>o 2 flexible hoses, for cold water insulated, length 500 mm, operating pressure 10 bar, LTG on one side, the other side optional _____</li> <li>o 2 flexible hoses, for hot water, length 500 mm, operating pressure 10 bar, LTG on one side, the other side optional _____</li> <li>o 1 x straight-way valve with electro-thermal actuator for water-side on/off control (2-step action)</li> <li>o 1 x three-way valve with electro-thermal actuator for water-side on/off control (2-step action)</li> <li>o 2 x two-way valve with reversible motor drive for continuous water-side control (3-step action)</li> <li>o 2 x three-way valve with reversible motor drive for continuous water-side control (3-step action)</li> <li>o Shut-off screw connection with presetting, drainable</li> </ul> <p><b>Ventilation grilles</b></p> <ul style="list-style-type: none"> <li>o Ventilation grille of aluminum, 85% free section, rounded edges, deflection by blade, finished natural anodized, length in mm _____ width in mm _____ <ul style="list-style-type: none"> <li>o type LDC,</li> <li>o type LDH</li> </ul> </li> <li>o Air outlet border frame for ventilation grille <ul style="list-style-type: none"> <li>o Special version grille/frame powder coated or painted similar to RAL _____</li> </ul> </li> </ul> <p><b>Unit fixation</b></p> <ul style="list-style-type: none"> <li>o Lateral wall bracket, complete, consisting of two solid supports of galvanized sheet steel and two adjustable spacers for a perpendicular installation of the units <p>Wall clearance in mm: _____</p> </li> <li>o Alternative: floor fixation, complete, consisting of two solid load bearing profiles for floor installation, fixation on the unit's back <p>Floor clearance in mm: _____</p> </li> <li>o Alternative: rear wall suspension including spacer <p>Wall clearance in mm: _____</p> </li> </ul>		



## Specification and Schedule of Prices

### Klimavent<sup>®</sup> induction unit type HFG-0/2 for perimeter installation

Edition 10.8.2011, page 3 of 3

#### Technical data

Primary airflow rate	[m <sup>3</sup> /h]	
Static pressure at primary air socket	[Pa]	
Sound power level of the unit (L <sub>WA</sub> )	[dB(A)]	

#### Cooling mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total cooling capacity per unit	[W]	
Primary air cooling capacity	[W]	
Cooling capacity of heat exchanger	[W]	
Temperature of supplied cold water	[°C]	
Cold water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Heating mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total heating capacity per unit	[W]	
Primary air heating capacity	[W]	
Heating capacity of heat exchanger	[W]	
Temperature of supplied hot water	[°C]	
Hot water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Convection mode

Room temperature lowered to	[°C]	
Temperature of supplied hot water	[°C]	
Heating capacity	[W]	

#### Unit characteristics

Brand / type / model	
Unit length / height / depth	[mm]

## Specification and Schedule of Prices

### Klimavent® induction unit type HFG-0/4 for perimeter installation

Edition 10.8.2011 / page 1 of 3

Qty.	Description	Unit price in €	Total price in €
	<p><b>Klimavent® induction unit type HFG-0/4, for 4-pipe-systems, with water-side control by valves.</b></p> <p>Induction unit with one heat exchanger with two separate water circuits for cooling and heating, output control via valve with electric actuator (separate accessory),</p> <p><u>consists of:</u></p> <ul style="list-style-type: none"> <li>- Torsion-resistant <u>housing</u> of galvanized sheet steel.</li> <li>- <u>Heat exchanger</u> with a high caloric output, made of copper tubing with press-fitted aluminum fins for a maximum operating pressure of 10 bar. Water connections with 1/2" internal thread and venting.</li> <li>- <u>Primary air chamber</u> with tie rod and seals for a high tightness class, with non-flammable metal nozzles, designed for induction with a high level of performance, low flow noise and optimum reflection of the primary sound.</li> <li>- Lateral <u>primary air inlet socket</u> of sheet metal, 100 mm outer diameter. Water and primary air connections on the right or left, as required.</li> <li>- <u>Drain tray</u> of galvanized sheet steel without drainage socket.</li> <li>- Easily replaceable self-extinguishing <u>secondary air filter</u> of polyamide fibres, synthetic resin bonded.</li> <li>- Air outlet with galvanized <u>dirt-trap grille</u>, mesh width 5 mm</li> </ul> <p>Size:</p> <p>o 500      o 630      o 800      o 1000      o 1250</p> <p><b>Manufacturer: LTG Aktiengesellschaft</b>  <b>Series: Klimavent® induction units</b>  <b>Type: HFG-0/4</b></p>		

## Specification and Schedule of Prices

### Klimavent® induction unit type HFG-0/4 for perimeter installation

Edition 10.8.2011 / page 2 of 3

Qty.	Description	Unit price in €	Total price in €
	<p><b><u>Accessories, special versions</u></b> (optional, at extra charge)</p> <ul style="list-style-type: none"> <li>o Integrated throttling element KLI 100/1</li> <li>o Unit with secondary air filter</li> <li>o Drain tray with drainage socket</li> <li>o Discharge socket, straight      o 70 mm      o 110 mm</li> <li>o Spreading vanes for improved room air flow</li> <li>o Primary air throttling element KLX 100/1</li> <li>o Air connection socket from below</li> <li>o Primary air nozzles of plastic, exchangeable</li> </ul> <p><b>Water connections</b></p> <ul style="list-style-type: none"> <li>o 2 flexible hoses, for cold water insulated, length 500 mm, operating pressure 10 bar, LTG on one side, the other side optional _____</li> <li>o 2 flexible hoses, for hot water, length 500 mm, operating pressure 10 bar, LTG on one side, the other side optional _____</li> <li>o 2 x straight-way valve with electro-thermal actuator for water-side on/off control (2-step action)</li> <li>o 2 x three-way valve with electro-thermal actuator for water-side on/off control (2-step action)</li> <li>o 2 x two-way valve with reversible motor drive for continuous water-side control (3-step action)</li> <li>o 2 x three-way valve with reversible motor drive for continuous water-side control (3-step action)</li> <li>o Shut-off screw connection with presetting, drainable</li> </ul> <p><b>Ventilation grilles</b></p> <ul style="list-style-type: none"> <li>o <u>Ventilation grille of aluminum</u>, 85% free section, rounded edges, deflection by blade, finished natural anodized, length in mm _____ width in mm _____ <ul style="list-style-type: none"> <li>o type LDC</li> <li>o type LDH</li> </ul> </li> <li>o Air outlet border frame for ventilation grille <ul style="list-style-type: none"> <li>o Special version grille/frame powder coated or painted similar to RAL _____</li> </ul> </li> </ul> <p><b>Unit fixation</b></p> <ul style="list-style-type: none"> <li>o <u>Lateral wall bracket</u>, complete, consisting of two solid supports of galvanized sheet steel and two adjustable spacers for a perpendicular installation of the units (not possible for HFG with bypass) <p>Wall clearance in mm: _____</p> </li> <li>o <u>Alternative:</u> floor fixation, complete, consisting of two solid load bearing profiles for floor installation, fixation on the unit's back <p>Floor clearance in mm: _____</p> </li> <li>o <u>Alternative:</u> rear wall suspension including spacer <p>Wall clearance in mm: _____</p> </li> </ul>		

## Specification and Schedule of Prices

### Klimavent® induction unit type HFG-0/4 for perimeter installation

Edition 10.8.2011 / page 3 of 3

#### Technical data

Primary airflow rate	[m³/h]	
Static pressure at primary air socket	[Pa]	
Sound power level of the unit (L <sub>WA</sub> )	[dB(A)]	

#### Cooling mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total cooling capacity per unit	[W]	
Primary air cooling capacity	[W]	
Cooling capacity of heat exchanger	[W]	
Temperature of supplied cold water	[°C]	
Cold water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Heating mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total heating capacity per unit	[W]	
Primary air heating capacity	[W]	
Heating capacity of heat exchanger	[W]	
Temperature of supplied hot water	[°C]	
Hot water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Convection mode

Room temperature lowered to	[°C]	
Temperature of supplied hot water	[°C]	
Heating capacity	[W]	

#### Unit characteristics

Brand / type / model	
Unit length / height / depth	[mm]

## Specification and Schedule of Prices

### Klimavent® induction unit type HFK-0/4 for perimeter installation

Edition 10.8.2011, page 1 of 3

Qty.	Description	Unit price in €	Total price in €
	<p><b>Klimavent® induction unit type HFK-0/4, for 4-pipe-systems, with water-side control by valves.</b></p> <p>Induction unit with one heat exchanger with two separate water circuits for cooling and heating, output control via valve with electric actuator (separate accessory),</p> <p><u>consists of:</u></p> <ul style="list-style-type: none"> <li>- Torsion-resistant <u>housing</u> of galvanized sheet steel.</li> <li>- <u>Heat exchanger</u> with a high caloric output, made of copper tubing with press-fitted aluminum fins for a maximum operating pressure of 10 bar. Water connections with 1/2" internal thread and venting.</li> <li>- Exchangeable <u>primary air nozzles</u> of plastic, designed for induction with a high level of performance, low flow noise and optimum reflection of the primary sound.</li> <li>- Lateral <u>primary air inlet</u> of sheet metal, with an 100 mm outer diameter. Water and primary air connections on the right or left, as required.</li> <li>- <u>Drain tray</u> of stainless steel V2A with drainage socket.</li> <li>- Easily replaceable self-extinguishing <u>secondary air filter</u> of polyamide fibres, synthetic resin bonded.</li> <li>- Air outlet with galvanized <u>dirt-trap grille</u>, mesh width 5 mm.</li> </ul> <p><u>Size:</u></p> <p>o 500      o 630      o 800      o 1000      o 1250</p> <p><b>Manufacturer: LTG Aktiengesellschaft</b>  <b>Series: Klimavent® induction units</b>  <b>Type: HFK-0/4</b></p>		

## Specification and Schedule of Prices

### Klimavent® induction unit type HFK-0/4 for perimeter installation

Edition 10.8.2011, page 2 of 3

Qty.	Description	Unit price in €	Total price in €
	<p><b><u>Accessories</u></b></p> <ul style="list-style-type: none"> <li>o Integrated throttling element KLI 100/1</li> <li>o Unit with secondary air filter</li> <li>o Discharge socket, straight o 70 mm</li> </ul> <p><b>Water-side control: valves and actuators</b></p> <ul style="list-style-type: none"> <li>o 2 x straight-way valve with electro-thermal actuator for water-side on/off control (2-step action)</li> </ul> <p><b>Ventilation grilles</b></p> <ul style="list-style-type: none"> <li>o <u>Ventilation grille of aluminum</u> type LDC, 85 % free section, aerodynamically optimized rounded edges, 20°- deflection by blade, finished natural anodized, fixation (provided by customer) on the sill casing (provided by customer).</li> </ul> <p>Length in mm _____ Width in mm _____</p> <p><b>Unit fixation</b></p> <ul style="list-style-type: none"> <li>o <u>Rear wall suspension</u> HAX including spacer</li> </ul> <p>Wall clearance in mm: _____</p>		

## Specification and Schedule of Prices

### Klimavent<sup>®</sup> induction unit type HFK-0/4 for perimeter installation

Edition 10.8.2011, page 3 of 3

#### Technical data

Primary airflow rate	[m³/h]	
Static pressure at primary air socket	[Pa]	
Sound power level of the unit (L <sub>WA</sub> )	[dB(A)]	

#### Cooling mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total cooling capacity per unit	[W]	
Primary air cooling capacity	[W]	
Cooling capacity of heat exchanger	[W]	
Temperature of supplied cold water	[°C]	
Cold water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Heating mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total heating capacity per unit	[W]	
Primary air heating capacity	[W]	
Heating capacity of heat exchanger	[W]	
Temperature of supplied hot water	[°C]	
Hot water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Convection mode

Room temperature lowered to	[°C]	
Temperature of supplied hot water	[°C]	
Heating capacity	[W]	

#### Unit characteristics

Brand / type / model	
Unit length / height / depth	[mm]



## Specification and Schedule of Prices

### Klimavent® induction unit type HFS for perimeter installation

Edition 10.8.2011, page 1 of 2

Qty.	Description	Unit price in €	Total price in €
	<p><b>Klimavent® induction unit type HFS, for 4-pipe systems, with water-side control by valves.</b></p> <p>Induction unit for A/C systems with a low built-in height (149 mm) for a room-saving installation, with one heat exchanger with two separate water circuits for cooling and heating, output control via valve with electric actuator (separate accessory),</p> <p><u>consists of:</u></p> <ul style="list-style-type: none"> <li>- torsion-resistant <u>housing</u> of galvanized sheet steel.</li> <li>- <u>Heat exchanger</u> with a high caloric output, made of copper tubing with press-fitted aluminum fins for a maximum operating pressure of 10 bar. Water connections with ½ " internal thread and venting.</li> <li>- Exchangeable <u>primary air nozzles</u> of plastic, designed for induction with a high level of performance, low flow noise and optimum reflection of the primary sound.</li> <li>- Lateral <u>primary air inlet socket</u> of sheet steel, 80 mm outer diameter. Water and primary air connections on the right or left, as required.</li> <li>- <u>Drain tray</u> of galvanized sheet steel without drainage socket.</li> <li>- Easily replaceable self-extinguishing <u>secondary air filter</u> of polyamide fibres, synthetic resin bonded.</li> <li>- Air outlet with galvanized <u>dirt-trap grille</u>, mesh width 5 mm.</li> </ul> <p>Size:</p> <p>o 500      o 630      o 800      o 1000      o 1250</p> <p><b>Manufacturer: LTG Aktiengesellschaft</b>  <b>Series: Klimavent® induction units</b>  <b>Type: HFS - 4</b></p>		

## Specification and Schedule of Prices

### Klimavent<sup>®</sup> induction unit type HFS for perimeter installation

Edition 10.8.2011, page 2 of 2

#### Technical data

Primary airflow rate	[m³/h]	
Static pressure at primary air socket	[Pa]	
Sound power level of the unit (L <sub>WA</sub> )	[dB(A)]	

#### Cooling mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total cooling capacity per unit	[W]	
Primary air cooling capacity	[W]	
Cooling capacity of heat exchanger	[W]	
Temperature of supplied cold water	[°C]	
Cold water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Heating mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total heating capacity per unit	[W]	
Primary air heating capacity	[W]	
Heating capacity of heat exchanger	[W]	
Temperature of supplied hot water	[°C]	
Hot water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Convection mode

Room temperature lowered to	[°C]	
Temperature of supplied hot water	[°C]	
Heating capacity	[W]	

#### Unit characteristics

Brand / type / model	
Unit length / height / depth	[mm]

## Specification and Schedule of Prices

### Klimavent® induction unit type HFG with bypass for perimeter installation

Edition 10.8.2011, page 1 of 3

Qty.	Description	Unit price in €	Total price in €
	<p><b>Klimavent® induction unit type HFG with bypass, for 2-pipe systems, with air-side control by dampers.</b></p> <p>Induction unit for A/C systems with one heat exchanger for cooling or heating, with bypass and dampers to automatically adjust the secondary airway inside the unit,</p> <p><u>consists of:</u></p> <ul style="list-style-type: none"> <li>- Torsion-resistant <u>housing</u> of galvanized sheet steel.</li> <li>- <u>Heat exchanger</u> with a high caloric output, made of copper tubing with press-fitted aluminum fins for a maximum operating pressure of 10 bar. Water connections with ½" internal thread.</li> <li>- <u>Primary air chamber</u> with tie rod and seals for a high tightness class, with non-flammable metal nozzles designed for induction with a high level of performance, low flow noise and optimum reflection of the primary sound.</li> <li>- Lateral <u>primary air inlet socket</u> of sheet metal, 100 mm outer diameter. Water and primary air connections on the right or left, as required.</li> <li>- <u>Drain tray</u> of galvanized sheet steel without drainage socket.</li> <li>- Easily replaceable self-extinguishing secondary air filter of polyamide fibres, synthetic resin bonded.</li> <li>- Air outlet with galvanized <u>dirt-trap grille</u>, mesh width 5 mm.</li> <li>- <u>Dampers</u> of galvanized sheet steel with elastic sealing in low-friction, maintenance-free ball bearings. Damper drive by powerful electric motor or pneumatic actuator. Control characteristic of the damper actuator with caloric output depending almost linearly on the control voltage (continuous or 3-step).</li> </ul> <p>Size:</p> <p>o 500      o 630      o 800      o 1000      o 1250</p> <p><b>Manufacturer:</b> LTG Aktiengesellschaft  <b>Series:</b> Klimavent® induction units  <b>Type:</b> HFG with bypass</p>		

## Specification and Schedule of Prices

### Klimavent® induction unit type HFG with bypass for perimeter installation

Edition 10.8.2011, page 2 of 3

Qty.	Description	Unit price in €	Total price in €
	<p><b>Actuator versions</b></p> <ul style="list-style-type: none"> <li>o <u>Variant "P"</u> pneumatic, LTG actuator, working range 0.2 ... 1.0 bar</li> <li>o <u>Variant "B"</u> 1 continuous actuator, Belimo LM 24 SR, per unit (for controllers with an analogue control output; the cooling output is used to process the complete bypass/cooling (heating) sequence). Operating voltage: 24 VAC Actuating signal Y: continuous 0-10 VDC or 0-20 V phase control Power input: 2 W (dimensioning 4 VA) Brand/Type: Belimo LM 24 SR Actuator/Unit: 1</li> <li>o <u>Variant "L"</u> 1 actuator, Siemens Landis + Stäfa GDB 131.1 E per unit (for controllers with user-programmable outputs ; the cooling output is used to process the complete bypass/cooling sequence) Operating voltage: 24 VAC Control type: 3-step Power input: 2 VA Manufacturer: Siemens Landis + Stäfa GDB 131.1.E Actuator/Unit: 1</li> </ul> <p><b>Manufacturer: LTG Aktiengesellschaft</b>  <b>Series: Klimavent® induction units</b>  <b>Type: Actuator versions for units with air-side control (two-pipe systems)</b></p>		

## Specification and Schedule of Prices

### Klimavent® induction unit type HFG with bypass for perimeter installation

Edition 10.8.2011, page 3 of 3

#### Technical data

Primary airflow rate	[m³/h]	
Static pressure at primary air socket	[Pa]	
Sound power level of the unit (L <sub>WA</sub> )	[dB(A)]	

#### Cooling mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total cooling capacity per unit	[W]	
Primary air cooling capacity	[W]	
Cooling capacity of heat exchanger	[W]	
Temperature of supplied cold water	[°C]	
Cold water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Heating mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total heating capacity per unit	[W]	
Primary air heating capacity	[W]	
Heating capacity of heat exchanger	[W]	
Temperature of supplied hot water	[°C]	
Hot water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Convection mode

Room temperature lowered to	[°C]	
Temperature of supplied hot water	[°C]	
Heating capacity	[W]	

#### Unit characteristics

Brand / type / model	
Unit length / height / depth	[mm]

## Specification and Schedule of Prices

### Klimavent® induction unit type HFH / HFL for perimeter installation

Edition 10.8.2011, page 1 of 4

Qty.	Description	Unit price in €	Total price in €
	<p><b>Klimavent® induction unit type HFH and HFL, for 4-pipe systems, with air-side control by dampers.</b></p> <p>Induction unit for A/C systems with separate heat exchangers for cooling and heating, with bypass and dampers to automatically adjust the secondary air-way inside the unit,</p> <p><u>consists of:</u></p> <ul style="list-style-type: none"> <li>- Torsion-resistant <u>housing</u> of galvanized sheet steel.</li> <li>- <u>Heat exchanger</u> with a high caloric output, made of copper tubing with press-fitted aluminum fins for a maximum operating pressure of 10 bar. Water connections with ½" internal thread.</li> <li>- Exchangeable <u>primary air nozzles</u> of plastic, designed for induction with a high level of performance, low flow noise and optimum reflection of the primary sound.</li> <li>- Lateral <u>primary air inlet socket</u> of sheet metal, 100 mm outer diameter. Water and primary air connections on the right or left, as required.</li> <li>- <u>Drain tray</u> of galvanized sheet steel without drainage socket.</li> <li>- Easily replaceable self-extinguishing <u>secondary air filter</u> of polyamide fibres, synthetic resin bonded.</li> <li>- Air outlet with galvanized <u>dirt-trap grille</u>, mesh width 5 mm.</li> <li>- <u>Dampers</u> of galvanized sheet steel with elastic sealing in low-friction, maintenance-free ball bearings. Damper drive in terms of a powerful electric motor or pneumatic actuator via a dependable connecting rod system ensuring that sequence overlaps are avoided. Control characteristic of the damper actuator with a caloric output depending almost linearly on the control voltage (continuous or 3-step).</li> </ul> <p>Size:</p> <p>o 500      o 630      o 800      o 1000      o 1250</p> <p><b>Manufacturer: LTG Aktiengesellschaft</b>  <b>Series: Klimavent® induction units</b>  <b>Type: HFH / HFL</b></p>		

## Specification and Schedule of Prices

### Klimavent® induction unit type HFH / HFL for perimeter installation

Edition 10.8.2011, page 2 of 4

Qty.	Description	Unit price in €	Total price in €
	<p><b>Actuator versions</b></p> <p>o <u>Variant "P"</u>: pneumatic, LTG actuator, working range 0.2 ... 1.0 bar</p> <p>o <u>Variant "B"</u>: 1 continuous actuator, Belimo LM 24 ZH, per unit (for controllers with an analogue control output; the cooling output is used to process the complete heating/bypass/cooling sequence). Operating voltage: 24 VAC Actuating signal Y: continuous 0-10 VDC or 0-20 V phase control Power input: 2 W (dimensioning 4 VA) Brand/Type: Belimo LM 24 ZH</p> <p>o <u>Variant "L"</u>: 1 actuator, Siemens Landis + Stäfa GDB 131.2 E per unit (for controllers with user-programmable outputs; the cooling output is used to process the complete heating/bypass/cooling sequence) Operating voltage: 24 VAC Control type: 3-step Power input: 2 VA Manufacturer: Siemens Landis + Stäfa GDB 131.2.E</p> <p><b>Manufacturer: LTG Aktiengesellschaft</b>  <b>Series: Klimavent® induction units</b>  <b>Type: Actuator versions for units with air-side control (4-pipe systems)</b></p>		



## Specification and Schedule of Prices

### Klimavent® induction unit type HFH / HFL for perimeter installation

Edition 10.8.2011, page 3 of 4

Qty.	Description	Unit price in €	Total price in €
	<p><b><u>Accessories, special versions</u></b> (optional, at extra charge)</p> <ul style="list-style-type: none"> <li>o Integrated throttling element KLI 100/1</li> <li>o Unit with secondary air filter</li> <li>o Drain tray with drainage socket</li> <li>o Discharge socket, straight      o 70 mm      o 110 mm</li> <li>o Spreading vanes for improved room air flow</li> <li>o Primary air throttling element KLX 100/1</li> <li>o Support for thermostat sensor ROXG 30/7</li> <li>o Support for thermostat HAX 148/4</li> <li>o Air connection socket from below</li> <li>o Primary air socket of sheet metal for increased fire protection</li> <li>o Primary air nozzles of aluminum for increased fire protection</li> </ul> <p><b>Water connections</b></p> <ul style="list-style-type: none"> <li>o VSXG 4/1 vent screw (one per heat exchanger)</li> <li>o VSXG 5/1 3/8" transition screw with internal thread</li> <li>o VSXG 5/2 1/2" transition screw with internal thread</li> <li>o flexible hose, for cold water/hot water, operating pressure 16 bar, LTG on one side, the other side optional _____ with / without Isolation with / without venting</li> <li>length _____ mm</li> <li>o Shut-off screw with presetting, can be emptied</li> <li>o straight-way valve (3-step action, 24 V)</li> <li>o three-way valve (3-step action, 24 V)</li> <li>o straight-way valve with thermal actuator (220 V)</li> </ul> <p><b>Ventilation grilles</b></p> <ul style="list-style-type: none"> <li>o <u>Ventilation grille</u> of aluminum, 85% free section, rounded edges, deflection by blade, finished natural anodized,  length in mm _____ width in mm _____ o type LDC      o type LDH</li> <li>o Air outlet <u>border frame</u> for ventilation grille <ul style="list-style-type: none"> <li>o Special version grille/frame powder coated or painted similar to RAL _____</li> </ul> </li> </ul> <p><b>Unit fixation</b></p> <ul style="list-style-type: none"> <li>o <u>Lateral wall bracket</u>, complete, consisting of two solid supports of galvanized sheet steel and two adjustable spacers for a perpendicular installation of the units Wall clearance in mm: _____</li> <li>o <u>Alternative</u>: floor fixation, complete, consisting of two solid load bearing profiles for floor installation, fixation on the unit's back  Floor clearance in mm: _____</li> <li>o <u>Alternative</u>: rear wall suspension including spacer  Wall clearance in mm: _____</li> </ul>		

## Specification and Schedule of Prices

### Klimavent<sup>®</sup> induction unit type HFH / HFL for perimeter installation

Edition 10.8.2011, page 4 of 4

#### Technical data

Primary airflow rate	[m <sup>3</sup> /h]	
Static pressure at primary air socket	[Pa]	
Sound power level of the unit (L <sub>WA</sub> )	[dB(A)]	

#### Cooling mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total cooling capacity per unit	[W]	
Primary air cooling capacity	[W]	
Cooling capacity of heat exchanger	[W]	
Temperature of supplied cold water	[°C]	
Cold water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Heating mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total heating capacity per unit	[W]	
Primary air heating capacity	[W]	
Heating capacity of heat exchanger	[W]	
Temperature of supplied hot water	[°C]	
Hot water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Convection mode

Room temperature lowered to	[°C]	
Temperature of supplied hot water	[°C]	
Heating capacity	[W]	

#### Unit characteristics

Brand / type / model	
Unit length / height / depth	[mm]

## Specification and Schedule of Prices

### Klimavent® displacement air induction unit type QHG for perimeter install.

Edition 10.8.2011, page 1 of 3

Qty.	Description	Unit price in €	Total price in €
	<p><b>Klimavent® displacement air induction unit type QHG, for 4-pipe or 2-pipe systems, with water-side control by valves.</b></p> <p>Displacement air induction unit for A/C systems with one heat exchanger with two separate water circuits for cooling and heating (4-pipe system) respect. with one heat exchanger for cooling or heating (2-pipe system); with bypass control valves for automatic setting of the secondary air path in the unit; with a variable, easy-to-detach air distribution box with displacement air diffuser, painted in black, with a uniform outflow and a secondary induction effect, adaptable to different sill geometries (utilization of the room axis dimension, free sill casing area 40 – 60 %),</p> <p><u>consists of:</u></p> <ul style="list-style-type: none"> <li>- Torsion-resistant <u>housing</u> of galvanized sheet steel.</li> <li>- <u>Heat exchanger</u> for a high caloric output, made of copper tubing with press-fitted aluminum fins for a maximum operating pressure of 10 bar. Water connections with ½" internal thread, with venting (for 4-pipe unit).</li> <li>- Exchangeable <u>primary air nozzles</u> of plastic, designed for induction with a high level of performance, low flow noise and optimum reflection of the primary sound.</li> <li>- Lateral <u>primary air inlet socket</u> of sheet metal, 100 mm outer diameter. Water and primary air connections on the right or left, as required.</li> <li>- <u>Drain tray</u> of galvanized sheet steel without drainage socket.</li> <li>- Easily replaceable self-extinguishing <u>secondary air filter</u> of polyamide fibres, synthetic resin bonded.</li> <li>- Air outlet with galvanized <u>dirt-trap grille</u>, mesh width 5 mm.</li> <li>- <u>Dampers</u> of galvanized sheet steel with elastic sealing in low-friction, maintenance-free ball bearings. Damper drive in terms of a powerful electric motor or pneumatic actuator.</li> </ul> <p>Size      /      Outlet height      /      Outlet width</p> <p>o 500    /      ..... mm      /      ..... mm</p> <p>o 630    /      ..... mm      /      ..... mm</p> <p>o 800    /      ..... mm      /      ..... mm</p> <p>o 1000   /      ..... mm      /      ..... mm</p> <p>o 1250   /      ..... mm      /      ..... mm</p> <p><b>Manufacturer: LTG Aktiengesellschaft</b>  <b>Series: Klimavent® displacement air induction units</b>  <b>Type: QHG with bypass</b></p>		

## Specification and Schedule of Prices

### Klimavent® displacement air induction unit type QHG for perimeter install.

Edition 10.8.2011, page 2 of 3

Qty.	Description	Unit price in €	Total price in €
	<p><b>Actuator versions</b></p> <p>o <u>Variant "P":</u> pneumatic, LTG actuator, working range 0.2 ... 1.0 bar</p> <p>o <u>Variant "B":</u> 1 continuous actuator, Belimo LM 24 SR, per unit (for controllers with an analogue control output; the cooling output is used to process the complete heating/bypass/cooling sequence). Operating voltage: 24 VAC Actuating signal Y: continuous 0 - 10 VDC or 0 - 20 V phase control Power input: 2 W (dimensioning 4 VA) Brand/Type: Belimo LM 24 SR Actuator/Unit: 1</p> <p>o <u>Variant "L":</u> 1 actuator, Siemens Landis + Stäfa GDB 131.1 E per unit (for controllers with user-programmable outputs; the cooling output is used to process the complete heating/bypass/cooling sequence) Operating voltage: 24 VAC Control type: 3-step Power input: 2 VA Manufacturer: Siemens Landis + Stäfa GDB 131.1.E Actuator/Unit: 1</p> <p><b>Manufacturer: LTG Aktiengesellschaft</b>  <b>Series: Klimavent® displacement air induction units</b>  <b>Type: Actuator versions for units with air-side control by dampers (two-pipe systems)</b></p>		

## Specification and Schedule of Prices

### Klimavent® displacement air induction unit type QHG for perimeter install.

Edition 10.8.2011, page 3 of 3

#### Technical data

Primary airflow rate	[m³/h]	
Static pressure at primary air socket	[Pa]	
Sound power level of the unit (L <sub>WA</sub> )	[dB(A)]	

#### Cooling mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total cooling capacity per unit	[W]	
Primary air cooling capacity	[W]	
Cooling capacity of heat exchanger	[W]	
Temperature of supplied cold water	[°C]	
Cold water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Heating mode

Room temperature	[°C]	
Primary air temperature	[°C]	
Total heating capacity per unit	[W]	
Primary air heating capacity	[W]	
Heating capacity of heat exchanger	[W]	
Temperature of supplied hot water	[°C]	
Hot water flow rate	[kg/h]	
Water-side pressure loss	[kPa]	

#### Convection mode

Room temperature lowered to	[°C]	
Temperature of supplied hot water	[°C]	
Heating capacity	[W]	

#### Unit characteristics

Brand / type / model	
Unit length / height / depth	[mm]

## Specification and Schedule of Prices

### Accessories for Klimavent® induction units

Edition 10.8.2011, page 1 of 5

Qty.	Description	Unit price in €	Total price in €
	<p><b><u>Accessories, special versions</u></b> (optional, at extra charge)</p> <ul style="list-style-type: none"> <li>o Integrated throttling element KLI 100/1</li> <li>o Unit with secondary air filter</li> <li>o Drain tray with drainage socket</li> <li>o Discharge socket, straight <ul style="list-style-type: none"> <li>o 70 mm</li> <li>o 110 mm</li> </ul> </li> <li>o Spreading vanes for improved room air flow</li> <li>o Primary air throttling element KLX 100/ 1</li> <li>o Support for thermostat sensor ROXG 30/7</li> <li>o Support for thermostat HAX 148 / 4</li> <li>o Air connection socket from below for HFL and HFG</li> <li>o Primary air nozzles of aluminum for increased fire protection</li> </ul> <p><b>Water connections</b></p> <ul style="list-style-type: none"> <li>o Venting screw connection VSXG 4/1 (one per heat exchanger)</li> <li>o Fitting <math>\frac{3}{8}</math> ", internal thread, VSXG 5/1</li> <li>o Fitting <math>\frac{1}{2}</math> ", internal thread, VSXG 5/2</li> <li>o Flexible hose for cold water/hot water, operating pressure 16 bar</li> </ul> <p>LTG on one side, the other according to requirement _____  with / without insulation  with / without venting</p> <p>Length in mm _____</p> <ul style="list-style-type: none"> <li>o Shut-off screw connection with presetting, drainable</li> <li>o Full-way valve with 3-position actuator (24 V)</li> <li>o Three-way valve with 3-position actuator (24 V)</li> <li>o Full-way valve with thermal actuator (220 V)</li> </ul> <p><b>Ventilation grille</b></p> <ul style="list-style-type: none"> <li>o <u>Ventilation grille</u> of aluminum, 85% free section, rounded edges, deflection by blade, finished natural anodized as standard or RAL to</li> </ul> <p>length in mm _____ width in mm _____</p> <ul style="list-style-type: none"> <li>o Type LDC</li> <li>o Type LDH</li> <li>o Air outlet <u>border frame</u> for ventilation grille</li> <li>o Special version grille/frame</li> </ul> <p>powder coated or painted similar to RAL No. _____</p>		

## Specification and Schedule of Prices

### Accessories for Klimavent® induction units

Edition 10.8.2011, page 2 of 5

Qty.	Description	Unit price in €	Total price in €
	<p><b>Unit fixation</b></p> <ul style="list-style-type: none"> <li>o <u>Lateral wall bracket</u>, complete, consisting of two solid supports of galvanized flat steel and two adjustable spacers for a perpendicular installation of the units (not possible for HFG with bypass).</li> </ul> <p>Wall clearance in mm: _____</p> <ul style="list-style-type: none"> <li>o <u>Alternative:</u> Floor fixation, complete, consisting of two solid load-bearing profiles for floor installation, fixation on the unit's back</li> <li>o <u>Alternative:</u> Rear wall suspension including spacer</li> </ul> <p>Wall clearance in mm: _____</p> <p><b>Manufacturer: LTG Aktiengesellschaft</b>  <b>Series: Klimavent® induction units</b>  <b>Type: Accessories for any HF.-unit</b></p>		



## Specification and Schedule of Prices

### Accessories for Klimavent® induction units

Edition 10.8.2011, page 3 of 5

Qty.	Description	Unit price in €	Total price in €
	<p><b>Control unit HKR 20</b></p> <p><u>Room thermostat</u> for 1-5 units for wall mounting and wiring on site.</p> <p><u>Supply</u> voltage 230 VAC/ 50 Hz, switching current 6A, with contactless center position, temperature range 5 – 30 °C.</p> <p>One <u>main switch</u> ON/OFF.</p> <p>Plastic <u>housing</u>, alpine white, protection IP 30.  Dimensions : 144 x 79 x 33 mm.</p> <p><b>Manufacturer: LTG Aktiengesellschaft</b>  <b>Type: HKR 20</b></p>		

## Specification and Schedule of Prices

### Accessories for Klimavent<sup>®</sup> induction units

Edition 10.8.2011, page 4 of 5

Qty.	Description	Unit price in €	Total price in €
	<p><b>Control unit HKR 40</b></p> <p>The control unit is used to individually control the room air temperature of A/C and ventilation systems.</p> <p>The temperature sensor has been integrated in a bypass tube connected to the induction unit with a cable length of abt. 2 m. Thus, the operating unit may be installed independently, e.g. in the window sill.</p> <p>The control unit may control continuous damper actuators of LTG four-pipe induction units (for cooling and heating). The unit is provided with an adjusting knob to correct the temperature setpoint of 23 °C +/- 3 K according to individual requirements.</p> <p>Colour of the unit: similar to RAL 9010 or similar to RAL 1013.</p> <p>Dimensions: 71 x 71 x 26 mm.</p> <p>Internally, the setpoint of 23 °C may again be adjusted by +/- 5 K.</p> <p>The control unit is characterized by a proportional action with non-adjustable proportional bands. It compares the actual value with the setpoint and, in case of discrepancies, creates a proportional continuous control signal.</p> <p><u>Transformer with distributor</u></p> <p><u>Transformer:</u>  power input 230 V~ ; 50 Hz / 24 V~ / 30VA  Protection: primary side by thermal protection, secondary side by safety fuse -230 V with Euro plug with a cable of abt. 1 m  Dimension of the mounting plate: 154 x 150 mm</p> <p><u>Distributor:</u>  Suitable for connecting up to 2 x 4 or 1 x 8 induction units,  power input 24 V~/ 0-10V =/ 3VA,  actuator with a cable abt. 3 m long (on request 10 m) and plug.  Connection between the actuator and the distributor is realized using a fool-proof plug.</p> <p>Wiring on site: 230 V~ connection and actuators</p> <p>Protection: for 230 V~ IP 30, otherwise IP 20</p> <p><b>Manufacturer: LTG Aktiengesellschaft</b>  <b>Type: HKR 40</b></p>		

## Specification and Schedule of Prices

### Accessories for Klimavent® induction units

Edition 10.8.2011, page 5 of 5

Qty.	Description	Unit price in €	Total price in €
	<p><b>Control unit HKR 6x00 for valve and damper controlled Klimavent® induction units series HFG and HFL</b></p> <p><u>Wall mounted controller</u> with integrated sensor with 2 Triac outputs to trigger a maximum of five 3-position or one thermal actuator 230 VAC per output.</p> <ul style="list-style-type: none"> <li>- Potential-free contact for window contact or presence detector</li> <li>- Sensor input for return air or changeover sensor</li> <li>- Input for external set-point displacement</li> <li>- Parameterization possible via digital operating unit</li> <li>- Master/slave function for sequential units connected in parallel</li> <li>- BatiBUS connection for centralized control function</li> </ul> <p>Supply voltage 230 VAC/ 50 Hz, power input 8 VA. Controller in a plastic housing for wall mounting. Protection : IP 54. Dimensions : 254 x 180 x 90 mm</p> <p><u>Operating modes</u></p> <ul style="list-style-type: none"> <li>- comfort : set-point 23 °C</li> <li>- economy : set-point heating 15 °C</li> <li>- antifreeze</li> </ul> <p><u>Operating level</u></p> <ul style="list-style-type: none"> <li>- set-point adjuster (correction +/-6 K)</li> <li>- mode selector switch</li> <li>- operating mode LED display</li> </ul> <p><u>Control characteristics</u></p> <ul style="list-style-type: none"> <li>o cooling only = two-pipe unit with 1 actuator HRK 6200</li> <li>o cooling and heating = four-pipe unit with 2 actuators HKR 6400</li> <li>o changeover = two-pipe unit as changeover HKR 6300</li> </ul> <p><u>Operating unit - Surface-type</u> Colour : similar to RAL 9010 Dimensions : 90 x 100 x 37 mm, Protection : IP 30</p> <p>o analog</p> <p><b>Manufacturer: LTG Aktiengesellschaft</b> <b>Type: HKR 6x00</b></p>		