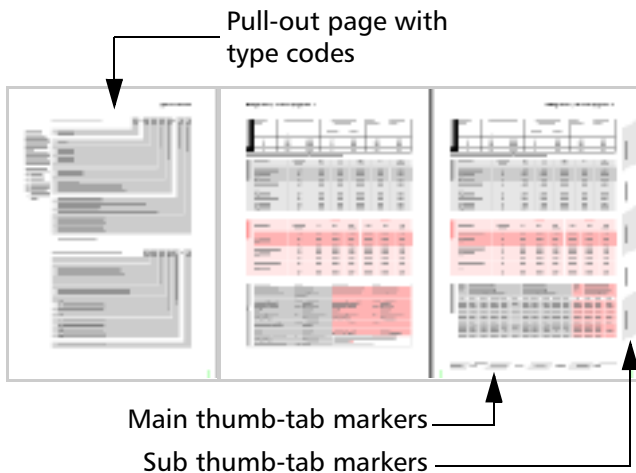




GEA Basic-Geko fan coil unit

Data and Facts

How to find the right Basic-Geko fan coil unit with accessories



Finding your way round the catalogue:

The table of contents opposite and the main and sub thumb-tab markers used in this catalogue make it easy and quick for you to find the various chapters.

The pull-out page at the front contains the type codes that enable you to determine the order numbers of your Basic-Geko and the valves fitted.



Information:

The chapters entitled "Basic-Geko and accessories" and "Installation examples" contain information about the Basic-Geko, accessories available, and installation possibilities.

Selecting the unit:

Select the size of unit suitable for your requirements from the overview of sizes.

Rating tables



Select the capacity stage you require from the rating tables. The values for the most common operating states can be found in these tables.

Values for other operating states you can easily calculate yourself: at the bottom left of every double page of rating tables there are steps for calculating the capacity stage (with a calculation example); at the bottom right are the relevant correction factors.

The following chapters contain information on the dimensions of the basic unit and casing, the acoustics, control systems, and accessories.

Following these chapters are those on "Pressure losses in the heat exchanger" and "Valves", in which you select the type of valve actuator depending on the control systems you want to use. The k_{vs} value for thermo-electric actuators is always 2.5.

For reversible actuators, you calculate in this chapter the water flow rate, \dot{V}_W , and determine the pressure loss Δp at the water end of the heat exchanger. You then look up the k_{vs} value in the corresponding diagram on page 27.

In the chapter after that, you select the electric heater.

The catalogue is concluded by a number of specification texts.

Type codes

Determining order numbers / How to fill out:

Select the criteria you require and enter the values in the respective boxes.

The number sequences you obtain are the order numbers for the Basic-Geko and/or valves.

Type codes for GEA Basic-Geko

Example Basic-Geko:
Order No.: G.U314.314

- G = Basic-Geko
- U = Return air unit
- 3 = Size 3
- 1 = Capacity stage 1
- 4 = 4-pipe system
- 31 = Electrical control box with MCE 3
- 4 = Ceiling connection, right

| | | | | | | | | | | |
|----------|------------|---|----------|-----------------|---|----------|----------------|---------------|--------------|-----------------|
| G | Basic-Geko | • | U | Circulating air | • | 1 | 3 | 31 | 4 | 4 |
| | | | System | | | Size | Capacity stage | Medium system | Electric box | Coil connection |
| | 1 | Size 1 | | | | | | | | |
| | 2 | Size 2 | | | | | | | | |
| | 3 | Size 3 | | | | | | | | |
| | 4 | Size 4 | | | | | | | | |
| | 5 | Size 5 | | | | | | | | |
| | 1 | Capacity stage 1 | | | | | | | | |
| | 2 | Capacity stage 2 | | | | | | | | |
| | 2 | 2-pipe system | | | | | | | | |
| | 3 | 2-pipe system (cooling only) and electric heater | | | | | | | | |
| | 4 | 4-pipe system (not for size 5 and capacity stage 2) | | | | | | | | |
| | 11 | Terminal strip with cover | | | | | | | | |
| | 21 | Electrical control box with terminal strip, contactor and HTC (electric heater) | | | | | | | | |
| | 31 | Electrical control box with MCE 3 | | | | | | | | |
| | 41 | Electrical control box with MCE 3, terminal strips, contactor and HTC | | | | | | | | |
| | 1 | Coil connection, wall, left | | | | | | | | |
| | 2 | Coil connection, wall right | | | | | | | | |
| | 3 | Coil connection, ceiling, left | | | | | | | | |
| | 4 | Coil connection, ceiling, right | | | | | | | | |

Connection side seen from front with view of discharge

Type codes for valves fitted

Example valves:
Order No.: VT225.B

- V = Valves
- T = Thermo-electric actuator
- 2 = 2-port for 2- and 4-pipe systems
- 25 = $k_{VS} = 2.50^*$
- B = Valves for Basic-Geko

Select 1 valve for 2-pipe systems (2nd box of order number remains blank), 2 valves for 4-pipe systems.

*) The k_{VS} value for thermo-electric actuators is always 2.50.

For valves with reversible actuators, determine the k_{VS} value as described on the page entitled "How to find the right Basic-Geko".

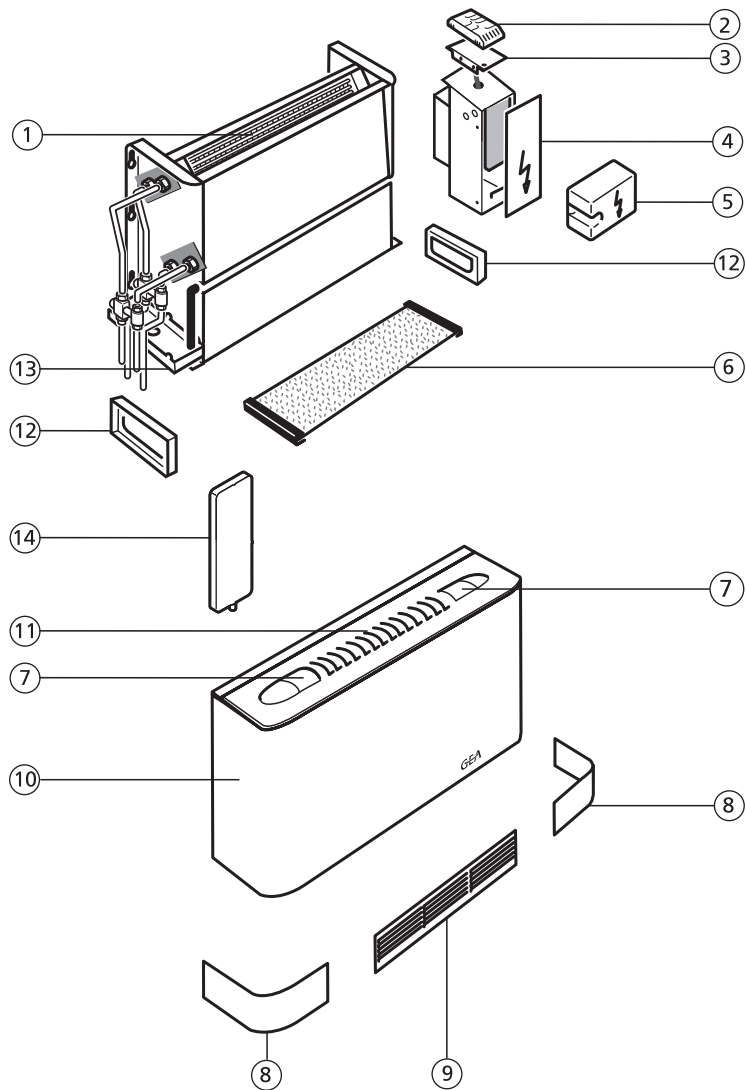
| | | | | | | | | | | |
|----------|--------|--|------------|--------------------------------------|---|----------|-----------|----------|-----------|----------|
| V | Valves | • | R | Reversible actuator (230 V, 3-point) | • | 2 | 25 | 2 | 25 | B |
| | | | Valve mode | | | Valves | Valves | Valves | Valves | Valves |
| | R | Reversible actuator (230 V, 3-point) | | | | | | | | |
| | T | Thermo-electric actuator (230 V, 2-point) | | | | | | | | |
| | 2 | 2-port (cooling/heating) for 2- and 4-pipe systems | | | | | | | | |
| | 3 | 4-port (cooling/heating) for 2- and 4-pipe systems | | | | | | | | |
| | 06 | $k_{VS} = 0.63$ (for valve drives R) | | | | | | | | |
| | 10 | $k_{VS} = 1.00$ (for valve drives R) | | | | | | | | |
| | 16 | $k_{VS} = 1.60$ (for valve drives R) | | | | | | | | |
| | 25 | $k_{VS} = 2.50$ (for valve drives R, T) | | | | | | | | |
| | 06 | $k_{VS} = 0.63$ (for valve drives R) | | | | | | | | |
| | 10 | $k_{VS} = 1.00$ (for valve drives R) | | | | | | | | |
| | 16 | $k_{VS} = 1.60$ (for valve drives R) | | | | | | | | |
| | 25 | $k_{VS} = 2.50$ (for valve drives R, T) | | | | | | | | |
| | BL | Coil connection, left, for Basic-Geko | | | | | | | | |
| | BR | Coil connection, right, for Basic-Geko | | | | | | | | |

k_{VS} value, 2-pipe: H/C, 4-pipe: Cooling

k_{VS} value only for 4-pipe: Heating

Description of the major components

1. Basic unit
2. Controller (fitted)
3. Controller bracket
4. Switchbox with electronic power unit
5. Terminal box
6. Filter
7. Control access flap, right/left
8. Unit foot cover, right/left
9. Air intake grille
10. Main casing
11. Discharge grille
12. Upper foot, right/left
13. Wall condensate pan (wall-mounted units only)
14. Ceiling condensate pan (ceiling-mounted units only)



Abbreviations and symbols

| | | | | | |
|-------------|----------------------------|-------------|---------------------------------------|------------------|---|
| L.P.H.W. | Low pressure hot water | φ_1 | Entering humidity | t_{W1} | Flow temperature |
| PCW | Chilled water | φ_2 | Leaving humidity | t_{W2} | Return temperature |
| HTC | High temperature cut out | r.h. | Relative humidity | Δt_W | Temperature difference, flow/return |
| CS | Capacity stage | \dot{Q}_H | Heating capacities | Δp | Heat-exchanger pressure loss on water side |
| MCR | Microcomputer controller | \dot{Q}_C | Cooling capacity, total | Δp_{max} | Maximum permissible pressure difference at which a valve still closes |
| BMS | Building management system | \dot{Q}_S | Cooling capacity, sensible | | |
| \dot{V}_A | Volumetric air flow | f_H | Correction factor, heating | | |
| \dot{V}_W | Water flow rate | f_C | Correction factor, cooling (total) | | |
| t_{A1} | Entering air temperature | f_S | Correction factor, cooling (sensible) | | |
| t_{A2} | Leaving air temperature | | | | |

GEA Basic-Geko fan coil unit in 5 sizes



Contents:

| | | | |
|-----------------------------------|----|---|----|
| Basic-Geko and accessories | 2 | Control systems and accessories | 19 |
| Installation examples | 4 | Pressure losses in the heat exchanger | 26 |
| Overview of capacity stages | 5 | Valves | 27 |
| Rating tables | 6 | Electric heating | 28 |
| Dimensions | 16 | Specification text | 31 |
| Acoustics | 18 | | |

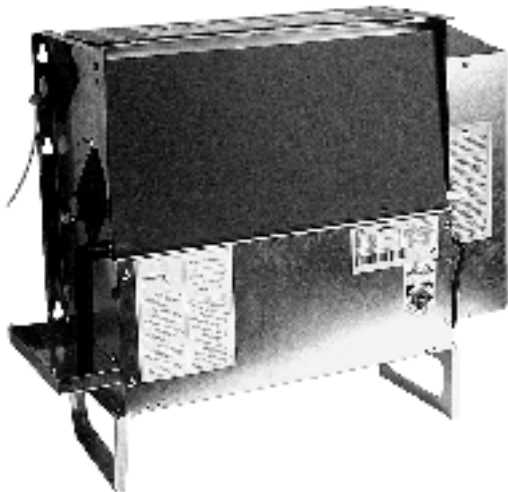
Basic-Geko fan coil unit and accessories

Basic-Geko fan coil unit

The Basic-Geko is a decentralised, modular, circulating-air system for heating, cooling and filtering the air. It can be used in industrial, commercial, and private premises as a wall-mounted or ceiling-mounted unit.

The unit is available as a 2- or 4-pipe system in 5 different sizes, each with 2 capacity stages.

The Basic-Geko has 3 fan speeds and is configured for a 230V/50Hz electricity supply. The heating function is implemented using hot water or an electric heater. Cooling is implemented using chilled water.



Technical information

Casing

- Sendzimir hot-dip-galvanised sheet steel
- Polyethylene for sound and thermal insulation

2-pipe system

- Cooling only
- Heating only
- Cooling or heating

4-pipe system

- Cooling and heating

Heat exchanger

- Pipes made of copper with aluminium fins fitted, max. operating pressure 16 bar
- Cooling medium: water; max. perm. glycol admix 50%
- Heating medium: water; max. flow temperature 90 °C
- Coil connection 1/2" internal thread; vent and drain screws

Electric heating

- Electric heating bar 230 V~
- Finned radiator made of aluminium
- Completely assembled and wired

Centrifugal fan

- Double inlet
- Quiet running
- Maintenance-free bearings
- Impeller made of plastic with forward-curved blades
- 3-speed external-rotor motor, 230V/50Hz
- Enclosure IP32
- Built-in thermocontacts
- Wired to terminal strip, ready for connection

Casing

- Front panel made of sheet steel; white; similar to RAL 9010
- Hinged flaps and discharge grille made of plastic (ABS); grey; similar to RAL 7035
- Also with unit foot covers and air intake grille; grey; similar to RAL 7035

Filter

- Synthetic filter medium; washable
- Filter classification G1

Discharge flexible discharge connector

- Fire protection class B2
- 4-hole fixing with 20-mm frame all round

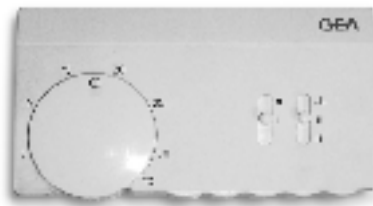
Basic-Geko fan coil unit and accessories



Valves

2- and 4-port valves (on/off control mode) with thermo-electric actuator

2- and 4-port valves (modulating control mode) with reversible actuator



MCR 2000 Electronic Temperature Controller

For Basic-Geko with terminal strip or electrical control box (incl. terminal strip) with/without electric-heater connection

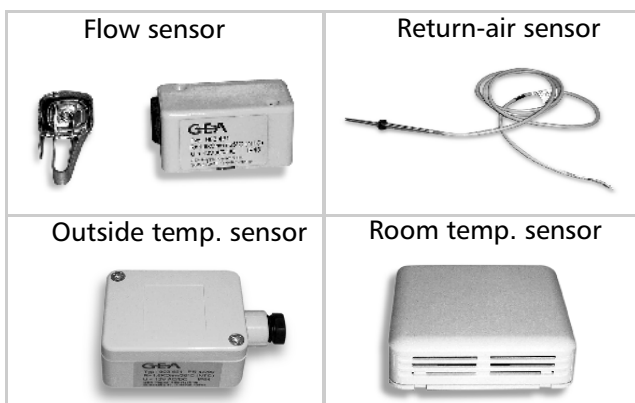
- Temperature control
- On/Off switch
- 3-speed blower circuitry
- Integral room temperature sensor



MCR 3102 Microcomputer Controller

MCR 3102 for Basic-Geko with electrical control box (incl. electronic power unit) with/without electric-heater connection

- Temperature control
- Day-/night time switchover
- 3-speed fan circuitry and automatic selection of fan speed
- Integral room temperature sensor
- on/off control mode or modulating control mode
- LED "Power On" indicator



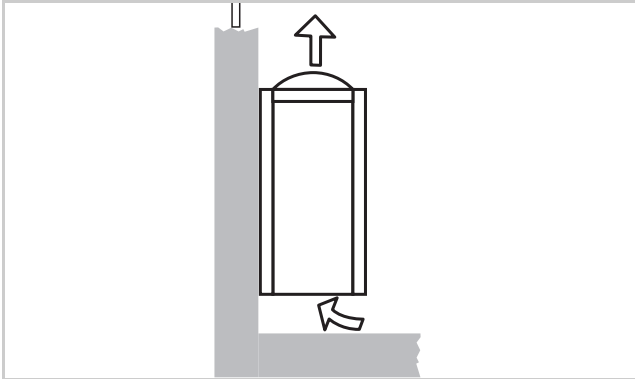
Sensors

- Flow sensor for mounting on the flow line for switching between cooling and heating mode
- Return-air sensor for temperature control by means of the return air
- Outside temperature sensor for cooling mode to increase the room temperature depending on the outside temperature (summer compensation)
- Room temperature sensor

Basic-Geko fan coil unit installation examples

Wall-mounted units

with casing

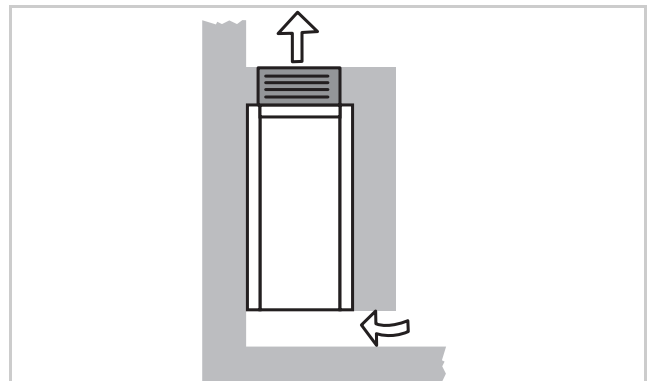
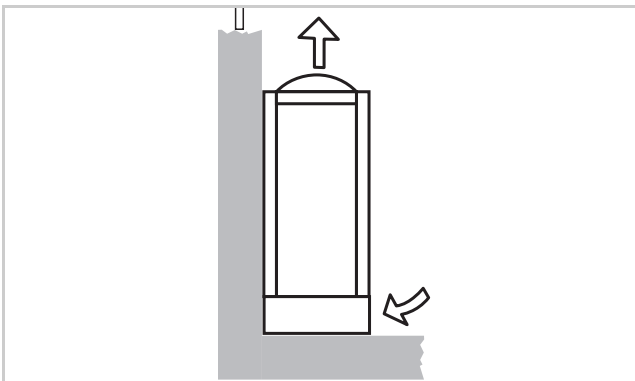


Wall-mounted units

without casing

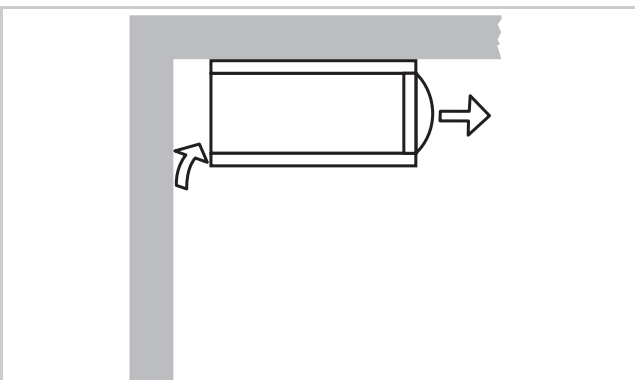
The Basic-Geko can be used for wall or ceiling mounting, for cooling, heating and filtering, with or without flexible discharge connector.

The units are fixed in place simply by means of being screwed to the wall or ceiling. The slots at the rear of the unit allow you to align the unit.



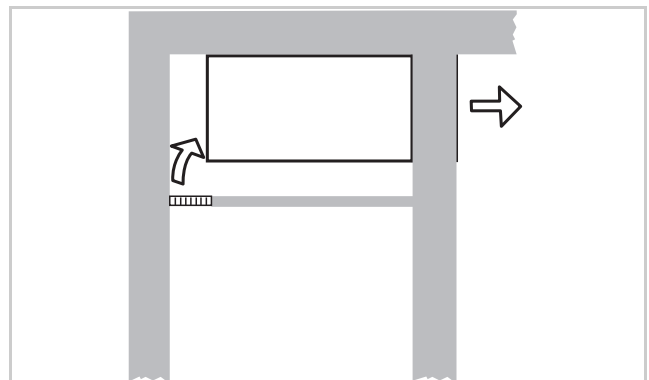
Ceiling-mounted units

with casing



Ceiling-mounted units

without casing



Basic-Geko fan coil unit overview of capacity stages

| | | | | |
|---------------|-------------------------|---|---|---------------|
| Size 1 | Capacity stage 1 | Air volume flow Cooling capacities Heating capacities Sound pressure level | 130 - 280 m ³ /h 0.76 - 1.22 kW 1.34 - 3.10 kW 13 - 36 dB(A) | Size 1 |
| | Capacity stage 2 | Air volume flow Cooling capacities Heating capacities Sound pressure level | 130 - 280 m ³ /h 1.01 - 1.72 kW 1.34 - 3.94 kW 13 - 36 dB(A) | |
| Size 2 | Capacity stage 1 | Air volume flow Cooling capacities Heating capacities Sound pressure level | 165 - 340 m ³ /h 1.37 - 2.27 kW 1.84 - 5.12 kW 22 - 39 dB(A) | Size 2 |
| | Capacity stage 2 | Air volume flow Cooling capacities Heating capacities Sound pressure level | 240 - 540 m ³ /h 1.62 - 2.75 kW 2.36 - 6.76 kW 32 - 52 dB(A) | |
| Size 3 | Capacity stage 1 | Air volume flow Cooling capacities Heating capacities Sound pressure level | 350 - 620 m ³ /h 2.40 - 3.49 kW 3.35 - 8.19 kW 24 - 44 dB(A) | Size 3 |
| | Capacity stage 2 | Air volume flow Cooling capacities Heating capacities Sound pressure level | 350 - 840 m ³ /h 2.40 - 4.13 kW 3.35 - 10.05 kW 24 - 50 dB(A) | |
| Size 4 | Capacity stage 1 | Air volume flow Cooling capacities Heating capacities Sound pressure level | 360 - 1030 m ³ /h 2.49 - 4.91 kW 3.72 - 12.22 kW 24 - 54 dB(A) | Size 4 |
| | Capacity stage 2 | Air volume flow Cooling capacities Heating capacities Sound pressure level | 700 - 1260 m ³ /h 3.49 - 5.43 kW 5.55 - 13.82 kW 44 - 58 dB(A) | |
| Size 5 | Capacity stage 1 | Air volume flow Cooling capacities Heating capacities Sound pressure level | 710 - 1350 m ³ /h 4.75 - 6.95 kW 6.52 - 16.46 kW 43 - 59 dB(A) | Size 5 |
| | Capacity stage 2 | Air volume flow Cooling capacities Heating capacities Sound pressure level | 710 - 1350 m ³ /h 5.42 - 8.33 kW 11.81 - 19.15 kW 43 - 59 dB(A) | |

Size 1, Capacity Stage 1

| Technical data | Fan speed | Air volume flow \dot{V}_A | | Operating voltage [230V/50Hz] | | Sound power level | Sound pressure level* |
|----------------|-----------|-----------------------------|---------------------|-------------------------------|-------------|-------------------|-----------------------|
| | | [m ³ /h] | [m ³ /s] | Output [W] | Current [A] | [dB(A)] | [dB(A)] |
| | 1 | 130 | 0.036 | 27 | 0.13 | 22 | 13 |
| 2 | 200 | 0.056 | 32 | 0.15 | 36 | 27 | |
| 3 | 280 | 0.078 | 39 | 0.18 | 45 | 36 | |

* The sound pressure level is expressed in relation to a reverberation field of a 100 m³ room and a reverberation time of 0.5 s.

| Cooling capacity | Chilled water | Fan speed | 2- and 4-pipe systems | | | |
|---|---------------|-----------|-----------------------|------------------|---------------|----------------------|
| | | | \dot{Q}_C [kW] | \dot{Q}_S [kW] | t_{A2} [°C] | φ_2 [% r.h.] |
| Flow/return 6/12°C $t_{A1} = +27^\circ\text{C}$ $\varphi_1 = 46\%$ r.h. | 1 | 0.76 | 0.59 | 13.7 | 89.4 | 3.3 |
| | 2 | 1.00 | 0.81 | 15.2 | 83.9 | 5.5 |
| | 3 | 1.22 | 1.00 | 16.6 | 79.3 | 7.8 |
| Flow/return 6/12°C $t_{A1} = +25^\circ\text{C}$ $\varphi_1 = 50\%$ r.h. | 1 | 0.64 | 0.51 | 13.4 | 90.5 | 2.5 |
| | 2 | 0.86 | 0.70 | 14.8 | 85.4 | 4.1 |
| | 3 | 1.05 | 0.87 | 15.8 | 81.4 | 6.0 |
| Flow/return 6/12°C $t_{A1} = +23^\circ\text{C}$ $\varphi_1 = 55\%$ r.h. | 1 | 0.53 | 0.43 | 13.3 | 91.3 | 1.7 |
| | 2 | 0.72 | 0.59 | 14.3 | 87.3 | 3.0 |
| | 3 | 0.88 | 0.74 | 15.3 | 83.5 | 4.4 |

| Heating capacity | Hot water | Fan speed | 2-pipe | | | 4-pipe | | |
|---|-----------|-----------|------------------|---------------|------------------|------------------|---------------|------------------|
| | | | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] |
| Flow/return 80/60°C $t_{A1} = +20^\circ\text{C}$ | 1 | 1.82 | 61.7 | 1.5 | 1.34 | 50.6 | 0.5 | |
| | 2 | 2.46 | 56.6 | 2.6 | 1.74 | 45.9 | 0.7 | |
| | 3 | 3.10 | 53.0 | 4.0 | 2.13 | 42.7 | 1.0 | |
| Flow/return 70/50°C $t_{A1} = +20^\circ\text{C}$ | 1 | 1.43 | 52.6 | 1.0 | 0.99 | 42.6 | 0.3 | |
| | 2 | 1.93 | 48.7 | 1.7 | 1.28 | 39.1 | 0.4 | |
| | 3 | 2.42 | 45.7 | 2.6 | 1.57 | 36.7 | 0.6 | |
| Flow/return 50/40°C $t_{A1} = +20^\circ\text{C}$ | 1 | 0.89 | 40.4 | 1.5 | 0.63 | 34.4 | 0.4 | |
| | 2 | 1.20 | 37.8 | 2.6 | 0.82 | 32.3 | 0.7 | |
| | 3 | 1.50 | 36.0 | 4.0 | 1.00 | 30.7 | 1.0 | |

| Determination of ratings ¹⁾ (interpolation) | Calculation steps | Example | Calculation steps | Example |
|--|---|---|--|---|
| | Size, CS, select higher fan speed | Size 1, CS 1, Fan speed 1 | Size, CS, system, select fan speed | Size 1, CS 1, 2-pipe, Fan speed 1 |
| | Specified operating state, not in table | PCW 8/12°C, $t_{A1} = +24^\circ\text{C}$, $\varphi_1 = 50\%$ r.h. | Specified operating state, not in table | L.P.H.W. 70/50°C, $t_{A1} = +15^\circ\text{C}$ |
| | Cooling capacity $\dot{Q}_{C(\text{tab})}$ for PCW 6/12°C, $t_{A1} = +27^\circ\text{C}$, $\varphi_1 = 46\%$ r.h. ²⁾ | $\dot{Q}_{C(\text{tab})} = \dot{Q}_{C(6/12/+27/46\%)} = 0.76$ [kW] | Heating capacity $\dot{Q}_{H(\text{tab})}$ for L.P.H.W. 80/60°C, $t_{A1} = +20^\circ\text{C}$ ³⁾ | $\dot{Q}_{H(\text{tab})} = \dot{Q}_{H(80/60/+20)} = 1.82$ [kW] |
| | Correction factor $f_{C(\text{tab})}$ for spec. mode ⁴⁾ | $f_{C(\text{tab})} = f_{C(8/12/+24/50\%)} = 0.73$ | Correction factor $f_{H(\text{tab})}$ for spec. mode ⁴⁾ | $f_{H(\text{tab})} = f_{H(70/50/+15)} = 0.90$ |
| | Cooling capacity \dot{Q}_C in spec. mode $\dot{Q}_C = f_{C(\text{tab})} * \dot{Q}_{C(\text{tab})}$ | $\dot{Q}_C = 0.73 * 0.76 = 0.55$ [kW] $= \dot{Q}_{C(8/12/+24/50\%)}$ | Heating capacity \dot{Q}_H in spec. mode $\dot{Q}_H = f_{H(\text{tab})} * \dot{Q}_{H(\text{tab})}$ | $\dot{Q}_H = 0.90 * 1.82 = 1.64$ [kW] $= \dot{Q}_{H(70/50/+15)}$ |
| | Cooling capacity, sens. $\dot{Q}_{S(\text{tab})}$ for PCW 6/12°C, $t_{A1} = +27^\circ\text{C}$, $\varphi_1 = 46\%$ r.h. | $\dot{Q}_{S(\text{tab})} = \dot{Q}_{S(6/12/+27/46\%)} = 0.59$ [kW] | Air volume flow $\dot{V}_{A(\text{tab})}$ | $\dot{V}_{A(\text{tab})} = 130$ [m ³ /h] |
| | Correction factor, sens. $f_{S(\text{tab})}$ for spec. mode | $f_{S(\text{tab})} = f_{S(8/12/+24/50\%)} = 0.80$ | Air discharge temp. t_{A2} in spec. mode $t_{A2} \approx 3000 * \dot{Q}_H / \dot{V}_{A(\text{tab})} + t_{L1}$ | $t_{A2} \approx 3000 * 1.64 / 130 + 15 \approx 53$ [°C] = $t_{A2(70/50/+15)}$ |
| Cooling capacity, sens. \dot{Q}_S in spec. mode $\dot{Q}_S = f_{S(\text{tab})} * \dot{Q}_{S(\text{tab})}$ | $\dot{Q}_S = 0.80 * 0.59 = 0.47$ [kW] $= \dot{Q}_{S(8/12/+24/50\%)}$ | 1) Capacities/outputs/discharge states in table/interpolated required for valve configuration 2) From "Cooling capacity" table, 3) From "Heating capacity" table, 4) From "Correction factors" table L.P.H.W. = Low pressure hot water, PCW = Chilled water | | |

Size 1, Capacity Stage 2

| Technical data | Fan speed | Air volume flow \dot{V}_A | | Operating voltage [230V/50Hz] | | Sound power level | Sound pressure level* |
|----------------|-----------|-----------------------------|---------------------|-------------------------------|-------------|-------------------|-----------------------|
| | | [m ³ /h] | [m ³ /s] | Output [W] | Current [A] | [dB(A)] | [dB(A)] |
| | 1 | 130 | 0.036 | 27 | 0.13 | 22 | 13 |
| 2 | 200 | 0.056 | 32 | 0.15 | 36 | 27 | |
| 3 | 280 | 0.078 | 39 | 0.18 | 45 | 36 | |

* The sound pressure level is expressed in relation to a reverberation field of a 100 m³ room and a reverberation time of 0.5 s.

| Cooling capacity | Chilled water | Fan speed | 2- and 4-pipe systems | | | | |
|---|---|-----------|-----------------------|------------------|---------------|----------------------|------------------|
| | | | \dot{Q}_C [kW] | \dot{Q}_S [kW] | t_{A2} [°C] | φ_2 [% r.h.] | Δp [kPa] |
| Flow/return 6/12°C $t_{A1} = +27^\circ\text{C}$ $\varphi_1 = 46\%$ r.h. | 1 | 1.01 | 0.73 | 10.6 | 96.5 | 0.0 | |
| | 2 | 1.37 | 1.02 | 12.1 | 92.7 | 14.8 | |
| | 3 | 1.72 | 1.31 | 13.3 | 89.2 | 22.1 | |
| | Flow/return 6/12°C $t_{A1} = +25^\circ\text{C}$ $\varphi_1 = 50\%$ r.h. | 1 | 0.89 | 0.64 | 10.5 | 97.0 | 6.9 |
| | | 2 | 1.21 | 0.90 | 11.8 | 93.8 | 11.9 |
| | | 3 | 1.52 | 1.16 | 12.9 | 90.4 | 17.7 |
| | Flow/return 6/12°C $t_{A1} = +23^\circ\text{C}$ $\varphi_1 = 55\%$ r.h. | 1 | 0.77 | 0.56 | 10.5 | 97.3 | 5.4 |
| | | 2 | 1.06 | 0.79 | 11.5 | 94.7 | 9.5 |
| | | 3 | 1.31 | 1.00 | 12.6 | 91.5 | 13.6 |

| Heating capacity | Hot water | Fan speed | 2-pipe | | | 4-pipe | | |
|---|---|-----------|------------------|---------------|------------------|------------------|---------------|------------------|
| | | | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] |
| Flow/return 80/60°C $t_{A1} = +20^\circ\text{C}$ | 1 | 2.18 | 69.9 | 3.1 | 1.34 | 50.6 | 0.5 | |
| | 2 | 3.08 | 65.8 | 5.7 | 1.74 | 45.9 | 0.7 | |
| | 3 | 3.94 | 61.9 | 8.7 | 2.13 | 42.7 | 1.0 | |
| | Flow/return 70/50°C $t_{A1} = +20^\circ\text{C}$ | 1 | 1.76 | 60.4 | 2.2 | 0.99 | 42.6 | 0.3 |
| | | 2 | 2.46 | 56.7 | 3.9 | 1.28 | 39.1 | 0.4 |
| | | 3 | 3.11 | 53.1 | 5.9 | 1.57 | 36.7 | 0.6 |
| | Flow/return 50/40°C $t_{A1} = +20^\circ\text{C}$ | 1 | 1.08 | 44.7 | 3.3 | 0.63 | 34.4 | 0.4 |
| | | 2 | 1.53 | 42.8 | 6.1 | 0.82 | 32.3 | 0.7 |
| | | 3 | 1.93 | 40.5 | 9.2 | 1.00 | 30.7 | 1.0 |

| Correction factors | Chilled water | Correction factor f_C for cooling capacity \dot{Q}_C | | | | | Correction factor f_S for cooling capacity \dot{Q}_S | | | | | Hot water | Correction factor f_H for heating capacity \dot{Q}_H | | |
|--------------------|---------------|--|------|------|------|------|--|------|------|------|-------|-----------|--|------|-----|
| | | Air intake t_{A1} [°C], φ_1 [% r.h.] | | | | | Air intake t_{A1} [°C], φ_1 [% r.h.] | | | | | | Air intake t_{A1} , [°C] | | |
| | [°C] | 32/ | 30/ | 27/ | 26/ | 24/ | 32/ | 30/ | 27/ | 26/ | 24/ | [°C] | +5 | +10 | +15 |
| 6/12 | 1.36 | 1.16 | 1.00 | 0.98 | 0.78 | 1.27 | 1.17 | 1.00 | 0.94 | 0.83 | 90/70 | 1.57 | 1.45 | 1.33 | |
| 7/13 | 1.27 | 1.08 | 0.91 | 0.89 | - | 1.22 | 1.12 | 0.95 | 0.89 | 0.78 | 80/60 | 1.35 | 1.23 | 1.12 | |
| 8/12 | 1.29 | 1.09 | 0.94 | 0.92 | 0.73 | 1.23 | 1.13 | 0.96 | 0.90 | 0.80 | 70/55 | 1.19 | 1.08 | 0.96 | |
| 8/14 | 1.18 | 0.99 | 0.83 | 0.80 | - | 1.17 | 1.07 | 0.89 | 0.83 | 0.72 | 70/50 | 1.13 | 1.02 | 0.90 | |
| 10/15 | 1.06 | 0.87 | 0.71 | 0.68 | - | 1.10 | 0.99 | 0.82 | 0.76 | 0.65 | 60/50 | 1.03 | 0.92 | 0.81 | |
| 12/16 | 0.92 | 0.74 | 0.59 | 0.56 | 0.42 | 1.02 | 0.92 | 0.75 | 0.69 | 0.57 | 60/40 | 0.91 | 0.79 | - | |
| 12/18 | 0.82 | 0.65 | 0.50 | - | - | 0.96 | 0.85 | 0.67 | - | - | 50/40 | 0.82 | 0.71 | 0.60 | |
| 14/18 | 0.74 | 0.59 | 0.46 | 0.42 | 0.33 | 0.92 | 0.81 | 0.63 | 0.57 | 0.45 | 40/30 | 0.61 | 0.49 | - | |

Size 2, Capacity Stage 1

| Technical data | Fan speed | Air volume flow \dot{V}_A | | Operating voltage [230V/50Hz] | | Sound power level | Sound pressure level* |
|----------------|-----------|-----------------------------|---------------------|-------------------------------|-------------|-------------------|-----------------------|
| | | [m ³ /h] | [m ³ /s] | Output [W] | Current [A] | [dB(A)] | [dB(A)] |
| | 1 | 165 | 0.046 | 30 | 0.14 | 31 | 22 |
| 2 | 240 | 0.067 | 35 | 0.16 | 41 | 32 | |
| 3 | 340 | 0.094 | 43 | 0.19 | 48 | 39 | |

* The sound pressure level is expressed in relation to a reverberation field of a 100 m³ room and a reverberation time of 0.5 s.

| Cooling capacity | Chilled water | Fan speed | 2- and 4-pipe systems | | | |
|---|---------------|-----------|-----------------------|------------------|---------------|----------------------|
| | | | \dot{Q}_C [kW] | \dot{Q}_S [kW] | t_{A2} [°C] | φ_2 [% r.h.] |
| Flow/return 6/12°C $t_{A1} = +27^\circ\text{C}$ $\varphi_1 = 46\%$ r.h. | 1 | 1.37 | 0.97 | 9.8 | 97.1 | 19.1 |
| | 2 | 1.81 | 1.31 | 11.0 | 94.4 | 31.3 |
| | 3 | 2.27 | 1.69 | 12.5 | 90.7 | 46.6 |
| Flow/return 6/12°C $t_{A1} = +25^\circ\text{C}$ $\varphi_1 = 50\%$ r.h. | 1 | 1.22 | 0.87 | 9.7 | 97.6 | 15.7 |
| | 2 | 1.60 | 1.16 | 10.8 | 95.0 | 25.2 |
| | 3 | 2.04 | 1.51 | 12.0 | 92.0 | 38.3 |
| Flow/return 6/12°C $t_{A1} = +23^\circ\text{C}$ $\varphi_1 = 55\%$ r.h. | 1 | 1.08 | 0.75 | 9.6 | 98.0 | 12.5 |
| | 2 | 1.41 | 1.01 | 10.7 | 95.8 | 20.0 |
| | 3 | 1.80 | 1.32 | 11.7 | 93.3 | 30.7 |

| Heating capacity | Hot water | Fan speed | 2-pipe | | | 4-pipe | | |
|---|-----------|-----------|------------------|---------------|------------------|------------------|---------------|------------------|
| | | | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] |
| Flow/return 80/60°C $t_{A1} = +20^\circ\text{C}$ | 1 | 2.88 | 72.1 | 6.5 | 1.84 | 53.2 | 1.0 | |
| | 2 | 3.92 | 68.6 | 11.2 | 2.46 | 48.2 | 1.7 | |
| | 3 | 5.12 | 64.8 | 17.9 | 2.98 | 44.7 | 2.3 | |
| Flow/return 70/50°C $t_{A1} = +20^\circ\text{C}$ | 1 | 2.32 | 61.9 | 4.6 | 1.41 | 45.5 | 0.7 | |
| | 2 | 3.11 | 58.6 | 7.7 | 1.84 | 41.9 | 1.0 | |
| | 3 | 4.06 | 55.6 | 12.3 | 2.23 | 39.0 | 1.5 | |
| Flow/return 50/40°C $t_{A1} = +20^\circ\text{C}$ | 1 | 1.41 | 45.5 | 6.9 | 0.89 | 36.0 | 1.0 | |
| | 2 | 1.93 | 44.0 | 11.9 | 1.13 | 34.0 | 1.6 | |
| | 3 | 2.52 | 42.0 | 18.9 | 1.39 | 32.2 | 2.3 | |

| Determination of ratings ¹⁾ (interpolation) | Calculation steps | Example | Calculation steps | Example |
|--|---|---|--|---|
| | Size, CS, select higher fan speed | Size 2, CS 1, Fan speed 1 | Size, CS, system, select fan speed | Size 2, CS 1, 2-pipe, Fan speed 1 |
| | Specified operating state, not in table | PCW 8/12°C, $t_{A1} = +24^\circ\text{C}$, $\varphi_1 = 50\%$ r.h. | Specified operating state, not in table | L.P.H.W. 70/50°C, $t_{A1} = +15^\circ\text{C}$ |
| | Cooling capacity $\dot{Q}_{C(\text{tab})}$ for PCW 6/12°C, $t_{A1} = +27^\circ\text{C}$, $\varphi_1 = 46\%$ r.h. ²⁾ | $\dot{Q}_{C(\text{tab})} = \dot{Q}_{C(6/12/+27/46\%)} = 1.37$ [kW] | Heating capacity $\dot{Q}_{H(\text{tab})}$ for L.P.H.W. 80/60°C, $t_{A1} = +20^\circ\text{C}$ ³⁾ | $\dot{Q}_{H(\text{tab})} = \dot{Q}_{H(80/60/+20)} = 2.88$ [kW] |
| | Correction factor $f_{C(\text{tab})}$ for spec. mode ⁴⁾ | $f_{C(\text{tab})} = f_{C(8/12/+24/50\%)} = 0.73$ | Correction factor $f_{H(\text{tab})}$ for spec. mode ⁴⁾ | $f_{H(\text{tab})} = f_{H(70/50/+15)} = 0.90$ |
| | Cooling capacity \dot{Q}_C in spec. mode $\dot{Q}_C = f_{C(\text{tab})} * \dot{Q}_{C(\text{tab})}$ | $\dot{Q}_C = 0.73 * 1.37 = 1.00$ [kW] $= \dot{Q}_{C(8/12/+24/50\%)}$ | Heating capacity \dot{Q}_H in spec. mode $\dot{Q}_H = f_{H(\text{tab})} * \dot{Q}_{H(\text{tab})}$ | $\dot{Q}_H = 0.90 * 2.88 = 2.59$ [kW] $= \dot{Q}_{H(70/50/+15)}$ |
| | Cooling capacity, sens. $\dot{Q}_{S(\text{tab})}$ for PCW 6/12°C, $t_{A1} = +27^\circ\text{C}$, $\varphi_1 = 46\%$ r.h. | $\dot{Q}_{S(\text{tab})} = \dot{Q}_{S(6/12/+27/46\%)} = 0.97$ [kW] | Air volume flow $\dot{V}_{A(\text{tab})}$ | $\dot{V}_{A(\text{tab})} = 165$ [m ³ /h] |
| | Correction factor, sensitive $f_{S(\text{tab})}$ for spec. mode | $f_{S(\text{tab})} = f_{S(8/12/+24/50\%)} = 0.80$ | Air discharge temp. t_{A2} in spec. mode $t_{A2} \approx 3000 * \dot{Q}_H / \dot{V}_{A(\text{tab})} + t_{L1}$ | $t_{A2} \approx 3000 * 2.59 / 165 + 15 \approx 62$ [°C] = $t_{A2(70/50/+15)}$ |

1) Capacities/outputs/discharge states in table/interpolated required for valve config.
2) From "Cooling capacity" table, 3) From "Heating capacity" table, 4) From "Correction factors" table
L.P.H.W. = Low pressure hot water, PCW = Chilled water

Size 2, Capacity Stage 2

| Technical data | Fan speed | Air volume flow \dot{V}_A | | Operating voltage [230V/50Hz] | | Sound power level | Sound pressure level* |
|----------------|-----------|-----------------------------|---------------------|-------------------------------|-------------|-------------------|-----------------------|
| | | [m ³ /h] | [m ³ /s] | Output [W] | Current [A] | [dB(A)] | [dB(A)] |
| | 1 | 240 | 0.067 | 49 | 0.23 | 41 | 32 |
| 2 | 350 | 0.097 | 62 | 0.28 | 50 | 41 | |
| 3 | 540 | 0.150 | 86 | 0.38 | 61 | 52 | |

* The sound pressure level is expressed in relation to a reverberation field of a 100 m³ room and a reverberation time of 0.5 s.

| Cooling capacity | Chilled water | Fan speed | 2- and 4-pipe systems | | | | |
|---|---|-----------|-----------------------|------------------|---------------|----------------------|------------------|
| | | | \dot{Q}_C [kW] | \dot{Q}_S [kW] | t_{A2} [°C] | φ_2 [% r.h.] | Δp [kPa] |
| Flow/return 6/12°C $t_{A1} = +27^\circ\text{C}$ $\varphi_1 = 46\%$ r.h. | 1 | 1.62 | 1.23 | 12.1 | 94.2 | 3.6 | |
| | 2 | 2.13 | 1.65 | 13.2 | 90.6 | 5.9 | |
| | 3 | 2.75 | 2.20 | 15.1 | 84.7 | 9.4 | |
| | Flow/return 6/12°C $t_{A1} = +25^\circ\text{C}$ $\varphi_1 = 50\%$ r.h. | 1 | 1.42 | 1.08 | 11.8 | 95.0 | 2.9 |
| | | 2 | 1.84 | 1.44 | 13.0 | 91.3 | 4.5 |
| | | 3 | 2.39 | 1.93 | 14.5 | 86.2 | 7.3 |
| | Flow/return 6/12°C $t_{A1} = +23^\circ\text{C}$ $\varphi_1 = 55\%$ r.h. | 1 | 1.19 | 0.91 | 11.8 | 95.5 | 2.1 |
| | | 2 | 1.56 | 1.22 | 12.8 | 92.3 | 3.4 |
| | | 3 | 2.03 | 1.65 | 14.1 | 87.7 | 5.4 |

| Heating capacity | Hot water | Fan speed | 2-pipe | | | 4-pipe | | |
|---|---|-----------|------------------|---------------|------------------|------------------|---------------|------------------|
| | | | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] |
| Flow/return 80/60°C $t_{A1} = +20^\circ\text{C}$ | 1 | 3.77 | 66.8 | 1.5 | 2.36 | 49.3 | 1.6 | |
| | 2 | 5.02 | 62.7 | 2.6 | 2.93 | 44.9 | 2.3 | |
| | 3 | 6.76 | 57.3 | 4.4 | 3.75 | 40.7 | 3.5 | |
| | Flow/return 70/50°C $t_{A1} = +20^\circ\text{C}$ | 1 | 2.99 | 57.1 | 1.0 | 1.79 | 42.2 | 1.0 |
| | | 2 | 3.92 | 53.4 | 1.7 | 2.23 | 39.0 | 1.5 |
| | | 3 | 5.32 | 49.3 | 2.9 | 2.86 | 35.7 | 2.2 |
| | Flow/return 50/40°C $t_{A1} = +20^\circ\text{C}$ | 1 | 1.86 | 43.1 | 1.6 | 1.13 | 34.0 | 1.6 |
| | | 2 | 2.44 | 40.8 | 2.6 | 1.42 | 32.1 | 2.3 |
| | | 3 | 3.31 | 38.2 | 4.5 | 1.81 | 30.0 | 3.6 |

| Correction factors | Chilled water | Correction factor f_C for cooling capacity \dot{Q}_C Air intake t_{A1} [°C], φ_1 [% r.h.] | | | | | Correction factor f_S for cooling capacity \dot{Q}_S Air intake t_{A1} [°C], φ_1 [% r.h.] | | | | | Hot water | Correction factor f_H for heating capacity \dot{Q}_H Air intake t_{A1} [°C] | | |
|--------------------|---------------|--|------|------|------|------|--|------|------|------|-------|-----------|--|------|------|
| | | [°C] | 32/ | 30/ | 27/ | 26/ | 24/ | 32/ | 30/ | 27/ | 26/ | | 24/ | [°C] | +5 |
| | 6/12 | 1.36 | 1.16 | 1.00 | 0.98 | 0.78 | 1.27 | 1.17 | 1.00 | 0.94 | 0.83 | 90/70 | 1.57 | 1.45 | 1.33 |
| 7/13 | 1.27 | 1.08 | 0.91 | 0.89 | - | 1.22 | 1.12 | 0.95 | 0.89 | 0.78 | 80/60 | 1.35 | 1.23 | 1.12 | |
| 8/12 | 1.29 | 1.09 | 0.94 | 0.92 | 0.73 | 1.23 | 1.13 | 0.96 | 0.90 | 0.80 | 70/55 | 1.19 | 1.08 | 0.96 | |
| 8/14 | 1.18 | 0.99 | 0.83 | 0.80 | - | 1.17 | 1.07 | 0.89 | 0.83 | 0.72 | 70/50 | 1.13 | 1.02 | 0.90 | |
| 10/15 | 1.06 | 0.87 | 0.71 | 0.68 | - | 1.10 | 0.99 | 0.82 | 0.76 | 0.65 | 60/50 | 1.03 | 0.92 | 0.81 | |
| 12/16 | 0.92 | 0.74 | 0.59 | 0.56 | 0.42 | 1.02 | 0.92 | 0.75 | 0.69 | 0.57 | 60/40 | 0.91 | 0.79 | - | |
| 12/18 | 0.82 | 0.65 | 0.50 | - | - | 0.96 | 0.85 | 0.67 | - | - | 50/40 | 0.82 | 0.71 | 0.60 | |
| 14/18 | 0.74 | 0.59 | 0.46 | 0.42 | 0.33 | 0.92 | 0.81 | 0.63 | 0.57 | 0.45 | 40/30 | 0.61 | 0.49 | - | |

Size 3, Capacity Stage 1

| Technical data | Fan speed | Air volume flow \dot{V}_A | | Operating voltage [230V/50Hz] | | Sound power level | Sound pressure level* |
|----------------|-----------|-----------------------------|---------------------|-------------------------------|-------------|-------------------|-----------------------|
| | | [m ³ /h] | [m ³ /s] | Output [W] | Current [A] | [dB(A)] | [dB(A)] |
| | 1 | 350 | 0.097 | 70 | 0.33 | 33 | 24 |
| 2 | 470 | 0.131 | 81 | 0.37 | 42 | 33 | |
| 3 | 620 | 0.172 | 97 | 0.44 | 53 | 44 | |

* The sound pressure level is expressed in relation to a reverberation field of a 100 m³ room and a reverberation time of 0.5 s.

| Cooling capacity | Chilled water | Fan speed | 2- and 4-pipe systems | | | |
|--|---------------|-----------|-----------------------|------------------|---------------|-------------------|
| | | | \dot{Q}_C [kW] | \dot{Q}_S [kW] | t_{A2} [°C] | ϕ_2 [% r.h.] |
| Flow/return 6/12°C $t_{A1} = +27^\circ\text{C}$ $\phi_1 = 46\%$ r.h. | 1 | 2.40 | 1.79 | 12.0 | 93.3 | 9.1 |
| | 2 | 2.95 | 2.25 | 13.0 | 90.4 | 13.1 |
| | 3 | 3.49 | 2.71 | 14.2 | 86.8 | 17.7 |
| Flow/return 6/12°C $t_{A1} = +25^\circ\text{C}$ $\phi_1 = 50\%$ r.h. | 1 | 2.12 | 1.59 | 11.7 | 94.1 | 7.2 |
| | 2 | 2.60 | 1.98 | 12.6 | 91.4 | 10.4 |
| | 3 | 3.06 | 2.39 | 13.7 | 88.0 | 14.0 |
| Flow/return 6/12°C $t_{A1} = +23^\circ\text{C}$ $\phi_1 = 55\%$ r.h. | 1 | 1.86 | 1.38 | 11.5 | 95.1 | 5.7 |
| | 2 | 2.24 | 1.70 | 12.4 | 92.3 | 8.0 |
| | 3 | 2.64 | 2.05 | 13.3 | 89.4 | 10.7 |

| Heating capacity | Hot water | Fan speed | 2-pipe | | | 4-pipe | | |
|---|-----------|-----------|------------------|---------------|------------------|------------------|---------------|------------------|
| | | | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] |
| Flow/return 80/60°C $t_{A1} = +20^\circ\text{C}$ | 1 | 5.44 | 66.2 | 3.6 | 3.35 | 48.5 | 3.5 | |
| | 2 | 6.79 | 63.0 | 5.4 | 4.03 | 45.0 | 4.8 | |
| | 3 | 8.19 | 59.3 | 7.6 | 4.68 | 42.5 | 6.2 | |
| Flow/return 70/50°C $t_{A1} = +20^\circ\text{C}$ | 1 | 4.35 | 57.0 | 2.5 | 2.58 | 41.9 | 2.3 | |
| | 2 | 5.34 | 53.8 | 3.6 | 3.06 | 39.4 | 3.1 | |
| | 3 | 6.47 | 51.1 | 5.1 | 3.57 | 37.1 | 4.0 | |
| Flow/return 50/40°C $t_{A1} = +20^\circ\text{C}$ | 1 | 2.70 | 43.0 | 3.8 | 1.63 | 33.9 | 3.6 | |
| | 2 | 3.32 | 41.0 | 5.6 | 1.93 | 32.2 | 4.9 | |
| | 3 | 4.01 | 39.3 | 7.8 | 2.28 | 31.0 | 6.5 | |

| Determination of ratings ¹⁾ (interpolation) | Calculation steps | Example | Calculation steps | Example |
|--|--|---|--|--|
| | Size, CS, select higher fan speed | Size 3, CS 1, Fan speed 1 | Size, CS, system, select fan speed | Size 3, CS 1, 2-pipe, Fan speed 1 |
| | Specified operating state, not in table | PCW 8/12°C, $t_{A1} = +24^\circ\text{C}$, $\phi_1 = 50\%$ r.h. | Specified operating state, not in table | L.P.H.W. 70/50°C, $t_{A1} = +15^\circ\text{C}$ |
| | Cooling capacity $\dot{Q}_{C(\text{tab})}$ for PCW 6/12°C, $t_{A1} = +27^\circ\text{C}$, $\phi_1 = 46\%$ r.h. ²⁾ | $\dot{Q}_{C(\text{tab})} = \dot{Q}_{C(6/12/+27/46\%)} = 2.40$ [kW] | Heating capacity $\dot{Q}_{H(\text{tab})}$ for L.P.H.W. 80/60°C, $t_{A1} = +20^\circ\text{C}$ ³⁾ | $\dot{Q}_{H(\text{tab})} = \dot{Q}_{H(80/60/+20)} = 5.44$ [kW] |
| | Correction factor $f_{C(\text{tab})}$ for spec. mode ⁴⁾ | $f_{C(\text{tab})} = f_{C(8/12/+24/50\%)} = 0.73$ | Correction factor $f_{H(\text{tab})}$ for specified mode ⁴⁾ | $f_{H(\text{tab})} = f_{H(70/50/+15)} = 0.90$ |
| | Cooling capacity \dot{Q}_C in spec. mode $\dot{Q}_C = f_{C(\text{tab})} * \dot{Q}_{C(\text{tab})}$ | $\dot{Q}_C = 0.73 * 2.40 = 1.75$ [kW] $= \dot{Q}_{C(8/12/+24/50\%)}$ | Heating capacity \dot{Q}_H in spec. mode $\dot{Q}_H = f_{H(\text{tab})} * \dot{Q}_{H(\text{tab})}$ | $\dot{Q}_H = 0.90 * 5.44 = 4.90$ [kW] $= \dot{Q}_{H(70/50/+15)}$ |
| | Cooling capacity, sens. \dot{Q}_S for PCW 6/12°C, $t_{A1} = +27^\circ\text{C}$, $\phi_1 = 46\%$ r.h. | $\dot{Q}_S = \dot{Q}_{S(6/12/+27/46\%)} = 1.79$ [kW] | Air volume flow $\dot{V}_{A(\text{tab})}$ | $\dot{V}_{A(\text{tab})} = 350$ [m ³ /h] |
| | Correction factor, sensitive $f_{S(\text{tab})}$ for specified mode | $f_{S(\text{tab})} = f_{S(8/12/+24/50\%)} = 0.80$ | Air discharge temp. t_{A2} in spec. mode $t_{A2} \approx 3000 * \dot{Q}_H / \dot{V}_{A(\text{tab})} + t_{L1}$ | $t_{A2} \approx 3000 * 4.90 / 350 + 15$ ≈ 57 [°C] = $t_{A2(70/50/+15)}$ |

1) Capacities/outputs/discharge states in table/interpolated required for valve config.
2) From "Cooling capacity" table, 3) From "Heating capacity" table, 4) From "Correction factors" table
L.P.H.W. = Low pressure hot water, PCW = Chilled water

Size 3, Capacity Stage 2

| Technical data | Fan speed | Air volume flow \dot{V}_A | | Operating voltage [230V/50Hz] | | Sound power level | Sound pressure level* |
|----------------|-----------|-----------------------------|---------------------|-------------------------------|-------------|-------------------|-----------------------|
| | | [m ³ /h] | [m ³ /s] | Output [W] | Current [A] | [dB(A)] | [dB(A)] |
| | 1 | 350 | 0.097 | 70 | 0.33 | 33 | 24 |
| 2 | 620 | 0.172 | 97 | 0.44 | 53 | 44 | |
| 3 | 840 | 0.233 | 118 | 0.52 | 59 | 50 | |

* The sound pressure level is expressed in relation to a reverberation field of a 100 m³ room and a reverberation time of 0.5 s.

| Cooling capacity | Chilled water | Fan speed | 2- and 4-pipe systems | | | | |
|---|---|-----------|-----------------------|------------------|---------------|----------------------|------------------|
| | | | \dot{Q}_C [kW] | \dot{Q}_S [kW] | t_{A2} [°C] | φ_2 [% r.h.] | Δp [kPa] |
| Flow/return 6/12°C $t_{A1} = +27^\circ\text{C}$ $\varphi_1 = 46\%$ r.h. | 1 | 2.40 | 1.79 | 12.0 | 93.3 | 9.1 | |
| | 2 | 3.49 | 2.71 | 14.2 | 86.8 | 17.7 | |
| | 3 | 4.13 | 3.30 | 15.5 | 82.4 | 23.9 | |
| | Flow/return 6/12°C $t_{A1} = +25^\circ\text{C}$ $\varphi_1 = 50\%$ r.h. | 1 | 2.12 | 1.59 | 11.7 | 94.1 | 7.2 |
| | | 2 | 3.06 | 2.39 | 13.7 | 88.0 | 14.0 |
| | | 3 | 3.62 | 2.90 | 14.9 | 84.1 | 18.9 |
| | Flow/return 6/12°C $t_{A1} = +23^\circ\text{C}$ $\varphi_1 = 55\%$ r.h. | 1 | 1.86 | 1.38 | 11.5 | 95.1 | 5.7 |
| | | 2 | 2.64 | 2.05 | 13.3 | 89.4 | 10.7 |
| | | 3 | 3.14 | 2.50 | 14.3 | 86.2 | 14.7 |

| Heating capacity | Hot water | Fan speed | 2-pipe | | | 4-pipe | | |
|---|---|-----------|------------------|---------------|------------------|------------------|---------------|------------------|
| | | | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] |
| Flow/return 80/60°C $t_{A1} = +20^\circ\text{C}$ | 1 | 5.44 | 66.2 | 3.6 | 3.35 | 48.5 | 3.5 | |
| | 2 | 8.19 | 59.3 | 7.6 | 4.68 | 42.5 | 6.2 | |
| | 3 | 10.05 | 55.6 | 11.0 | 5.53 | 39.6 | 8.3 | |
| | Flow/return 70/50°C $t_{A1} = +20^\circ\text{C}$ | 1 | 4.35 | 57.0 | 2.5 | 2.58 | 41.9 | 2.3 |
| | | 2 | 6.47 | 51.1 | 5.1 | 3.57 | 37.1 | 4.0 |
| | | 3 | 7.97 | 48.2 | 7.4 | 4.25 | 35.1 | 5.4 |
| | Flow/return 50/40°C $t_{A1} = +20^\circ\text{C}$ | 1 | 2.70 | 43.0 | 3.8 | 1.63 | 33.9 | 3.6 |
| | | 2 | 4.01 | 39.3 | 7.8 | 2.28 | 31.0 | 6.5 |
| | | 3 | 4.94 | 37.5 | 11.4 | 2.69 | 29.5 | 8.7 |

| Correction factors | Chilled water | Correction factor f_C for cooling capacity \dot{Q}_C Air intake t_{A1} [°C], φ_1 [% r.h.] | | | | | Correction factor f_S for cooling capacity \dot{Q}_S Air intake t_{A1} [°C], φ_1 [% r.h.] | | | | | Hot water | Correction factor f_H for heating capacity \dot{Q}_H Air intake t_{A1} , [°C] | | |
|--------------------|---------------|--|------|------|------|------|--|------|------|------|-------|-----------|--|------|------|
| | | [°C] | 32/ | 30/ | 27/ | 26/ | 24/ | 32/ | 30/ | 27/ | 26/ | | 24/ | [°C] | +5 |
| | 6/12 | 1.36 | 1.16 | 1.00 | 0.98 | 0.78 | 1.27 | 1.17 | 1.00 | 0.94 | 0.83 | 90/70 | 1.57 | 1.45 | 1.33 |
| 7/13 | 1.27 | 1.08 | 0.91 | 0.89 | - | 1.22 | 1.12 | 0.95 | 0.89 | 0.78 | 80/60 | 1.35 | 1.23 | 1.12 | |
| 8/12 | 1.29 | 1.09 | 0.94 | 0.92 | 0.73 | 1.23 | 1.13 | 0.96 | 0.90 | 0.80 | 70/55 | 1.19 | 1.08 | 0.96 | |
| 8/14 | 1.18 | 0.99 | 0.83 | 0.80 | - | 1.17 | 1.07 | 0.89 | 0.83 | 0.72 | 70/50 | 1.13 | 1.02 | 0.90 | |
| 10/15 | 1.06 | 0.87 | 0.71 | 0.68 | - | 1.10 | 0.99 | 0.82 | 0.76 | 0.65 | 60/50 | 1.03 | 0.92 | 0.81 | |
| 12/16 | 0.92 | 0.74 | 0.59 | 0.56 | 0.42 | 1.02 | 0.92 | 0.75 | 0.69 | 0.57 | 60/40 | 0.91 | 0.79 | - | |
| 12/18 | 0.82 | 0.65 | 0.50 | - | - | 0.96 | 0.85 | 0.67 | - | - | 50/40 | 0.82 | 0.71 | 0.60 | |
| 14/18 | 0.74 | 0.59 | 0.46 | 0.42 | 0.33 | 0.92 | 0.81 | 0.63 | 0.57 | 0.45 | 40/30 | 0.61 | 0.49 | - | |

Size 4, Capacity Stage 1

| Technical data | Fan speed | Air volume flow \dot{V}_A | | Operating voltage [230V/50Hz] | | Sound power level | Sound pressure level* |
|----------------|-----------|-----------------------------|---------------------|-------------------------------|-------------|-------------------|-----------------------|
| | | [m ³ /h] | [m ³ /s] | Output [W] | Current [A] | [dB(A)] | [dB(A)] |
| | 1 | 360 | 0.100 | 70 | 0.33 | 33 | 24 |
| 2 | 610 | 0.169 | 97 | 0.44 | 52 | 43 | |
| 3 | 1030 | 0.286 | 142 | 0.62 | 63 | 54 | |

* The sound pressure level is expressed in relation to a reverberation field of a 100 m³ room and a reverberation time of 0.5 s.

| Cooling capacity | Chilled water | Fan speed | 2- and 4-pipe systems | | | | |
|------------------|---|-----------|-----------------------|------------------|---------------|----------------------|------------------|
| | | | \dot{Q}_C [kW] | \dot{Q}_S [kW] | t_{A2} [°C] | φ_2 [% r.h.] | Δp [kPa] |
| | Flow/return 6/12°C $t_{A1} = +27^\circ\text{C}$ $\varphi_1 = 46\%$ r.h. | 1 | 2.49 | 1.87 | 11.8 | 94.6 | 5.0 |
| | | 2 | 3.61 | 2.80 | 13.6 | 89.4 | 9.8 |
| | | 3 | 4.91 | 3.98 | 15.7 | 82.3 | 17.0 |
| | Flow/return 6/12°C $t_{A1} = +25^\circ\text{C}$ $\varphi_1 = 50\%$ r.h. | 1 | 2.18 | 1.65 | 11.6 | 95.4 | 4.0 |
| | | 2 | 3.15 | 2.46 | 13.2 | 90.4 | 7.7 |
| | | 3 | 4.28 | 3.49 | 15.1 | 84.1 | 13.3 |
| | Flow/return 6/12°C $t_{A1} = +23^\circ\text{C}$ $\varphi_1 = 55\%$ r.h. | 1 | 1.87 | 1.41 | 11.5 | 96.1 | 3.0 |
| | | 2 | 2.69 | 2.10 | 12.9 | 91.5 | 5.8 |
| | | 3 | 3.65 | 2.97 | 14.5 | 85.9 | 10.0 |

| Heating capacity | Hot water | Fan speed | 2-pipe | | | 4-pipe | | |
|------------------|---|-----------|------------------|---------------|------------------|------------------|---------------|------------------|
| | | | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] |
| | Flow/return 80/60°C $t_{A1} = +20^\circ\text{C}$ | 1 | 5.73 | 67.4 | 2.1 | 3.72 | 50.8 | 4.9 |
| | | 2 | 8.55 | 61.7 | 4.2 | 5.12 | 45.0 | 8.6 |
| | | 3 | 12.22 | 55.3 | 8.1 | 6.89 | 39.9 | 14.4 |
| | Flow/return 70/50°C $t_{A1} = +20^\circ\text{C}$ | 1 | 4.59 | 57.9 | 1.4 | 2.91 | 44.1 | 3.3 |
| | | 2 | 6.70 | 52.7 | 2.8 | 3.96 | 39.3 | 5.7 |
| | | 3 | 9.55 | 47.6 | 5.3 | 5.32 | 35.4 | 9.5 |
| | Flow/return 50/40°C $t_{A1} = +20^\circ\text{C}$ | 1 | 2.82 | 43.3 | 2.2 | 1.83 | 35.1 | 5.3 |
| | | 2 | 4.16 | 40.3 | 4.3 | 2.50 | 32.2 | 9.1 |
| | | 3 | 5.99 | 37.3 | 8.3 | 3.36 | 29.7 | 15.2 |

| Determination of ratings ¹⁾ (interpolation) | Calculation steps | Example | Calculation steps | Example |
|--|---|---|--|--|
| | Size, CS, select higher fan speed | Size 4, CS 1, Fan speed 1 | Size, CS, system, select fan speed | Size 4, CS 1, 2-pipe, Fan speed 1 |
| | Spec. operating state, not in table | PCW 8/12°C, $t_{A1} = +24^\circ\text{C}$, $\varphi_1 = 50\%$ r.h. | Specified operating state, not in table | L.P.H.W. 70/50°C, $t_{A1} = +15^\circ\text{C}$ |
| | Cooling capacity $\dot{Q}_{C(\text{tab})}$ for PCW 6/12°C, $t_{A1} = +27^\circ\text{C}$, $\varphi_1 = 46\%$ r.h. ²⁾ | $\dot{Q}_{C(\text{tab})} = \dot{Q}_{C(6/12/+27/46\%)} = 2.49$ [kW] | Heating capacity $\dot{Q}_{H(\text{tab})}$ for L.P.H.W. 80/60°C, $t_{A1} = +20^\circ\text{C}$ ³⁾ | $\dot{Q}_{H(\text{tab})} = \dot{Q}_{H(80/60/+20)} = 5.73$ [kW] |
| | Correction factor $f_{C(\text{tab})}$ for spec. mode ⁴⁾ | $f_{C(\text{tab})} = f_{C(8/12/+24/50\%)} = 0.73$ | Correction factor $f_{H(\text{tab})}$ for spec. mode ⁴⁾ | $f_{H(\text{tab})} = f_{H(70/50/+15)} = 0.90$ |
| | Cooling capacity \dot{Q}_C in spec. mode $\dot{Q}_C = f_{C(\text{tab})} * \dot{Q}_{C(\text{tab})}$ | $\dot{Q}_C = 0.73 * 2.49 = 1.82$ [kW] $= \dot{Q}_{C(8/12/+24/50\%)}$ | Heating capacity \dot{Q}_H in spec. mode $\dot{Q}_H = f_{H(\text{tab})} * \dot{Q}_{H(\text{tab})}$ | $\dot{Q}_H = 0.90 * 5.73 = 5.16$ [kW] $= \dot{Q}_{H(70/50/+15)}$ |
| | Cooling capacity, sens. $\dot{Q}_{S(\text{tab})}$ for PCW 6/12°C, $t_{A1} = +27^\circ\text{C}$, $\varphi_1 = 46\%$ r.h. | $\dot{Q}_{S(\text{tab})} = \dot{Q}_{S(6/12/+27/46\%)} = 1.87$ [kW] | Air volume flow $\dot{V}_{A(\text{tab})}$ | $\dot{V}_{A(\text{tab})} = 360$ [m ³ /h] |
| | Correction factor, sensitive $f_{S(\text{tab})}$ for spec. mode | $f_{S(\text{tab})} = f_{S(8/12/+24/50\%)} = 0.80$ | Air discharge temp. t_{A2} in spec. mode $t_{A2} \approx 3000 * \dot{Q}_H / \dot{V}_{A(\text{tab})} + t_{L1}$ | $t_{A2} \approx 3000 * 5.16 / 360 + 15$ ≈ 58 [°C] = $t_{A2(70/50/+15)}$ |

1) Capacities/outputs/discharge states in table/interpolated required for valve config.
2) From "Cooling capacity" table, 3) From "Heating capacity" table, 4) From "Correction factors" table
L.P.H.W. = Low pressure hot water, PCW = Chilled water

Size 4, Capacity Stage 2

| Technical data | Fan speed | Air volume flow \dot{V}_A | | Operating voltage [230V/50Hz] | | Sound power level | Sound pressure level* |
|----------------|-----------|-----------------------------|---------------------|----------------------------------|----------------|-------------------|-----------------------|
| | | [m ³ /h] | [m ³ /s] | Output [W] | Current [A] | [dB(A)] | [dB(A)] |
| | 1 | 700 | 0.194 | 99 | 0.47 | 53 | 44 |
| 2 | 800 | 0.222 | 103 | 0.47 | 56 | 47 | |
| 3 | 1260 | 0.350 | 195 | 0.88 | 67 | 58 | |

* The sound pressure level is expressed in relation to a reverberation field of a 100 m³ room and a reverberation time of 0.5 s.

| Cooling capacity | Chilled water | Fan speed | 2- and 4-pipe systems | | | |
|---|---------------|-----------|-----------------------|---------------------|------------------|-------------------------|
| | | | \dot{Q}_C [kW] | \dot{Q}_S [kW] | t_{A2} [°C] | φ_2 [% r.h.] |
| Flow/return 6/12°C $t_{A1} = +27^\circ\text{C}$ $\varphi_1=46\%$ r.h. | 1 | 3.94 | 3.09 | 14.1 | 87.7 | 11.5 |
| | 2 | 4.28 | 3.39 | 14.6 | 86.0 | 13.3 |
| | 3 | 5.43 | 4.48 | 16.6 | 79.4 | 20.4 |
| Flow/return 6/12°C $t_{A1} = +25^\circ\text{C}$ $\varphi_1=50\%$ r.h. | 1 | 3.44 | 2.72 | 13.6 | 88.9 | 9.0 |
| | 2 | 3.70 | 2.96 | 14.2 | 87.1 | 10.2 |
| | 3 | 4.73 | 3.93 | 15.9 | 81.3 | 15.9 |
| Flow/return 6/12°C $t_{A1} = +23^\circ\text{C}$ $\varphi_1=55\%$ r.h. | 1 | 2.93 | 2.31 | 13.3 | 90.1 | 6.8 |
| | 2 | 3.18 | 2.54 | 13.7 | 88.8 | 7.8 |
| | 3 | 4.07 | 3.37 | 15.2 | 83.7 | 12.2 |

| Heating capacity | Hot water | Fan speed | 2-pipe | | | 4-pipe | | |
|---|-----------|-----------|---------------------|------------------|---------------------|---------------------|------------------|---------------------|
| | | | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] |
| Flow/return 80/60°C $t_{A1} = +20^\circ\text{C}$ | 1 | 9.39 | 59.9 | 5.0 | 5.55 | 43.6 | 9.9 | |
| | 2 | 10.29 | 58.3 | 5.9 | 6.01 | 42.4 | 11.3 | |
| | 3 | 13.82 | 52.6 | 10.1 | 7.72 | 38.2 | 17.6 | |
| Flow/return 70/50°C $t_{A1} = +20^\circ\text{C}$ | 1 | 7.38 | 51.4 | 3.3 | 4.30 | 38.3 | 6.6 | |
| | 2 | 8.05 | 50.0 | 3.9 | 4.65 | 37.3 | 7.5 | |
| | 3 | 10.85 | 45.6 | 6.7 | 5.97 | 34.1 | 11.6 | |
| Flow/return 50/40°C $t_{A1} = +20^\circ\text{C}$ | 1 | 4.58 | 39.5 | 5.2 | 2.71 | 31.5 | 10.4 | |
| | 2 | 5.03 | 38.7 | 6.1 | 2.94 | 30.9 | 12.0 | |
| | 3 | 6.75 | 36.0 | 10.4 | 3.77 | 28.9 | 18.5 | |

| Correction factors | Chilled water | Correction factor f_C for cooling capacity \dot{Q}_C Air intake t_{A1} [°C], φ_1 [% r.h.] | | | | | | Correction factor f_S for cooling capacity \dot{Q}_S Air intake t_{A1} [°C], φ_1 [% r.h.] | | | | | | Hot water | Correction factor f_H for heating capacity \dot{Q}_H Air intake t_{A1} , [°C] | | |
|--------------------|---------------|---|------|------|------|------|------|---|------|------|-------|------|------|-----------|---|-----|-----|
| | | [°C] | 32/ | 30/ | 27/ | 26/ | 24/ | 32/ | 30/ | 27/ | 26/ | 24/ | [°C] | | +5 | +10 | +15 |
| 6/12 | 1.36 | 1.16 | 1.00 | 0.98 | 0.78 | 1.27 | 1.17 | 1.00 | 0.94 | 0.83 | 90/70 | 1.57 | 1.45 | 1.33 | | | |
| 7/13 | 1.27 | 1.08 | 0.91 | 0.89 | - | 1.22 | 1.12 | 0.95 | 0.89 | 0.78 | 80/60 | 1.35 | 1.23 | 1.12 | | | |
| 8/12 | 1.29 | 1.09 | 0.94 | 0.92 | 0.73 | 1.23 | 1.13 | 0.96 | 0.90 | 0.80 | 70/55 | 1.19 | 1.08 | 0.96 | | | |
| 8/14 | 1.18 | 0.99 | 0.83 | 0.80 | - | 1.17 | 1.07 | 0.89 | 0.83 | 0.72 | 70/50 | 1.13 | 1.02 | 0.90 | | | |
| 10/15 | 1.06 | 0.87 | 0.71 | 0.68 | - | 1.10 | 0.99 | 0.82 | 0.76 | 0.65 | 60/50 | 1.03 | 0.92 | 0.81 | | | |
| 12/16 | 0.92 | 0.74 | 0.59 | 0.56 | 0.42 | 1.02 | 0.92 | 0.75 | 0.69 | 0.57 | 60/40 | 0.91 | 0.79 | - | | | |
| 12/18 | 0.82 | 0.65 | 0.50 | - | - | 0.96 | 0.85 | 0.67 | - | - | 50/40 | 0.82 | 0.71 | 0.60 | | | |
| 14/18 | 0.74 | 0.59 | 0.46 | 0.42 | 0.33 | 0.92 | 0.81 | 0.63 | 0.57 | 0.45 | 40/30 | 0.61 | 0.49 | - | | | |

Size 5, Capacity Stage 1

| Technical data | Fan speed | Air volume flow \dot{V}_A | | Operating voltage [230V/50Hz] | | Sound power level | Sound pressure level* |
|----------------|-----------|-----------------------------|---------------------|-------------------------------|-------------|-------------------|-----------------------|
| | | [m ³ /h] | [m ³ /s] | Output [W] | Current [A] | [dB(A)] | [dB(A)] |
| | 1 | 710 | 0.197 | 96 | 0.45 | 52 | 43 |
| 2 | 920 | 0.256 | 124 | 0.57 | 58 | 49 | |
| 3 | 1350 | 0.375 | 200 | 0.89 | 68 | 59 | |

* The sound pressure level is expressed in relation to a reverberation field of a 100 m³ room and a reverberation time of 0.5 s.

| Cooling capacity | Chilled water | Fan speed | 2- and 4-pipe systems | | | |
|--|---------------|-----------|-----------------------|------------------|---------------|-------------------|
| | | | \dot{Q}_C [kW] | \dot{Q}_S [kW] | t_{A2} [°C] | ϕ_2 [% r.h.] |
| Flow/return 6/12°C $t_{A1} = +27^\circ\text{C}$ $\phi_1 = 46\%$ r.h. | 1 | 4.75 | 3.55 | 12.4 | 92.0 | 19.8 |
| | 2 | 5.57 | 4.26 | 13.5 | 88.7 | 26.3 |
| | 3 | 6.95 | 5.48 | 15.1 | 83.5 | 39.0 |
| Flow/return 6/12°C $t_{A1} = +25^\circ\text{C}$ $\phi_1 = 50\%$ r.h. | 1 | 4.13 | 3.11 | 12.2 | 92.5 | 15.4 |
| | 2 | 4.86 | 3.73 | 13.1 | 89.6 | 20.6 |
| | 3 | 6.04 | 4.80 | 14.6 | 84.8 | 30.4 |
| Flow/return 6/12°C $t_{A1} = +23^\circ\text{C}$ $\phi_1 = 55\%$ r.h. | 1 | 3.61 | 2.70 | 11.9 | 93.6 | 12.1 |
| | 2 | 4.23 | 3.23 | 12.7 | 91.0 | 16.1 |
| | 3 | 5.26 | 4.14 | 14.0 | 86.8 | 23.7 |

| Heating capacity | Hot water | Fan speed | 2-pipe | | | 4-pipe | | |
|---|-----------|-----------|------------------|---------------|------------------|------------------|---------------|------------------|
| | | | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] |
| Flow/return 80/60°C $t_{A1} = +20^\circ\text{C}$ | 1 | 10.69 | 64.8 | 7.8 | 6.52 | 47.3 | 17.2 | |
| | 2 | 12.75 | 61.3 | 10.6 | 7.56 | 44.5 | 22.2 | |
| | 3 | 16.46 | 56.3 | 13.8 | 9.38 | 40.7 | 32.3 | |
| Flow/return 70/50°C $t_{A1} = +20^\circ\text{C}$ | 1 | 8.43 | 55.3 | 5.2 | 5.09 | 41.3 | 11.5 | |
| | 2 | 10.07 | 52.6 | 7.2 | 5.89 | 39.1 | 14.9 | |
| | 3 | 13.09 | 48.9 | 11.4 | 7.29 | 36.1 | 21.6 | |
| Flow/return 50/40°C $t_{A1} = +20^\circ\text{C}$ | 1 | 5.23 | 41.9 | 8.0 | 3.20 | 33.4 | 18.2 | |
| | 2 | 6.25 | 40.2 | 11.0 | 3.71 | 32.0 | 23.6 | |
| | 3 | 8.18 | 38.0 | 17.9 | 4.60 | 30.1 | 34.2 | |

| Determination of ratings ¹⁾ (interpolation) | Calculation steps | Example | Calculation steps | Example |
|--|--|---|---|--|
| | Size, CS, select higher fan speed | Size 5, CS 1, Fan speed 1 | Size, CS, system, select fan speed | Size 5, CS 1, 2-pipe, Fan speed 1 |
| | Specified operating state, not in table | PCW 8/12°C, $t_{A1} = +24^\circ\text{C}$, $\phi_1 = 50\%$ r.h. | Specified operating state, not in table | L.P.H.W. 70/50°C, $t_{A1} = +15^\circ\text{C}$ |
| | Cooling capacity $\dot{Q}_{C(\text{tab})}$ for PCW 6/12°C, $t_{A1} = +27^\circ\text{C}$, $\phi_1 = 46\%$ r.h. ²⁾ | $\dot{Q}_{C(\text{tab})} = \dot{Q}_{C(6/12/+27/46\%)} = 4.75$ [kW] | Heating capacity $\dot{Q}_{H(\text{tab})}$ for L.P.H.W. 80/60°C, $t_{A1} = +20^\circ\text{C}$ ³⁾ | $\dot{Q}_{H(\text{tab})} = \dot{Q}_{H(80/60/+20)} = 10.69$ [kW] |
| | Correction factor $f_{C(\text{tab})}$ for spec. mode ⁴⁾ | $f_{C(\text{tab})} = f_{C(8/12/+24/50\%)} = 0.73$ | Correction factor $f_{H(\text{tab})}$ for spec. mode ⁴⁾ | $f_{H(\text{tab})} = f_{H(70/50/+15)} = 0.90$ |
| | Cooling capacity \dot{Q}_C in spec. mode $\dot{Q}_C = f_{C(\text{tab})} * \dot{Q}_{C(\text{tab})}$ | $\dot{Q}_C = 0.73 * 4.75 = 3.47$ [kW] $= \dot{Q}_{C(8/12/+24/50\%)}$ | Heating capacity \dot{Q}_H in spec. mode $\dot{Q}_H = f_{H(\text{tab})} * \dot{Q}_{H(\text{tab})}$ | $\dot{Q}_H = 0.90 * 10.69 = 9.62$ [kW] $= \dot{Q}_{H(70/50/+15)}$ |
| | Cooling capacity, sens. $\dot{Q}_{S(\text{tab})}$ for PCW 6/12°C, $t_{A1} = +27^\circ\text{C}$, $\phi_1 = 46\%$ r.h. | $\dot{Q}_{S(\text{tab})} = \dot{Q}_{S(6/12/+27/46\%)} = 3.55$ [kW] | Air volume flow $\dot{V}_{A(\text{tab})}$ | $\dot{V}_{A(\text{tab})} = 710$ [m ³ /h] |
| | Correction factor, sensitive $f_{S(\text{tab})}$ for spec. mode | $f_{S(\text{tab})} = f_{S(8/12/+24/50\%)} = 0.80$ | Air discharge temp. t_{A2} in spec. mode $t_{A2} \approx 3000 * \dot{Q}_H / \dot{V}_{A(\text{tab})} + t_{L1}$ | $t_{A2} \approx 3000 * 9.62 / 710 + 15$ ≈ 56 [°C] = $t_{A2(70/50/+15)}$ |
| | Cooling capacity, sens. \dot{Q}_S in spec. mode $\dot{Q}_S = f_{S(\text{tab})} * \dot{Q}_{S(\text{tab})}$ | $\dot{Q}_S = 0.80 * 3.55 = 2.84$ [kW] $= \dot{Q}_{S(8/12/+24/50\%)}$ | 1) Capacities/outputs/discharge states in table/interpolated required for valve config. 2) From "Cooling capacity" table, 3) From "Heating capacity" table, 4) From "Correction factors" table L.P.H.W. = Low pressure hot water, PCW = Chilled water | |

Size 5, Capacity Stage 2

| Technical data | Fan speed | Air volume flow \dot{V}_A | | Operating voltage [230V/50Hz] | | Sound power level | Sound pressure level* |
|----------------|-----------|-----------------------------|---------------------|-------------------------------|-------------|-------------------|-----------------------|
| | | [m ³ /h] | [m ³ /s] | Output [W] | Current [A] | [dB(A)] | [dB(A)] |
| | 1 | 710 | 0.197 | 96 | 0.45 | 52 | 43 |
| 2 | 920 | 0.256 | 124 | 0.57 | 58 | 49 | |
| 3 | 1350 | 0.375 | 200 | 0.89 | 68 | 59 | |

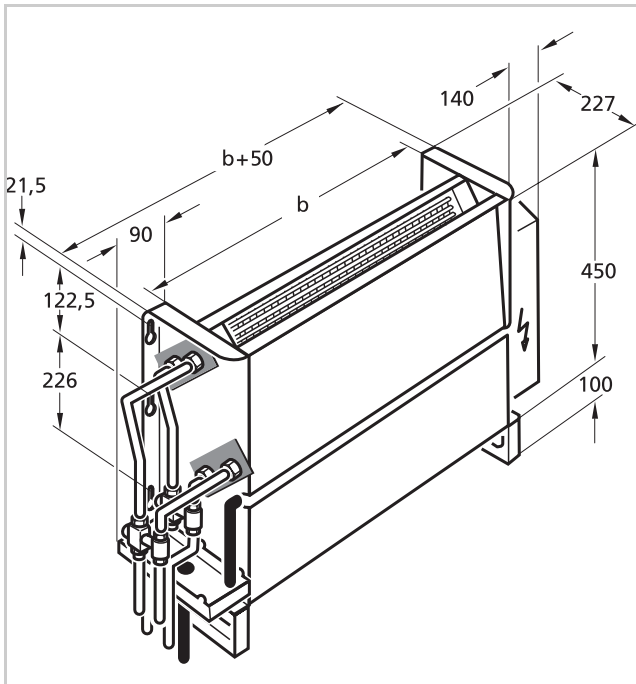
* The sound pressure level is expressed in relation to a reverberation field of a 100 m³ room and a reverberation time of 0.5 s.

| Cooling capacity | Chilled water | Fan speed | 2- and 4-pipe systems | | | |
|--|---------------|-----------|-----------------------|------------------|---------------|-------------------|
| | | | \dot{Q}_C [kW] | \dot{Q}_S [kW] | t_{A2} [°C] | ϕ_2 [% r.h.] |
| Flow/return 6/12°C $t_{A1} = +27^\circ\text{C}$ $\phi_1 = 46\%$ r.h. | 1 | 5.42 | 3.94 | 10.8 | 96.2 | 14.9 |
| | 2 | 6.43 | 4.77 | 11.8 | 93.7 | 20.3 |
| | 3 | 8.33 | 6.36 | 13.2 | 89.8 | 32.5 |
| Flow/return 6/12°C $t_{A1} = +25^\circ\text{C}$ $\phi_1 = 50\%$ r.h. | 1 | 4.77 | 3.48 | 10.7 | 96.6 | 11.8 |
| | 2 | 5.69 | 4.23 | 11.5 | 94.5 | 16.2 |
| | 3 | 7.35 | 5.63 | 12.8 | 91.0 | 25.9 |
| Flow/return 6/12°C $t_{A1} = +23^\circ\text{C}$ $\phi_1 = 55\%$ r.h. | 1 | 4.16 | 3.01 | 10.6 | 97.1 | 9.2 |
| | 2 | 4.98 | 3.68 | 11.3 | 95.5 | 12.7 |
| | 3 | 6.35 | 4.84 | 12.5 | 92.0 | 19.8 |

| Heating capacity | Hot water | Fan speed | 2-pipe | | | 4-pipe | | |
|---|-----------|-----------|------------------|---------------|------------------|------------------|---------------|------------------|
| | | | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] | \dot{Q}_H [kW] | t_{A2} [°C] | Δp [kPa] |
| Flow/return 80/60°C $t_{A1} = +20^\circ\text{C}$ | 1 | 11.81 | 69.5 | 5.7 | n.a. | n.a. | n.a. | |
| | 2 | 14.46 | 66.8 | 8.3 | n.a. | n.a. | n.a. | |
| | 3 | 19.15 | 62.2 | 13.8 | n.a. | n.a. | n.a. | |
| Flow/return 70/50°C $t_{A1} = +20^\circ\text{C}$ | 1 | 9.42 | 59.5 | 3.8 | n.a. | n.a. | n.a. | |
| | 2 | 11.64 | 57.7 | 5.7 | n.a. | n.a. | n.a. | |
| | 3 | 15.15 | 53.4 | 9.2 | n.a. | n.a. | n.a. | |
| Flow/return 50/40°C $t_{A1} = +20^\circ\text{C}$ | 1 | 5.86 | 44.6 | 5.9 | n.a. | n.a. | n.a. | |
| | 2 | 7.13 | 43.1 | 8.5 | n.a. | n.a. | n.a. | |
| | 3 | 9.39 | 40.7 | 14.1 | n.a. | n.a. | n.a. | |

| Correction factors | Chilled water | Correction factor f_C for cooling capacity \dot{Q}_C Air intake t_{A1} [°C], ϕ_1 [% r.h.] | | | | | Correction factor f_S for cooling capacity \dot{Q}_S Air intake t_{A1} [°C], ϕ_1 [% r.h.] | | | | | Hot water | Correction factor f_H for heating capacity \dot{Q}_H Air intake t_{A1} , [°C] | | |
|--------------------|---------------|---|------|------|------|------|---|------|------|------|-------|-----------|--|------|------|
| | [°C] | 32/ | 30/ | 27/ | 26/ | 24/ | 32/ | 30/ | 27/ | 26/ | 24/ | [°C] | +5 | +10 | +15 |
| | 6/12 | 1.36 | 1.16 | 1.00 | 0.98 | 0.78 | 1.27 | 1.17 | 1.00 | 0.94 | 0.83 | 90/70 | 1.57 | 1.45 | 1.33 |
| 7/13 | 1.27 | 1.08 | 0.91 | 0.89 | - | 1.22 | 1.12 | 0.95 | 0.89 | 0.78 | 80/60 | 1.35 | 1.23 | 1.12 | |
| 8/12 | 1.29 | 1.09 | 0.94 | 0.92 | 0.73 | 1.23 | 1.13 | 0.96 | 0.90 | 0.80 | 70/55 | 1.19 | 1.08 | 0.96 | |
| 8/14 | 1.18 | 0.99 | 0.83 | 0.80 | - | 1.17 | 1.07 | 0.89 | 0.83 | 0.72 | 70/50 | 1.13 | 1.02 | 0.90 | |
| 10/15 | 1.06 | 0.87 | 0.71 | 0.68 | - | 1.10 | 0.99 | 0.82 | 0.76 | 0.65 | 60/50 | 1.03 | 0.92 | 0.81 | |
| 12/16 | 0.92 | 0.74 | 0.59 | 0.56 | 0.42 | 1.02 | 0.92 | 0.75 | 0.69 | 0.57 | 60/40 | 0.91 | 0.79 | - | |
| 12/18 | 0.82 | 0.65 | 0.50 | - | - | 0.96 | 0.85 | 0.67 | - | - | 50/40 | 0.82 | 0.71 | 0.60 | |
| 14/18 | 0.74 | 0.59 | 0.46 | 0.42 | 0.33 | 0.92 | 0.81 | 0.63 | 0.57 | 0.45 | 40/30 | 0.61 | 0.49 | - | |

Dimensions - basic unit



The dimensions shown in the illustrations opposite are not dependent on the size.

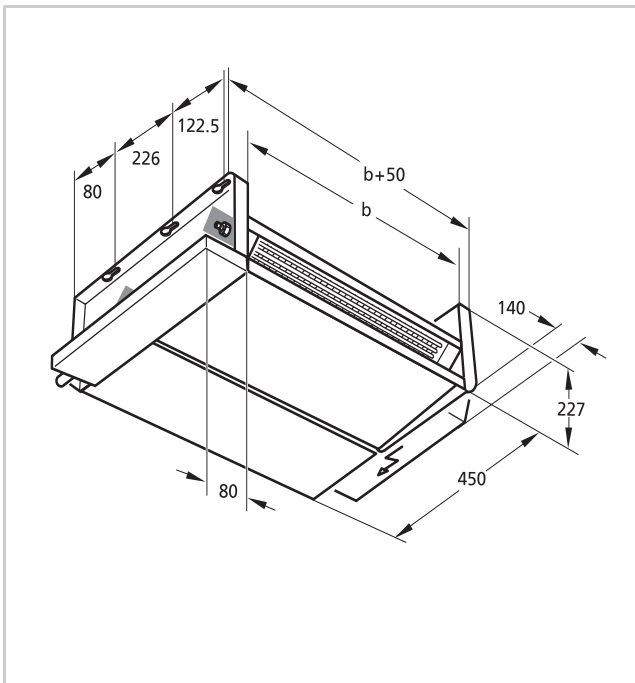
The length and weight vary depending on the size, as shown in the table below.

Size-dependent weights and lengths of the basic unit

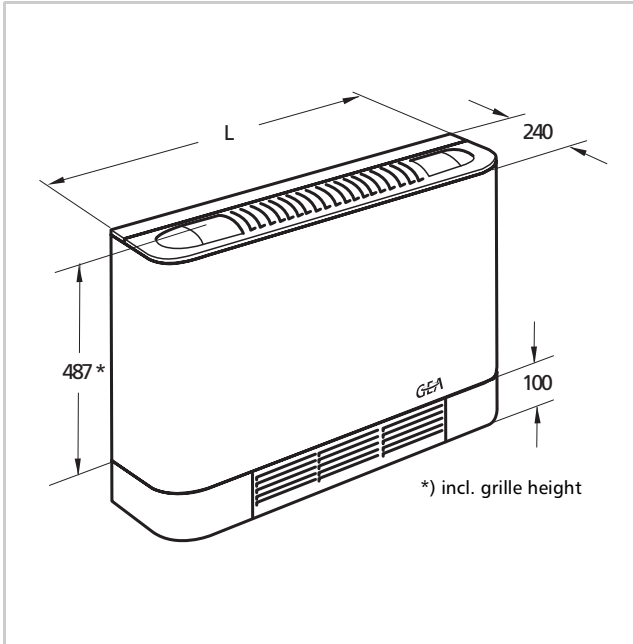
(See Type Codes for order numbers)

| Size | Weight [kg] * | b [mm] | b + 50 [mm] |
|------|---------------|--------|-------------|
| 1 | 25 | 464 | 514 |
| 2 | 32 | 614 | 664 |
| 3 | 40 | 764 | 814 |
| 4 | 43 | 914 | 964 |
| 5 | 48 | 1214 | 1264 |

* Basic unit incl. casing



Dimensions - casing and accessories



Casing with discharge grille white; similar to RAL 9010
grey; similar to RAL 7035
(wall and ceiling mounting)

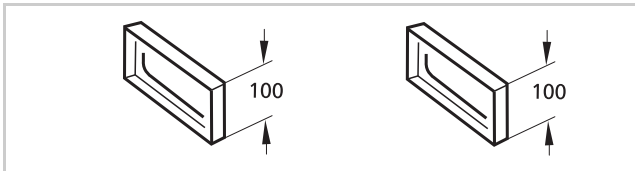
| Size | Weight [kg] | Order No. |
|------|-------------|-----------|
| 1 | 7.3 | Z102 |
| 2 | 8.4 | Z202 |
| 3 | 9.5 | Z302 |
| 4 | 10.3 | Z402 |
| 5 | 12.6 | Z502 |

Air intake grille and unit foot cover grey; similar to RAL 7035
(wall and ceiling mounting)

| Size | Weight [kg] | Order No. |
|------|-------------|-----------|
| 1 | 0.36 | Z105 |
| 2 | 0.40 | Z205 |
| 3 | 0.47 | Z305 |
| 4 | 0.52 | Z405 |
| 5 | 0.63 | Z505 |

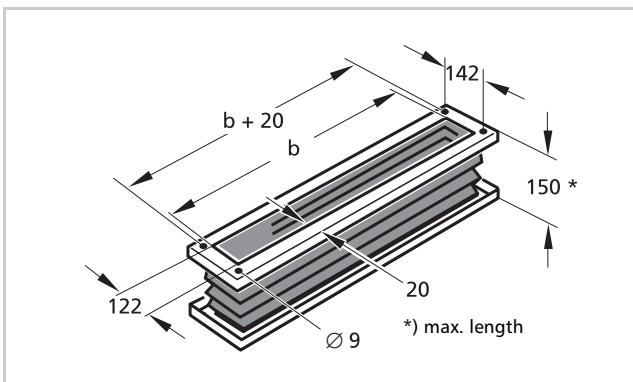
Size-specific lengths of the casing

| Size | 1 | 2 | 3 | 4 | 5 |
|--------|-----|-----|------|------|------|
| L [mm] | 827 | 977 | 1127 | 1277 | 1577 |



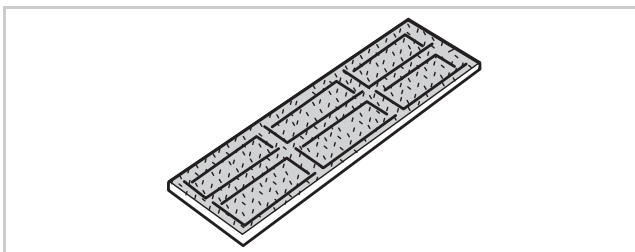
Unit Feet (1 set = 2 pieces)

| Size | Weight [kg] | Order No. |
|------|-------------|-----------|
| 1-5 | 0.26 | Z103 |



Flexible discharge connector

| Size | b [mm] | Weight [kg] | Order No. |
|------|--------|-------------|-----------|
| 1 | 464 | 1.6 | Z101 |
| 2 | 614 | 2.1 | Z201 |
| 3 | 764 | 2.6 | Z301 |
| 4 | 914 | 3.1 | Z401 |
| 5 | 1214 | 4.1 | Z501 |



Spare filter (1 set = 5 pieces)

| Size | Weight [kg] | Order No. |
|------|-------------|-----------|
| 1 | 0.15 | Z106 |
| 2 | 0,26 | Z206 |
| 3 | 0.34 | Z306 |
| 4 | 0.37 | Z406 |
| 5 | 0.43 | Z506 |

Acoustics: sound pressure level, sound power level

Technical data

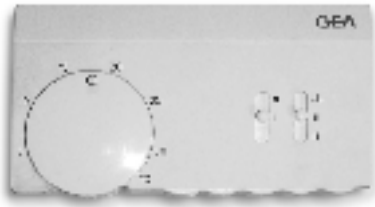
| Size | Capacity stages | Fan speed | Air volume flow [m ³ /h] | Sound power level | | | | | | | | | | Sound pressure level* | | | |
|------|-----------------|-----------|-------------------------------------|---------------------------|-----|-----|-----|------|------|------|------|------------|----------|-----------------------|----------|-------|----|
| | | | | [dB] | | | | | | | | | | Total level | | | |
| | | | | Octave mid frequency [Hz] | | | | | | | | | | dB | dB(A) | dB(A) | NR |
| | | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | unweighted | weighted | weighted | weighted | | |
| 1 | 1 | 1 | 130 | 38 | 34 | 28 | <20 | <20 | <20 | <20 | <20 | 40 | 22 | 13 | 8 | | |
| | | 2 | 200 | 43 | 36 | 37 | 36 | 32 | <20 | <20 | <20 | 45 | 36 | 27 | 23 | | |
| | | 3 | 280 | <20 | 37 | 40 | 45 | 40 | 35 | 24 | <20 | 49 | 45 | 36 | 33 | | |
| | 2 | 1 | 130 | 38 | 34 | 28 | <20 | <20 | <20 | <20 | <20 | 40 | 22 | 13 | 8 | | |
| | | 2 | 200 | 43 | 36 | 37 | 36 | 32 | <20 | <20 | <20 | 45 | 36 | 27 | 23 | | |
| | | 3 | 280 | <20 | 37 | 40 | 45 | 40 | 35 | 24 | <20 | 49 | 45 | 36 | 33 | | |
| 2 | 1 | 1 | 165 | 50 | 38 | 33 | 30 | <20 | <20 | <20 | <20 | 50 | 31 | 22 | 17 | | |
| | | 2 | 240 | 49 | 39 | 41 | 40 | 37 | 30 | <20 | <20 | 51 | 41 | 32 | 28 | | |
| | | 3 | 340 | 48 | 41 | 45 | 46 | 44 | 40 | 31 | <20 | 53 | 48 | 39 | 35 | | |
| | 2 | 1 | 240 | 39 | 52 | 40 | 38 | 35 | 25 | <20 | <20 | 53 | 41 | 32 | 26 | | |
| | | 2 | 350 | <20 | 51 | 47 | 48 | 46 | 43 | 34 | <20 | 54 | 50 | 41 | 37 | | |
| | | 3 | 540 | 49 | 52 | 57 | 57 | 56 | 55 | 49 | 42 | 63 | 61 | 52 | 49 | | |
| 3 | 1 | 1 | 350 | <20 | 35 | 38 | 33 | <20 | <20 | <20 | <20 | 41 | 33 | 24 | 20 | | |
| | | 2 | 470 | <20 | 39 | 42 | 42 | 38 | 30 | <20 | <20 | 47 | 42 | 33 | 29 | | |
| | | 3 | 620 | 38 | 45 | 50 | 53 | 47 | 43 | 32 | <20 | 56 | 53 | 44 | 41 | | |
| | 2 | 1 | 350 | <20 | 35 | 38 | 33 | <20 | <20 | <20 | <20 | 41 | 33 | 24 | 20 | | |
| | | 2 | 620 | 38 | 45 | 50 | 53 | 47 | 43 | 32 | <20 | 56 | 53 | 44 | 41 | | |
| | | 3 | 840 | 45 | 50 | 55 | 58 | 54 | 51 | 44 | 35 | 62 | 59 | 50 | 46 | | |
| 4 | 1 | 1 | 360 | <20 | 35 | 38 | 33 | <20 | <20 | <20 | <20 | 40 | 33 | 24 | 20 | | |
| | | 2 | 610 | 37 | 48 | 47 | 53 | 45 | 40 | 30 | <20 | 48 | 52 | 43 | 41 | | |
| | | 3 | 1030 | 49 | 52 | 58 | 62 | 58 | 55 | 49 | 41 | 65 | 63 | 54 | 50 | | |
| | 2 | 1 | 700 | 43 | 49 | 50 | 53 | 48 | 44 | 35 | <20 | 57 | 53 | 44 | 41 | | |
| | | 2 | 800 | 45 | 51 | 52 | 54 | 51 | 48 | 39 | 27 | 59 | 56 | 47 | 42 | | |
| | | 3 | 1260 | 52 | 58 | 63 | 64 | 63 | 60 | 56 | 49 | 69 | 67 | 58 | 54 | | |
| 5 | 1 | 1 | 710 | <20 | 51 | 49 | 50 | 48 | 45 | 34 | <20 | 56 | 52 | 43 | 39 | | |
| | | 2 | 920 | 41 | 52 | 54 | 56 | 53 | 52 | 42 | 32 | 61 | 58 | 49 | 46 | | |
| | | 3 | 1350 | 50 | 58 | 64 | 64 | 63 | 61 | 57 | 50 | 70 | 68 | 59 | 55 | | |
| | 2 | 1 | 710 | <20 | 51 | 49 | 50 | 48 | 45 | 34 | <20 | 56 | 52 | 43 | 39 | | |
| | | 2 | 920 | 41 | 52 | 54 | 56 | 53 | 52 | 42 | 32 | 61 | 58 | 49 | 46 | | |
| | | 3 | 1350 | 50 | 58 | 64 | 64 | 63 | 61 | 57 | 50 | 70 | 68 | 59 | 55 | | |

* The sound pressure level is expressed in relation to a reverberation field of a 100 m³ room and a reverberation time of 0.5 s.

Selection criteria for electrical equipment

| | | MCR 3102 Microcomputer Control System Room-temperature control in circulating-air mode, (night time) temperature-reduction mode, automatic fan control, valve control | | MCR 2000 Electronic Temperature Control System Room-temperature control in circulating-air mode, limited fan control, valve control |
|---|--------------------------------------|---|-------------------|---|
| | | On/off control mode | Mod. control mode | On/off control mode |
| 2-pipe system | Heating only (water) | ✓ | ✓ | ✓ |
| | Cooling only (water) | ✓ | ✓ | ✓ |
| | Heating (water) or cooling (water) | ✓ | ✓ | ✓ |
| 2-pipe system and electric heating | Electric heating and cooling (water) | ✓ | | ✓ |
| 4-pipe system | Heating (water) and cooling (water) | ✓ | | ✓ |
| MCR 2000 Electronic Temperature Control System | | | | |
| MCR 3102 Microcomputer Control System | | | | |
| Accessories for Control Systems | | | | |

MCR 2000 and electrical equipment



MCR 2000

Electronic temperature controller for surface mounting or for installation in the Basic-Geko; integral room temperature sensor; connection of NTC sensors for measuring room and flow temperatures possible for

- 2-pipe system (cooling or heating with water)
- 2-pipe system (cooling with water and 230 V~ electric heating)
- 4-pipe system (cooling and heating with water)

When several Basic-Geko are combined with an MCR 2000, the fan speeds of the fan motors must not be connected or activated in parallel.

Functions and switching elements

- Automatic switchover between cooling and heating
- Integral room temperature sensor
- Valve activation in on/off control mode
- Setpoint range 5°C ... 30°C
- Setpoint limitation
- Switches 0 - 1 for operation
- Switches 1 - 2 - 3 for fan speeds
- Enclosure IP30
- White; similar to RAL 9010

Electrical equipment

Mounted on the Basic-Geko is a terminal box with terminal strip. A non GEA controller or the MCR 2000 can be connected to this terminal box. The terminal strip has been extended to enable the electric heating to be connected.

For instructions on how to connect a non GEA controller, see Instruction Manual Basic-Geko, chapter 6.2.

For connecting the MCR 2000 to the electricity supply, the following connections (cables) are required depending on the scope of functions :

- | | |
|---|---|
| • Device supply: | 3 x 1.5 mm ² Type NYM |
| • Electric heater supply: | 3 x 2.5 mm ² Type NYM |
| • Controller - terminal strip connection: | max. 10 x 1.5 mm ² Type NYY |
| • Per sensor (max. 2 sensors): | 2 x 2 x 0.8 J-Y(st)Y |
| • Stand-by contact: | 2 x 2 x 0.8 J-Y(st)Y |

Control valves

On/off control mode ("Open/Closed"); mounted at factory

MCR 2000 and control equipment for Basic-Geko fan coil unit

| System: | On/off control mode, fan running continuously | | | | Fan control (on/off control mode without valves) | | Fan and valve control (on/off control mode) | | | |
|--|---|--------------|--------------------|------------------------------|--|--------------|---|--------------|--------------|--------------------|
| | 2-pipe system | | 4-pipe system | | 2-pipe system only | | 2-pipe system only | | | |
| Function: | Heating only | Cooling only | Heating or cooling | Cooling and electric heating | Heating only | Cooling only | Heating or cooling | Heating only | Cooling only | Heating or cooling |
| | ⇓ | ⇓ | ⇓ | ⇓ | ⇓ | ⇓ | ⇓ | ⇓ | ⇓ | ⇓ |
| Valves mounted (thermo-electric drive) | | | | | | | | | | |
| 3-port valve | VT3□□□■.B□ | VT3□□□■.B□ | VT3□□□■.B□ | VT3□□□□.B□ | | | | VT3□□□■.B□ | VT3□□□■.B□ | VT3□□□■.B□ |
| alternatively | | | | | | | | | | |
| 2-port valve | VT2□□□■.B□ | VT2□□□■.B□ | VT2□□□■.B□ | VT2□□□□.B□ | | | | VT2□□□■.B□ | VT2□□□■.B□ | |
| Electrical equipment mounted | | | | | | | | | | |
| | Type code | Type code | Type code | Type code | Type code | Type code | Type code | Type code | Type code | Type code |
| Terminal strip with cover | G.U□□2.11□ | G.U□□2.11□ | G.U□□2.11□ | G.U□□4.11□ | G.U□□2.11□ | G.U□□2.11□ | G.U□□2.11□ | G.U□□2.11□ | G.U□□2.11□ | G.U□□2.11□ |
| Electrical control box with terminal strip plus: Contactor and high temperature cut out (with electric heating only) | | | | G.U□□3.21□ | | | | | | |
| Separate electronic temperature controller | | | | | | | | | | |
| Separate controller incl. temperature sensor | MCR 2000 | MCR 2000 | MCR 2000 | MCR 2000 | MCR 2000 | MCR 2000 | MCR 2000 | MCR 2000 | MCR 2000 | MCR 2000 |
| Controller installation kit (controller holder, fixing material, controller connecting cable) | ZE 2000 | ZE 2000 | ZE 2000 | ZE 2000 | ZE 2000 | ZE 2000 | ZE 2000 | ZE 2000 | ZE 2000 | ZE 2000 |
| Separate sensors | | | | | | | | | | |
| Return-air sensor (necessary if controller installed in unit) | 903.474 | 903.474 | 903.474 | 903.474 | 903.474 | 903.474 | 903.474 | 903.474 | 903.474 | 903.474 |
| alternatively | | | | | | | | | | |
| Room-temp. sensor | 903.414 | 903.414 | 903.414 | 903.414 | 903.414 | 903.414 | 903.414 | 903.414 | 903.414 | 903.414 |
| Flow sensor (necessary for heating/cooling switchover) | | 903.434 | | | | | | | | 903.434 |

MCR 3102 and electrical equipment



MCR 3102 for surface mounting or for installation in the Basic-Geko; integral room temperature sensor; connection of NTC sensors for measuring room and flow temperatures possible for

- 2-pipe system (cooling only, heating with water only)
- 2-pipe system (cooling or heating with water)
- 2-pipe system (cooling with water and 230 V~ electric heating)
- 4-pipe system (cooling and heating with water)

The controller can be used for a maximum of 8 units.

Functions and switching elements

- Setpoint range for room temperature 10°C 30°C
- Mode selector for the fan
1-2-3 = manual selection of the fan speeds
- Auto = automatic selection of the fan speeds as required
- ● = unit "Off"
- Switch for daytime and night time temperature reduction
- LED "Power On" indicator
- Integral room temperature sensor
- Valve activation in on/off-/modulating control mode
- Enclosure IP20

Basic settings (protected)

- Setpoint limitation (18°C 24°C)
- Automatic switchover between cooling and heating
- Setting range of temperature reduction from 1K ... 7K
- 2-pipe system variable depending on room and flow temperature (flow sensor 903.431 necessary)
- 4-pipe system with 2K difference between cooling and heating
- "On/Off" or continuous fan operation selectable
- White; similar to RAL 9010

Electrical equipment

An electrical control box with MCE 3 electronic power unit is mounted on the Basic-Geko. This switch box is configured for the MCR 3102 controller. The following can be connected to the electronic power unit:

- Flow sensor, order no.: 903.431
- Timer, order no.: 902.070, or CCS contact
- Outside temperature sensor for summer compensation, order no.: 903.451
- Room temperature sensor, order no.: 903.411

The following connections (cables) are required depending on the scope of functions for connecting the MCR 3102 to the electricity supply:

- Device supply: 3 x 1.5 mm² Type NYM
- Electric heater supply: 3 x 2.5 mm² Type NYM
- Controller - electronic power unit connection: 4 x 2 x 0.8 J-Y(st)Y
- Per sensor (max. 3 sensors): 2 x 2 x 0.8 J-Y(st)Y
- Temperature reduction (ext. contact or timer): 2 x 2 x 0.8 J-Y(st)Y

Control valves (mounted at factory)

Possible valve functions with MCE 3 electronic power unit:

- 2-pipe system, continuous (modulating control mode) or "Open/Closed" (on/off control mode)
- 4-pipe system, "Open/Closed" only (on/off control mode)

MCR 3102 and control equipment for Basic-Geko fan coil unit

| | Modulating control mode | | On/off control mode | | | | Fan sequence control | |
|--|-------------------------|--------------|---------------------|--------------|-----------------------------|---------------------|----------------------|--------------------|
| | 2-pipe system | | 2-pipe system | | 4-pipe system | | 2-pipe system | |
| System: | Heating only | Cooling only | Heating or cooling | Heating only | Heating or electric heating | Heating and cooling | Heating only | Heating or cooling |
| Function: | ⇕ | ⇕ | ⇕ | ⇕ | ⇕ | ⇕ | ⇕ | ⇕ |
| Valves mounted | | | | | | | | |
| 3-port valve; reversible motor valve | VR3□□□■.B□ | VR3□□□■.B□ | VR3□□□■.B□ | | | | | |
| altern. 2-port valve | VR2□□□■.B□ | VR2□□□■.B□ | | | | | | |
| 3-port valve; thermo-electric valve | | | VT3□□□■.B□ | VT3□□□■.B□ | VT3□□□□.B□ | VT3□□□□.B□ | | |
| altern. 2-port valve | | | VT2□□□■.B□ | VT2□□□■.B□ | VT2□□□□.B□ | VT2□□□□.B□ | | |
| Electrical equipment mounted | | | | | | | | |
| | Type code | Type code | Type code | Type code | Type code | Type code | Type code | Type code |
| Electrical control box with MCE 3 electronic power unit | G.U□□2.31□ | G.U□□2.31□ | G.U□□2.31□ | G.U□□2.31□ | G.U□□2.31□ | G.U□□4.31□ | G.U□□2.31□ | G.U□□2.31□ |
| Electrical control box as above, also installed: Contactor and high temperature cut out (with electric heating only) | | | | | G.U□□3.41□ | | | |
| Separate microcomputer controller | | | | | | | | |
| Separate controller incl. temperature sensor | MCR 3102 | MCR 3102 | MCR 3102 | MCR 3102 | MCR 3102 | MCR 3102 | MCR 3102 | MCR 3102 |
| Controller installation kit (controller holder, fixing material, controller connecting cable) | ZE 3100 | ZE 3100 | ZE 3100 | ZE 3100 | ZE 3100 | ZE 3100 | ZE 3100 | ZE 3100 |
| Separate sensor, 1 x necessary per device group | | | | | | | | |
| Return-air sensor (necessary if controller installed in unit) | 903.471 * | 903.471 * | 903.471 * | 903.471 * | 903.471 | 903.471 | 903.471 | 903.471 |
| * = Return-air sensor only in conjunction with continuous fan operation, otherwise select room temperature sensor | | | | | | | | |
| Altern. room-temp. sensor | 903.411 | 903.411 | 903.411 | 903.411 | 903.411 | 903.411 | 903.411 | 903.411 |
| Flow sensor (necessary for heating/cooling switchover) | | | | | | | | 903.431 |

Accessories for control systems (MCR 2000 and MCR 3102)



Room temperature sensor - Order no. 903.411 (MCR 3102 only)

Thermistor sensor for surface mounting

- NTC sensor element
- Plastic casing; white; similar to RAL 9010
- Dimensions in mm (w x h x d): 84 x 84 x 22
- Resistance coefficient at 25°C = 1.6 kΩ
- Enclosure IP20

Room temperature sensor - Order no. 903.414 (MCR 2000 only)

Thermistor sensor for surface mounting

- NTC sensor element
- Plastic casing; white; similar to RAL 9010
- Dimensions in mm (w x h x d): 84 x 84 x 22
- Resistance coefficient at 25°C = 10 kΩ
- Enclosure IP20



Outside temperature sensor - Order no. 903.451 (MCR 3102 only)

Thermistor sensor; only for cooling mode to increase the room temperature depending on the outside temperature (to DIN 1946 Part 2/3).

- NTC sensor element
- High-impact-resistant, white plastic casing for mounting on outside wall
- Conduit thread union
- Resistance coefficient at 25°C = 1.6 kΩ
- Enclosure IP54
- Dimensions in mm (w x h x d): 65 x 50 x 37.5

Return-air sensor - Order no. 903.471 (MCR 3102 only)

Thermistor sensor for installation in device

- NTC sensor element
- Sensor sleeve made of stainless steel
- Sensor-sleeve length 100 mm; cable length 1.5 m
- Max. ambient temperature 105°C
- Resistance coefficient at 25°C = 1.6 kΩ
- Enclosure IP43



Return-air sensor - Order no. 903.474 (MCR 2000 only)

Thermistor sensor for installation in device

- NTC sensor element
- Sensor sleeve made of stainless steel
- Sensor-sleeve length 100 mm; cable length 1.5 m
- Max. ambient temperature 105°C
- Resistance coefficient at 25°C = 10 kΩ
- Enclosure IP43

Accessories for control systems (MCR 2000 and MCR 3102)



Flow sensor - Order no. 903.431 (MCR 3102 only)

Thermistor sensor for mounting on flow line

- NTC sensor element
- Sensor on base plate; plastic casing; white; similar to RAL 9010
- Mounted on flow line by means of clamping belt
- Max. ambient temperature 100°C
- Dimensions in mm (w x h x d): 30 x 60 x 30
- Resistance coefficient at 25°C = 1.6 kΩ
- Enclosure IP43

Flow sensor - Order no. 903.434 (MCR 2000 only)

Thermistor sensor for mounting on flow line

- NTC sensor element
- Sensor on base plate; plastic casing; white; similar to RAL 9010
- Mounted on flow line by means of clamping belt
- Max. ambient temperature 100°C
- Dimensions in mm (w x h x d): 30 x 60 x 30
- Resistance coefficient at 25°C = 10 kΩ
- Enclosure IP43



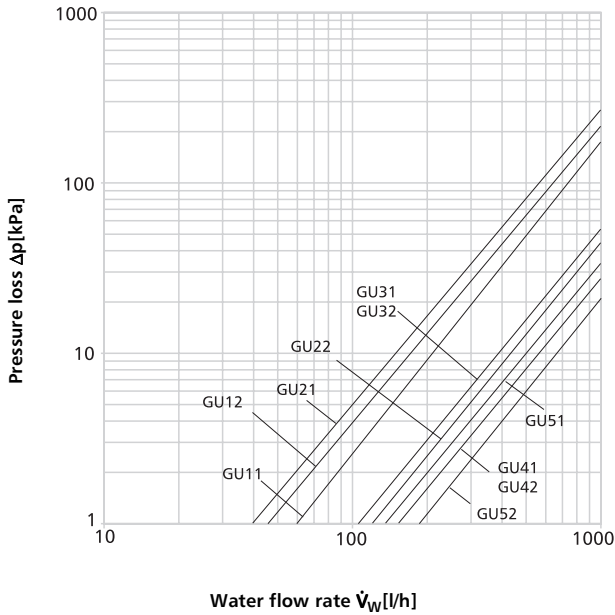
Digital timer - Order no. 902.070

Quartz-controlled timer with digital program screen display

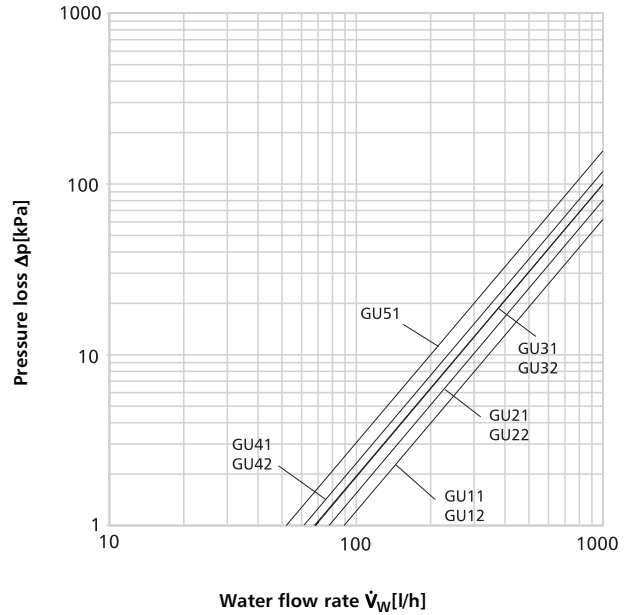
- 100-hour power reserve
- Display of time, weekday and control state of the output
- Summer/winter switchover
- Setting of On/Off times and weekdays (max. 8 program screens)
- Supply voltage 230V~/50Hz ... 60Hz
- Output switchover contact, 16A ohmic, 250 V~
- Setting accuracy 1 minute, clock error +/- 2.5s/d
- Shortest switching time 1 minute
- LCD 6 mm high
- Enclosure IP30

Pressure losses in the heat exchanger

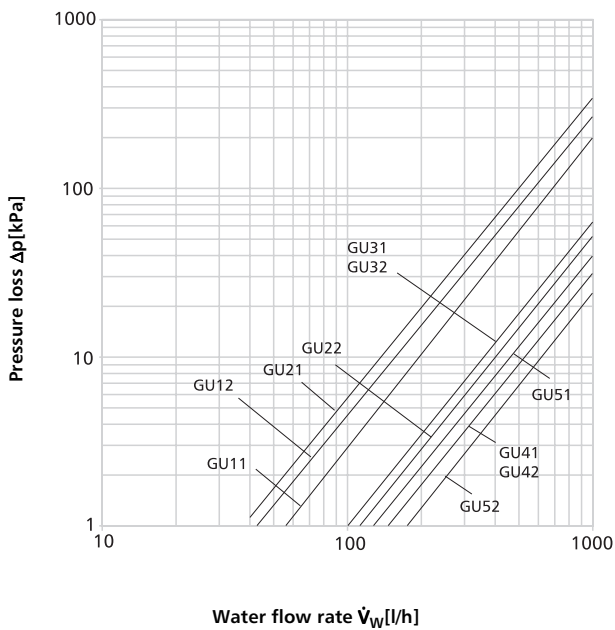
Pressure losses in the heat exchanger *
Heating in the 2-pipe system



Pressure losses in the heat exchanger *
Heating in the 4-pipe system



Pressure losses in the heat exchanger *
Cooling in the 2-/4-pipe system



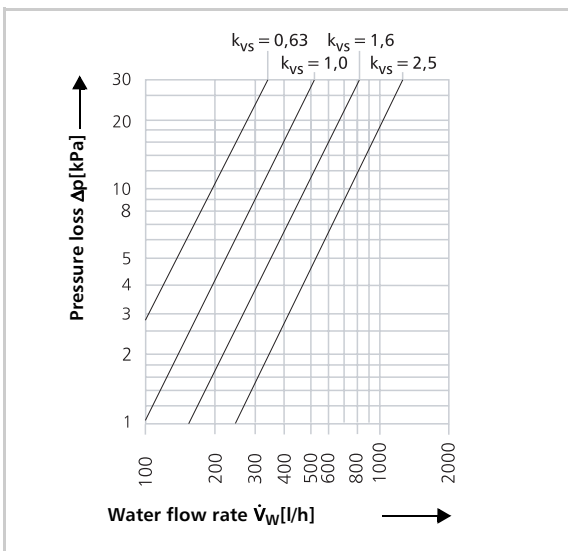
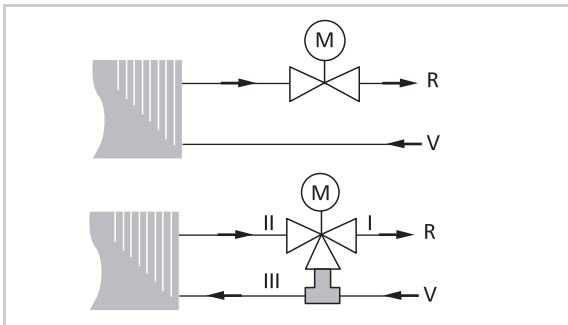
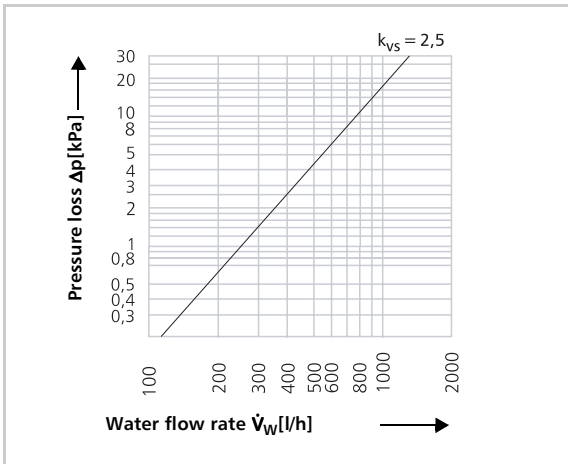
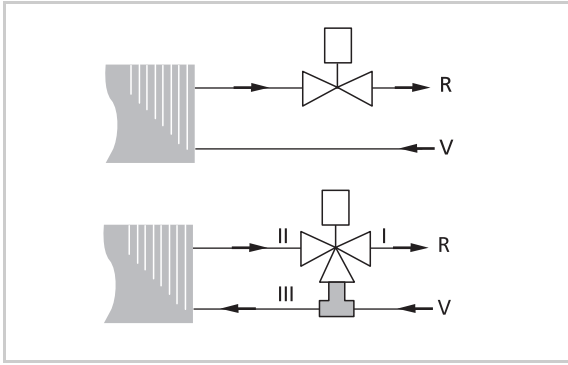
Water flow rate \dot{V}_W

| | Calculation steps | Example |
|--------------|---|---|
| Heating mode | Heating capacity \dot{Q}_H from Sizes chap. (if nec. with aid of correction factors) | $\dot{Q}_H (70/50/15) = 3.92 \text{ kW}$ |
| | Temperature difference Δt_W between flow and return $\Delta t_W = t_{W1} - t_{W2}$ | $\Delta t_W = 70 - 50 = 20 \text{ K}$ |
| | Water flow rate \dot{V}_W $\dot{V}_W = 860 \cdot \dot{Q}_H / \Delta t_W$ | $\dot{V}_W = 860 \cdot 3.92 / 20 = 169 \text{ l/h}$ |
| Cooling mode | Cooling capacity \dot{Q}_C from Sizes chap. (if nec. with aid of correction factors) | $\dot{Q}_C (8/12/24/50) = 2.01 \text{ kW}$ |
| | Temperature difference Δt_W between return and flow $\Delta t_W = t_{W2} - t_{W1}$ | $\Delta t_W = 12 - 8 = 4 \text{ K}$ |
| | Water flow rate \dot{V}_W $\dot{V}_W = 860 \cdot \dot{Q}_C / \Delta t_W$ | $\dot{V}_W = 860 \cdot 2.01 / 4 = 432 \text{ l/h}$ |

Heat-exchanger pressure loss Δp on water side

| Pressure loss Δp from diagram | Example |
|--|---|
| Input variables: water flow rate \dot{V}_W and size/type Intersection of device characteristic and parallel to pressure loss axis is Δp | Heating Type GU 31, $\dot{V}_W = 169 \text{ l/h}$ Cooling: Type GU 22, $\dot{V}_W = 432 \text{ l/h}$ |
| In heating mode | $\Delta p = 1.7 \text{ kPa}$ |
| In cooling mode | $\Delta p = 16.8 \text{ kPa}$ |

* To keep the diagram clear and simple to understand, only the first characters of the type codes are stated.



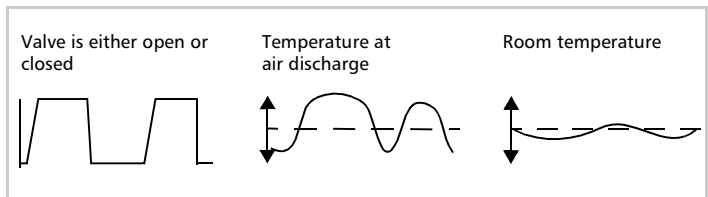
On/off control mode (thermo-electric) / 2- and 4-port

| | |
|---------------------------------------|----------------------|
| Nominal pressure | 16 bar |
| Max. permissible ambient temperature | 50°C |
| Max. flow temperature | 110°C |
| Operating voltage | 230V / 50/60 Hz |
| Power consumption | 3 VA |
| Enclosure (for vertical installation) | IP 43 |
| Running time | appr. 180 s at 50 Hz |

Water/glycol mix with max. 50% glycol permissible

Connected loads for valves with thermo-electric drive

| Ports | k_{vs} value [m ³ /h] | Δp_{max} * [kPa] | Valve connections *** | Order no. 2-port | Order no. 4-port |
|-------|------------------------------------|--------------------------|-----------------------|------------------|------------------|
| 2 | 2.5 | 200 | R 3/4" | 935.464 | - |
| 3 | 2.5 | 50 | R 3/4" | - | 935.354 |



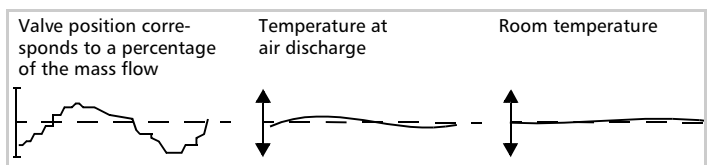
Modulating control mode (motor-operated) / 2- and 4-port

| | |
|---------------------------------------|---------------------------------------|
| Nominal pressure | 16 bar |
| Max. permissible ambient temperature | 60°C |
| Max. flow temperature | 110°C |
| Operating voltage | 230V / 50/60 Hz |
| Power consumption | 7 VA |
| Enclosure (for vertical installation) | IP 43 |
| Running time | appr. 120 s at 50 Hz (100 s at 60 Hz) |

Water/glycol mix with max. 50% glycol permissible

Connected loads for valves with motor-operated drive

| Ports | k_{vs} value [m ³ /h] | Δp_{max} * [kPa] | Valve connections ** | Order no. 2-port | Order no. 4-port |
|-------|------------------------------------|--------------------------|----------------------|------------------|------------------|
| 2 / 3 | 0,63 | 1600/800** | R 1/2" | 935.423 | 935.413 |
| 2 / 3 | 1,00 | 1200/250** | R 1/2" | 935.424 | 935.414 |
| 2 / 3 | 1,60 | 1200/250** | R 1/2" | 935.425 | 935.415 |
| 2 / 3 | 2,50 | 400/100** | R 3/4" | 935.426 | 935.416 |



Note: the max. pressure loss when the valve is fully open must not exceed 25 kPa in cooling mode and 20 kPa in heating mode.

* Max. permissible pressure difference at which the valve still closes against the pressure

** For 4-port valves

*** External thread, flat-sealing

Electric heating (1-stage)



Used as a cooling unit in the 2-pipe system, the Basic-Geko can be equipped ex-works with an electric heater (230 V).

The electric heating can be controlled by either the MCR 3102 or the MCR 2000 controller.

Function:

- Automatic switch-on of the electric heating depending on the setpoint/actual temperature value variation
- Fan run-on timer and switch-off of the electric heating (MCR 3102 only)

Design:

- Finned radiator made of aluminium
- Heating capacity, 1-stage, switched
- 1 power contactor
- 2 safety temperature limiters
- All components wired to VDE 0700
- Protection measures to VDE 0100

Notes:

The air volume flow must not be reduced to a level below those specified in the table on page 29.

For safety reasons, the electric heater must not be mounted upside down.

Electric heating (1-stage)

Technical data

| Size | Capacity stages | Fan speed | Air volume flow [m ³ /h] | Electric heating | | | |
|------|-----------------|-----------|-------------------------------------|------------------|----------------------|---|---|
| | | | | \dot{Q}_H [kW] | Temp. difference [K] | t _{A2} [°C] (t _{A1} = 10°C) | t _{A2} [°C] (t _{A1} = 20°C) |
| 1 | 1 | 1 | 130 | 0.8 | 18.6 | 28.6 | 38.6 |
| | | 2 | 200 | 0.8 | 12.1 | 22.1 | 32.1 |
| | | 3 | 280 | 0.8 | 8.6 | 18.6 | 28.6 |
| | 2 | 1 | 130 | 0.8 | 18.6 | 28.6 | 38.6 |
| | | 2 | 200 | 0.8 | 12.1 | 22.1 | 32.1 |
| | | 3 | 280 | 0.8 | 8.6 | 18.6 | 28.6 |
| 2 | 1 | 1 | 165 | 1.1 | 20.2 | 30.2 | 40.2 |
| | | 2 | 240 | 1.1 | 13.9 | 23.9 | 33.9 |
| | | 3 | 340 | 1.1 | 9.8 | 19.8 | 29.8 |
| | 2 | 1 | 240 | 1.1 | 13.9 | 23.9 | 33.9 |
| | | 2 | 350 | 1.1 | 9.5 | 19.5 | 29.5 |
| | | 3 | 540 | 1.1 | 6.2 | 16.2 | 26.2 |
| 3 | 1 | 1 | 350 | 2.0 | 17.3 | 27.3 | 37.3 |
| | | 2 | 470 | 2.0 | 12.9 | 22.9 | 32.9 |
| | | 3 | 620 | 2.0 | 9.8 | 19.8 | 29.8 |
| | 2 | 1 | 350 | 2.0 | 17.3 | 27.3 | 37.3 |
| | | 2 | 620 | 2.0 | 9.8 | 19.8 | 29.8 |
| | | 3 | 820 | 2.0 | 7.4 | 17.4 | 27.4 |
| 4 | 1 | 1 | 360 | 3.0 | 25.2 | 35.2 | 45.2 |
| | | 2 | 610 | 3.0 | 14.9 | 24.9 | 34.9 |
| | | 3 | 1030 | 3.0 | 8.8 | 18.8 | 28.8 |
| | 2 | 1 | 700 | 3.0 | 13.0 | 23.0 | 33.0 |
| | | 2 | 800 | 3.0 | 11.3 | 21.3 | 31.3 |
| | | 3 | 1260 | 3.0 | 7.2 | 17.2 | 27.2 |
| 5 | 1 | 1 | 710 | 4.0 | 17.0 | 27.0 | 37.0 |
| | | 2 | 920 | 4.0 | 13.2 | 23.2 | 33.2 |
| | | 3 | 1350 | 4.0 | 9.0 | 19.0 | 29.0 |
| | 2 | 1 | 710 | 4.0 | 17.0 | 27.0 | 37.0 |
| | | 2 | 920 | 4.0 | 13.2 | 23.2 | 33.2 |
| | | 3 | 1350 | 4.0 | 9.0 | 19.0 | 29.0 |

Notes:

Basic-Geko

Fan coil unit as return air unit for heating and/or cooling for

- Wall mounting, coil connection on left
- Wall mounting, coil connection on right
- Ceiling mounting, coil connection on left
- Ceiling mounting, coil connection on right (connection side seen from front looking at discharge)

Basic design

- Sendzimir hot-dip-galvanised sheet steel
- Polyethylene for sound and thermal insulation

Heat exchanger

- Copper pipes with aluminium fins fitted
- Max. operating pressure 16 bar
- Vent and drain screws
- Connection adapter 1/2" internal thread
- Heating medium: water; max. flow temperature 90°C
- Cooling medium: water; max. perm. glycol admix 50%
- Heat exchanger variants
- 2-pipe system (2/3/4 rows of pipes)
- 2-pipe system (2/3/4 rows of pipes), cooling and electric heating only
- 4-pipe system (2 + 1; 3 + 1 rows of pipes)

Centrifugal fan(s)

- Impeller made of plastic with forward-curved blades
- Double inlet
- Quiet-running, maintenance-free bearings
- 3-speed external-rotor motor, 230V/50Hz
- Enclosure IP32
- Fire-protection class A1 (DIN 4102)
- Insulation class B
- Motor protection by means of built-in thermocontact
- Wired to terminal strip, ready for connection

Condensate pans

- Main condensate pan made of Sendzimir hot-dip galvanised sheet steel
- Lateral condensate pan made of plastic

- Underside thermal insulation made of polyethylene
- Fire-protection class B2 (DIN 4102)

Filter

- Synthetic, washable filter medium
- Filter classification G1
- Simple to replace

Electrical equipment

- Terminal strip with cover for direct activation (IP20) of fan valve drive(s) in on/off control mode and with connection possibility for
 - control systems provided by others
 - GEA MCR 2000 electronic temperature controller (2-pipe system)
 - GEA MCR 2000 electronic temperature controller (4-pipe system)

Alternatives:

- Electrical control box with terminal strips, contactor and high temperature cut out (HTC); for direct activation of fans valve drive(s) in 2-point operation and electric heating with connection possibility for
 - control systems provided by others
 - GEA MCR 2000 electronic temperature controller
- Electrical control box with MCE 3 electronic power unit with
 - Fan activation in 3 speeds
 - Valve activation with 2-pipe systems in on/off or modulating control mode
 - Valve activation with 4-pipe systems in on/off control mode
 - Connection possibility for GEA MCR 3102 microcomputer controller
- Electrical control box with MCE 3 electronic power unit and terminal strips, contactor and high temperature cut out (HTC) with
 - Fan activation in 3 speeds
 - Valve activation in on/off control mode
 - Activation of electric heating
 - Connection possibility for GEA MCR 3102 microcomputer controller

Specification text

GEA Basic-Geko

| | Fan speed | 1 | 2 | 3 | Unit |
|--|----------------------------------|---|---|---|-------------------|
| Techn. data | Air volume flow | | | | m ³ /h |
| | Operating voltage/frequency | | | | V/Hz |
| | Motor output | | | | W |
| | Current consumption | | | | A |
| Cooling | Entering air temperature | | | | °C |
| | Entering humidity | | | | % r.h. |
| | Leaving air temperature | | | | °C |
| | Leaving humidity | | | | % r.h. |
| | Condensate quantity | | | | g/kg |
| | Condensate quantity | | | | l/h |
| | Cooling medium (PCW) | | | | |
| | Water intake temperature | | | | °C |
| | Water discharge temp. | | | | °C |
| | Mass flow | | | | kg/h |
| | Pressure loss (HEx) | | | | kPa |
| | Cooling capacity, total | | | | kW |
| | Cooling capacity, sensible | | | | kW |
| Heating | Entering air temperature | | | | °C |
| | Leaving air temperature | | | | °C |
| | Heating medium (L.P.H.W.) | | | | |
| | Water intake temperature | | | | °C |
| | Water discharge temp. | | | | °C |
| | Mass flow | | | | kg/h |
| | Pressure loss (HEx) | | | | kPa |
| | Heat output | | | | kW |
| | Electric heating | | | | kW |
| Acoustics | Sound power level | | | | dB [A] |
| | Sound pressure level | | | | dB [A] |
| Sound pressure level expressed in relation to a reverberation field of a 100 m ³ room and a reverberation time of 0.5 s | | | | | |

Manufacturer: GEA Happel Klimatechnik

Order no.: G.U.□□□.□□□

Dimensions (mm) and weights (kg)

Width: _____

Height: _____

Depth: _____

Weight: _____

| Accessories | Description | Dimensions in mm | Weights in kg | Order number | Item | Qty. | |
|---------------------------------------|------------------------------|------------------|---------------|--------------|------|------|--|
| | Flexible discharge connector | Width: | | | Z□01 | | |
| | | Height: | | | | | |
| | | Depth: | | | | | |
| | Casing | Width: | | | Z□02 | | |
| | | Height: | | | | | |
| | | Depth: | | | | | |
| Unit Feet | | | | Z103 | | | |
| Air intake grille and unit foot cover | | | | Z□05 | | | |
| Spare filter | | | | Z□06 | | | |

□ = Enter size (1...5) here.

Flexible discharge connector

- Fire protection class B2
- 4-hole fixing with 20-mm frame all round

Casing

- Front panel made of coated sheet steel; white; similar to RAL 9010
- Hinged flaps and discharge grille made of plastic (ABS); grey; similar to RAL 7035

Unit Feet

- for basic unit
- Sendzimir hot-dip-galvanised sheet steel
- 1 set = 2 pieces

Air intake grille and unit foot cover

- Made of ABS
- Grey; similar to RAL 7035

Spare filter

- Filter classification G1
- 1 set = 5 pieces
- Made of polypropylene

Manufacturer: GEA Happel Klimatechnik

Order no.: Z□□□

Specification text

GEA controllers for surface mounting or for installation in the Basic-Geko

| MCR 2000 Order no. MCR 2000 | | MCR 3102 Order no. MCR 3102 | |
|--|---|---|---|
| for return air units | | for return air units | |
| Cooling with water | Cooling with water in 2-pipe system with electric heating | Cooling with water | Cooling with water in 2-pipe system with electric heating |
| Heating with water | Cooling and heating with water in 4-pipe system | Heating with water | Cooling and heating with water in 4-pipe system |
| Automatic cooling/heating switchover | Automatic cooling/heating switchover with neutral zone (1K-12K) | Smooth cooling/heating switchover in 2-pipe system (flow sensor necessary). Automatic cooling/heating switchover with neutral zone (2K) in 4-pipe system | Automatic cooling/heating switchover with neutral zone (2K) |
| Electronic room temperature sensor | Electronic room temperature sensor | Electronic room temperature sensor | Electronic room temperature sensor |
| Switches 0 - 1 for operation Switches 1-2-3 for fan speeds | Switches 0 - 1 for operation Switches 1-2-3 for fan speeds | 3-speed fan activation, manual or automatic. Switches OFF-1-2-3-AUTOMATIC for fan operation | 3-speed fan activation, manual or automatic. Switches OFF-1-2-3-AUTOMATIC for fan operation |
| Setpoint setter 5°C ... 30°C | Setpoint setter 5°C ... 30°C | Setpoint setter 10°C ... 30°C | Setpoint setter 10°C ... 30°C |
| Mechanical setting-range limitation | Mechanical setting-range limitation | Electronically limited setpoint range (18°C ... 24°C), selectable | Electronically limited setpoint range (18°C ... 24°C), selectable |
| Valve activation in on/off control mode | Valve and electric-heater activation in on/off control mode | Valve activation with 2-pipe systems in on/off- or modulating control mode | Valve and electric-heater activation in on/off control mode |
| NTC sensor connection possibility for room and flow temperatures | NTC sensor connection possibility for room temperature | NTC sensor connection possibility for room, flow and outside temperatures | NTC sensor connection possibility for room and outside temperatures |
| Connection possibility for a stand-by contact | Connection possibility for a stand-by contact | - | - |
| Room freeze-protection function (in presence of heating medium only) | Room freeze-protection function (in presence of heating medium only; 4-pipe system) | Night time temp. reduction with room freeze-prot. function (in pres. of heating medium only) by switch or ext. floating contact, adjustable by means of potentiometer (1K - 7K) | Night time temp. reduction with room freeze-prot. function (in pres. of heating medium only) by switch or ext. floating contact, adjustable by means of potentiometer (1K - 7K) |
| - | - | LED with fault code display and operation readiness | LED with fault code display and operation readiness |
| Enclosure IP30 | Enclosure IP30 | Enclosure IP20 | Enclosure IP20 |
| White, similar to RAL 9010 | White, similar to RAL 9010 | White, similar to RAL 9010 | White, similar to RAL 9010 |

Accessories for controllers

GEA controller installation kit for MCR 2000

Controller bracket and connecting cable for installing the room-temperature controller in the Basic-Geko

- Controller bracket made of Sensimir hot-dip-galvanised sheet steel, including bits and pieces for fixing
- Connecting cable for connecting to the control electronics

Manufacturer: GEA Happel Klimatechnik
Order no.: ZE2000

GEA return-air sensor

Thermistor sensor for installation in device

- NTC sensor element
- Resistance $R(25) = 10 \text{ k}\Omega$
- Enclosure IP43
- Sensor sleeve made of stainless steel
- Max. ambient temperature 105°C
- Sensor-sleeve length 100 mm; cable length 1.5 m

Manufacturer: GEA Happel Klimatechnik
Order no.: 903.474

GEA room temperature sensor

Thermistor sensor for surface mounting

- NTC sensor element
- Resistance $R(25) = 10 \text{ k}\Omega$
- Enclosure IP20
- Casing made of plastic; white; similar to RAL 9010
- Dimensions (w x h x d): 84 mm x 84 mm x 22 mm

Manufacturer: GEA Happel Klimatechnik
Order no.: 903.414

GEA flow sensor

Thermistor sensor for mounting on flow line

- NTC sensor element
- Resistance $R(25) = 10 \text{ k}\Omega$
- Enclosure IP43
- Sensor on base plate, plastic casing
- Mounting on flow line by means of clamping belt
- Max. ambient temperature 100°C
- Dimensions (w x h x d): 30 mm x 60 mm x 30 mm

Manufacturer: GEA Happel Klimatechnik
Order no.: 903.434

GEA controller installation kit for MCR 3102

Controller bracket and connecting cable for installing the room-temperature controller in the Basic-Geko

- Controller bracket made of Sensimir hot-dip-galvanised sheet steel, including bits and pieces for fixing
- Connecting cable for connecting to the control electronics

Manufacturer: GEA Happel Klimatechnik
Order no.: ZE3100

GEA return-air sensor

Thermistor sensor for installation in device

- NTC sensor element
- Resistance $R(25) = 1.6 \text{ k}\Omega$
- Enclosure IP43
- Sensor sleeve made of stainless steel
- Max. ambient temperature 105°C
- Sensor-sleeve length 100 mm; cable length 1.5 m

Manufacturer: GEA Happel Klimatechnik
Order no.: 903.471

GEA room temperature sensor

Thermistor sensor for surface mounting

- NTC sensor element
- Resistance $R(25) = 1.6 \text{ k}\Omega$
- Enclosure IP20
- Casing made of plastic; white; similar to RAL 9010
- Dimensions (w x h x d): 84 mm x 84 mm x 22 mm

Manufacturer: GEA Happel Klimatechnik
Order no.: 903.411

GEA flow sensor

Thermistor sensor for mounting on flow line

- NTC sensor element
- Resistance $R(25) = 1.6 \text{ k}\Omega$
- Enclosure IP43
- Sensor on base plate, plastic casing
- Mounting on flow line by means of clamping belt
- Max. ambient temperature 100°C
- Dimensions (w x h x d): 30 mm x 60 mm x 30 mm

Manufacturer: GEA Happel Klimatechnik
Order no.: 903.431

GEA outside temperature sensor

Thermistor sensor for surface mounting

- NTC sensor element
- Resistance $R(25) = 1.6 \text{ k}\Omega$
- Enclosure IP54
- Casing made of high-impact-resistant plastic; white; similar to RAL 9010
- Dimensions (w x h x d): 65mm x 50 mm x 37.5 mm

Manufacturer: GEA Happel Klimatechnik
Order no.: 903.451

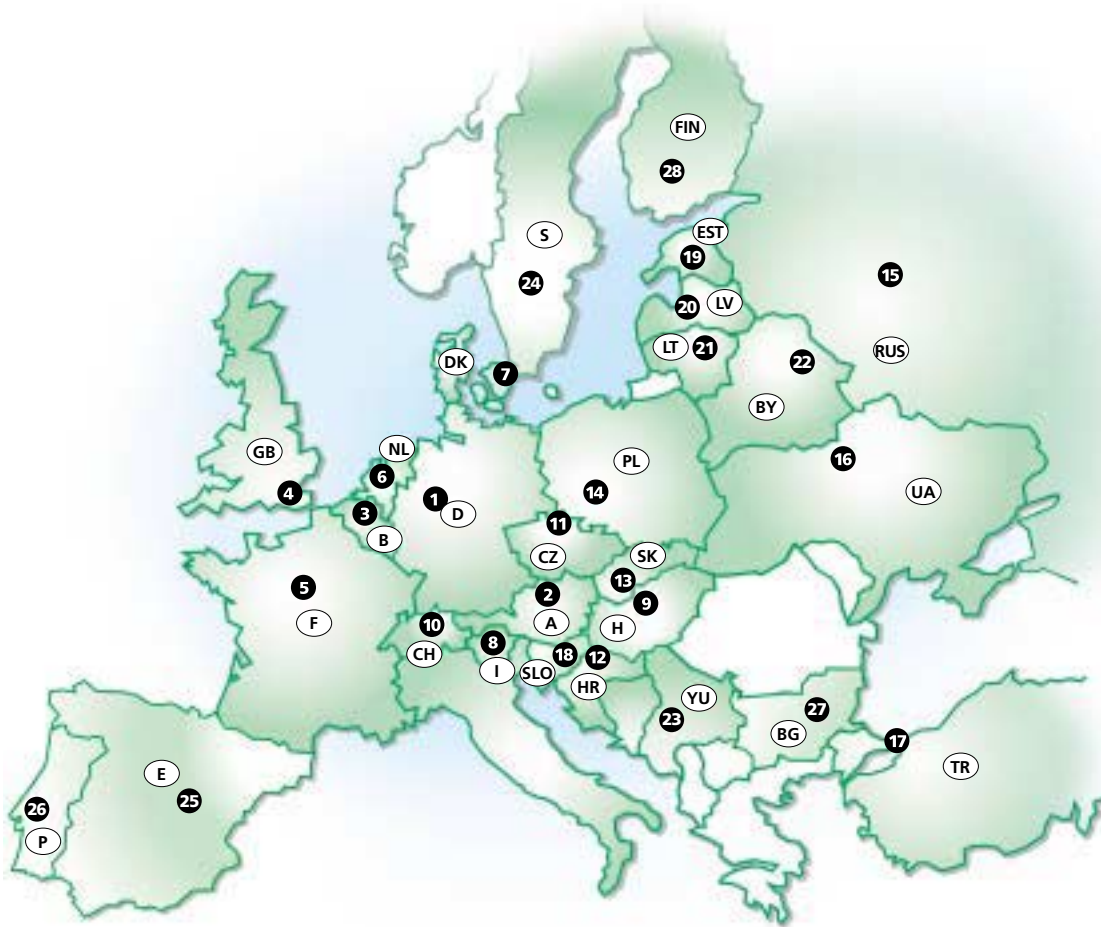
Specification text

Valves

| | Valve drive | k _{Vs} value | Design | Compatible with room-temperature controller |
|--|---|--|--|---|
| 2-pipe system | <input type="checkbox"/> Modulating control mode | | | |
| | Reversible actuator, 230V/50Hz | <input type="checkbox"/> 0.63 (DN15) <input type="checkbox"/> 1.00 (DN15) <input type="checkbox"/> 1.60 (DN15) <input type="checkbox"/> 2.50 (DN20) | <input type="checkbox"/> 2-port valve (not for cooling or heating) | MCR 3102 |
| | Current consumption 0.03 A | | | |
| | Power consumption 7 VA | | <input type="checkbox"/> 4-port valve | |
| | Valve running time 120 s at 50 Hz | | | |
| | Max. ambient temperature 60 °C | | | |
| | IP43 enclosure (for vertical installation) | | | |
| | <input type="checkbox"/> On/off control mode | | | |
| | Thermo-electr. actuator, 230V/50Hz | <input type="checkbox"/> 2.5 (DN20) | <input type="checkbox"/> 2-port valve (not for cooling or heating) | MCR 3102 MCR 2000 |
| | Starting-current consumption 0.03 A | | | |
| Operating-current consumption 0.013 A | <input type="checkbox"/> 4-port valve | | | |
| Power consumption 3 VA | | | | |
| Valve oper. time approx. 180 s at 50 Hz | | | | |
| Max. ambient temperature 50 °C | | | | |
| IP43 enclosure (for vertical installation) | | | | |
| 2-pipe system and electric heating | <input type="checkbox"/> On/off control mode | | | |
| | Thermo-electr. actuator, 230V/50Hz | <input type="checkbox"/> 2.5 (DN20) | <input type="checkbox"/> 2-port valve (not for cooling or heating) | MCR 3102 MCR 2000 |
| | Starting-current consumption 0.03 A | | | |
| | Operating-current consumption 0.013 A | | <input type="checkbox"/> 4-port valve | |
| | Power consumption 3 VA | | | |
| | Valve oper. time approx. 180 s at 50 Hz | | | |
| | Max. ambient temperature 50 °C | | | |
| IP43 enclosure (for vertical installation) | | | | |
| 4-pipe system | <input type="checkbox"/> On/off control mode | | | |
| | Thermo-electr. actuator, 230V/50Hz | <input type="checkbox"/> 2.5 (DN20) | <input type="checkbox"/> 2-port valve | MCR 3102 MCR 2000 |
| | Starting-current consumption 0.03 A | | | |
| | Operating-current consumption 0.013 A | | <input type="checkbox"/> 4-port valve | |
| | Power consumption 3 VA | | | |
| | Valve oper. time approx. 180 s at 50 Hz | | | |
| | Max. ambient temperature 50 °C | | | |
| IP43 enclosure (for vertical installation) | | | | |

Manufacturer: GEA Happel Klimatechnik

Order no.: V□□□□□□.B□



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GB-Edenbridge
- 5** GEA Happel France sarl
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- 6** GEA Happel
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Capelle a/d IJssel

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- 8** GEA-Büro West
A-6020 Innsbruck
- 9** GEA Klimatechnika Kft
H-1022 Budapest
- 10** GEA Thermtec
Schweiz AG
CH-3065 Bolligen-Station
- 11** GEA LVZ, a.s.
CZ-46120 Liberec
GEA Klimatizace spol. s r.o.
CZ-46312 Liberec
- 12** GEA-Klima-rashladna
tehnika d.o.o.
HR-10000 Zagreb
- 13** GEA Klimatizácia s.r.o.
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- 14** GEA
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- 15** GEA Konditioner
Moskva
Moskva
- 16** GEA Klimatizacija
Ukraina
Kyjiv
- 17** ISISAN
TR-80700 Balmumcu
Istanbul
- 18** GEA
Klimatizacijska Tehnika
SL-1000 Ljubljana
- 19** GEA PT Baltic Ltd.
LT-2009 Vilnius
- 20** GEA PT Baltic Ltd.
LT-2009 Vilnius

- 21** GEA PT Baltic Ltd.
LT-2009 Vilnius
- 22** GEA PT Baltic Ltd.
LT-2009 Vilnius
- 23** GEA Klimatehnika YU
YU-11070 Novi Beograd
- 24** GEA EXOS
Luftbehandling AB
S-30245 Halmstad
- 25** GEA
Climatización España
E-08870 Sitges, Barcelona
- 26** Nónio, Lda.
P-1269-090 Lisboa
- 27** EVISS Ltd.
BG-7000 Rousse
- 28** Oy Teknocalor AB
FIN-01300 Vantaa

