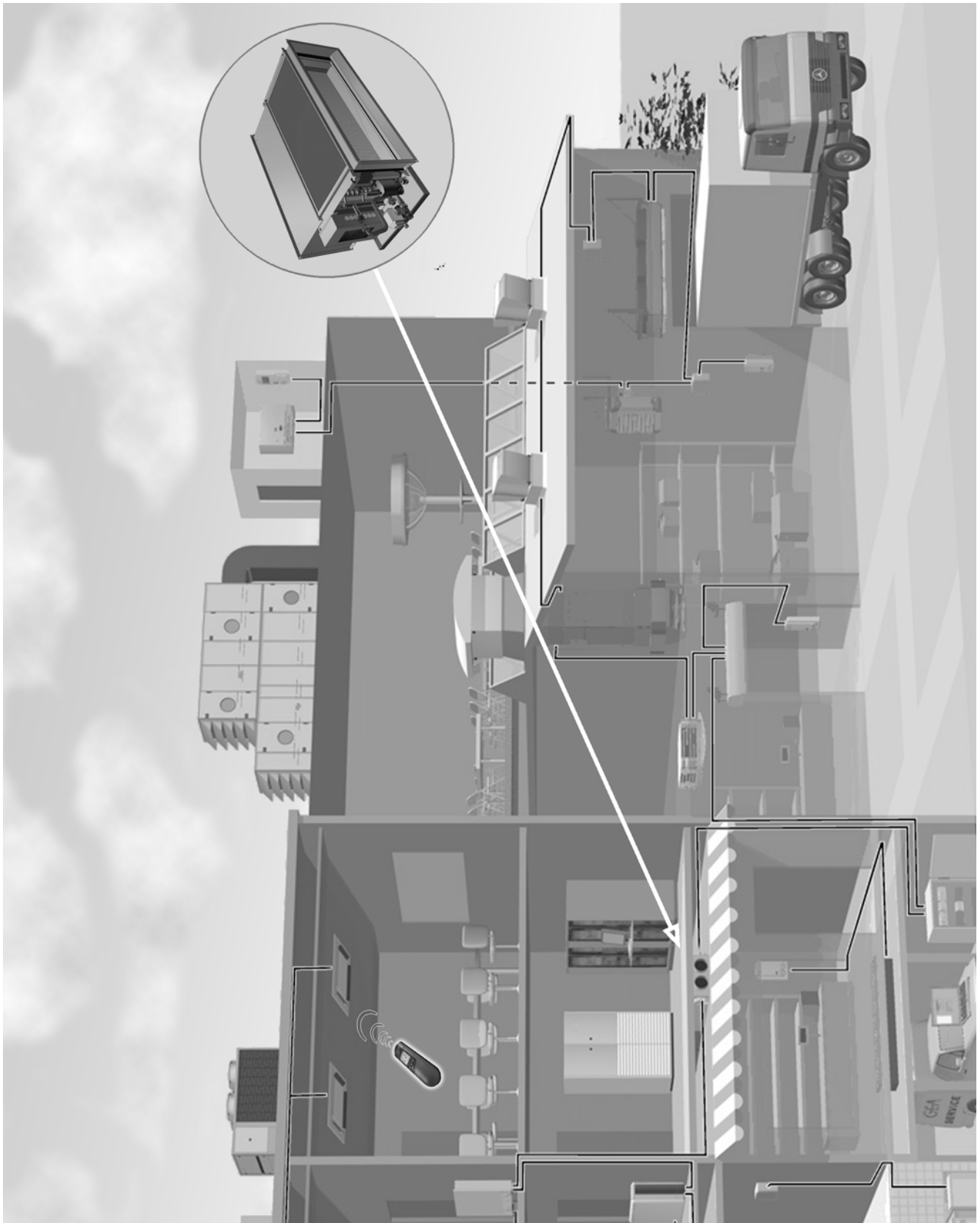


GEA Fan Coil Units

High-performance distribution of air and power:
GEA HyPower-Geko®

Operation manual

Product range of GEA Air Treatment



Unit type code

Unit type code

Control packet

Valve key

Model size

1 = Model size 1
2 = Model size 2
3 = Model size 3
4 = Model size 4

Capacity stage

1 = Capacity stage 1
2 = Capacity stage 2
3 = Capacity stage 3

Aerodynamic function

U = Recirculating-air unit

Medium function

Heating only
0W = PWW

Cooling only
W0 = Chilled water pump

Cooling or Heating
WC = Pumped chilled - warm water

Cooling and heating
WW = Pumped chilled - warm water

Medium connection

Ceiling
3 = Left
4 = right

Speeds

Terminal box with terminal strip
F = Min..Max (EC motor)

Metal steel electric control box with terminal block or for integrated controls
S = Min..Max (EC motor)

Thermal contact
E = EC motor - with integrated motor protection

Condensate pump
0 = with condensate drain
1 = with condensate pump

Fan chamber
A = without fan chamber
B = with fan chamber
C = with fan chamber - insulated

Filters
0 = without mat filter
2 = G2 mat filter
4 = G4 mat filter

Controller type
3 = MATRIX 3000
5 = MATRIX 3500
4 = MATRIX 4000

Controller package no.

Monitoring panel
IP20
B = MATRIX OP30C
C = MATRIX OP31C
D = MATRIX OP44C
E = MATRIX OP50C
F = MATRIX OP51C
N = MATRIX.IR
X = CET.EC
Z = without control panel

Unit type

Master unit, control panel
A = control panel enclosed
Master unit
C = without control panel
Slave unit
D = without control panel

Function type
R = 3-point 230 V
T = 2-point 230 V
N = 3-point 24 V
Q = 2-point 24 V
S = 0-10 V, 24 V
C = 3-point 230 V + 2 contacts

Valve body
2 = 2-way
3 = 3-way

K_{vs}-value
03 = K_{vs} 0,25 (R, N, S, C)
04 = K_{vs} 0,40 (R, N, S, C)
06 = K_{vs} 0,63 (R, N, S, C)
10 = K_{vs} 1,0 (R, N, S, C)
16 = K_{vs} 0,40 (R, N, S, C, T, Q)
25 = K_{vs} 2,5 (R, N, S, C, T, Q)
40 = K_{vs} 4,0 (R, N, S, C, T, Q)
63 = K_{vs} 6,3 (R, N, S, C, T, Q)
80 = K_{vs} 8,0 (R, N, S, C, T, Q)

Connection/shut-off
0 = Inlet/outlet flow with outside thread
1 = Inlet/outlet with solder fitting
2 = Inlet/outlet + ball trap with external thread
3 = Inlet/outlet + ball trap with solder fitting
4 = Inlet + ball trap/
outlet + shut-off valve with external thread
5 = Inlet + ball trap/
outlet + shut-off valve with solder fitting

Medium connection
L = Left
R = Right

Accessory key

Model size
1 = Model size 1
2 = Model size 2
3 = Model size 3
4 = Model size 4

Accessory class
A = Air-side accessories

Accessory types

Inlet side (intake)
Air-intake plenum with round connector (not insulated)
03 = Intake flexible connection
21 = Intake sound absorber connection
51 = Air intake grille (intervention protection)

Discharge side (outlet)
04 = Discharge plenum with round connector (insulated)
11 = Air discharge flexible connection
21 = Air discharge sound attenuator connection
91 = Air discharge transition piece

Other
61 = Suspension rail - 950 mm
62 = Suspension rail - 1550 mm
63 = Suspension rail - 2150 mm
71 = Seal cap for round connector (insulated)
82 = Spare filter G2
84 = Spare filter G4

Intake - discharge side
1 = Inlet side (intake)
2 = Discharge side (outlet)
3 = Other

*) Connection side from front, viewing the discharge

Table of Contents

1	Safety and User Instructions	8
1.1	Availability of the operation manual	8
1.2	Symbols used	8
1.3	Safety instructions: warning and danger symbols	8
1.4	Safety-conscious work procedures	9
1.5	Personnel selection and qualification	10
1.6	Proper use	10
1.7	Improper use	12
1.8	Safety regulations and codes	12
1.9	Modifications and changes	12
1.10	Spare parts	12
2	Technical Description	13
2.1	Basic unit components	13
2.2	Material specification	15
2.3	Range of Application	15
2.3.1	Water inlet temperature	15
2.3.2	External air side resistance	16
2.3.3	Unit and heat exchanger	16
2.3.4	Valves with modulating actuators	17
2.3.5	Valves with thermoelectric actuators	17
2.3.6	Valves with continuous actuators	18
2.4	Dimensions	18
2.4.1	Basic unit	18
2.4.2	Air side accessories	19
2.5	Unit data	21
2.5.1	Unit weight and water content of the heat exchanger	21
2.5.2	Air flow rate	21
2.5.3	Acoustic values	21
2.5.4	Electrical data of fans with EC motors	22
2.5.5	Electrical data of valve actuators	22
2.6	Condensate pump	22
2.6.1	Function of condensate drain	22
2.6.2	Technical data and capacity of condensate pump	23
2.7	Air side accessories	24
3	Shipping and storage	25
3.1	Transport safety	25
3.2	Packaged content	25
3.3	Packaging	25
3.4	Shipping	25
3.5	Temporary storage	26
3.6	Disposal	26

4	Mounting	27
4.1	Installation site	27
4.2	Recommended service opening for maintenance work on the basic unit	27
4.3	Pre-installation work	28
4.4	Unit mounting	30
4.4.1	Installation with various fixing materials	30
4.4.2	Mounting with suspension rail (accessory)	32
4.4.3	Assembly discharge transition piece	35
4.4.4	Mounting flexible canvas connection	35
4.4.5	Installing contact protection	36
4.4.6	Assembly of the intake/discharge sound attenuator	36
4.4.7	Installation intake/discharge plenum and seal cap for round connector DN250	37
4.4.8	Installation condensate tray	38
4.4.9	Assembly of auxiliary drain pan	38
5	Hydraulic Connection	39
5.1	General	39
5.2	Overview of valves	39
5.3	Heating and cooling connections for units without valves or with on-site valves provided by others	41
5.3.1	Mounting connections	41
5.3.2	Medium connection	42
5.3.3	Medium connection 2-pipe system	42
5.3.4	Medium connection of a 4-pipe system	43
5.4	Heating and cooling water connections for units with factory-mounted valves	45
5.4.1	Mounting connections	45
5.4.2	Medium connection in a 2-pipe system	46
5.4.3	Medium connection in a 4-pipe system	48
5.5	Connecting condensate drain	50
5.6	Connecting condensate pump	51
6	Electrical connection	53
6.1	Connection diagrams	53
6.2	Terminal box or electrical control box	53
6.3	Fan Speed	55
6.3.1	Fan with EC motor	55
6.4	Connection with control by others	55
6.4.1	Connection of HyPower-Geko with EC motors	56
6.5	Overview of the GEA MATRIX control electronics	58
6.6	Mounting control panel	58
6.7	Electrical connection with GEA MATRIX	60
6.7.1	Connecting mains supply voltage for controller	60
6.7.2	Completing bus connection	61
6.7.3	Connecting external sensor (option)	62
6.7.4	Connecting the inlet sensor (option)	62
6.7.5	Connecting room sensor/return-air sensor (option)	62
6.7.6	Connecting supply-air sensor (for subsequent retrofitting)	63
6.7.7	Connecting status and fault signal	63
6.7.8	Connecting function inputs and outputs	63
6.8	Network and shielding connection MATRIX.Net	64
6.8.1	Group structure	64

6.8.2	Network structure MATRIX.Net	65
6.8.3	Topologies of network MATRIX.Net	66
6.8.4	Line structure	67
6.8.5	Line structure with branch feeder	67
6.8.6	Network set up MATRIX.Net	69
7	Commissioning	71
7.1	Safety check	71
7.1.1	Pre-commissioning checklist	71
7.1.2	The following pre-commissioning checks must be performed:	72
7.2	Checking the control and shut-off valves	73
7.2.1	Checking the control valves	73
7.2.2	Shut-off valve settings (variants)	74
7.2.3	Shut-off valve for control valves up to 1.6 kvs (1/2") value for fan coil units	75
7.2.4	Shut-off valve for control valves from to 2.5 kvs (3/4") to 4.0 kvs (3/4") value for fan coil units	76
7.2.5	Shut-off valve for control valves from to 6.3 kvs (5/4") to 8.0 kvs (5/4") value for fan coil units	77
7.3	Unit air venting	78
7.4	Checking the condensate drain	78
7.5	Terminating resistors	79
7.6	Address setting	80
7.7	Setting limitation functions	81
7.8	Switch on unit	82
7.9	Checking data connection	83
7.9.1	Checking data connection	84
7.10	Checking control inputs and outputs	84
7.10.1	Functional input	84
7.10.2	Operating programs	85
7.11	Check condensate pump (applies only to cooling units with condensate pump)	86
7.12	Functional characteristics for the use of GEA MATRIX	87
7.12.1	Fan	87
7.12.2	Valves	88
7.12.3	Condensate pump	88
7.12.4	Standby mode	88
7.12.5	Indoor Anti-Freeze Protection	89
7.12.6	Summer / winter compensation	89
8	Maintenance and Troubleshooting	90
8.1	Maintenance	90
8.2	Quarterly maintenance	91
8.2.1	Examine filter	91
8.2.2	Replacing filter	92
8.2.3	Examine WAT and condensate tray	92
8.3	Annual maintenance	93
8.3.1	Clean accessory modules (sound absorber, intake/discharge boxes) (optional)	93
8.3.2	Checking bolt and screw medium connections	93
8.3.3	Checking the electrical connections and earthing	94
8.3.4	Air venting the heat exchanger	94
8.3.5	Check the heat exchanger and drip tray for dirt/mold, and cle-	

	an and disinfect if required.	94
8.3.6	Check fan	96
8.3.7	Check internal insulation for dirt and mould and, if necessary, clean and disinfect	97
8.3.8	Check the valves	99
8.4	Before cooling season	99
8.4.1	Clean the sensor of the condensate pump	99
8.4.2	Checking condensate pump function	101
8.5	Break-downs	101
	Declaration of Conformity.	107

1 Safety and User Instructions

This is an original operation manual verified by the manufacturer.

GEA HyPower fan coil units are developed and manufactured in accordance with the state-of-the-art technological standards, established technical safety codes and EC Directive on Machinery.

Use the unit when it is in a technically sound condition for the intended purpose observing the current operation manual, taking safety aspects and potential hazards into account! Otherwise failure to follow these instructions may result in death or injury to the user, third persons or damage to the GEA unit, connected units or other equipment. Have all faults repaired by an authorized specialist without delay!

1.1 Availability of the operation manual

This operation manual contains important instructions regarding safe and proper operation of the GEA unit.



This operation manual applies to installation companies, operators, building technicians, technical personnel or instructed persons as well as electricians.

This operation manual must be available at the location of the unit at all times. When working on the equipment, observe all instructions and precautions in the current operation manual, in particular the chapter on safety.

1.2 Symbols used

The following symbols are used to highlight particular text sections in this operation manual:

- This symbol is used to indicate lists.
- This symbol indicates handling instructions.
- ✓ This symbol indicates the result of an action.



USER INSTRUCTIONS

User instructions provide optimal, efficient and environmentally friendly methods for using and handling the units.



RECYCLING

This symbol is used to highlight instructions on proper reuse of packaging material and disused components and assembly groups (separated according to recyclable materials, e.g. metal, plastic, etc.).

1.3 Safety instructions: warning and danger symbols

All information in this chapter is important and relevant for your safety. That is why not all of the information contained in the present chapter is labelled with special danger pictograms.

In subsequent chapters of this manual, warning notes are indicated by pictograms. General safety instructions are listed at the beginning of the respective chapter and special safety instructions on specific jobs are listed along with the respective steps. The following warnings are used:

**HAZARDOUS VOLTAGE!**

This symbol indicates a risk of electrical shock that can result in serious injury, death and material damage.

**DANGER OF SCALDING!**

This symbol indicates a risk of scalding through running hot liquids that can result in personal injury including death and material damage.

**WARNING: RISK OF ROTATING COMPONENTS!**

This symbol indicates hazardous rotating parts with a risk of personal injury including death and material damage.

**DANGER DUE TO OVERHEAD LOADS!**

This symbol indicates a risk of hanging loads that can result in serious injury, death and material damage.

**PERSONAL INJURY!**

This symbol indicates (different from the above-mentioned danger types) a hazardous location with a risk of personal injury including death and material damage.

**DAMAGE TO THE UNIT!**

This symbol indicates a hazardous location with a risk of material damage that can also lead to personal injury.

**ENVIRONMENTAL DAMAGE!**

This symbol warns about damage to the environment.

1.4 Safety-conscious work procedures

To ensure your own safety consider the following safety instructions:

**HAZARDOUS VOLTAGE!**

Before carrying out any jobs on the unit, power the unit down to prevent injury from electrical current. Ensure that the unit is secured against being switched on again at an appropriate point of the on-site power supply.

**DANGER OF SCALDING!**

Before performing work on the valves or the inlet or outlet pipes, seal off the heating or cooling medium inlet to prevent scalding. Commence work only after the heating medium has cooled down.

**WARNING: RISK OF ROTATING COMPONENTS!**

Rotating fan impeller wheel poses a risk of injury! Before performing any work on the unit, ensure that the unit is de-energized. Ensure that the unit is secured against being switched on again at an appropriate point of the on-site power supply.

**DANGER DUE TO OVERHEAD LOADS!**

Wear a helmet and safety boots to prevent injury from falling components, especially when fitting the unit to the ceiling. Ceiling installations should always be performed by two persons.

**PERSONAL INJURY!**

Always wear protective gloves when shipping or installing the unit to prevent injury caused by sharp edges.

The following accident prevention regulations apply (VBG1, BGV A2 (previously: VBG4), VBG7w, VBG9a) and generally recognized codes for machinery and principles of engineering, particularly DIN VDE 0100, DIN VDE 0105.

1.5 Personnel selection and qualification

The unit may be installed, operated and maintained only by qualified, specially trained and authorized staff. The following tasks described in the operation manual and the service manual may only be performed by qualified personnel:

- Shipping and storage
- Mounting
- Hydraulic Connection
- Electrical connection
- Commissioning
- Maintenance

1.6 Proper use

Fan coil units of the HyPower Geko series are exclusively designed for heating, filtering and cooling purposes. Water or water/glycol solution (max. 50%) may be used as the medium.

**EQUIPMENT DAMAGE!**

During the installation it must be ensured that no condensation or splash water penetrates into electric units, also in the event of unit/installation damage.

The following limit values apply to medium for operating Cu/Al heat exchangers:

Parameter		Unit	Value
pH-value (at 20 °C)			7.5 - 9
Conductivity (at 20 °C)		µS/cm	< 700
Oxygen content	O ₂	mg/l	< 0.1
Total hardness		°dH	1 - 15
Dissolved sulphur	S		not detectable
Sodium	Na ⁺	mg/l	< 100
Iron	Fe ²⁺ , Fe ³⁺	mg/l	< 0.1
Manganese	Mn ²⁺	mg/l	< 0.05
Ammonium content	NH ₄ ⁺	mg/l	< 0.1
Chloride	Cl ⁻	mg/l	< 100
Sulphate	SO ₄ ²⁻	mg/l	< 50
Nitrite	NO ₂ ⁻	mg/l	< 50
Nitrate	NO ₃ ⁻	mg/l	< 50

Tab. 1-1: Limit values for medium used in closed heating and cooling circuits



EQUIPMENT DAMAGE!

In open systems (e.g. when using well water), used water should additionally be cleansed of suspended matter using a filter to be installed at the inlet. Failure to do so could result in a risk of erosion by suspended matter (consider the limit values specified in Tab. 1-1).

It must also be ensured that the unit is protected from dust and other substances that can cause acidic or alkaline reaction with water (aluminium corrosion).

It is not allowed to use HyPower units, in particular with a cooling function, for suction of kitchen exhaust air containing organic acids, e.g. vinegar. It is likewise not allowed to use cleaning agents containing vinegar or other organic acids, in order to clean rooms where such units are installed, due to a substantial risk of acid-related corrosion of aluminium fins!

The HyPower-Geko may only be operated indoors.

The HyPower-Geko is designed for wall and ceiling installation.



The unit is considered to be used in an improper manner if it is applied for other purposes or a purpose that is not covered by the scope of the given operation manual. The manufacturer or supplier is not liable for any resulting damage: the user alone bears the full risk.

The operator is responsible for proper use.

Proper use also stipulates the observance of the operation manual and the inspection and maintenance conditions defined by GEA.

1.7 Improper use

The HyPower-Geko may not be operated:

- for handling outdoor air,
- in areas subject to explosion risk,
- in wet areas or
- in locations with high dust levels or aggressive air.



PERSONAL INJURY AND EQUIPMENT DAMAGE!

Improper use can cause personal injury and material damage.

1.8 Safety regulations and codes

When carrying out installation, commissioning, maintenance and service of the GEA Flex-Geko units, all local safety regulations and codes as well as generally established technical practices must be followed.

1.9 Modifications and changes

No changes, add-ons or modifications may be performed on the GEA HyPower-Geko air treatment unit or its components.

Changes or modifications of the Flex-Geko unit will invalidate the CE conformity and render all warranty claims null and void.

1.10 Spare parts

Only original GEA Air Treatment spare parts are allowed, since GEA Air Treatment is not liable if third-party spare parts are used.

2 Technical Description

2.1 Basic unit components

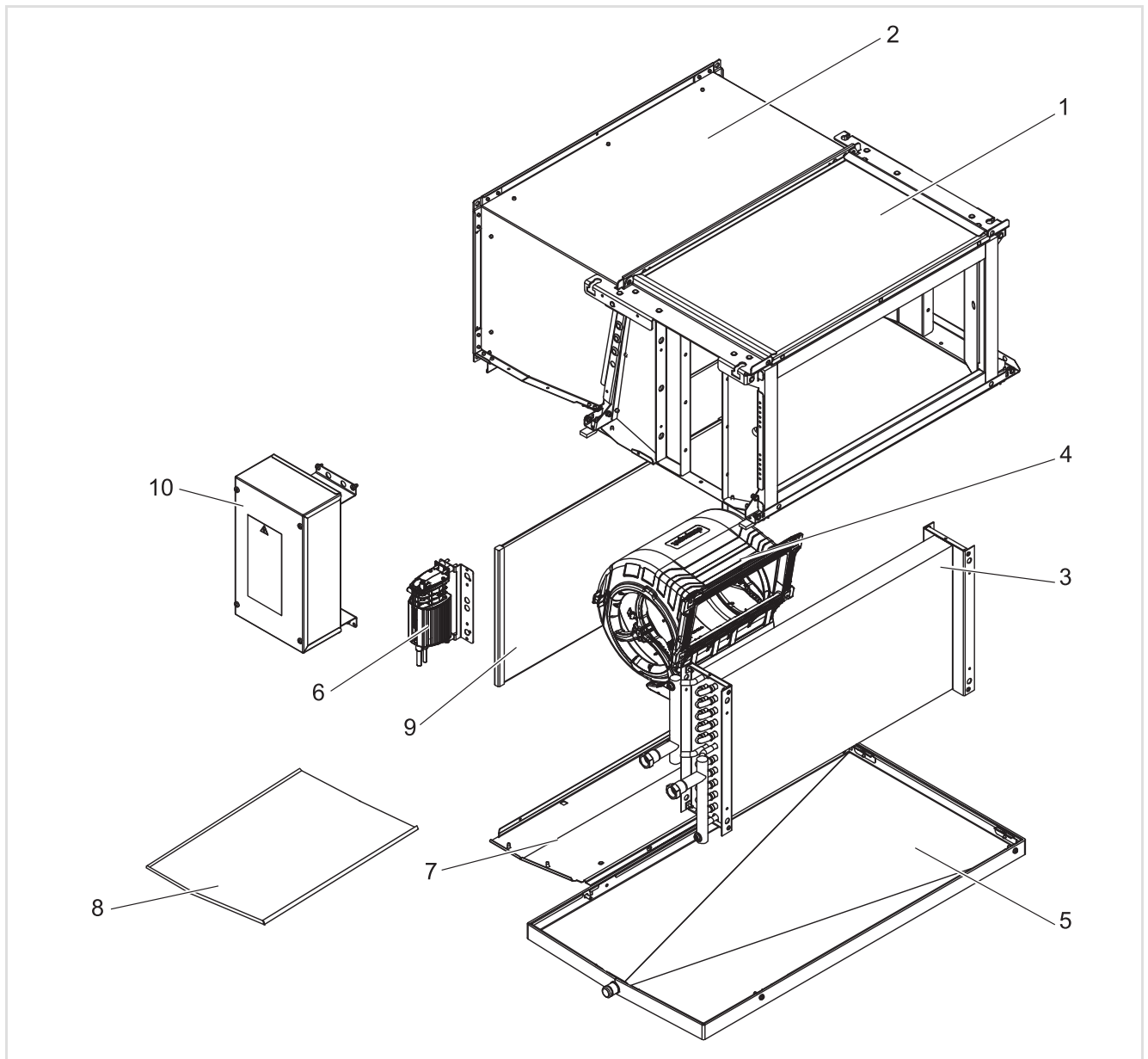


Fig. 2-1: Basic unit components

Pos. 1: Basic casing (incl. assembly mountings)
Pos. 2: Fan chamber (optional)
Pos. 3: Heat exchanger
Pos. 4: Fan
Pos. 5: Coil drip tray
Pos. 6: Condensate pump

Pos. 7: Service panel
Pos. 8: Auxiliary drain pan
Pos. 9: Filters
Pos. 10: Electrical control box

Various unit parts indicated in Fig. 2-1 are specified in detail as follows.

Basic casing (incl. assembly mountings) (Pos. 1)

The basic casing consists of a single-form panel design made of galvanized sheet steel with external insulation made of PE. The assembly mountings are for the ceiling assembly of the unit and are a component of the basic casing.

Fan chamber (optional) (Pos. 2)

The fan chamber consists of a single-form panel design made of galvanized sheet steel (optionally with inside insulation with a glass-fiber laminated mineral wool).

Heat exchanger (Pos. 3)

The heat exchanger for chilled and warm water has connecting spigots with 1/2" internal thread as well as air vents and drain valves. Depending on the unit application, the heat exchanger is equipped with two connecting spigots (water inlet and outlet in a 2-pipe system) or with four connecting spigots (water inlet and outlet in a 4-pipe system).

Fan (Pos. 4)

The fan consists of one or two centrifugal fans. The centrifugal fans are equipped with low-noise, maintenance-free ball bearings. The continuously variable EC motor is equipped with integrated control electronics and blockage protection. Protection class IP20 and insulation class F.

Coil drip tray (Pos. 5)

In the HyPower-Geko, the condensate tray is for the collection of the condensation water forming at the heat exchanger.

Condensate pump (Pos. 6)

The main drain pan collects condensate from the heat exchanger and valves of the HyPower-Geko.

Service panel (Pos. 7)

The service panel provides easy access to the unit's internal components.

Auxiliary drain pan (Pos. 8)

Additional condensate tray for the collection of condensation water from the control valves and shut-off instruments.

Filters (Pos. 9)

The filter consists of a filter hose with a clip-on frame and plastic clamping rail.

Electrical control box (Pos. 10)

Depending on the version, the switch box made of plastic or galvanized sheet steel contains:

- one or more printed circuit board(s)
- terminal block(s).

2.2 Material specification

Unit part	Material
Fan chamber (optional)	galvanized sheet steel (optionally: insulation made of mineral wool laminated with glass fiber)
Basic casing (including assembly mountings)	galvanized steel sheet, insulation PE
Heat exchanger	Copper/aluminium (copper/copper, copper/alodine)
EC motor	Different materials
Connecting cable	Different materials
Fan with casing	Plastic
Coil drip tray	galvanized sheet steel with polyethylene thermal insulation on the underside
Filters	Filter fleece, synthetic
Auxiliary drain pan	Galvanized metal sheet

Tab. 2-1: Material specification of unit components

2.3 Range of Application

2.3.1 Water inlet temperature

To prevent condensate from forming on non-insulated casing parts when the temperature falls below the dew point during cooling operation, certain minimum inlet temperatures must be maintained. These temperatures depend on ambient temperature and indoor relative humidity and are specified in the following diagram.

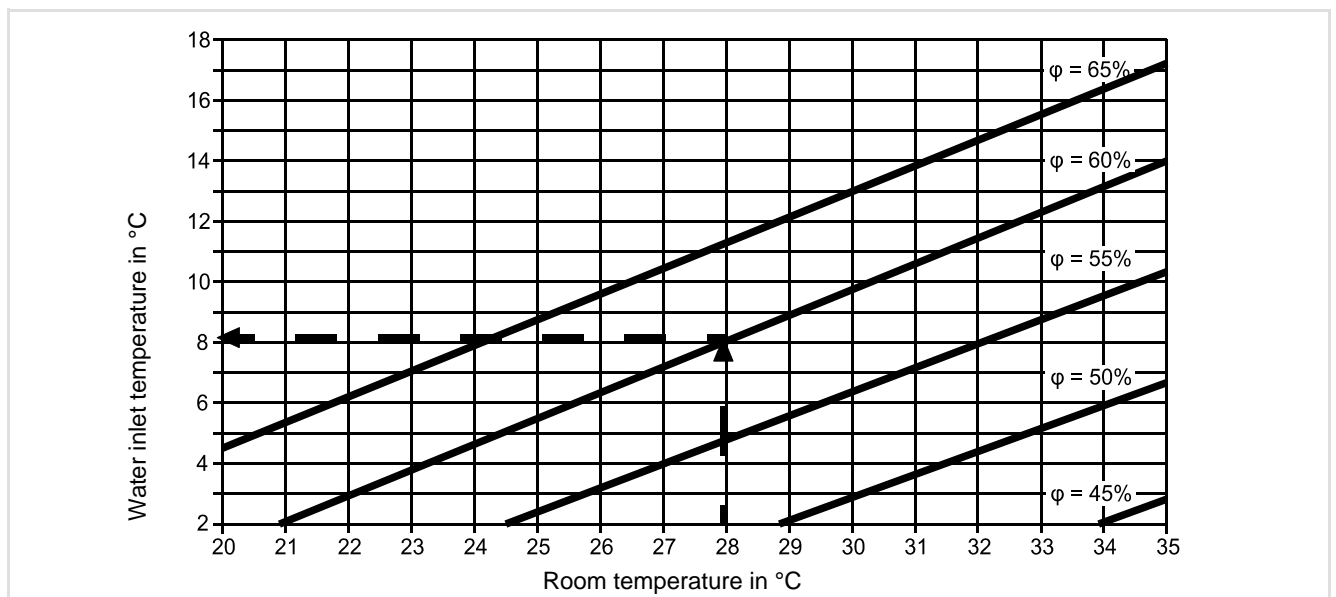


Fig. 2-2: Minimum allowed water inlet temperature as a function of indoor air condition; air pressure = 1013 hPa; j = relative humidity

Example:

The room temperature is 28°C, the relative humidity is 60%. According to the diagram (Fig. 2-2), the minimum allowable water inlet temperature is 8°C.

2.3.2 External air side resistance


NOTICE:

The on-site external air-side resistance may not exceed the values 200 Pa at 300 m³/h for BG 1, 500 m³/h for BG 2, 700 m³/h for BG 3 and 1000 m³/h for BG 4.

2.3.3 Unit and heat exchanger

Unit and heat exchanger	Values
Max. operating pressure/temperature	1.6 MPa (16 bar) / 90 °C
Max. allowed ambient temperature	40 °C
Min. allowed ambient temperature	2 °C
Operating voltage	230 V AC, 50/60 Hz
Power consumption/protection class	Refer to identification plate
Max. discharge temperature	75 °C (fire hazard)

Tab. 2-2: Operating limits for unit and heat exchanger

Model size	Capacity size	Maximum medium flow rate [l/h]		
		2-pipe cooling or heating circuit	4-pipe cooling circuit	4-pipe heating circuit
1	1	700	1050	342
	2	1400	1400	685
	3	2100	-	-
2	1	1050	1580	514
	2	2100	2100	1027
	3	3160	-	-
3	1	1400	2100	685
	2	2800	2800	1370
	3	4200	-	-
4	1	1400	2100	685
	2	2800	2800	1370
	3	4200	-	-

Tab. 2-3: Maximum allowed medium flow rate

2.3.4 Valves with modulating actuators

Valves with modulating actuator 230 V/24 V	Values	
	230 V	24 V
Max. operating pressure/inlet temperature	1.6 MPa (16 bar) / 110 °C	
Max. allowed ambient temperature	60 °C	
Operating voltage	230 V AC 50/60 Hz	24 V AC 50/60 Hz
Power consumption/protection class	0.7 VA/IP43	
Running time	120 s (50 Hz) 100 s (60 Hz)	150 s (50 Hz) 125 s (60 Hz)
water	Max. 50% glycol share allowable	

Tab. 2-4: Operating limits for valves with modulating actuators

Valves with modulating servo drives 230 V and 2 voltage-free auxiliary switches	Values
Max. operating pressure/inlet temperature	1.6 MPa (16 bar) / 110 °C
Max. allowed ambient temperature	60 °C
Operating voltage	230 V AC, 50/60 Hz
Power consumption/protection class	0.7 VA/IP43
Running time	150 s (50 Hz); 125 s (60 Hz)
Load capacity for auxiliary switch	max. 5 (1) A/250 V max. 100 mA/24 V
water	Max. 50% glycol share allowable

Tab. 2-5: Operating limits for valves with modulating servo drive and auxiliary switches

2.3.5 Valves with thermoelectric actuators

Valves with thermoelectric actuators 230 V/24 V	Values					
	M100 230 V	M100 24 V	MT4 230 V	MT4 24 V	MT8 230 V	MT8 24 V
Max. operating pressure/inlet temperature	1,6 MPa (16 bar) / 110 °C					
Max. allowed ambient temperature	50 °C					
Operating voltage	230 V AC 50/60 Hz	24 V AC 50/60 Hz	230 V AC 50/60 Hz	24 V AC 50/60 Hz	230 V AC 50/60 Hz	24 V AC 50/60 Hz
Power consumption/protection class	3 VA/IP43		3 VA/IP44		3 VA/IP44	
Running time	180 s	280 s	150 s	240 s	210 s	360 s
Water	Max. 50% glycol share allowable					

Tab. 2-6: Operating limits for valves with thermoelectric actuators

2.3.6 Valves with continuous actuators

Valves with continuous actuators	Values
Max. operating pressure/inlet temperature	1.6 MPa (16 bar) / 110 °C
Max. allowed ambient temperature	60 °C
Operating voltage	24 VAC, 50/60 Hz
Analog control signal	0 ... 10 (2 ... 10) V
Power consumption/protection class	1.4 VA/IP43
Running time	150 s (50 Hz); 125 s (60 Hz)
Water	Max. 50% glycol share allowable

Tab. 2-7: Operating limits for valves with continuous actuators

2.4 Dimensions

2.4.1 Basic unit

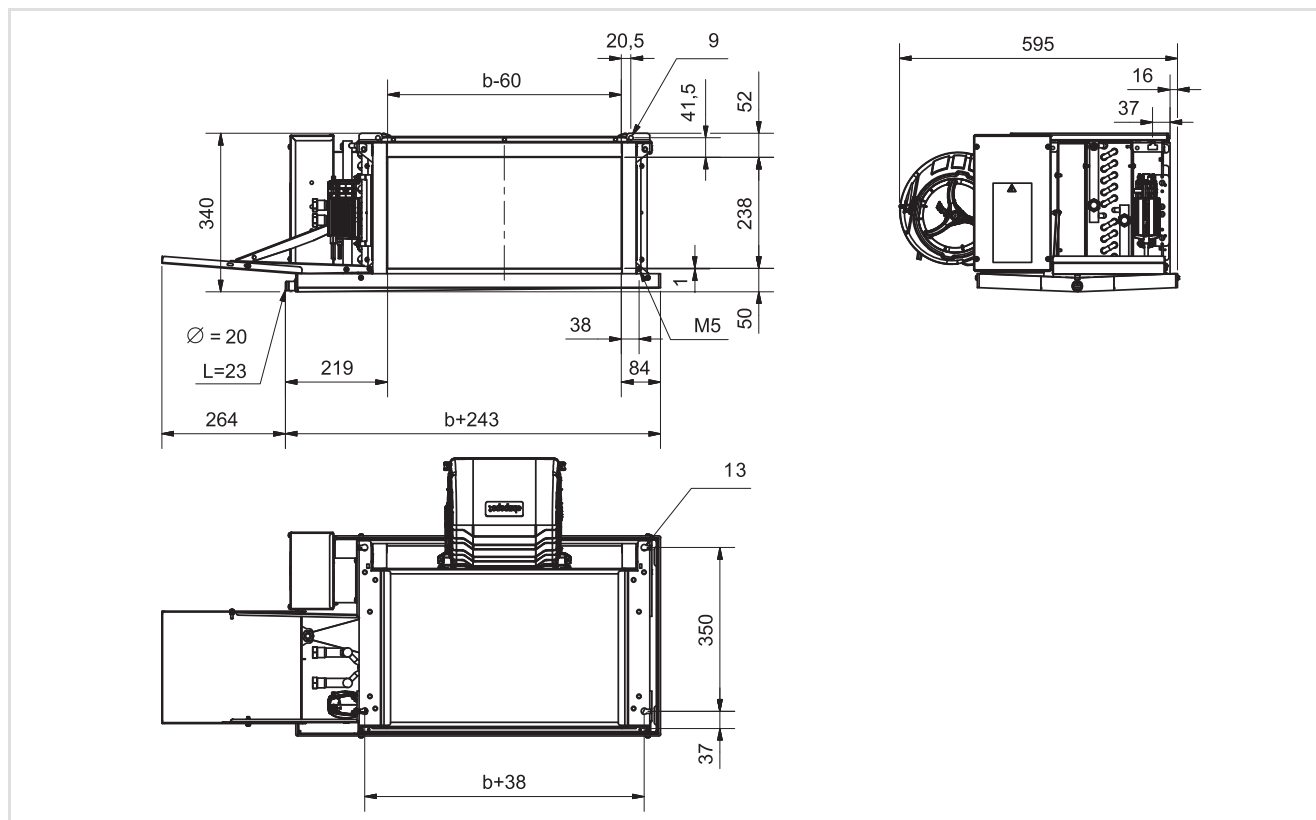


Fig. 2-3: Dimensions without fan chamber

Model size	1	2	3	4
b [mm]	560	865	1170	1590

Tab. 2-8: Width of basic unit, depending on unit size

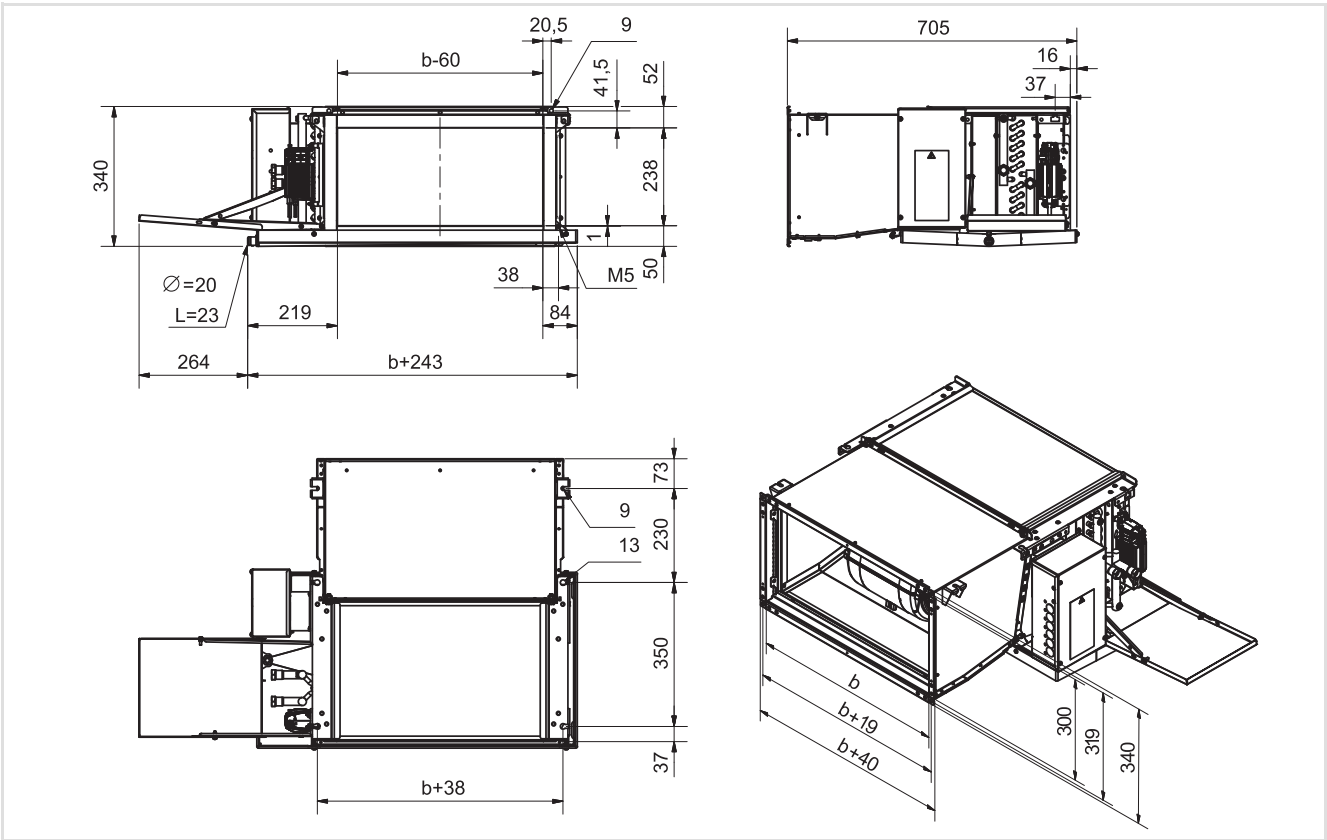


Fig. 2-4: Dimensions with fan chamber

Model size	1	2	3	4
b [mm]	560	865	1170	1590

Tab. 2-9: Widths dependent on unit size

2.4.2 Air side accessories

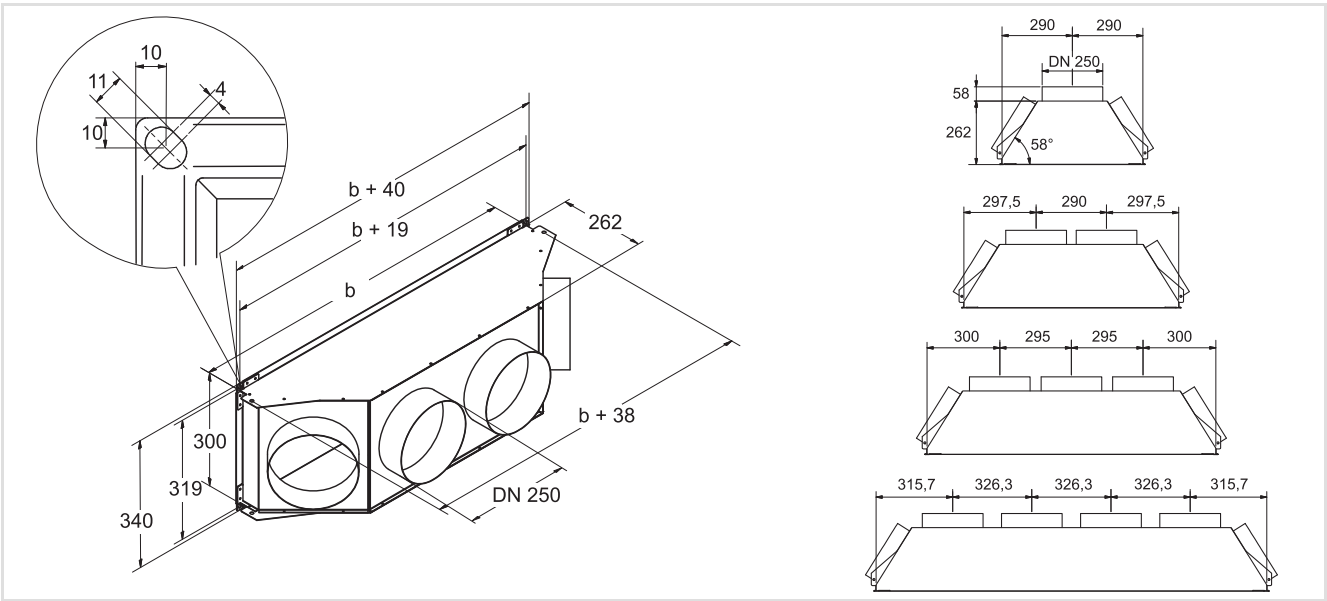


Fig. 2-5: Dimensions of intake and discharge plenum

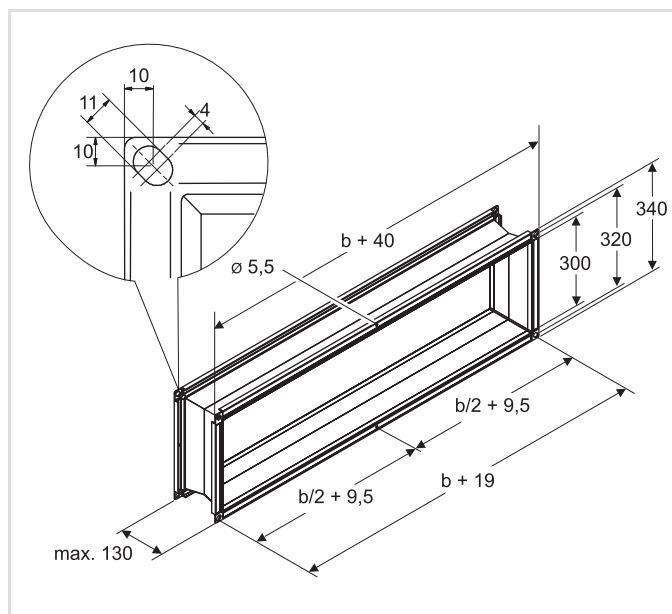


Fig. 2-6: Dimensions of intake and air discharge flexible connection

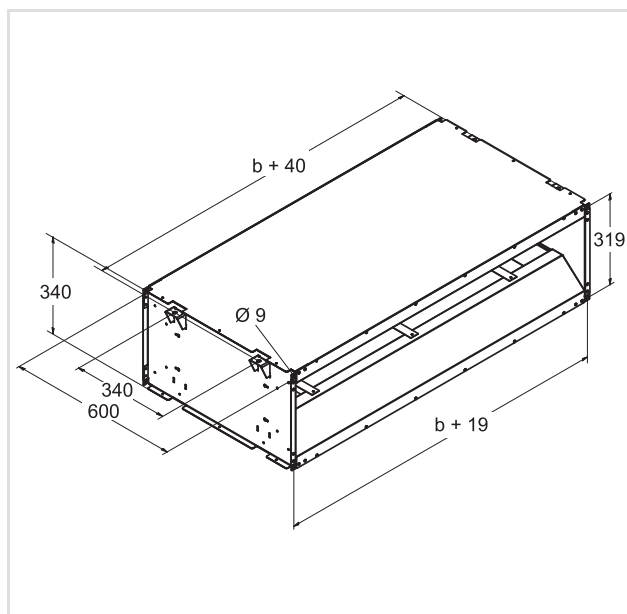


Fig. 2-8: Dimensions of intake and air discharge sound absorber fittings

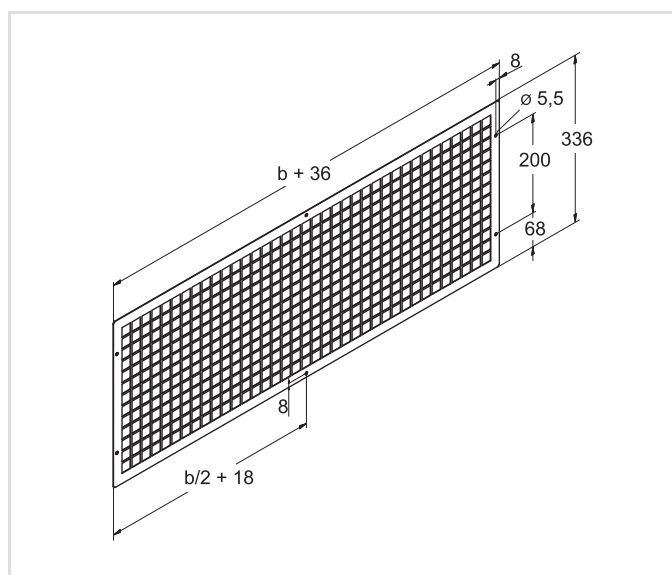


Fig. 2-7: Dimensions air intake grille (intervention protection)

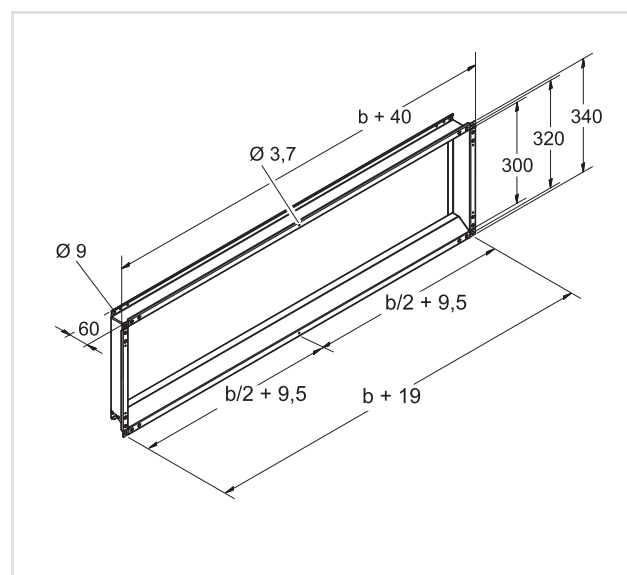


Fig. 2-9: Dimensions of air discharge transition piece

Model size	1	2	3	4
b [mm]	560	865	1170	1590

Tab. 2-10: Width of accessories dependent on unit size

2.5 Unit data

2.5.1 Unit weight and water content of the heat exchanger

Model size	Weight ¹⁾ [kg]			Water charge[l]						
				2-pipe			4-pipe			
	Cooling circuit		Heating circuit							
	VK A	VK B	VK C	CS 1	CS 2	CS 3	CS 1	CS 2	CS 1	CS 2
1	27	33	36	1,2	2,2	3,3	1,7	2,2	0,7	1,2
2	37	45	48	1,7	3,3	4,8	2,5	3,3	0,9	1,7
3	48	59	62	2,2	4,3	6,4	3,2	4,3	1,2	2,2
4	60	75	79	2,9	5,8	8,5	4,3	5,8	1,6	2,9

1) Max. basic unit weight without accessories LG ... capacity stage VK Fan chamber

Tab. 2-11: Unit weight and water charge of heat exchanger

2.5.2 Air flow rate

Model size	Air volume flow [m³/h] ^{*)}		
	Min. / Max.		
	VK A	VK B	VK C
1	505 / 1170	415 / 1095	415 / 1080
2	740 / 2300	525 / 2110	500 / 1965
3	1115 / 3460	815 / 3045	735 / 2745
4	1455 / 4540	970 / 4050	880 / 3695

*) at 0 Pa external pressure VK Fan chamber

Tab. 2-12: air flow rate

2.5.3 Acoustic values

Model size	Sound power level – intake-side [dB(A)] ^{*)}			Sound power level - discharge side [dB(A)] ^{*)}			Sound power level - casing radiation [dB(A)] ^{*)}		
	Min. / Max.			Min. / Max.			Min. / Max.		
	VK A	VK B	VK C	VK A	VK B	VK C	VK A	VK B	VK C
1	52 / 74	46 / 72	42 / 68	51 / 73	48 / 73	45 / 72	-	43 / 65	37 / 60
2	45 / 75	39 / 71	37 / 67	42 / 75	41 / 73	40 / 72	-	35 / 64	30 / 58
3	54 / 77	48 / 75	46 / 71	50 / 76	49 / 75	48 / 75	-	41 / 68	37 / 62
4	50 / 78	46 / 75	43 / 72	46 / 76	43 / 74	42 / 73	-	40 / 68	36 / 62

*) For control voltage 2-10V at 0 Pa external pressure (free intake and discharge)
VK Fan chamber

Tab. 2-13: Acoustic values of the basic unit

2.5.4 Electrical data of fans with EC motors

Model size	Current consumption [A] ^{*)}			Power consumption [W] ^{*)}		
	Min. / Max.			Min. / Max.		
	VK A	VK B	VK C	VK A	VK B	VK C
1	0.13 / 1.54	0.11 / 1.47	0.11 / 1.44	20 / 213	18 / 212	16 / 206
2	0.18 / 2.09	0.16 / 2.10	0.15 / 2.07	17 / 296	13 / 300	11 / 288
3	0.30 / 3.43	0.26 / 3.47	0.23 / 3.47	33 / 510	27 / 485	26 / 471
4	0.29 / 3.76	0.26 / 3.98	0.23 / 3.83	30 / 591	25 / 573	23 / 541

^{*)} For control voltage 2-10V at 0 Pa external pressure (free intake and discharge)
VK Fan chamber

Tab. 2-14: Electrical data of fans with EC motors at 230 V, 50 Hz

2.5.5 Electrical data of valve actuators

2 and 3-way valves on/off control mode (thermoelectric actuator)						2 and 3-way valves modulating operation (modulating actuator)				2 and 3-way valves continuous operation (continuous actuator)	
Starting current [A]		operating current [A]		Power consumption [W]		Current consumption [A]		Power consumption [W]		Current consumption [A]	Power consumption [W]
230 V	24 V	230 V	24 V	230 V	24 V	230 V	24 V	230 V	24 V	24 V	24 V
0,3	0,6	0,013	0,09	3	3	0,03	0,03	7	0,7	0,06	1,4

Tab. 2-15: Electrical data of valve actuators at 230 V, 50 Hz and 24 V, 50 Hz (and 0-10 V signal)



NOTICE!

For protection, the values cited in the connection plans should be observed (see Chapter 6, Tab. 6-1).

2.6 Condensate pump

In cooling units, condensate may form and is collected in the coil drip tray. If a slope for condensate drainage is not fitted, a condensate pump must be installed. This pump drains condensate into higher placed upstream drainage pipework.

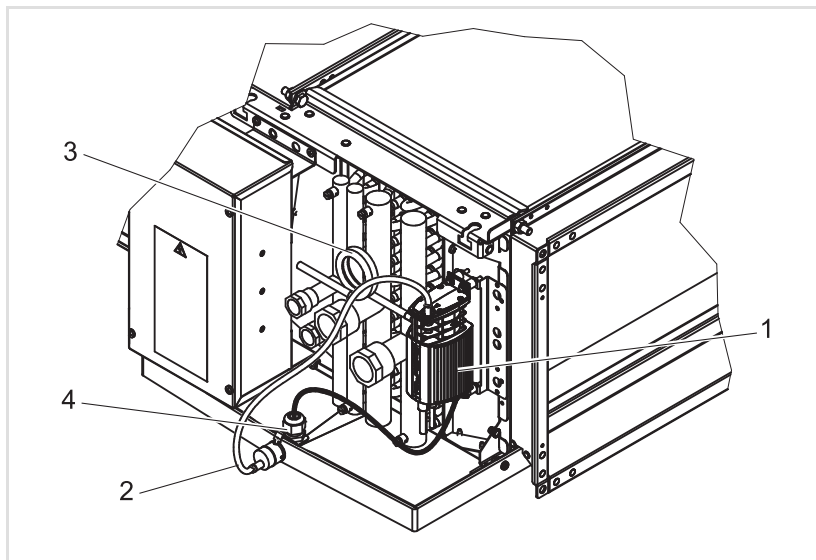
2.6.1 Function of condensate drain

A separate level sensor is installed on the side of the unit at the condensate tray other than the condensate pump, which performs the following functions:

- Start of the condensate pump when the condensate level exceeds 4 mm from the bottom of the condensate tray.
- Switch-off of the condensate pump after the condensate is pumped out.
- Sends the signal ALARM if the maximum permitted height of the condensate level of 12 mm from the bottom of the condensate tray is exceeded.

2.6.2 Technical data and capacity of condensate pump

The max. delivery head of the pump is 8 m, the maximum volume flow is 14 l/h. In the Fig. 2-11 the power of the pump is specified in l/h relative to the delivery head.



- Pos. 1: Condensate pump
 Pos. 2: Suction hose with suction basket
 Pos. 3: Pressure hose for on-site condensate connection (1.5 m long)
 Pos. 4: Fill level sensor with protective cover

Fig. 2-10: Condensate pump

Technical data of condensate pump

Technical Specifications	Values
Operating voltage	230 V AC/50 Hz
Starting current	max. 0.07 A
Operating current	0.02 A
Power consumption	4.7 W
Protection class	IP64
Max. pump head	8 m
Max. water flow rate	14 l/h
Sound power level	with H = 0 m 31 dB(A) with H = 1 m 32 dB(A)

Tab. 2-16: Technical data condensate pump

Condensate pump capacity

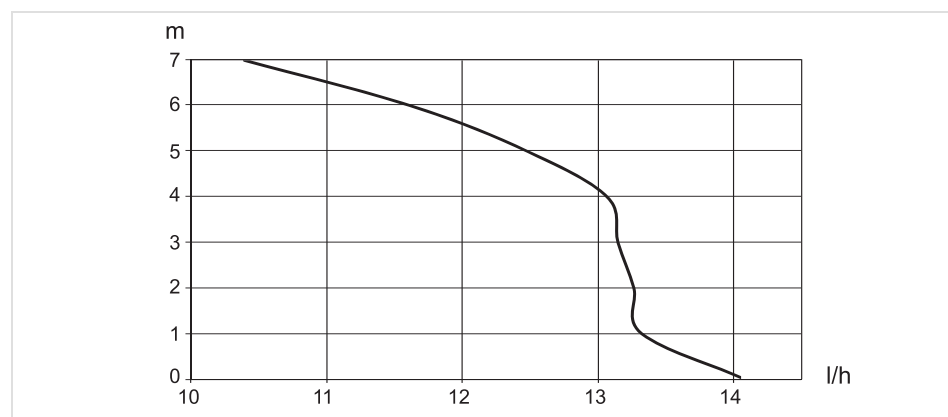


Fig. 2-11: Condensate pump capacity (pump head/volume)

2.7 Air side accessories

The following accessories can be supplied for the HyPower-Geko fan coil unit:

Designation	Order No.	Design version
Flexible connection	ZGH.#A112 discharge ZGH.#A111 intake	Fire classification B1
Air intake box with round connector, not insulated	ZGH.#A031	Air intake plenum with round connectors DN 250, galvanized sheet steel
Discharge plenum with round connector, insulated	ZGH.#A042	Discharge plenum with round spigot DN 250, galvanized sheet steel with exterior sound and heat insulation
Seal cap for round connection, intake, insulated	ZGH.0A711	Made of galvanized sheet steel, for the closure of the intake connector DN 250
Seal cap for round connector, discharge, insulated	ZGH.0A712	Made of galvanized sheet steel, for the closure of the discharge connector DN 250
Sound absorber for suction side assembly	ZGH.#A211	Galvanized sheet steel module with sound attenuating plates
Sound absorber for pressure side assembly	ZGH.#A212	Galvanized sheet steel module with sound attenuating plates
Discharge transition piece, insulated	ZGH.#A912	Module made of galvanized sheet steel with exterior thermal insulation
Contact protection	ZGH.#A511	Galvanized sheet steel, for preventing contact with unit intake opening, if no suction side accessories or on-site provided ducts are connected.
Suspension rail 950 mm 1550 mm 2150 mm	ZGH.0A613 ZGH.0A623 ZGH.0A633	For quick mounting of basic unit and accessories with threaded rods M8 and fixing material
Replacement filter set	ZGH.#A823 ZGH.#A843	Synthetic-filter hose, filter quality G2 (1 Set = 5 pieces) Synthetic-filter hose, filter quality G4 (1 Set = 5 pieces)

Tab. 2-17: Air side accessories HyPower-Geko



NOTICE!

The symbol "#" is a placeholder for the size still to be specified.

3 Shipping and storage

3.1 Transport safety

**DANGER DUE TO OVERHEAD LOADS!**

It is extremely dangerous to stand under overhead loads.

- Make sure there are no persons below an overhead load!

**DAMAGE TO THE UNIT!**

Improper shipping can cause damage to the fan coil unit.

- If damage has been caused by impacts to the unit or by dropping it, carefully check that the fan coil unit is working properly.
- Take care when transporting the fan coil unit!

3.2 Packaged content

Remove packing and inspect shipment immediately upon receipt to determine if any damage has occurred to the unit during shipment (if any damage is found, immediately file claim for damage with the transportation company), also check for missing items and verify that the shipment is complete. For this purpose compare the details of the unit type plate with the information on the dispatch note. The same applies to all accessory items. Missing parts or claims of shipping damage must only be reported to the transport insurance, if the damage has been confirmed by the delivering carrier.

3.3 Packaging

The unit is packed on a pallet in a carton with reinforcements that permits stacking (max. 2 pieces). The accessories are packaged individually in cartons and fastened to the carton of the unit. Everything is wrapped with a protective foil.

3.4 Shipping

**EQUIPMENT DAMAGE AND PERSONAL INJURY!**

- Always wear protective gloves to prevent injury caused by sharp edges.
- To prevent injury ensure that at least two people carry the HyPower-Geko.
- When delivering on pallets, use only lifting gear and transport vehicles with sufficient load-bearing capacity.
- Secure the load during transit to prevent it from tipping or falling.

Horizontal transport

The HyPower-Geko must only be transported and lifted on both sides of bottom edges (refer to Fig. 3-1).

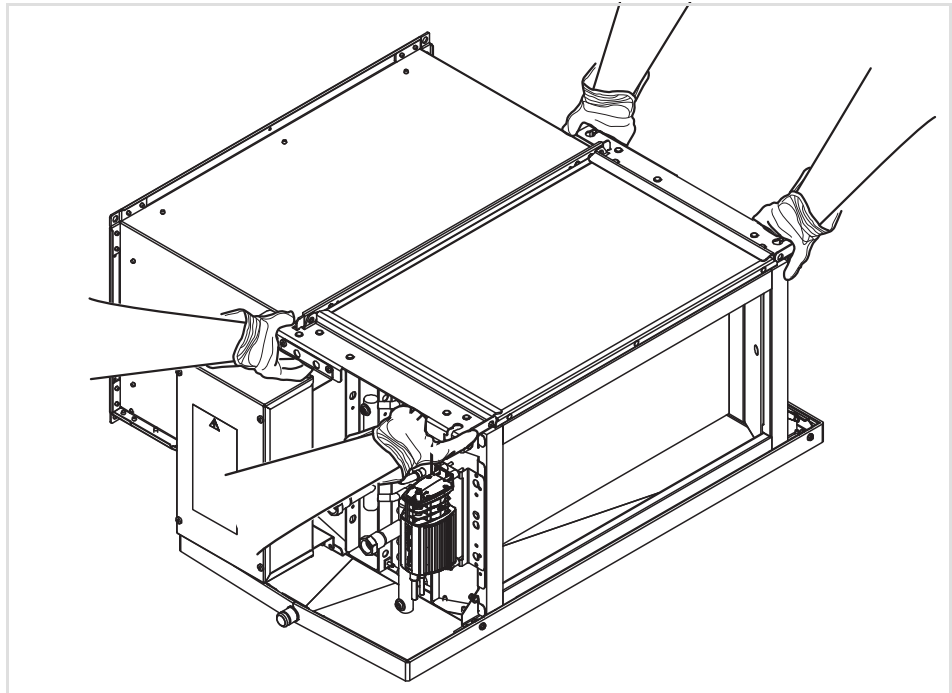


Fig. 3-1: Shipping

3.5 Temporary storage

When storing the unit for a temporary period, the following aspects must be considered:

- Store the fan coil unit in its original packing.
- The storage location must be protected from the elements, dry and dust-free with relative humidity between 50% and 85%. The storage temperature must be between -10 to +50 °C.



DAMAGE TO THE UNIT!

All residual water must be drained from the heat exchanger!
Frost risk!

- The fan coil unit must be protected from impacts, vibrations, etc.
- Protect the unit from soiling before and during installation

3.6 Disposal



RECYCLING!

Ensure that operating supplies, packaging and replacement parts are disposed of in a safe and environmentally friendly manner. Use the local recycling facilities and observe all pertinent local regulations and codes.

During disposal, the units components must be separated as far is possible and sorted by material type (refer to "Material specification" on page 15).

4 Mounting

**HAZARDOUS VOLTAGE!**

Before drilling, ensure that the drilling area is free from electrical cables and pipes.

**PERSONAL INJURY!**

Injury may be caused by falling parts and sharp edges! Wear a helmet, safety boots and protective gloves when installing the unit. Ceiling installations should always be performed by two persons.

**DANGER TO PERSONS / HAZARDOUS VOLTAGE!**

If the HyPower basic unit is operated without GEA accessories or on-site accessories provided by others or ductwork on air intake side - an appropriate contact protection must be provided at the unit air intake! In this case a contact protection supplied by GEA as an optional accessory can be used (Order-Nr ZGH.#A511, where „#“ is reserved for unit size).

**NOTE!**

It must be ensured that no mechanical deformations or twisting occurs when installing units in different positions and configurations.

4.1 Installation site

Type, condition and ambient temperature of the installation site must be suitable for the relevant fan coil unit (refer to Chapter 1.6 and Chapter 1.7). Consider the following points:

- Only indoor mounting of the unit is allowed.
- Ceiling or mounting systems must be capable of bearing the weight of the unit, including all accessories.
- Consider the appropriate fixing material (screws/bolts, plugs, etc.) that correspond with total unit weight and characteristics of suspension points.

**NOTICE!**

Make sure all wall and ceiling openings are completed in coordination with an architect or static engineer and the building contractor.

4.2 Recommended service opening for maintenance work on the basic unit

In order to carry out all necessary service and maintenance work on the basic unit it is recommended that a service opening with minimum dimensions of W x 1040 mm (W x 1150 mm)* is provided (see Fig. 4-1) .

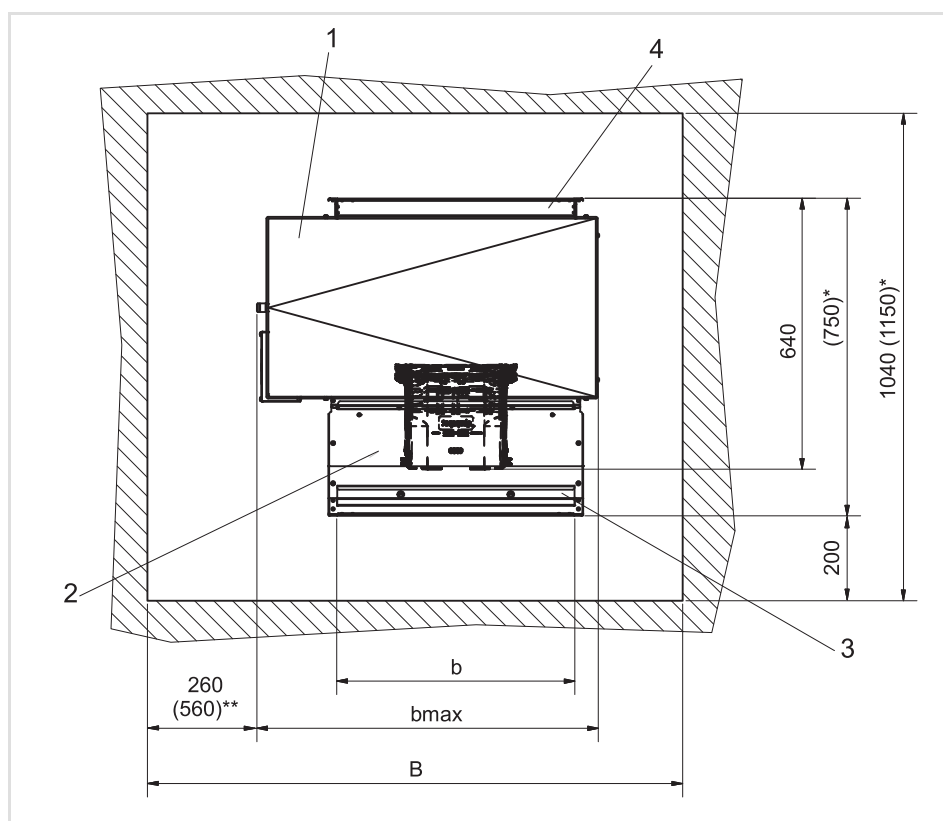


Fig. 4-1: Service opening

*) Dimensions in brackets apply to units with fan chambers

**) Dimensions in brackets apply to accessories

Pos. 1: Coil drip tray

Pos. 2: Service panel

Pos. 3: Filter behind cover strip

Pos. 4: Discharge transition piece

Model size	1	2	3	4
b [mm]	560	865	1170	1590
b _{max} [mm]	805	1110	1415	1835
B [mm]	1260	1560	1860	2290

Tab. 4-1: Dimensions basic unit and service opening



NOTICE!

Please consider that further or larger openings might have to be provided if accessories are mounted.

4.3 Pre-installation work

Depending on the connection side, the pipes can be connected from the left or from the right. The following installation clearances must be observed:

Position No., refer to Fig. 4-2	REASON	Installation clearance [mm]
1	for proper inflow of the air from the back (does not ap- ply if connected to an on- site intake duct)	to the back 200
2	for installation work, e.g. for lateral connection to the on- site valve piping	to the side 260 without valve accessories 560 with valve accessories

Tab. 4-2: Installation clearances

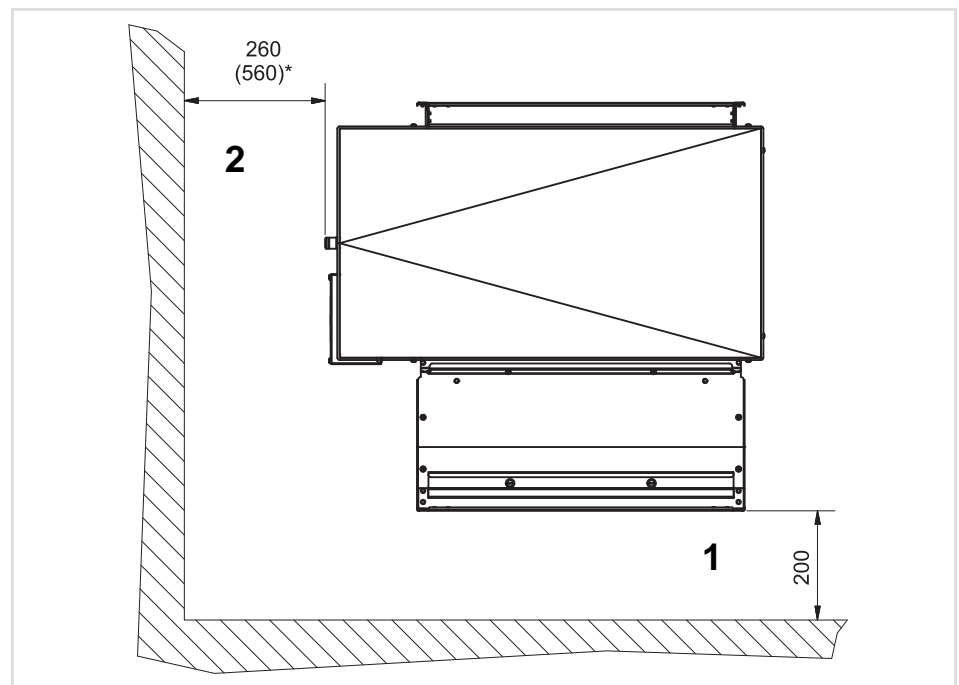


Fig. 4-2: Assembly spacing (viewing from below)

*) Dimensions in brackets apply to valve accessories for assembly of factory valve equipment

**NOTE!**

The spacing between unit top edge and room ceiling should be at least 50 mm.

4.4 Unit mounting

4.4.1 Installation with various fixing materials

To fasten the units, assembly mountings with 2 holes are provided (1 on each side, see Fig. 4-5, Pos. 1). Appropriate fixing accessories are needed depending on the mounting variant (refer to Fig. 4-4).

For mounting on the room ceiling, at least 2 holes (intake/discharge plenum, 1 on each side) or 4 holes (basic unit or intake/discharge sound attenuator, 2 on each side) are required.

The position of the holes of the assembly mountings is presented in the Fig. 4-3. The spacing of the holes of the assembly mountings correspond exactly to the spacing of the assembly holes in the room ceiling, for the basic unit as well as the assemblies of the accessory.



DAMAGE TO THE UNIT!

The unit must be mounted in such a way to ensure unobstructed air flow in subsequent operation.

The clearance between the unit top line and the room ceiling should amount to at least 50 mm.

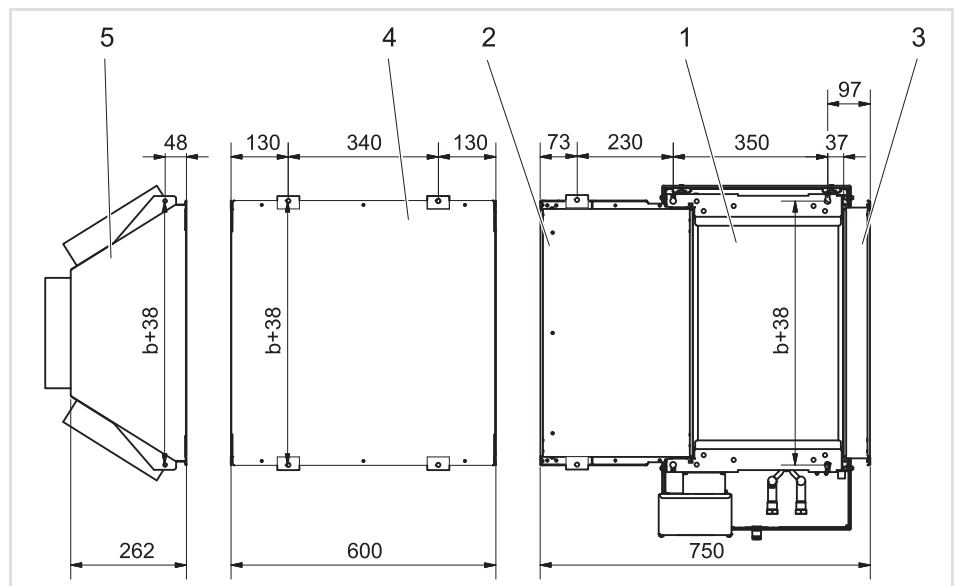


Fig. 4-3: Hole spacing of the assembly mountings

Pos. 1: Basic unit

Pos. 2: Fan chamber

Pos. 3: Discharge transition piece

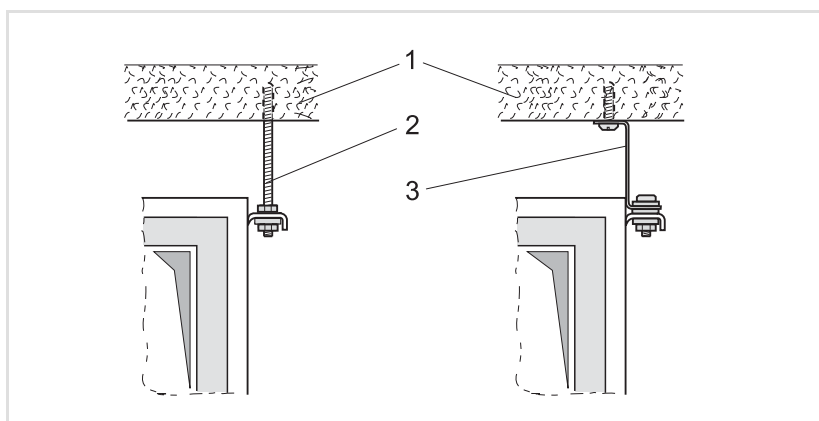
Pos. 4: Intake/discharge sound attenuator

Pos. 5: Intake/discharge plenum

Model size	1	2	3	4
b [mm]	560	865	1170	1590

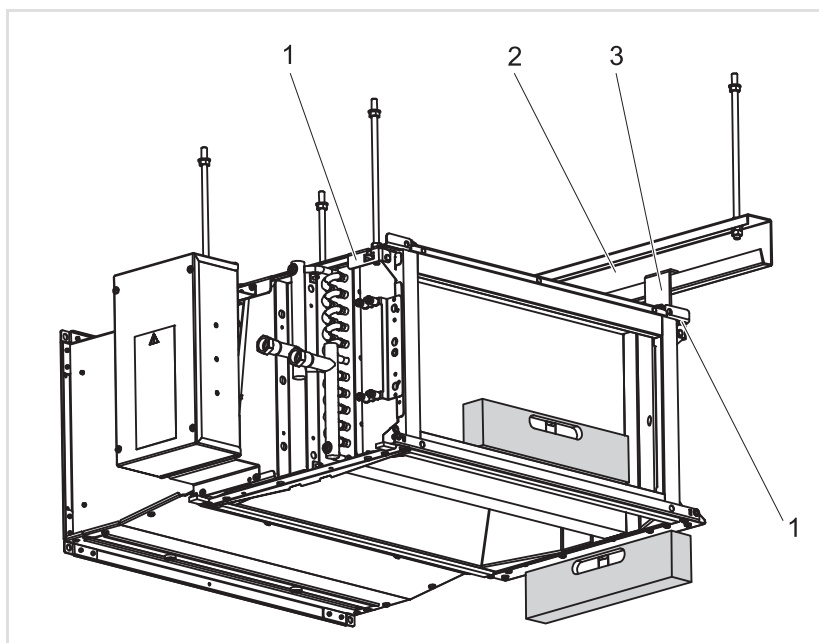
Tab. 4-3: Unit size dependent width of accessories

- Ensure that there is enough space available for valve installation.
- Ensure connection possibility for the mounting brackets (examples in Fig. 4-4).
- Use bolts/screws to fix the HyPower-Geko unit.
- Use a spirit level to exactly align the HyPower-Geko in longitudinal and lateral direction (refer to Fig. 4-5).
- Tighten the fixing bolts.



Pos. 1: Ceiling construction
Pos. 2: Threaded rod M8 (on-site)
Pos. 3: Z-Profile (on-site)

Fig. 4-4: Examples of mounting variants



Pos. 1: Assembly mountings
Pos. 2: Suspension rail
Pos. 3: Track adapter

Fig. 4-5: Assembly of the HyPower-Geko



NOTE!

Trouble-free condensate drainage is ensured only in horizontally mounted cooling units.

4.4.2 Mounting with suspension rail (accessory)

Suspension rails are available for easy and quick installation as an accessory.

Depending on the type and number of mounted accessory modules, three different rail lengths are available. The Fig. 4-6 demonstrates possible module combinations.

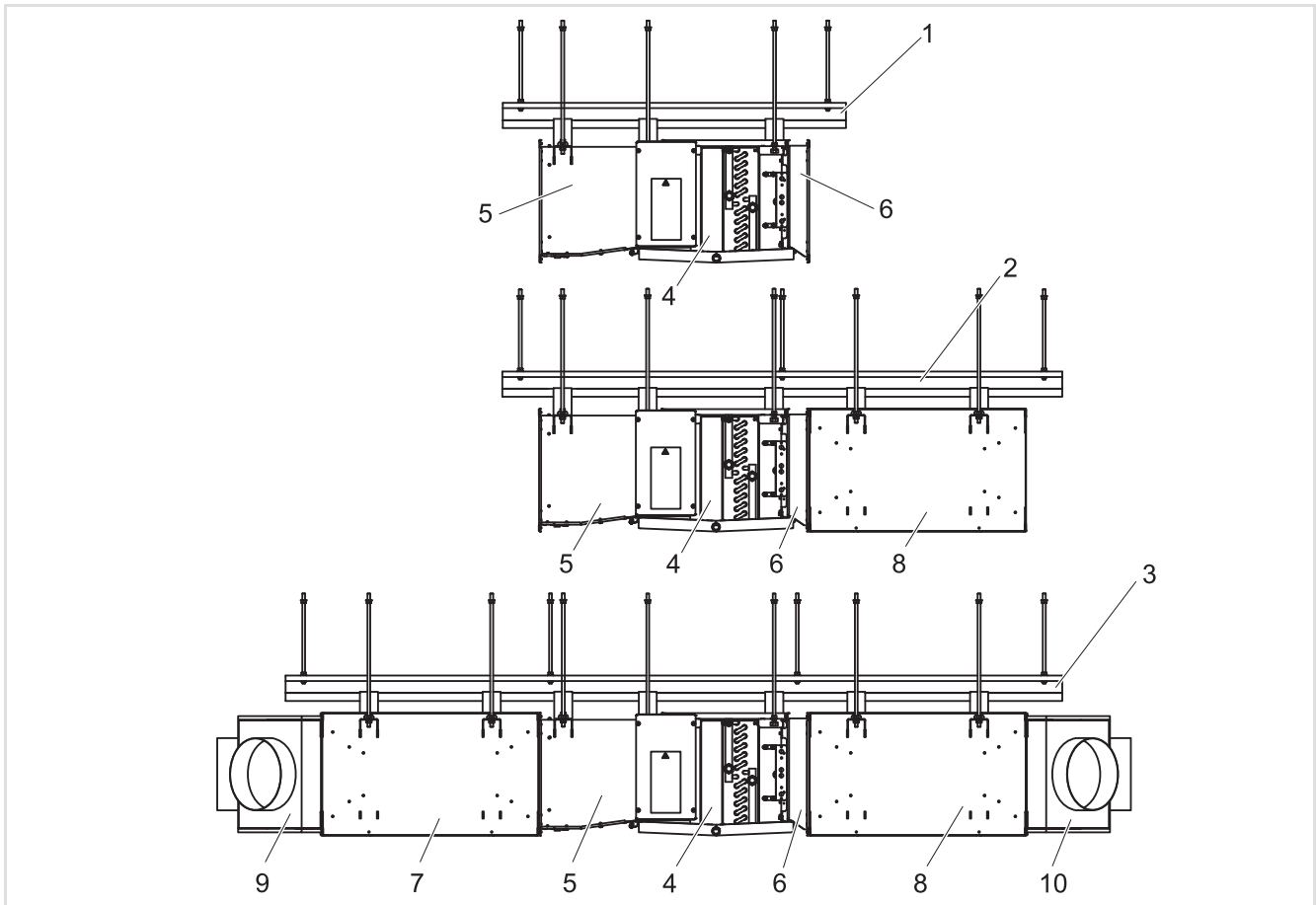


Fig. 4-6: Sample module combinations

- Pos. 1: Suspension rail length 950 mm (ZGH.0A613)
- Pos. 2: Suspension rail length 1550 mm (ZGH.0A623)
- Pos. 3: Suspension rail length 2150 mm (ZGH.0A633)
- Pos. 4: Basic unit
- Pos. 5: Fan chamber

- Pos. 6: Discharge transition piece
- Pos. 7: Intake sound attenuator
- Pos. 8: Discharge sound attenuator
- Pos. 9: Air intake plenum
- Pos. 10: Discharge plenum

Rail adapters are provided for the assembly of the unit using the suspension rail. The required mounting materials for the unit including threaded rods and screws is provided in the accessory package.

Hole spacing of the assembly mountings and suspension rails, see Fig. 4-8.



DAMAGE TO THE UNIT!

The unit must be mounted in such a way to ensure unobstructed air flow in subsequent operation.

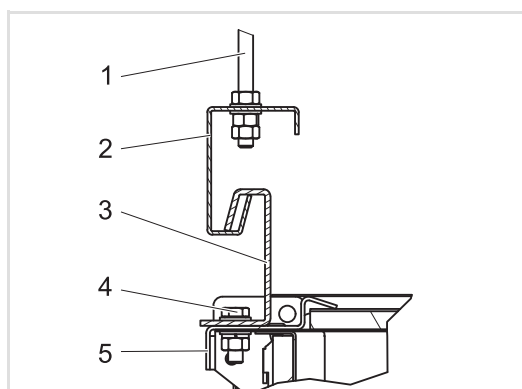


Fig. 4-7: Fixing rail adapter

- Pos. 1: Threaded rod M8
 Pos. 2: Assembly track
 Pos. 3: Track adapter
 Pos. 4: Screw M8x25, washer, nut
 Pos. 5: Assembly mounting of the unit/accessories

- Use the fixing material (see Fig. 4-7, Pos. 4) to fasten the rail adapters (see Fig. 4-7, Pos. 3) to the assembly mountings on the side of the unit/accessory (see Fig. 4-7, Pos. 5), on which the suspension rail (see Fig. 4-7, Pos. 2) is installed.

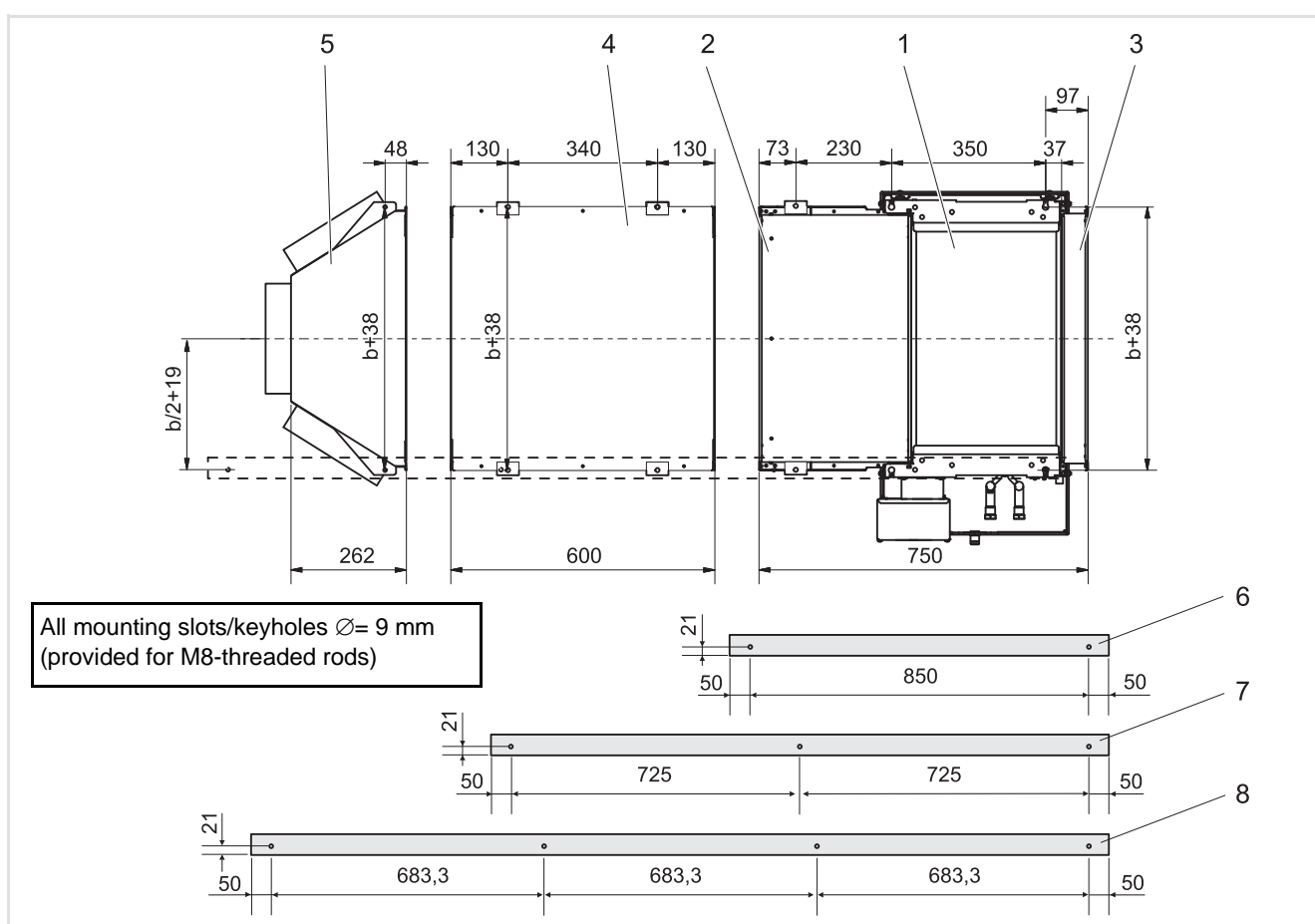


Fig. 4-8: Keyholes for mounting suspension rail

- Pos. 1: Basic unit
 Pos. 2: Fan chamber
 Pos. 3: Discharge transition piece
 Pos. 4: Intake/discharge sound attenuator

- Pos. 5: Intake/discharge plenum
 Pos. 6: Suspension rail length 950 mm (ZGH.0A613)
 Pos. 7: Suspension rail length 1550 mm (ZGH.0A623)
 Pos. 8: Suspension rail length 2150 mm (ZGH.0A633)

Model size	1	2	3	4
b [mm]	560	865	1170	1590

Tab. 4-4: Unit size dependent width of accessories

- Ensure that there is enough space available for valve installation.
- Fasten the threaded rods M8 with suitable tools below the ceiling.
- Secure the suspension rail below the room ceiling by using appropriate means.
- Refer to Fig. 4-8 for the position of the mounting slots/keyholes for the suspension rail and threaded rods.
- Hang the HyPower-Geko with rail adapters (see Fig. 4-7) in the suspension track.
- Lift the opposite side of the HyPower-Geko unit so that the threaded rods go through the holes of the assembly mountings.
- Connect the HyPower-Geko using supplied fixing material.
- Use a spirit level to exactly align the MPower-Geko in longitudinal and lateral direction (refer to Fig. 4-5).
- Tighten the fixing bolts.

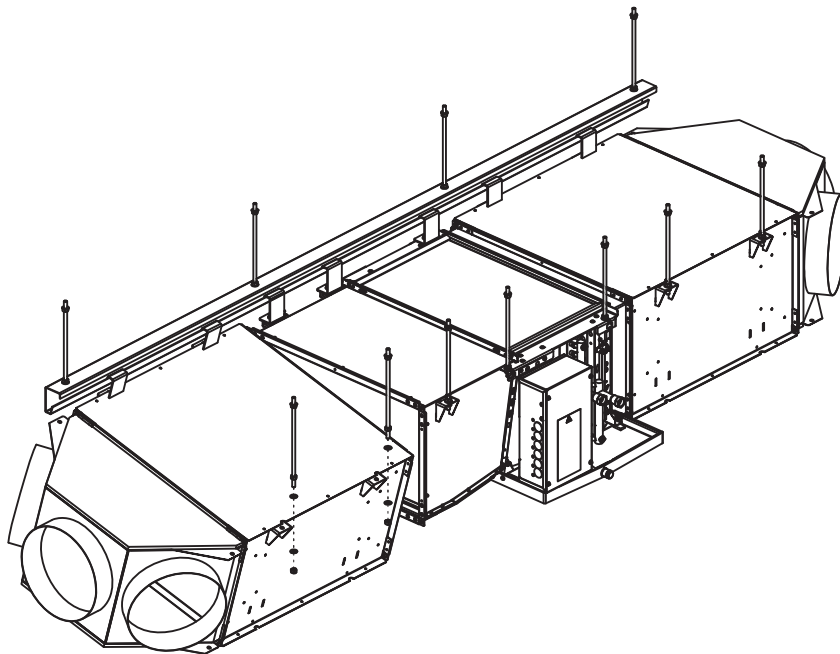


Fig. 4-9: Mounting with suspension rail



NOTE!

Trouble-free condensate drainage is ensured only in horizontally mounted cooling units.

4.4.3 Assembly discharge transition piece



NOTICE!

For the assembly of discharge side accessories (discharge sound attenuator, discharge plenum, flexible canvas discharge connection or on-site ducts) on the basic unit, the discharge transition piece (Order No.: ZGH.#A912, where the # sign indicates the model size of the unit) is absolutely required.

The discharge transition piece is supplied extra with the adhesive tape provided for sealing the flange of the discharge transition piece and the unit.

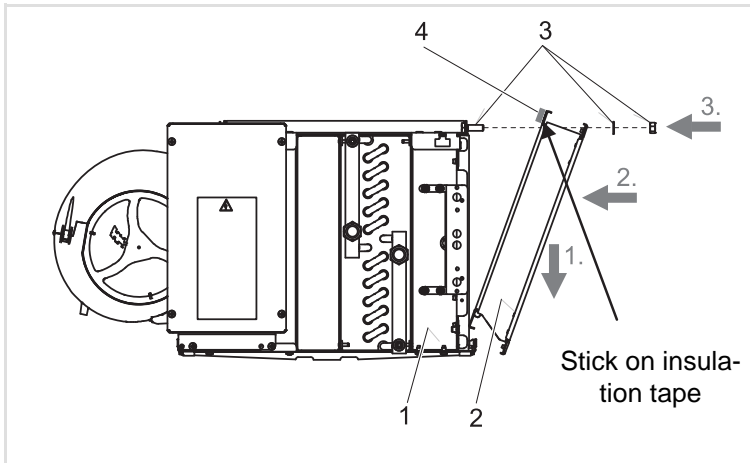


Fig. 4-10: Assembly discharge transition piece

- Pos. 1: Basic unit
 Pos. 2: Discharge transition piece
 Pos. 3: Screw M8x25, washer, nut (2 pcs.)
 Pos. 4: Insulation tape

- Stick the adhesive tape above the flange of the discharge transition piece (see Fig. 4-10, Pos. 4).
- Set the flange of the discharge transition piece in place and screw it on using M8 screws (washers and nuts) on the side of the air discharge of the basic unit (see Step 1 to 3., Fig. 4-10)

4.4.4 Mounting flexible canvas connection



NOTICE!

The flexible canvas connection is delivered separately with the enclosed adhesive tape provided for the duct seal between the flange of the flexible supports and the unit with fan chamber or sound attenuator, or discharge transition piece.

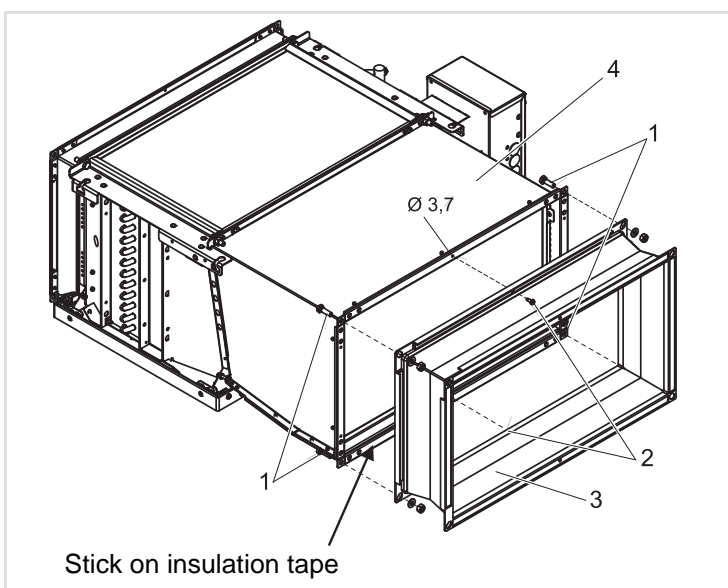


Fig. 4-11: Mounting flexible canvas connection

- Pos. 1: Screw M8x25, washer, nut (4 pcs)
 Pos. 2: Sheet-metal screw 4.8x13 (2 St.)
 Pos. 3: Flexible canvas connection
 Pos. 4: Unit with fan chamber

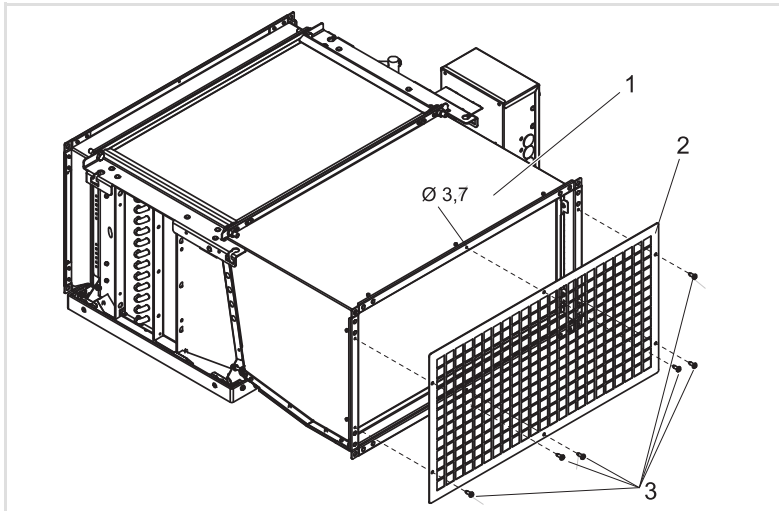
- Stick the adhesive tape on to the flange.
- Fasten the flange of the flexible canvas supports (Order No.: ZGH.#A112 (discharge side), ZGH.#A111 (inlet side), whereby the # sign indicates the model size of the unit) using M8 screws (washers and nuts) and tapping screws (see Fig. 4-11 Pos. 2,) to the unit with fan section or to the sound attenuator, or to the discharge transition piece.

4.4.5 Installing contact protection



PERSONAL INJURY!

For units without fan section (type GH##.####.###A#), a suitable on-site intervention protection must be ensured.



Pos. 1: Unit with fan chamber

Pos. 2: Intervention protection

Pos. 3: Sheet-metal screw 4.8x13 (6 St.)

If the unit is installed without accessories or building-side duct on the inlet side, the installation of an intervention protection on the inlet side is mandatory.

The GEA air intake grille, which is deliverable as an accessory, can be used (Order No.: ZGH.#A511, where the # sign stands for the model size).

- Fasten the protecting grille using 6 tapping screws 4.8x13 to the fan section of the unit.

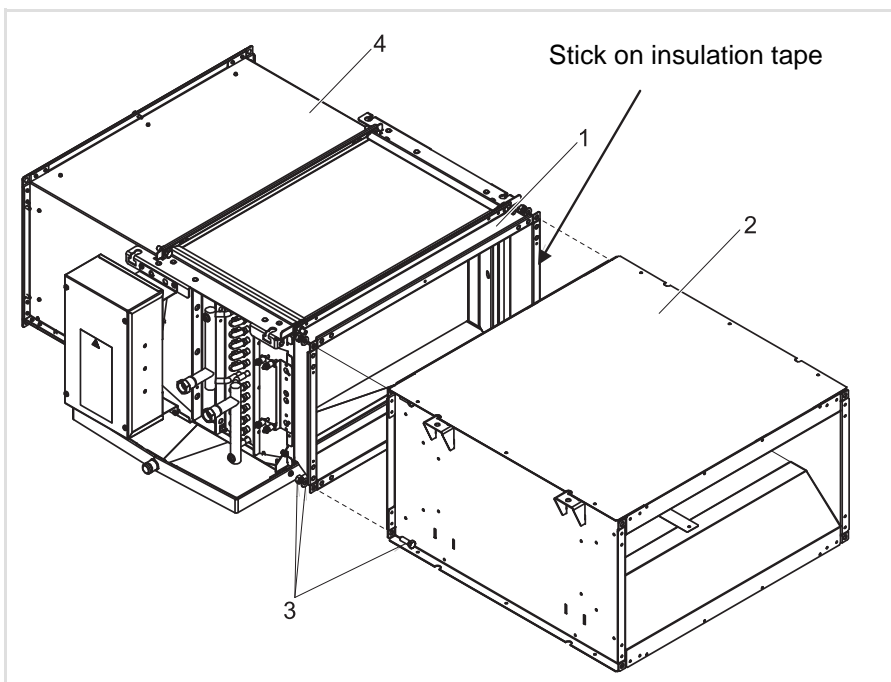
Fig. 4-12: Installing contact protection

4.4.6 Assembly of the intake/discharge sound attenuator



NOTICE!

The intake/discharge sound attenuator is delivered with separately enclosed adhesive tape provided for the duct seal between the flange of the sound attenuator and the unit with fan section or the discharge-transition piece.



Pos. 1: Discharge transition piece

Pos. 2: Discharge sound attenuator

Pos. 3: Screw M8x25, washer, nut(4 pcs)

Pos. 4: Fan chamber

The intake sound attenuator (ZGH.#A211) can be mounted on the inlet side if the basic unit is furnished with a fan section. The discharge sound attenuator (ZGH.#A212) can be mounted on the discharge side if the unit is furnished with a discharge transition piece (ZGH.#A912).

- Stick the adhesive tape on to the flange.
- Fasten the intake/discharge sound attenuator to the unit with M8 screws (washers and nuts).

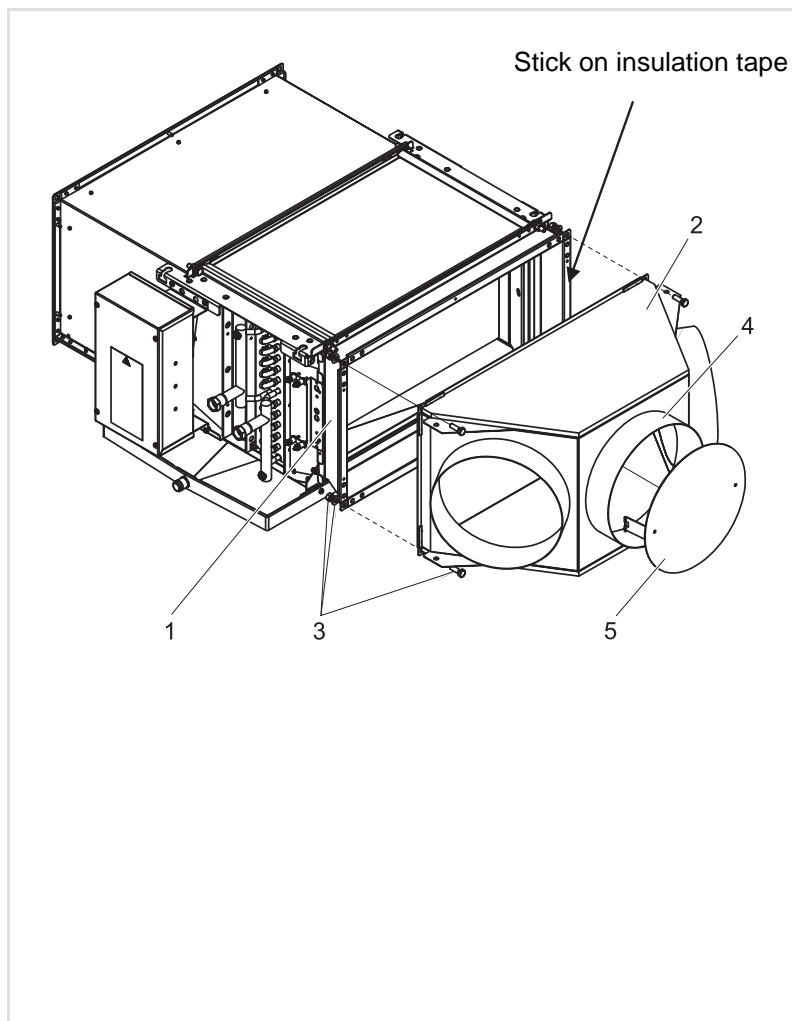
Fig. 4-13: Assembly of intake/discharge sound attenuator

4.4.7 Installation intake/discharge plenum and seal cap for round connector DN250



NOTICE!

The intake/discharge plenum with round connector DN250 is delivered with separately enclosed adhesive tape provided for the seal between the flange of the box and the unit with fan section or the discharge-transition piece, or intake/discharge-sound attenuator or flexible canvas connection.



- Pos. 1: Discharge transition piece
- Pos. 2: Discharge plenum
- Pos. 3: Screw M8x25, washer, nut(4 pcs)
- Pos. 4: Round connector DN250
- Pos. 5: Cover cap DN250

The assembly of the air intake plenum (ZGH.#A031) to the inlet side is only possible if the basic unit is furnished with a fan section or if the unit is furnished with a discharge transition piece on the discharge side (discharge plenum ZGH.#A042).

- Stick the adhesive tape on to the flange.
- Fasten the box to the discharge transition piece or to the fan section with M8 screws (washers, nuts).

For units which are furnished with an intake or discharge plenum, unused round connectors can be closed with a seal cap (ZGH.0A711(inlet side), ZGH.0A712(discharge side)).

- Insert the cover cap(s) on the round connector(s) to be closed and secure by using adhesive or insulation tape.

Fig. 4-14: Installation intake/discharge plenum and seal cap for round connector DN250



NOTE!

In order to avoid air-side losses, the connection between the round connector and on-site ductwork by others and/or cover caps must be sealed on-site by others!

4.4.8 Installation condensate tray

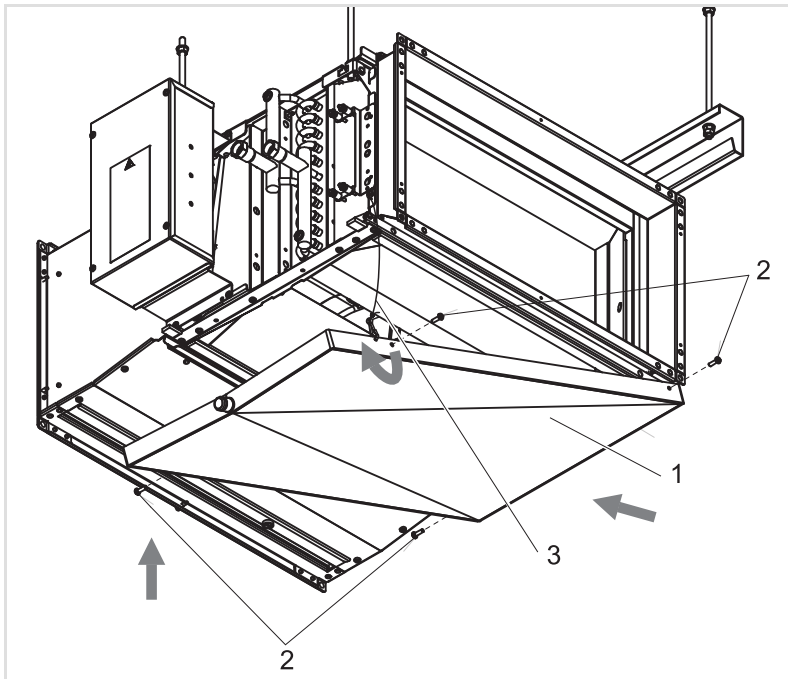


NOTICE!

This notice only concerns the unit in cooling operation.

The condensate tray is always supplied separately and is to be installed before unit assembly.

The condensate drain outlet of the condensate tray must always be on the heat exchanger connection side!



Pos. 1: Coil drip tray

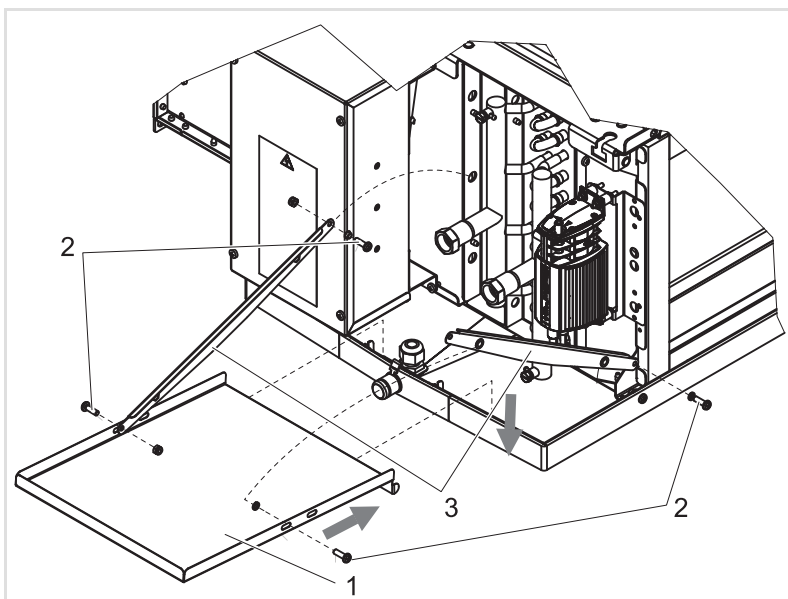
Pos. 2: Fastening screws (4 pcs)

Pos. 3: Arrester straps

Mount the condensate tray (Pos. 1) on the opposite side of the heat exchanger connection and fasten with 4 screws (Pos. 2).

Fig. 4-15: Assembly of condensate tray

4.4.9 Assembly of auxiliary drain pan



Pos. 1: Auxiliary drain pan

Pos. 2: Screw, nut (4 pcs)

Pos. 3: Support (2 pcs)

Assemble the additional condensate tray (Pos. 1) by hanging it and fastening 2 supports (Pos. 3) using 4 screws and nuts (Pos. 2).

Fig. 4-16: Assembly of auxiliary drain pan

5 Hydraulic Connection

5.1 General

If units are not fitted with valves or have been fitted with valves on-site by others, the installation of the supply and return lines depends on how the on-site medium connections are run and/or the valve types used.



DANGER OF SCALDING BY ESCAPING HEATING MEDIUM!

Before the on-site piping and hydraulic connections of the Hypower-Geko are set up, the heating/cooling medium must be shut off and secured against inadvertent opening.



All field cooling medium pipework must be insulated to prevent condensate formation.

If the pipes are run close to the lateral drain pan, these should be insulated above the lateral drain pan on-site by others.

When all connections are completed, all bolt/screw connections should be tightened and checked that they are free of mechanical stress.

5.2 Overview of valves

Various circuit configurations can be used for the supply of both heating and cooling medium.



NOTICE!

The correct direction of medium flow is marked on the valves by an arrow and/or a letter.

Valves with modulating actuator

These valves enable continuous water-side control (modulating operation). If 3-way valves are fitted by the manufacturer, control is performed via a distributor circuit (refer to Fig. 5-3).

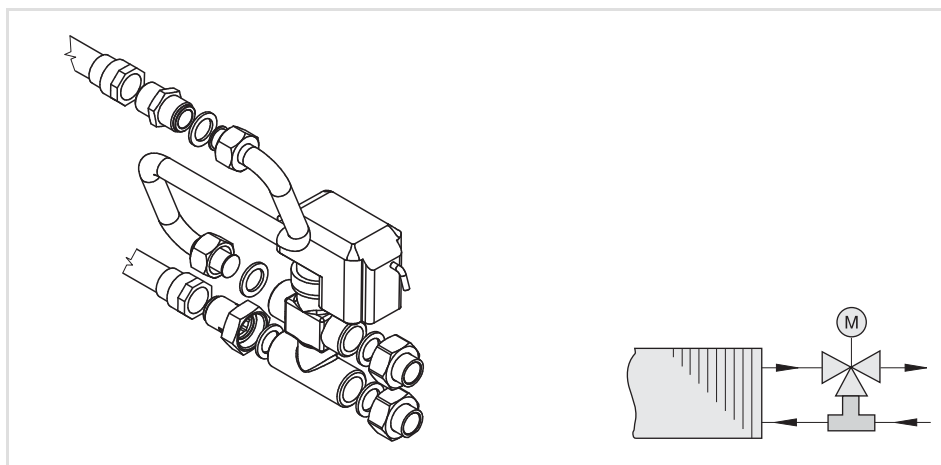


Fig. 5-1: Motor actuated 3-way valve

With a 2-way valve, control is carried out by throttling the medium supply (see Fig. 5-2).

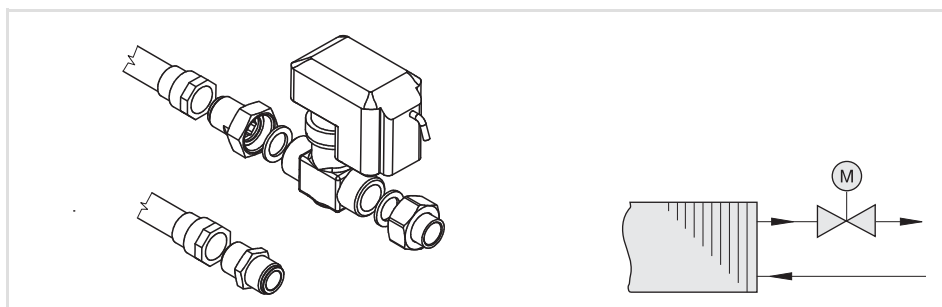


Fig. 5-2: Motor actuated 2-way valve

Valves with thermoelectric actuator

On/off operation (open/close) is possible with these valves. If 3-way valves are fitted by the manufacturer, control is performed via a distributor circuit (refer to Fig. 5-3).

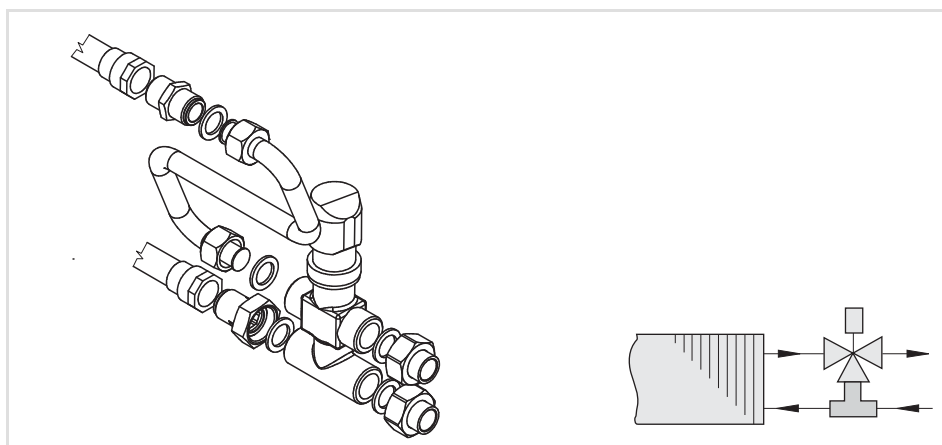


Fig. 5-3: 3-way valves with thermoelectric actuator

With a 2-way valve, control is carried out by throttling the medium supply (see Fig. 5-4).

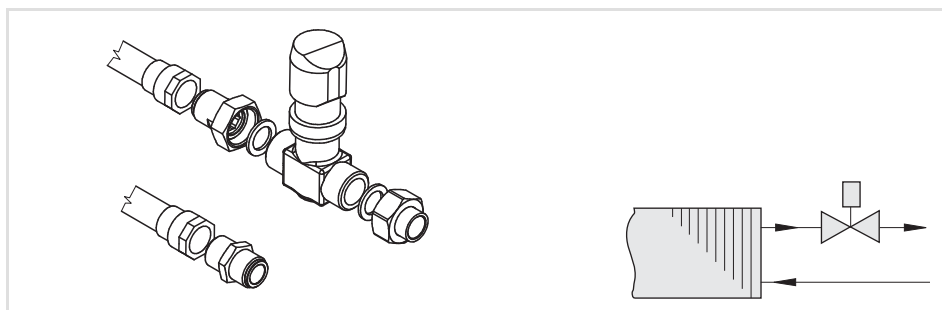


Fig. 5-4: 2-way valves with thermoelectric actuator

Shut-off valve

The shut-off valve is used to limit or shut off the medium flow (refer to Fig. 5-5).

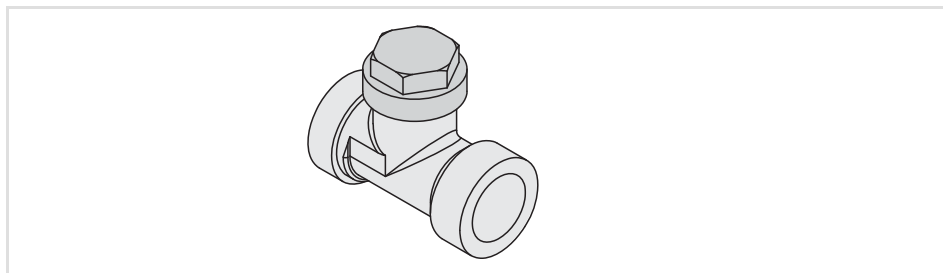


Fig. 5-5: Shut-off valve

Ball valve

The ball valve is used to limit or shut off the medium flow (refer to Fig. 5-6).

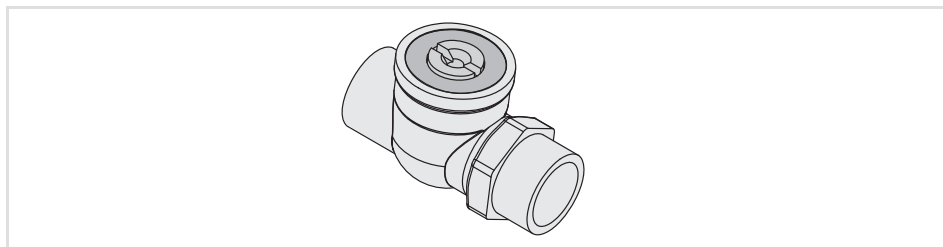


Fig. 5-6: Ball valve

5.3 Heating and cooling connections for units without valves or with on-site valves provided by others

In case of units without valves or with valves provided on-site by others, the installation of the water inlet and outlet depends on how the on-site medium connections are run and/or on the valves used.

5.3.1 Mounting connections



DAMAGE TO THE UNIT!

During installation the connecting nut on the heat exchanger must be countered using a suitable tool.

- At the beginning of the fitting procedure, remove caps on the water inlet and outlet pipes.
- Fit the connections while ensuring they are free of mechanical stress.



NOTICE!

The connections for the heat exchanger must be sealed on-site by others!

5.3.2 Medium connection



DAMAGE TO THE UNIT!

All on-site valves and piping installations with cooling medium, which do not lie above the lateral condensate tray(s), must be insulated on-site.

- Ensure that there is enough space available for valve installation.
- Please observe all instructions in Section "Mounting connections" on page 41.
- Run the pipes at a right angle to the side or backwards.
- Seal the connections.
- Screw in the connections.

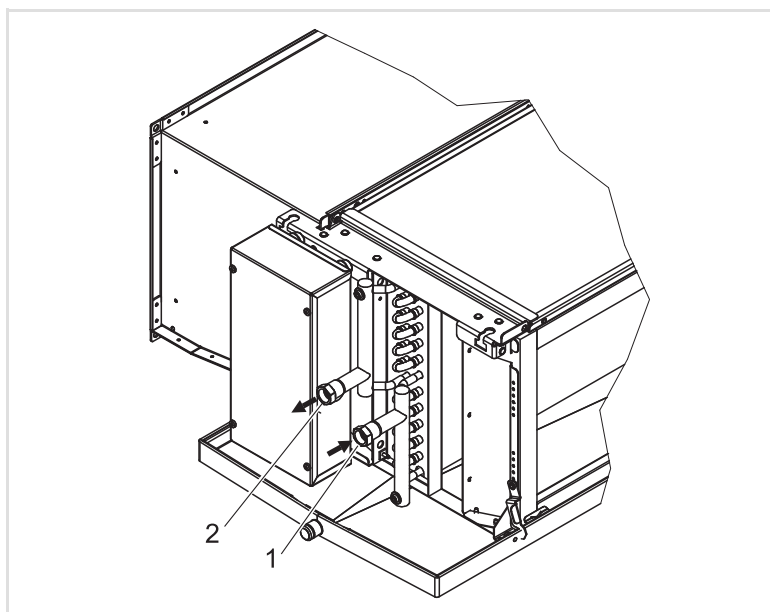
5.3.3 Medium connection 2-pipe system



NOTICE!

When making a medium connection to the unit, always ensure the correct connection to the input and output of the heat exchanger! Exchanging the connections can lead to loss of efficiency! (see Fig. 5-7 and Fig. 5-8)

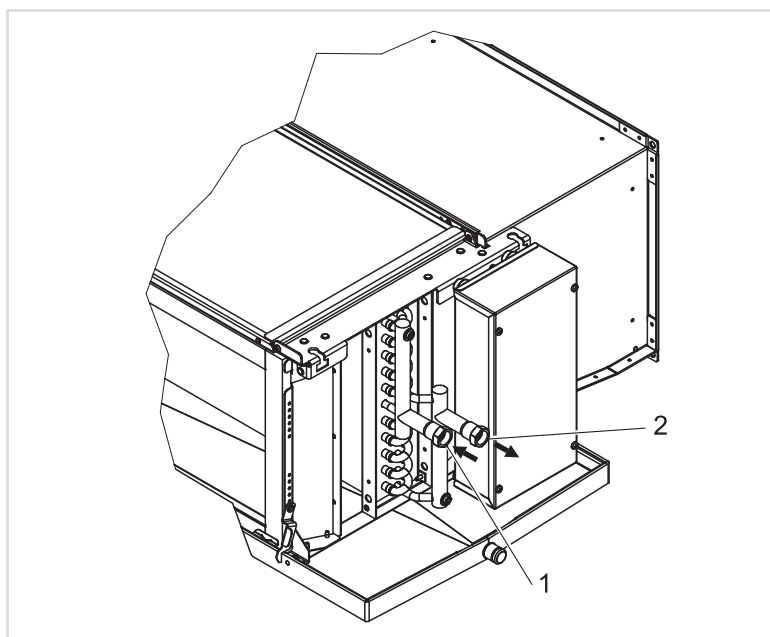
The connection fittings of the heat exchanger always have an inner thread (see Tab. 5-1)



Pos. 1: Water inlet (internal screw thread, see Tab. 5-1)

Pos. 2: Return line (internal screw thread, see Tab. 5-1)

Fig. 5-7: Heat exchanger connections 2-pipe system, left connection



Pos. 1: Water inlet (internal screw thread, see Tab. 5-1)

Pos. 2: Return line (internal screw thread, see Tab. 5-1)

Fig. 5-8: Heat exchanger connections 2-pipe system, right connection

Type identification	Connection fittings of the heat exchanger - internal screw thread
GH11.#0W(W0,WC)#.#####	G 1/2"
GH12.#0W(W0,WC)#.#####	G 1/2"
GH13.#0W(W0,WC)#.#####	G 1/2"
GH21.#0W(W0,WC)#.#####	G 1/2"
GH22.#0W(W0,WC)#.#####	G 1/2"
GH23.#0W(W0,WC)#.#####	G 3/4"
GH31.#0W(W0,WC)#.#####	G 1/2"
GH32.#0W(W0,WC)#.#####	G 3/4"
GH33.#0W(W0,WC)#.#####	G 1"
GH41.#0W(W0,WC)#.#####	G 3/4"
GH42.#0W(W0,WC)#.#####	G 1"
GH43.#0W(W0,WC)#.#####	G 1"

Tab. 5-1: Connecting dimensions of the fittings of the heat exchanger, 2-pipe system

5.3.4 Medium connection of a 4-pipe system



NOTICE!

When making a medium connection to the unit, always ensure the correct connection to the input and output of the heat exchanger! Exchanging the connections can lead to loss of efficiency! (see Fig. 5-9 and Fig. 5-10)

The connection fittings of the heat exchanger always have an inner thread . (refer to Tab. 5-2)

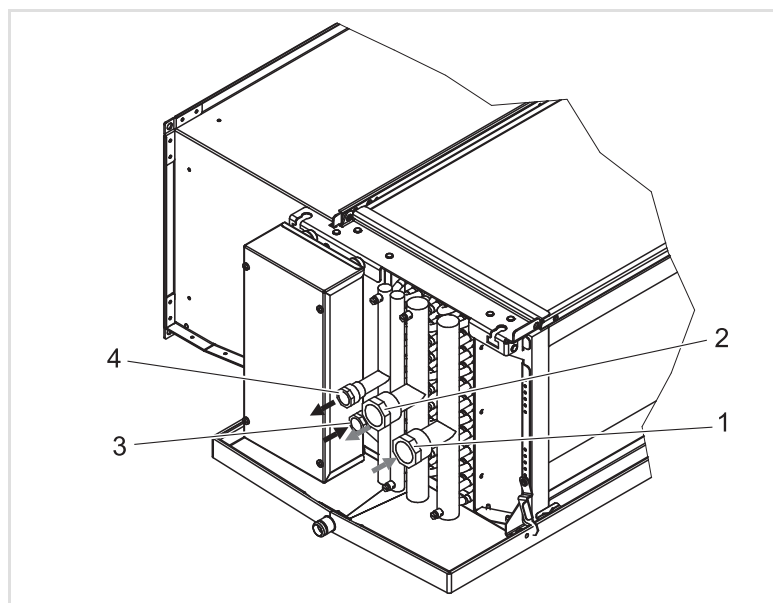


Fig. 5-9: Heat exchanger connections 4-pipe system, left connection

- Pos. 1: Water inlet cooling (internal screw thread, see water inlet cooling (internal screw thread, see) Tab. 5-2)
- Pos. 2: Return line cooling (internal screw thread, see Tab. 5-2)
- Poz. 3: Supply line heating (internal screw thread, see Tab. 5-2)
- Pos. 4: Return line heating (internal screw thread, see Tab. 5-2)

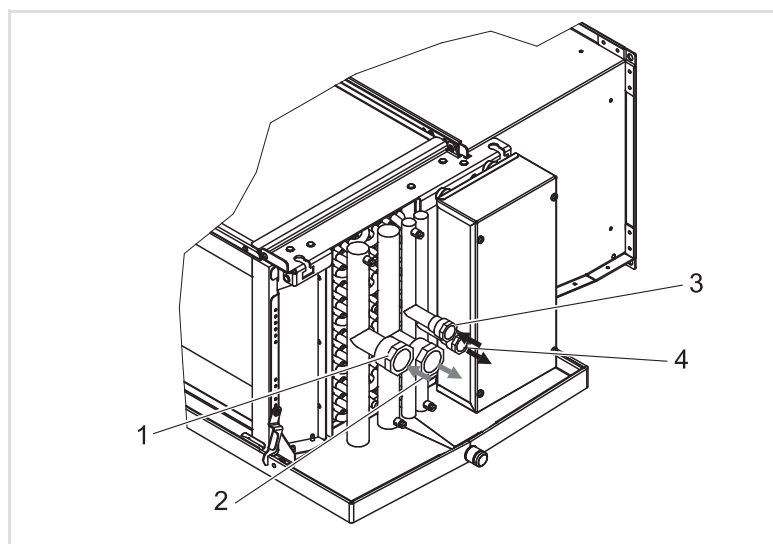


Fig. 5-10: Heat exchanger connections 4-pipe-system, right connection

- Pos. 1: Water inlet cooling (internal screw thread, see water inlet cooling (internal screw thread, see) Tab. 5-2)
- Pos. 2: Return line cooling (internal screw thread, see Tab. 5-2)
- Poz. 3: Supply line heating (internal screw thread, see Tab. 5-2)
- Pos. 4: Return line heating (internal screw thread, see Tab. 5-2)

Type identification	Connection fittings of the heat exchanger - internal screw thread	
	Cooling	Heating
GH11.#WW#.#####	G 1/2"	G 1/2"
GH12.#WW#.#####	G 1/2"	G 1/2"
GH21.#WW#.#####	G 1/2"	G 1/2"
GH22.#WW#.#####	G 1/2"	G 1/2"
GH31.#WW#.#####	G 3/4"	G 1/2"
GH32.#WW#.#####	G 3/4"	G 1/2"
GH41.#WW#.#####	G 3/4"	G 1/2"
GH42.#WW#.#####	G 1"	G 1/2"

Tab. 5-2: Connecting dimensions of the fittings of the heat exchanger, 4-pipe system

5.4 Heating and cooling water connections for units with factory-mounted valves

5.4.1 Mounting connections

- At the beginning of the fitting procedure, remove caps on the water inlet and outlet pipes.
- Fit the connections while ensuring they are free of mechanical stress.



DAMAGE TO THE UNIT!

During installation, the connecting nut on the heat exchanger must be countered using a suitable tool. All on-site and factory-provided piping and valves with cooling medium that are not fitted directly above the condensate pan must be insulated on-site by others.

Valve key Code number k_{vs} value			Connection code					
Cooling or heating valve (2 and 4-pipe system)	heating valve (4-pipe system)	k_{vs} value m^3/h	0	1	2	3	4	5
			External thread, flat sealing	Solder fitting for Cu tube	External thread, flat sealing	Solder fitting for Cu tube	External thread, flat sealing	Solder fitting for Cu tube
VGH.## 03.□L VGH.## 03.□R	VGH.## ## ## 03.□L VGH.## ## ## 03.□R	0,25	R1/2"	Ø 12 mm	R3/4"	Ø 15 mm	R3/4"	Ø 15 mm
VGH.## 04.□L VGH.## 04.□R	VGH.## ## ## 04.□L VGH.## ## ## 04.□R	0,40	R1/2"	Ø 12 mm	R3/4"	Ø 15 mm	R3/4"	Ø 15 mm
VGH.## 06.□L VGH.## 06.□R	VGH.## ## ## 06.□L VGH.## ## ## 06.□R	0,63	R1/2"	Ø 12 mm	R3/4"	Ø 15 mm	R3/4"	Ø 15 mm
VGH.## 10.□L VGH.## 10.□R	VGH.## ## ## 10.□L VGH.## ## ## 10.□R	1,00	R1/2"	Ø 12 mm	R3/4"	Ø 15 mm	R3/4"	Ø 15 mm
VGH.## 16.□L VGH.## 16.□R	VGH.## ## ## 16.□L VGH.## ## ## 16.□R	1,60	R1/2"	Ø 12 mm	R3/4"	Ø 15 mm	R3/4"	Ø 15 mm
VGH.## 25.□L VGH.## 25.□R	VGH.## ## ## 25.□L VGH.## ## ## 25.□R	2,50	R3/4"	Ø 15 mm	R3/4"	Ø 15 mm	R3/4"	Ø 15 mm
VGH.## 40.□L VGH.## 40.□R	VGH.## ## ## 40.□L VGH.## ## ## 40.□R	4,00	R3/4"	Ø 15 mm	R3/4"	Ø 15 mm	R3/4"	Ø 15 mm
VGH.## 63.□L VGH.## 63.□R	VGH.## ## ## 63.□L VGH.## ## ## 63.□R	6,30	R5/4"	Ø 22 mm	R1"	Ø 22 mm	R1"	Ø 22 mm
VGH.## 80.□L VGH.## 80.□R	VGH.## ## ## 80.□L VGH.## ## ## 80.□R	8,00	R5/4"	Ø 22 mm	R1"	Ø 22 mm	R1"	Ø 22 mm

Tab. 5-3: Overview of valve connections

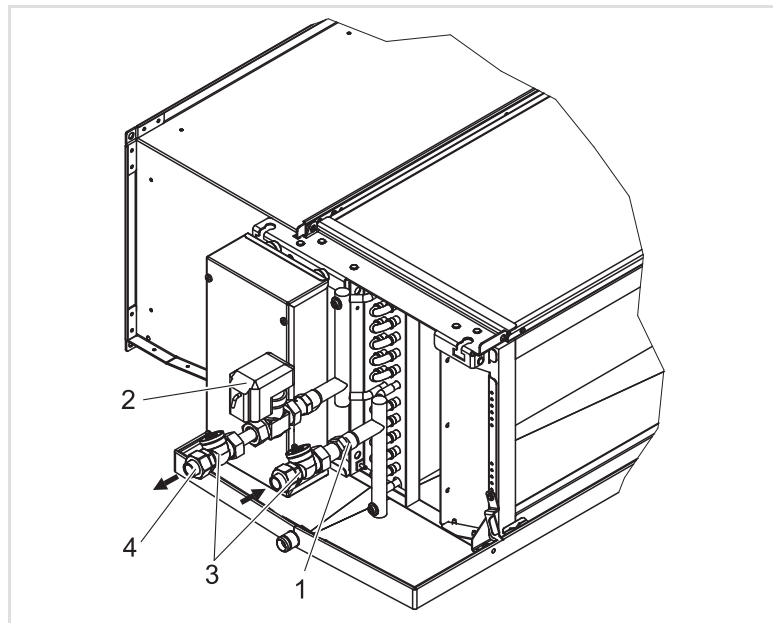


NOTICE!

All control valves, ball valves or shut-off valves as well as other valve accessories are not components of the unit, but rather always separately enclosed in the packaging. The assembly should be carried out on-site according to the attached instructions of the valve accessory.

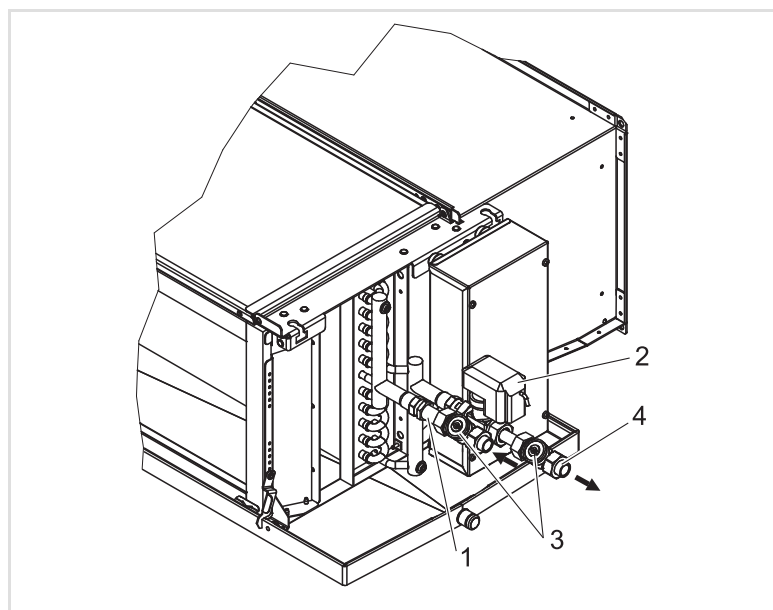
5.4.2 Medium connection in a 2-pipe system

2-way valve



- Pos. 1: Supply line
- Pos. 2: Valve actuator motor
- Pos. 3: Shut-off valve/ball valve (optional)
- Pos. 4: Return line

Fig. 5-11: Piping connections of 2-pipe system, 2-way valve, left connection



- Pos. 1: Supply line
- Pos. 2: Valve actuator motor
- Pos. 3: Shut-off valve/ball valve (optional)
- Pos. 4: Return line

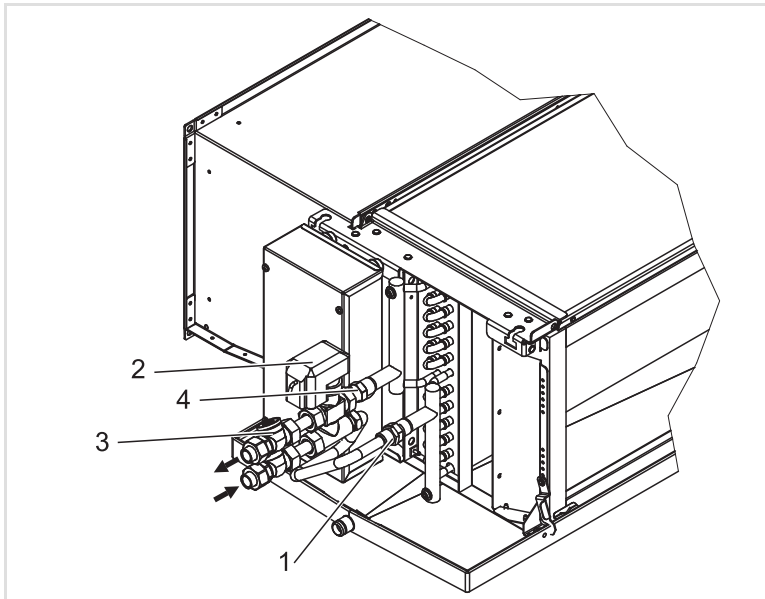
Fig. 5-12: Piping connections of 2-pipe system, 2-way valve, right connection



NOTICE!

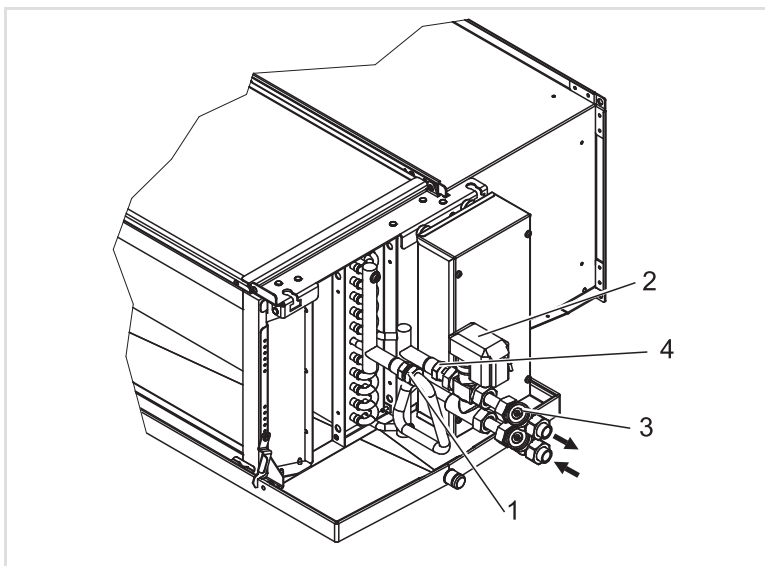
The valve accessories are always delivered separately and must be installed on-site to the basic unit.

The ball valves can be fitted at the water inlet or return line, the shut-off valve must always be fitted at the return line!

3-way valve

- Pos. 1: Supply line
 Pos. 2: Valve actuator motor
 Pos. 3: Shut-off valve/ball valve (optional)
 Pos. 4: Return line

Fig. 5-13: Piping connections of 2-pipe system, 3-way valve, left connection



- Pos. 1: Supply line
 Pos. 2: Valve actuator motor
 Pos. 3: Shut-off valve/ball valve (optional)
 Pos. 4: Return line

Fig. 5-14: Piping connections of 2-pipe system, 3-way valve, right connection

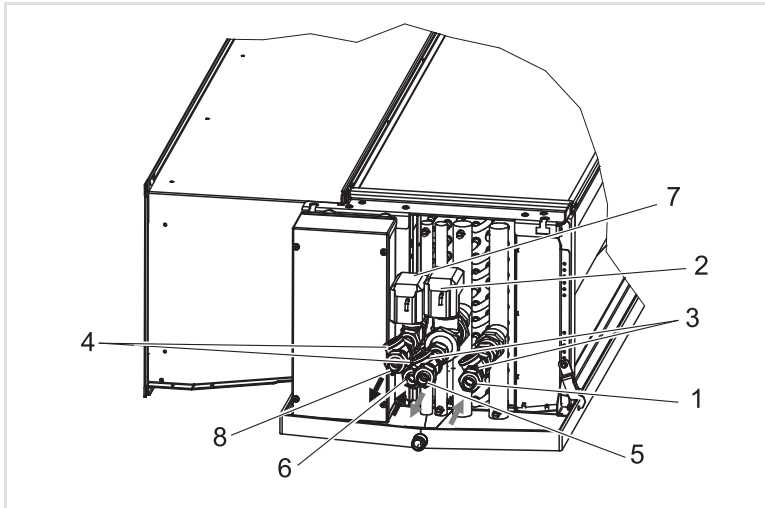
**NOTICE!**

The valve accessories are always delivered separately and must be installed on-site to the basic unit.

The ball valves can be fitted at the water inlet or return line, the shut-off valve must always be fitted at the return line!

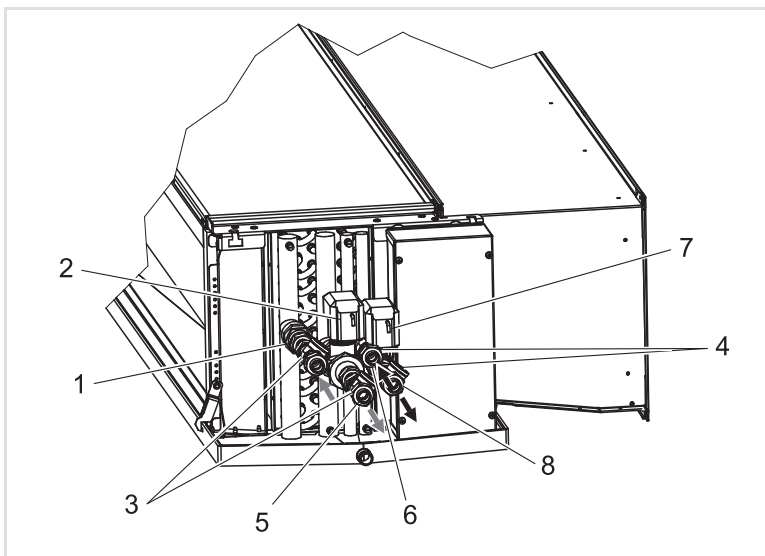
5.4.3 Medium connection in a 4-pipe system

2-way valve



- Pos. 1: Supply line cooling
- Pos. 2: Valve actuator motor cooling
- Pos. 3: Shut-off valve/ball valve cooling (optional)
- Pos. 4: Shut-off valve/ball valve heating (optional)
- Pos. 5: Return line cooling
- Pos. 6: Supply line heating
- Pos. 7: Valve actuator motor heating
- Pos. 8: Return line heating

Fig. 5-15: Piping connections of 4-pipe system, 2-way valve, left connection



- Pos. 1: Supply line cooling
- Pos. 2: Valve actuator motor cooling
- Pos. 3: Shut-off valve/ball valve cooling (optional)
- Pos. 4: Shut-off valve/ball valve heating (optional)
- Pos. 5: Return line cooling
- Pos. 6: Supply line heating
- Pos. 7: Valve actuator motor heating
- Pos. 8: Return line heating

Fig. 5-16: Piping connections of 4-pipe system, 2-way valve, right connection



NOTICE!

The valve accessories are always delivered separately and must be installed on-site to the basic unit.

The ball valves can be fitted at the water inlet or return line, the shut-off valve must always be fitted at the return line!

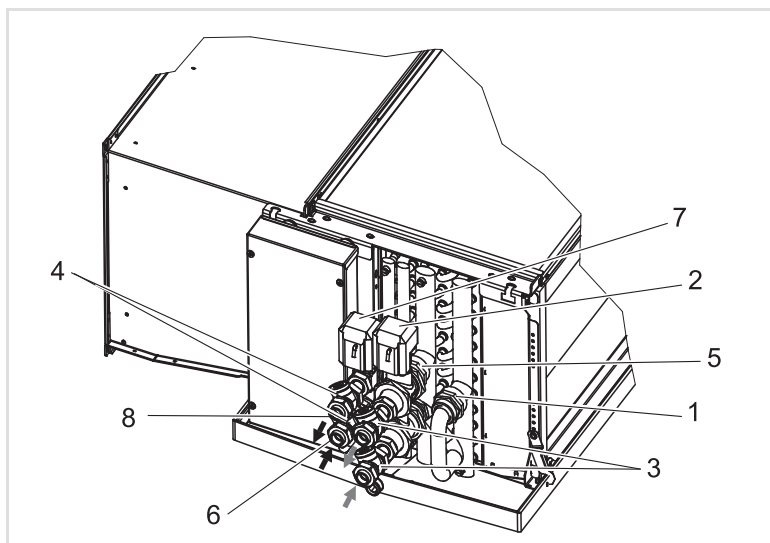
3-way valve

Fig. 5-17: Piping connections of 4-pipe system, 3-way valve, left connection

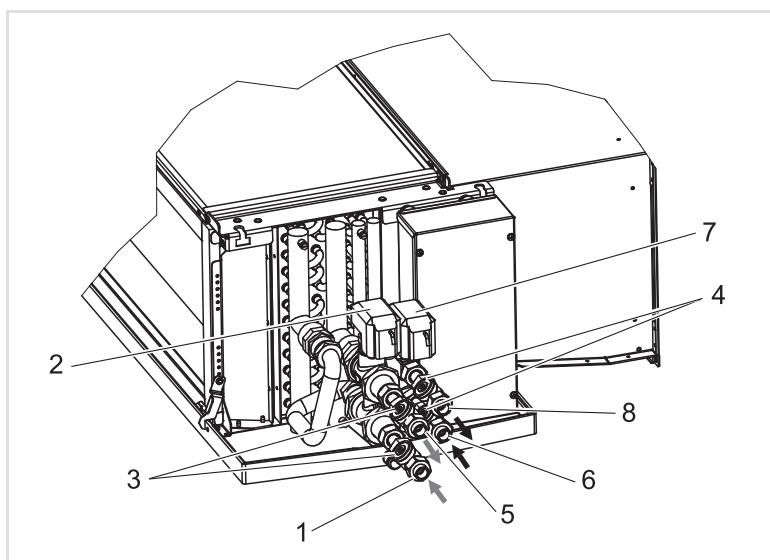


Fig. 5-18: Piping connections of 4-pipe system, 3-way valve, right connection

- Pos. 1: Supply line cooling
- Pos. 2: Valve actuator motor cooling
- Pos. 3: Shut-off valve/ball valve cooling (optional)
- Pos. 4: Shut-off valve/ball valve heating (optional)
- Pos. 5: Return line cooling
- Pos. 6: Supply line heating
- Pos. 7: Valve actuator motor heating
- Pos. 8: Return line heating

- Pos. 1: Supply line cooling
- Pos. 2: Valve actuator motor cooling
- Pos. 3: Shut-off valve/ball valve cooling (optional)
- Pos. 4: Shut-off valve/ball valve heating (optional)
- Pos. 5: Return line cooling
- Pos. 6: Supply line heating
- Pos. 7: Valve actuator motor heating
- Pos. 8: Return line heating

**NOTICE!**

The valve accessories are always delivered separately and must be installed on-site to the basic unit.

The ball valves can be fitted at the water inlet or return line, the shut-off valve must always be fitted at the return line!

5.5 Connecting condensate drain

To drain off condensate properly, the condensate drain provided on-site must be connected to the coil drip tray.

- Insert a plastic hose or a copper pipe on the provided connector of the drain pan and seal it, (refer to Fig. 5-19, Pos. 2).
- When connecting the condensate drain to the sewage system, observe the relevant regulations of the local Water Board (stench trap).



NOTICE!

Maintain a continuous drain line pitch to provide adequate condensate drainage.

When running pressure-free piping or outdoor drainage, a stench trap is not required.

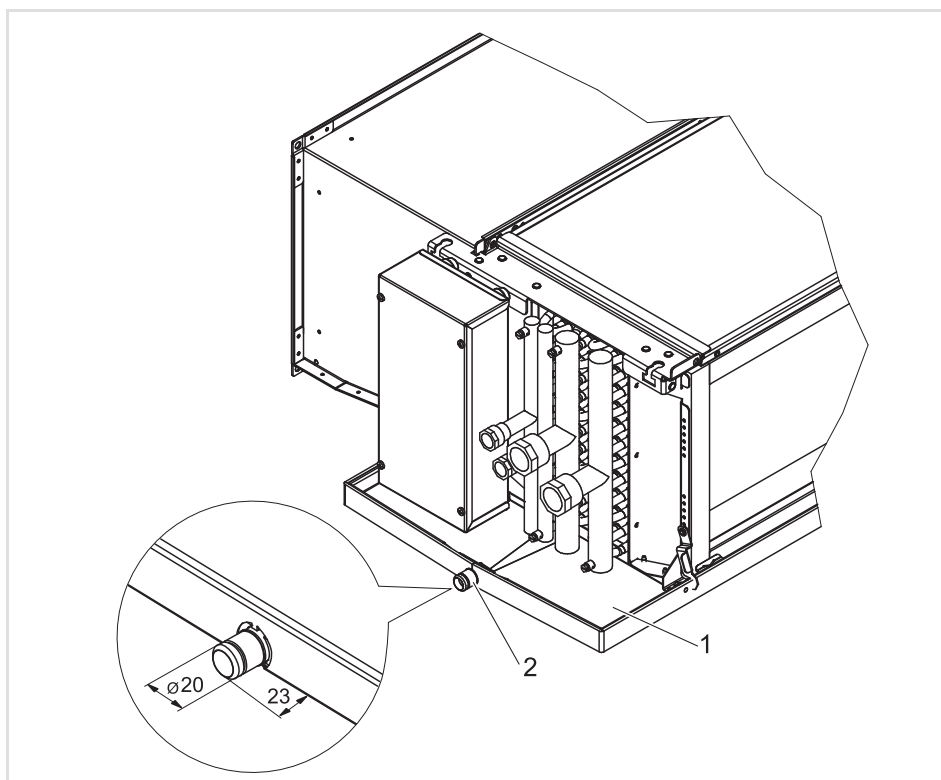


Fig. 5-19: Condensate drain

Pos. 1: Coil drip tray

Pos. 2: Condensate drain outlet

5.6 Connecting condensate pump

Pos. 1: Condensate tray
 Pos. 2: Plastic-end piece of the suction hose of the condensate pump
 Pos. 3: Inlet hose
 Pos. 4: Condensate pump
 Pos. 5: Pressure hose (1.5 m long)
 Pos. 6: Fill level sensor
 Pos. 7: Drain connection of the condensate tray with o-ring
 Pos. 8: Sensor holder
 Pos. 9: Cable penetration
 Pos. 10: Nut of the cable sleeve

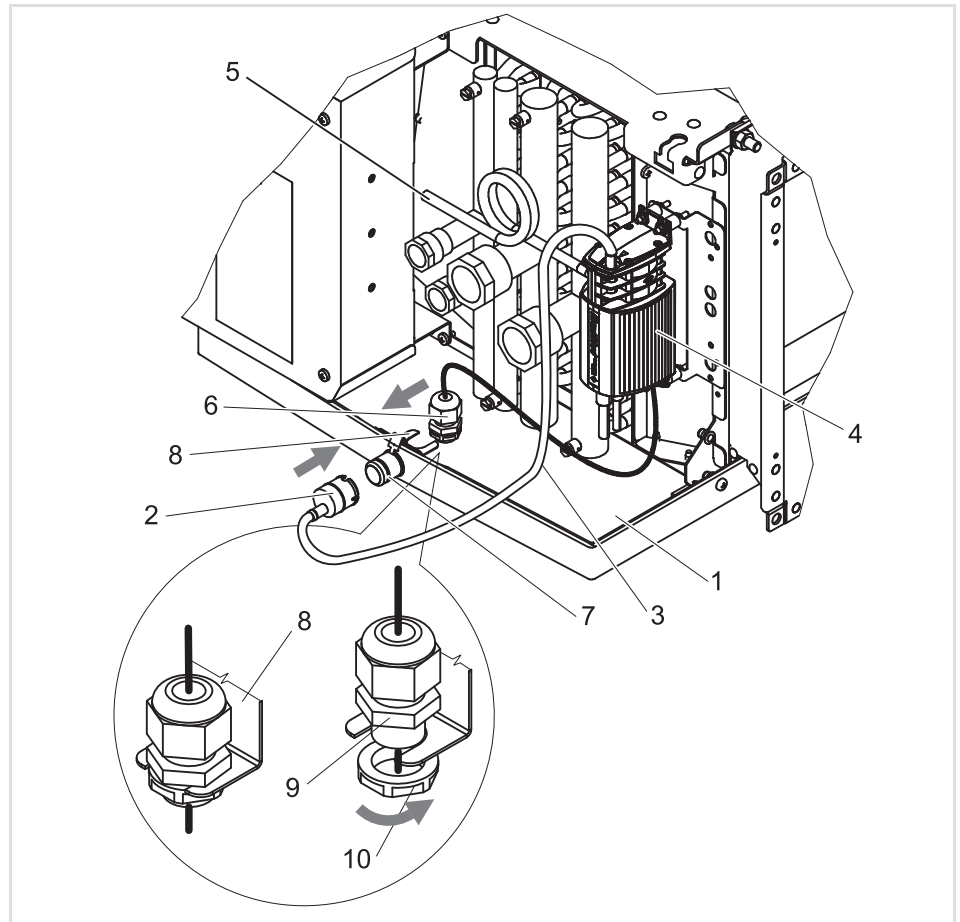


Fig. 5-20: Connecting condensate pump

- Execution including fill level sensor (see Fig. 5-20, Pos. 6) attach to the bracket (see Fig. 5-20, Pos. 8) and secure the cable penetrations with a nut (see Fig. 5-20, Pos. 10).
- Lubricate the drain connection of the condensate tray including its O-ring (see Fig. 5-20, Pos. 7) with lubricant. Set the plastic end piece of the suction hose of the condensate pump (see Fig. 5-21, Pos. 3) on the outlet fitting of the condensate tray (see Fig. 5-21, Pos. 2) until it sits firmly. For the assembly of the end piece, be sure that the half-round hole at the edge of the end piece (see Fig. 5-21, Pos. 1) is on the upper side.

Pos. 1: Half-round hole at the edge of the end piece
 Pos. 2: Condensate tray
 Pos. 3: Plastic end piece of the suction hose of the condensate pump

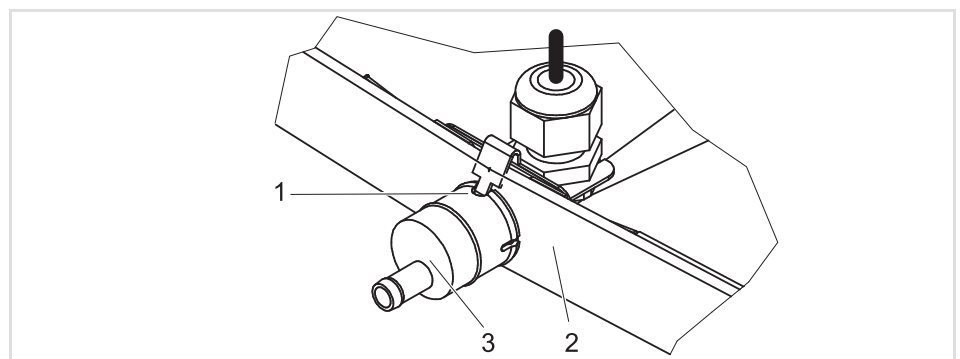


Fig. 5-21: Assembly of the end piece of the pump suction hose assembly

The end of the pressure hose of the condensate pump must be connected with free discharge to the on-site condensate discharge facility. If the pipe extension is run with additional counter-pressure, e.g. by extending the factory-provided pressure hose, the actual discharge volume is reduced by the additional resistance (refer to Tab. 5-4 and Fig. 5-22).



NOTICE!

When laying out the pressure hose, ensure that it is not bent or folded. To prevent the transmission of structure-borne noise, the hose should be insulated against all surfaces with which it could come into contact.

Actual discharge volume of condensate pump in [l/h]				
Vertical discharge head	Horizontal discharge head [m]			
	5	10	20	30
0	14,0	13,9	13,5	12,5
1	13,3	13,3	13,2	13,0
2	13,2	13,3	13,2	13,0
3	13,1	13,1	13,0	13,0
4	13,0	13,0	12,9	12,8
5	12,4	12,3	12,2	12,0
6	11,5	11,0	10,8	10,4
7	10,3	9,9	9,4	8,5

Tab. 5-4: Actual discharge volume of the condensate pump depending on the horizontal and vertical discharge distance

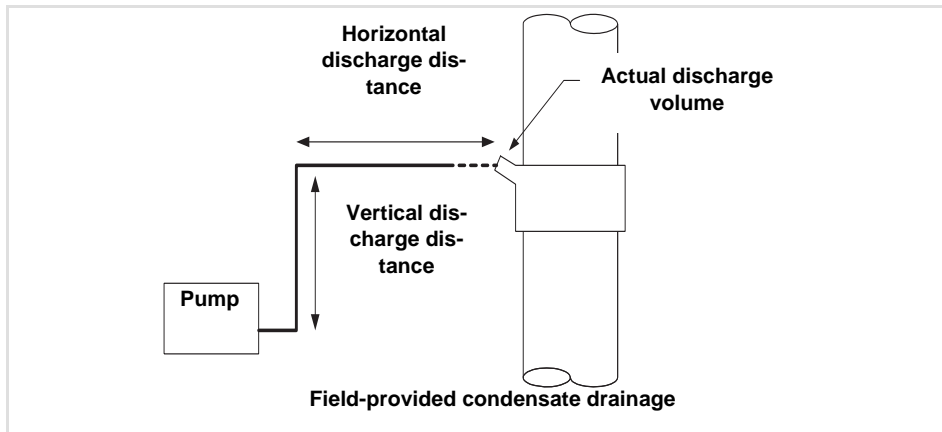


Fig. 5-22: Horizontal and vertical discharge heads

6 Electrical connection



HAZARDOUS VOLTAGE!

The electrical installation of the fan coil unit may only be carried out by qualified licensed electricians in observance of this operation manual and the following regulations:

- VDE regulations, including safety regulations
- Accident prevention regulations
- Installation instructions

6.1 Connection diagrams

The electrical connection of fan coil units must be performed in accordance with the valid wiring diagrams. The wiring diagram is located on the inside cover of the unit connection box or is enclosed separately.



HAZARDOUS VOLTAGE!

The connection diagrams do not specify any protective measures. All currently valid standards and regulations when performing connections and checked with the local power company.

Control/power electronics	Fusing
Matrix 3001	B 10 A
Matrix 3501	B 10 A
Matrix 4001	B 10 A
Miniature switch	B 6 A

Tab. 6-1: Fusing

6.2 Terminal box or electrical control box

Depending on the model variant, the HyPower-Geko is delivered with a

- terminal box or
- metal sheet electrical control box.

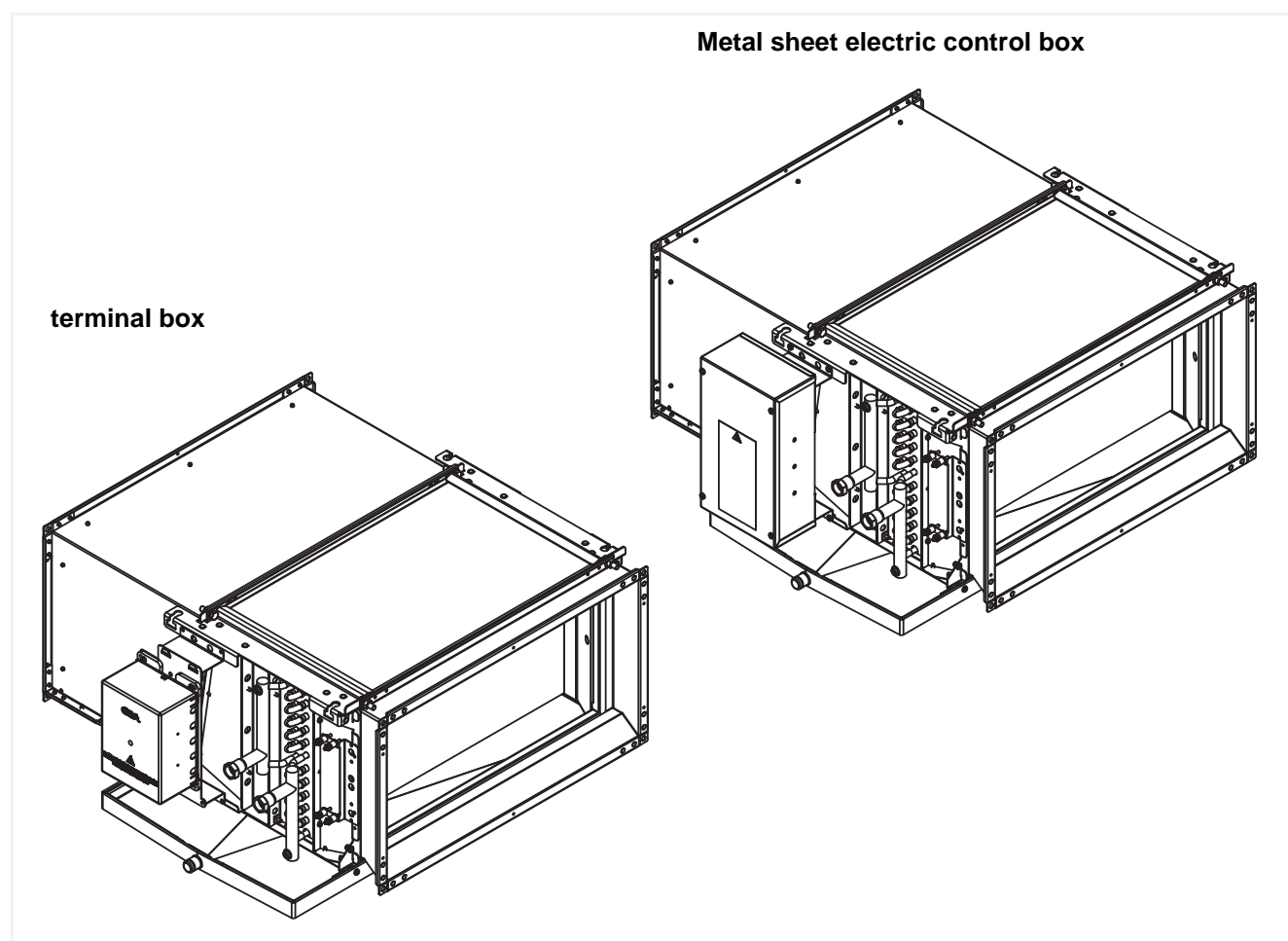


Fig. 6-1: terminal box/electric control box

Terminal box

The terminal box contains a terminal block and, depending on the model, additional electrical parts.

Metal sheet electric control box

The metal sheet electrical control box contains (depending on the model):

- one terminal block and other electrical parts (if required)
- a controller/control electronics MATRIX 3001/3501/4001

6.3 Fan Speed

6.3.1 Fan with EC motor

The EC motor has continuously variable speed control. A control signal 0-10V DC is required for this purpose.



DAMAGE TO THE UNIT!

If multiple motors are installed in one unit, alarm signals must be tapped off for each motor separately if a control system provided on-site is used. The error signal is ground-referenced and a serial interconnection of multiple outputs can cause motor damage. An overload of malfunction-report outputs can also cause motor damage.

Speed combination	Cable EC motor, cable color						
	brown	blue	greenish-yellow	white	red/brown	yellow w	blue/green
	Terminal designation						
S, F	L	N	PE	11.1	11.3	11.4	11.5

Tab. 6-2: Connection diagram

Only connecting terminals for motor(s) are shown. Refer to the unit-specific wiring diagram for wiring other connecting terminals.

6.4 Connection with control by others

The components are connected via a terminal block. Depending on the particular model, these are located in a terminal box or in a sheet steel electrical switch box installed on the left or right side of the basic casing, depending on where the coil connections are mounted.

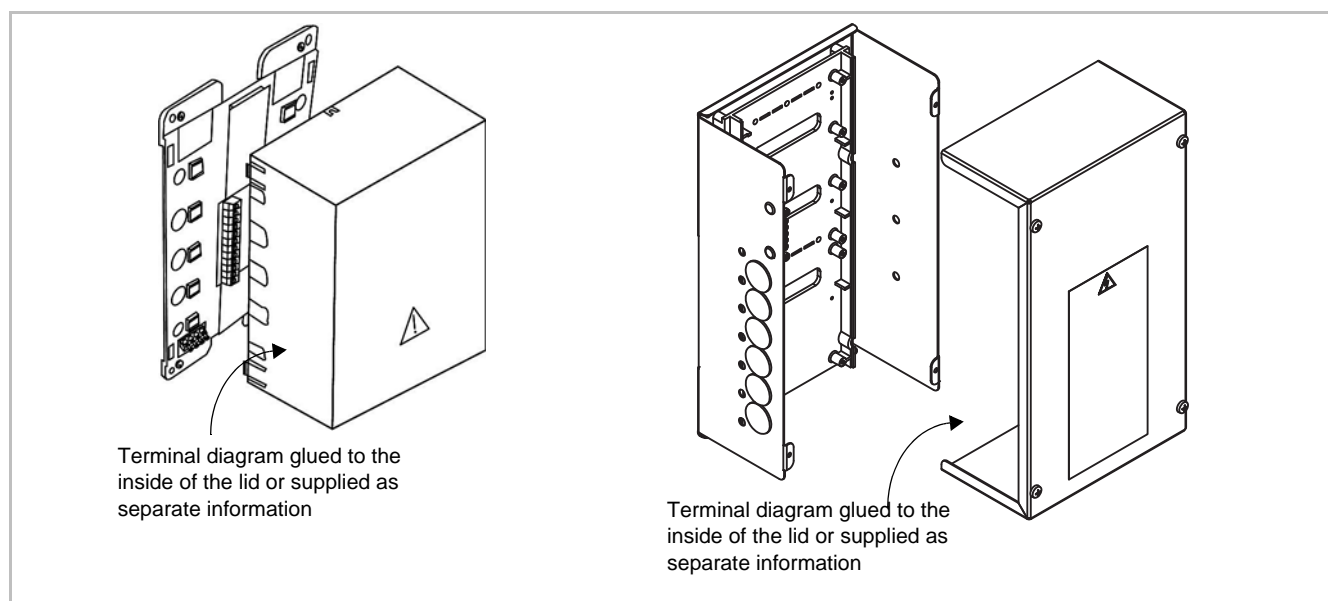


Fig. 6-2: Terminal box and metal sheet electrical control box

**NOTICE!**

Refer to the wiring diagram enclosed with the unit for detailed instructions when connecting individual components (fan, valves, etc.). Before commencing connections, check that the order code of the unit's electrical equipment matches the wiring diagram.

According to the relevant regulations, an all-pole isolating device must be provided by others on site.

- Connect only in accordance with the unit-specific wiring diagram.

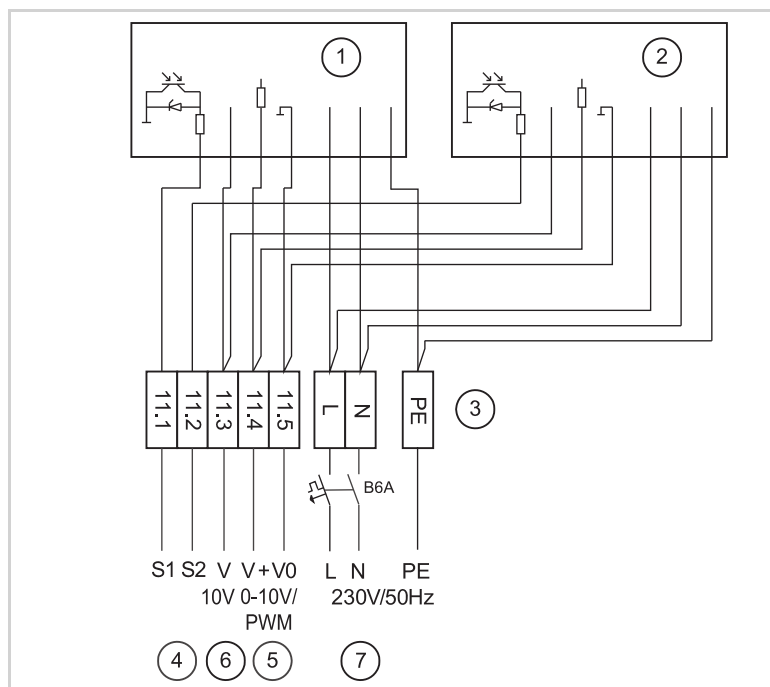
6.4.1 Connection of HyPower-Geko with EC motors

EC motors require 230 V AC 50 Hz supply voltage. 0-10 V DC or PWM signal is required for RPM regulation.

Multiple EC motors can be wired in parallel with regard to supply voltage and control signal..

**DAMAGE TO THE UNIT!**

If multiple motors are installed in one unit, alarm signals must be tapped off for each motor separately if a control system provided on-site is used. The error signal is ground-referenced and a serial interconnection of multiple outputs can cause motor damage. An overload of malfunction-report outputs can also cause motor damage.



Pos. 1: EC-Motor 1

Pos. 2: EC motor 2 (only in certain sizes; see Tab. 6-3)

Pos. 3: Terminal block

Pos. 4: Alarm signal (error) (max. load of 10 mA)

Pos. 5: Control signal 0-10 V DC / PWM (max. consumption of 0.1mA)

Pos. 6: Output voltage 10V DC (max. loading capacity of 1mA)

Pos. 7: Operating voltage 230 V AC; Fuse of max. 6A

Fig. 6-3: Connecting HyPower-Geko with EC motors

**NOTICE!**

Before commencing connections, check that the order code of the unit's electrical equipment matches the wiring diagram.

Model size	1	2	3	4
Number of EC motors	1	1	2	2
Fan type	S	D	S + D	D + D

Tab. 6-3: Number of EC motors (S...single, D...double)

If a unit is fitted with one motor, an alarm signal is conducted to the terminals 11.1. If a unit is fitted with two motors, alarm signals are conducted to terminals 11.1 and 11.2. Individual alarm signals are ground-referenced. In a trouble-free state the output transistor is closed, the signal is wired to terminals 11.1 or 11.2 and connected to ground (identical to potential on terminal 11.5).

If a PWM (pulse-width modulation) signal is used for regulation, the latter must feature a basic frequency between 1 KHz and 10 KHz. At < 10% pulsing the speed amounts to 0; at 14% the motor is running at n_{min} ; at 100% the motor is running at n_{max} .

When actuated with a 0-10V signal, consider that the speed is = 0 for an input voltage of less than 1V; if voltage amounts to 1.4V the motor is running at n_{min} ; with 10V the motor is running at n_{max} .



NOTE!

A maximum of 10 mA current and 30 V voltage can be applied to malfunction-report outputs. In a trouble-free state the output transistor is closed (E, C path). According to the relevant regulations, an all-pole isolating device must be provided by others on site. If an earth leakage circuit breaker is used, all-current sensitive types (type B) must be used.

6.5 Overview of the GEA MATRIX control electronics

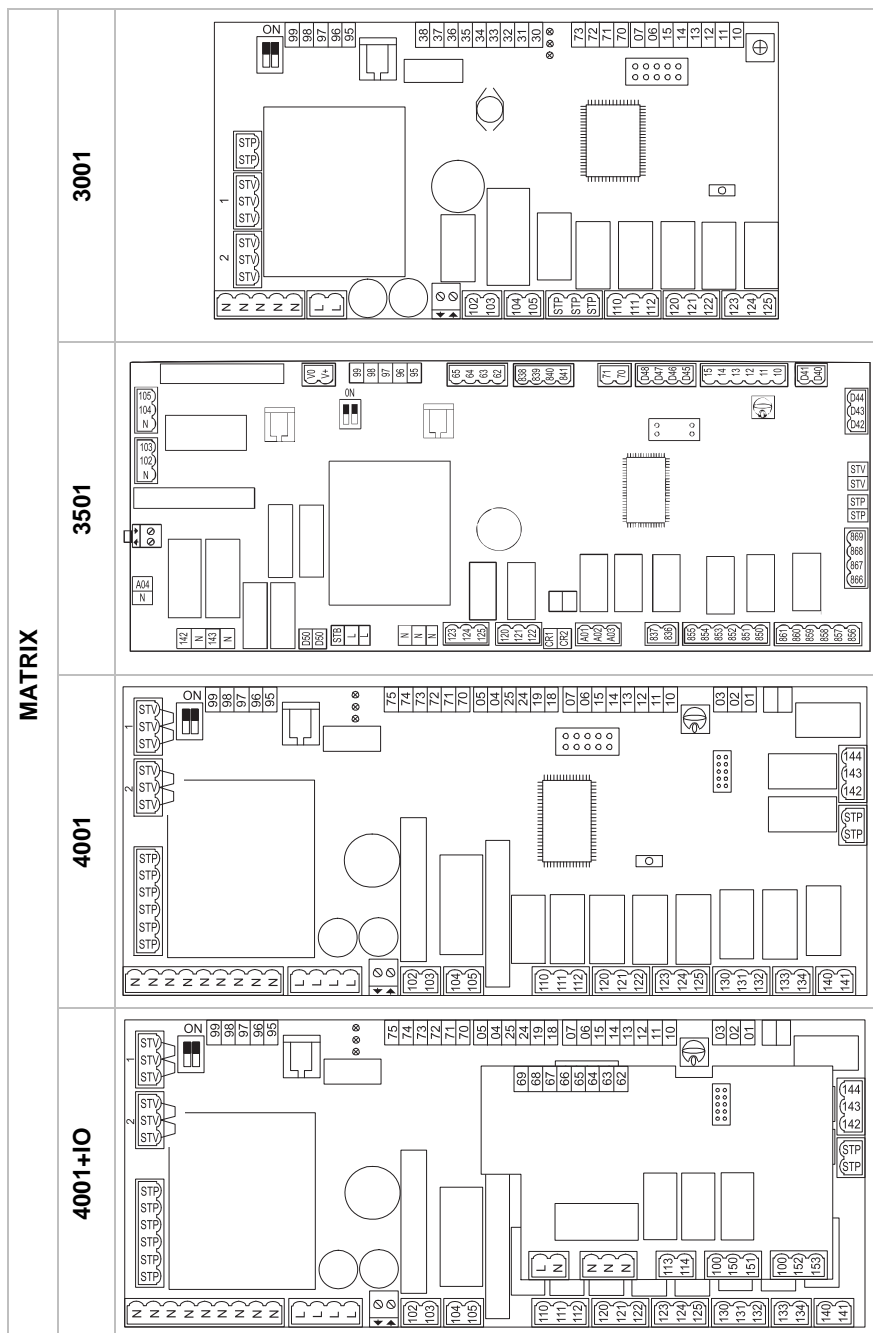


Fig. 6-4: Overview of controller types

The GEA MATRIX control electronics are built into the electric control box.

The following table illustrates different controller circuit boards.

In order to enable necessary connections, the following PCB layouts illustrate the controller type installed in each case.

You can also check the controller type (e.g. MATRIX 3001) in the wiring diagram attached to the inside of control box panel or on the label of printed circuit board.

6.6 Mounting control panel

All IP20 control panels have an integrated room temperature sensor. The latter can be used when the control panel is mounted at an optimum indoor location for regulating temperature. All IP54 control panels are supplied with a separate external room temperature sensor.

**NOTICE!**

The installation site of the room temperature sensor is crucial for the precise control of room temperature. Therefore avoid mounting the sensor in the following locations (refer to Fig. 6-5):

- next to doors, windows, hatches etc., as intense movement of air can cause incorrect measurements and affect control operation.
- on hot or cold walls (e.g. chimney, outside wall), since the wall temperature can cause incorrect measurements,
- behind blinds and net curtains, as the insulating layers of air can cause incorrect measurements.
- in the direct vicinity to the units' discharge grille as discharge temperature can cause incorrect measurements.

If no optimum mounting location for an IP20 control panel is available, or if a IP54 control panel is supplied, a separate room temperature sensor or return-air sensor must be fitted.

This automatically disables all temperature sensors fitted in the control panel.

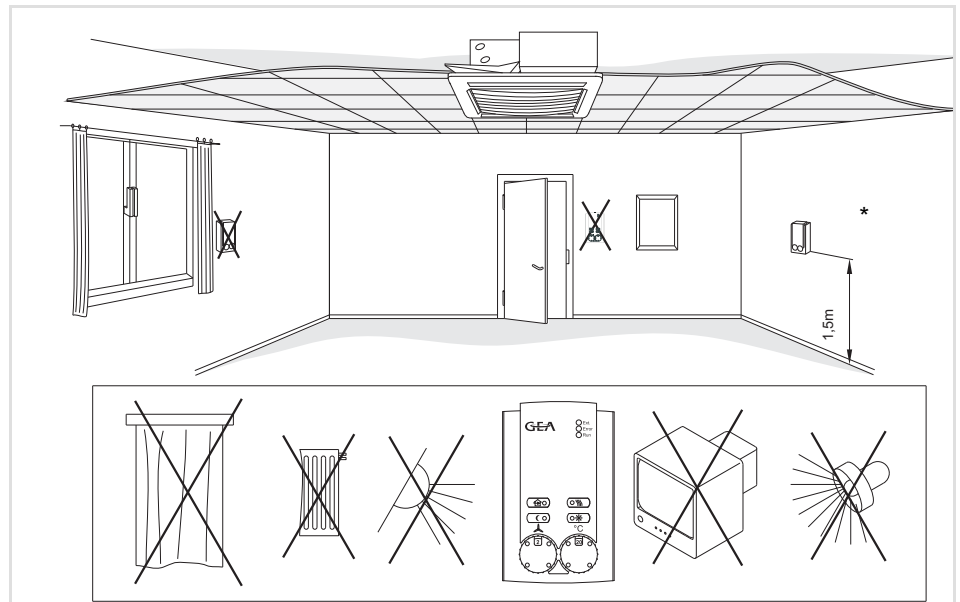


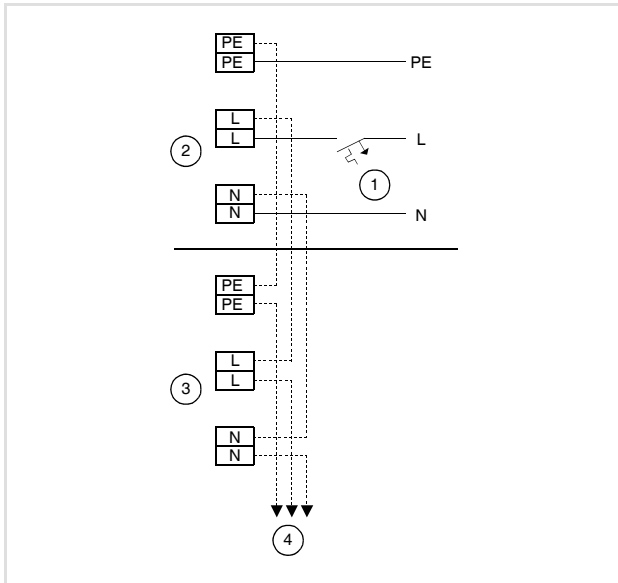
Fig. 6-5: Mounting the control panel and room temperature sensor

* recommended installation height

For mounting your control panel on the wall or in flush-mounted sockets (in the wall), refer to the relevant operation manual for the respective control panel. There you will also find the right drill template.

6.7 Electrical connection with GEA MATRIX

6.7.1 Connecting mains supply voltage for controller



MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

Pos. 1: Power supply 230 V AC / 50 Hz,
on-site fusing by others max. B 10 A

Pos. 2: Connection to first unit

Pos. 3: Connection to second unit

Pos. 4: To further units

- For units without a condensate pump, the mains voltage is connected directly to the controller (Pos.2 and Pos. 3).
- For units with a condensate pump, the separate terminal strip in the switching box is connected to the terminals L, N, PE (e.g. with 3x1.5 mm² NYM).
- Apply the mains supply voltage in accordance with the wiring diagram.

Fig. 6-6: Connecting mains supply voltage



NOTICE!

Power supply for slave units can be provided by the master unit (refer to Fig. 6-6, Pos. 3 and Pos 4). The power terminals for the separate terminal strip (unit with condensate pump) are approved for double assignment with same cross-section. Consider total current consumption of the units with and maximum fusing of B10 A. If required, an auxiliary power supply must be applied. According to the relevant regulations, an all-pole isolating device must be provided by others on site.



NOTICE!

Use the following control cables for connection:

- In order to meet the specifications of the Declaration of Conformity: multi-wire control cable 0.5 mm² with copper weave shielding
- Install the control cable shielding in the GEA air treatment units using cable shield grounding clamps to ensure the best possible electrical contact.
- Apply the shielding with the grounding clamps to a large ground surface area! Apply the shielding on one side (otherwise transient current can occur).
- The maximum total line length must not exceed 50 m.

GEA does not assume any liability in regard to meeting the requirements of the Declaration of Conformity if other cable types, like foil-type shielding, are used. Likewise, GEA cannot make statements regarding the suitability of such cable types.

6.7.2 Completing bus connection

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

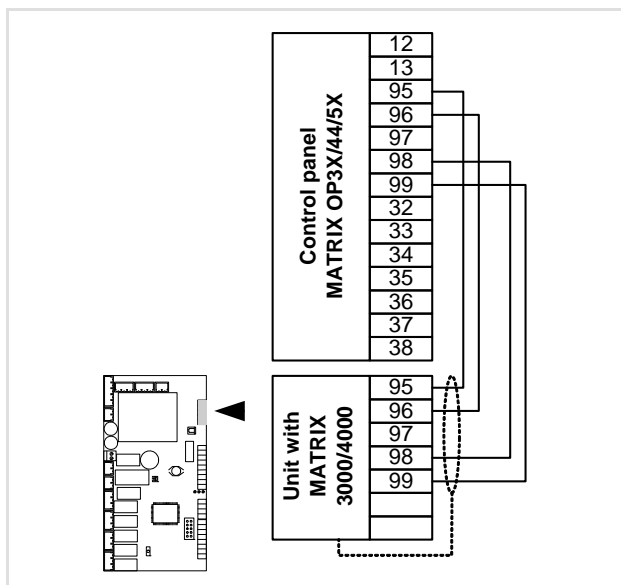


Fig. 6-7: Control panel connection – air treatment unit

Control panel connection – air treatment unit

Only units with MATRIX 3000/4000 controller equipment can be operated. with the MATRIX OP3X/44/5X control panels

- Connect the control cables in accordance with the wiring diagram.
- The following cable is recommended as bus line:
Make: HELUKABEL Type: CAN-BUS flexible 2 x 2 x ... mm2 (see notice on Page 61)

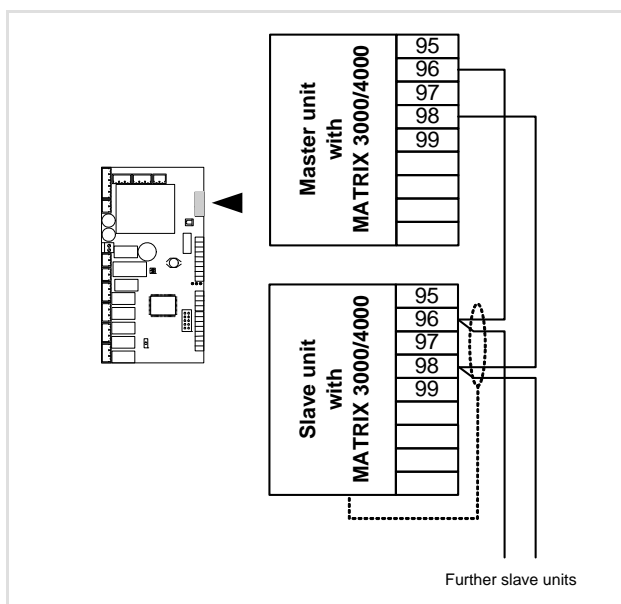


Fig. 6-8: Connecting master unit with slave units

Connecting master unit to slave units

If units are fitted with MATRIX 3000/4000 controllers, a 2-core bus line must be used.

- Connect the control cables in accordance with the wiring diagram.
- Individual units are fitted with MATRIX 3000/4000.
- The following cable is recommended as the bus line:
Make: HELUKABEL
Type: CAN-BUS flexible 2 x 2 x ... mm2
(see notice on Page 61)

**NOTICE!**

For connection, use only twisted-pair wire with braided shield certified according to DIN 19245 T3 and EN 50170.

6.7.3 Connecting external sensor (option)

MATRIX			
3001	3501	4001	4001+IO
		✓	✓

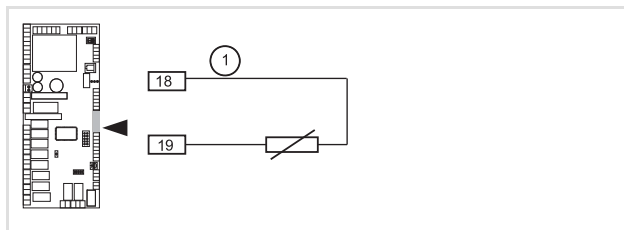


Fig. 6-9: Connecting outdoor sensor

Pos. 1: Connecting cable (refer to notice on Page 60)

- Connect the outdoor sensor according to wiring diagram.

6.7.4 Connecting the inlet sensor (option)

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

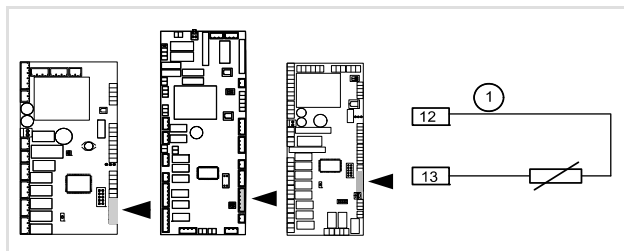


Fig. 6-10: Connecting inlet sensor

Pos. 1: Connecting cable (refer to notice on Page 60)

- Connect the inlet sensor according to the wiring diagram.
- Connect the shielding of the sensor line with grounding clamps to a large ground area.

6.7.5 Connecting room sensor/return-air sensor (option)

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

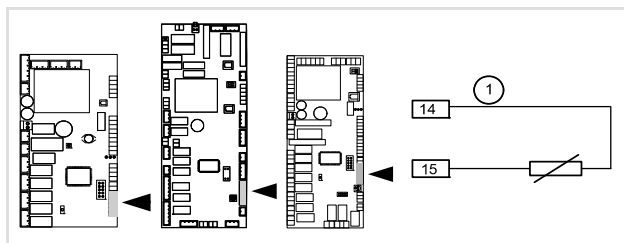


Fig. 6-11: Connecting room sensor/return-air sensor

Pos. 1: Connecting cable (see notice on Page 60)

- Connect the room or return-air sensor according to the wiring diagram.

6.7.6 Connecting supply-air sensor (for subsequent retrofitting)

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

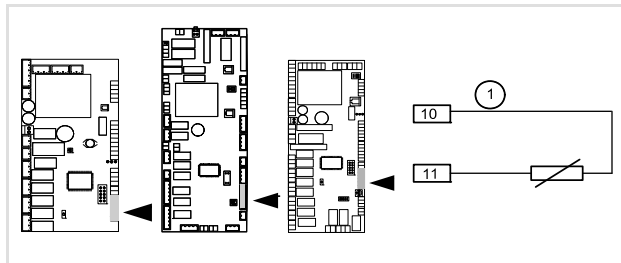


Fig. 6-12: Connecting the supply-air sensor

Pos. 1: Connecting cable (refer to notice on Page 60)

- Connect the supply-air sensor according to the wiring diagram.

6.7.7 Connecting status and fault signal

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

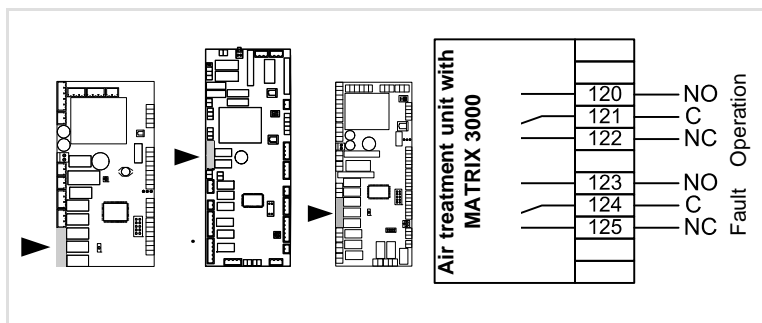


Fig. 6-13: Connecting status and fault signal

The controller PCB enables to tap status and alarm messages using a volt-free contact. The contact load at 230 V AC amounts to a maximum of 4 A ohmic / 2 A inductive.

- Connect in accordance with the wiring diagram.

Operation:

contact closed on terminal 120 - 121

Fault:

contact closed on terminal 124 - 125

6.7.8 Connecting function inputs and outputs

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

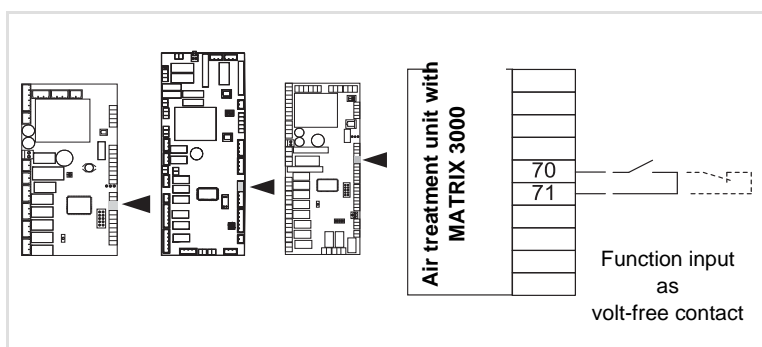


Fig. 6-14: Connecting function input

Function input can be assigned with different functions depending on the supplied control equipment.

To activate the function the contact must be:

- closed for economy mode operation
- open for unit OFF with frost protection

This function can be changed using the service tool MATRIX.PDA or service software MATRIX.PC.

- Connect in accordance with the wiring diagram.

The loop resistance may not exceed 500 W.

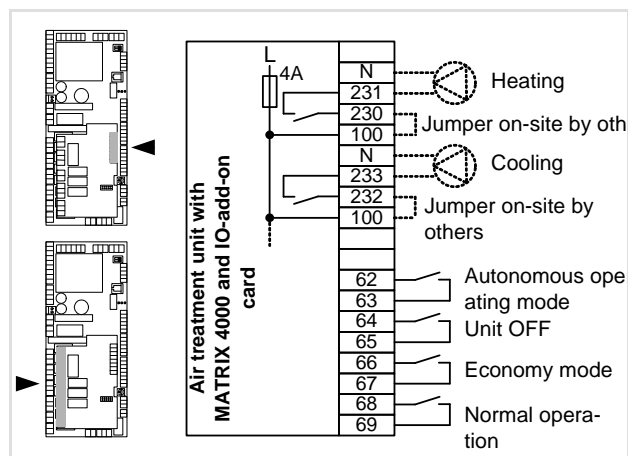


Fig. 6-15: Wiring function inputs and outputs

MATRIX			
3001	3501	4001	4001+IO
			✓

Function inputs

Functional inputs can be assigned with different functions.

- Normal operation
- Economy mode
- Autonomous operating mode (functions of these operating modes can be programmed using the service software MATRIX.PC)
- Switching the unit off (without frost-free condition in room)

Function outputs

The control contains 2 function outputs:

- Heat request (max. 230 V/4 A ohmic/ 2 A inductive)
- Cool request (max. 230 V/4 A ohmic/ 2 A inductive)

If no jumpers are set at 100-230 and 100-232, outputs 230-231 and 232-233 can be used as volt free outputs (max. 2 A).

- Connect in accordance with the wiring diagram.

The loop resistance may not exceed 500 Ω.

6.8 Network and shielding connection MATRIX.Net

This section contains information about the MATRIX.Net and the correct network setup. The MATRIX.Net is a network for connecting various components of the GEA control system (network users) in one data bus. The bus enables the exchange of all information required for control and regulation between the users.

Network participants can be: controller, control panels, global modules, Lon® interfaces, Servicetools

6.8.1 Group structure

A group consists of a minimum of 2 and a maximum of 20 users (control panel, 16 air treatment units, valve module, DV module and LON module). This means, for example, that a control panel and a controller/unit form a group. However, a group can also be made up of a LON module and a controller/unit. The LON module transmits setpoints and current readings into the group.

For units fitted with MATRIX 3000 and MATRIX 4000, a group can also be formed by replacing the control panel by a global module, such as MATRIX.LON.

Group structure with the system MATRIX 3000, 3500 and/or MATRIX 4000

A group may be formed using the MATRIX 3000 and MATRIX 4000 systems. The Fig. 6-16 shows, as an example, a network consisting of control panel, MATRIX 3000, MATRIX 3500, MATRIX 4000 and various global modules.

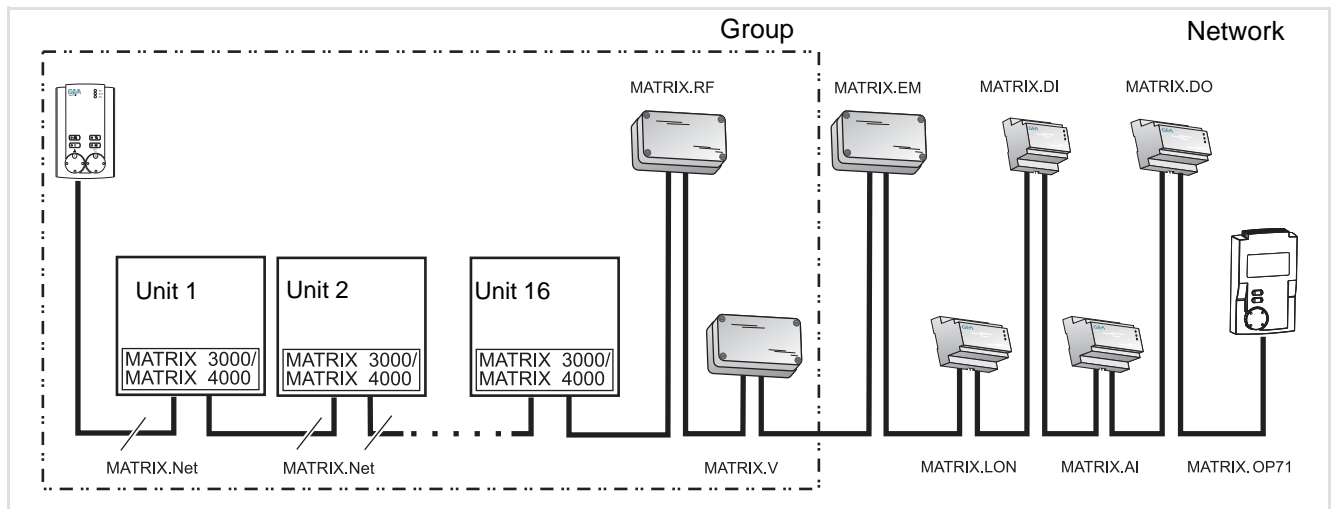


Fig. 6-16: Group structure of a combination of the controller types MATRIX 3000, 3500 and MATRIX 4000

Any assignment and combination of the controllers/units is possible. However, only MATRIX 3000 or only MATRIX 4000 controllers may be used. We recommend the arrangement of a control panel as the first component of a group.

The group address is assigned:

- via the group address switch on the control panel – refer to the “Commissioning and Testing” section in the relevant operation manual for GEA MATRIX control panels.
- on the printed circuit board of the MATRIX 3000/3500/4000 controller – refer to the unit’s operation manual.

The MATRIX OP71 is assigned to this group with the cluster configuration – see the "Sub menu Cluster Config." in the operation manual "GEA MATRIX® - Control Panel OP71". Data assignment of MATRIX.LON module is performed via LON-side configuration. The MATRIX.V, MATRIX.RF and MATRIX.EM modules are assigned to this group via the group address switch – refer to the “Commissioning” section in this operation manual or the corresponding manual for GEA MATRIX Global Modules.

6.8.2 Network structure MATRIX.Net

A network can consist of one or several (up to 16) groups. Global modules can also be integrated into the network. The network structure/network topology of MATRIX.Net must be performed linearly – see “Topologies of network MATRIX.Net” on page 66. The maximum extent of the MATRIX.Net network is shown in Fig. 6-17.

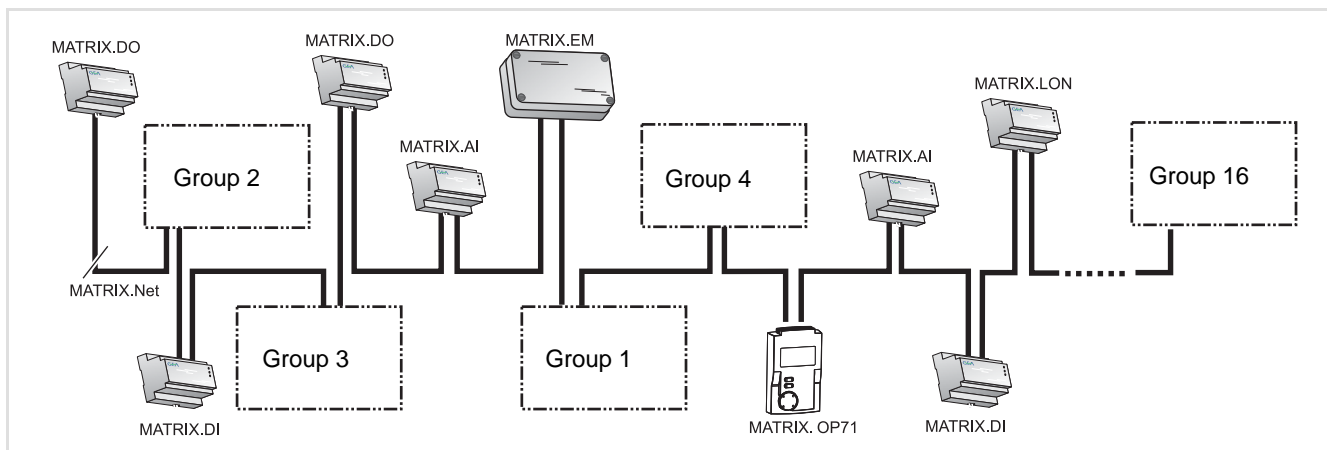


Fig. 6-17: Example of maximum extent of the network

At its maximum extent, the network can consist of:

- a maximum of 16 unit groups – see “Topologies of network MATRIX.Net” on page 66
- two digital input modules (MATRIX.DI)
- two analog input modules (MATRIX.AI)
- two digital output modules (MATRIX.DO)
- one extract-air manager (MATRIX.EM)
- up to 16 LON[®] modules (MATRIX.LON)
- a maximum of 1 module MATRIX.LON can be assigned to each group to an intra-group control panel (MATRIX control panel OP71) **

****** If a management module (LON module) gets registered in a group that is assigned to a cluster with MATRIX control panel for all OP71 groups, an address conflict will occur. Therefore the LON module and the MATRIX control panel OP71 must service different groups.

The arrangement of the unit groups and global modules in the network is arbitrary. The following factors are critical for the assignment of units, control panels and global modules to a group:

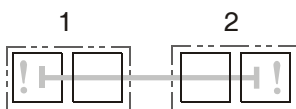
- the setting of the group address switch (refer to the chapter “Commissioning and Testing” in the relevant operation manual) or the assignment of a module input and output to a unit group via the MATRIX.PC service tool (refer to the online help for the service software).

and not the physical assignment.

6.8.3 Topologies of network MATRIX.Net

The MATRIX.Net can be set **in a line structure and a line structure with branch feeder**. All units equipped with GEA MATRIX system can access this data bus. The data bus must be terminated at both physical ends to avoid reflections which can interfere with data transfer. Switchable bus terminating resistors are integrated on the respective boards enabling safe termination – refer to Chapter “Connecting MATRIX.Net”.

6.8.4 Line structure



The illustration shows the setup of the MATRIX.Net with line structure. As an example, two groups, each consisting of a control panel and a global module, are networked. In addition, the power supply of the control panel via the controller (terminal 95/99) is also presented.

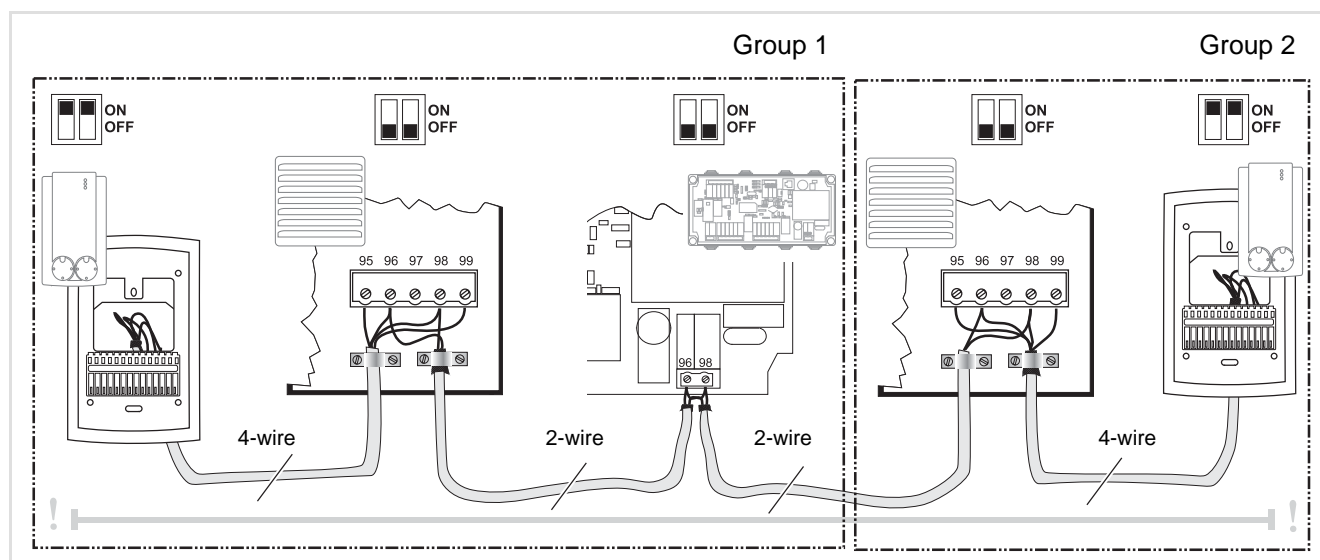


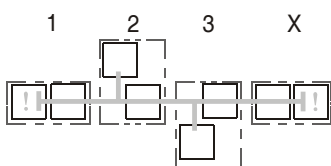
Fig. 6-18: Set up of MATRIX.Net in line structure



NOTICE!

The data transfer cable must be run as demonstrated in Fig. 6-18 so that only one side of the respective shielding is applied – see “Shielding / Earthing” on page 70.

6.8.5 Line structure with branch feeder



The illustration shows the setup of the MATRIX.Net as line with branch feeder structure. A sample connection of a control panel via a branch feeder in multiple groups is illustrated. The maximum allowed branch feeder length is 25 m.

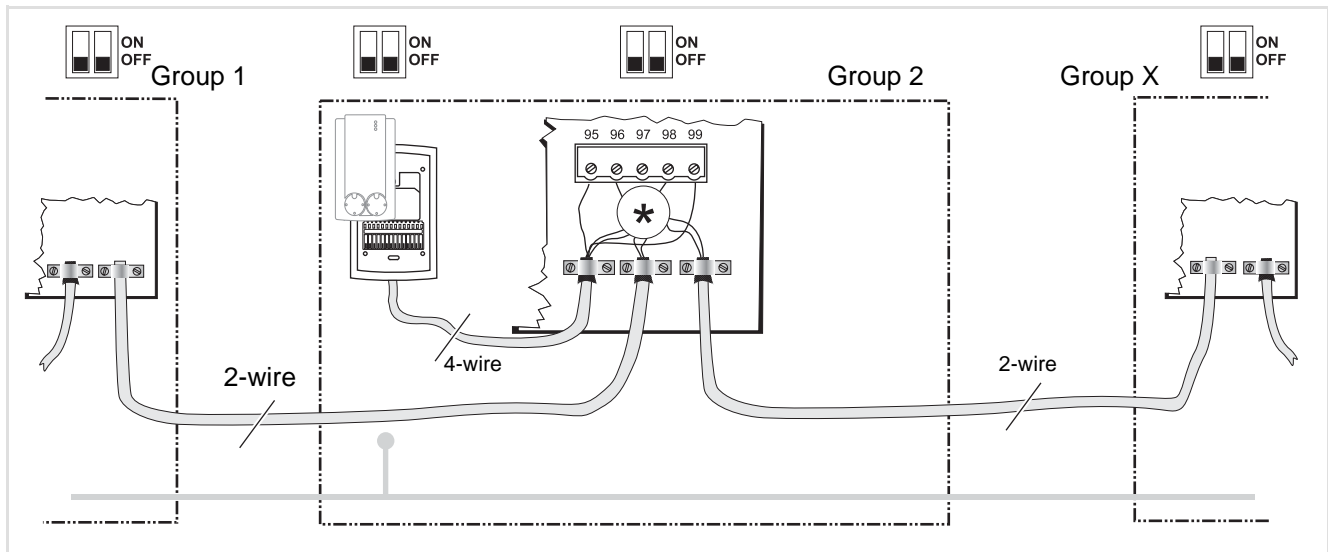


Fig. 6-19: Structure of a MATRIX.Net in line structure with a branch feeder. Since it is not permissible to connect three lines, an intermediate terminal must be provided! To do this, the intermediate terminals (STV) mounted on the board (if not already occupied) or terminals fitted on site by others can be used



NOTICE!

The data transfer cable must be run as demonstrated in Fig. 6-19 in such a way that only one side of the respective shielding is applied – see “Shielding / Earthing” on page 70.

6.8.6 Network set up MATRIX.Net

Data transfer cable

For building of the MATRIX.Net, only use data transfer cable according to DIN 19245 T3, with twisted wires pairs and with braided shielding.

We recommend the following data transfer cable:

Total max. line length [m]	Max. line length with branch feeders [m]	Manufacturer	Cable type	only MATRIX.Net	MATRIX.Net + supply voltage
50	50	LAPP cable	UNITRONIC® BUS CAN	1x2x0.22	2x2x0.22
300	150	LAPP cable	UNITRONIC® BUS CAN	1x2x0.34	2x2x0.34
600	150	LAPP cable	UNITRONIC® BUS CAN	1x2x0.5	2x2x0.5
30	30	LAPP cable	UNITRONIC® BUS LD	1x2x0.22	2x2x0.22
30	30	LAPP cable	UNITRONIC® Li2YCY (TP)		2x2x0.22
150	60	LAPP cable	UNITRONIC® Li2YCY (TP)	1x2x0.34	2x2x0.34
150	60	LAPP cable	UNITRONIC® Li2YCY (TP)	1x2x0.5	2x2x0.5
30	30	LAPP cable	UNITRONIC® Li2YCY PiMF		2x2x0.22
300	150	LAPP cable	UNITRONIC® Li2YCY PiMF		2x2x0.34
600	150	LAPP cable	UNITRONIC® Li2YCY PiMF		2x2x0.5
50	50	HELUKABEL	CAN BUS	1x2x0.22	4x1x0.22
300	150	HELUKABEL	CAN BUS	1x2x0.34	4x1x0.34
600	150	HELUKABEL	CAN BUS	1x2x0.5	4x1x0.5
30	30	HELUKABEL	PAAR-TRONIC-Li-2YCYV 2X2X		2x2x0.22
30	30	BELDEN	9841	1x2xAWG24	
30	30	BELDEN	9842		2x2xAWG24
150	60	BELDEN	3105A	1x2xAWG22	
150	60	BELDEN	3107A		2x2xAWG22

Tab. 6-4: Data transfer cable

Line lengths

Regardless of the cross section and the number of users, the maximum line length including branch feeders must not exceed 600 m.

The branch feeder must not exceed 25 m. The total length of all branch feeders may not exceed a maximum 150 m.



RECOMMENDATION

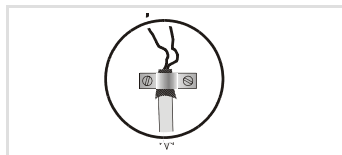
Bridges must be used in the network if there are more than 110 users. In order to increase the line lengths, special bridges are necessary which decouple the running times of the telegrams between the network segments.

The cross-section of the bus cable must be changed depending on the MATRIX.net cable length!

Line length	Line Type
up to 50 m	2 x 2 x 0.22 mm ² * 1 x 2 x 0.22 mm ²
up to 600 m	2 x 2 x 0.5 mm ² * 1 x 2 x 0.5 mm ²

*Contains 2 wires for the voltage supply of the control panels or modules

Shielding / Earthing



- Install the data transfer cable (MATRIX.Net) **on one side** in the GEA air treatment unit using shielding clips to ensure the best possible electrical contact.
- Apply the shielding with the grounding clamps to a large ground area!
- In systems with a large network, or if large-scale EMC impairment is likely, the shielding should be applied on both sides. Ensure beforehand that there are no differences in potential.

7 Commissioning

**HAZARDOUS VOLTAGE!**

Power the unit down before carrying out any work on the unit. Ensure that the unit is properly secured against subsequent switch-on at an appropriate point of the on-site power supply.

**DANGER OF SCALDING!**

Before completing any kind of job on fan coil units:
Seal off the heating medium inlet before performing work on the valves or the inlet or outlet pipes and secure this sealing from being opened unintentionally. Do not commence work before the heating medium has cooled down.

**WARNING: RISK OF ROTATING COMPONENTS!**

Rotating fan impeller wheel poses a risk of injury! Power the unit down before carrying out any work on the unit. Ensure that the unit is properly secured against subsequent switch-on at an appropriate point of the on-site power supply.

7.1 Safety check

7.1.1 Pre-commissioning checklist

- The entire plant comprising HyPower-Geko units has been installed both mechanically and electrically.
- The system and HyPower-Geko units are de-energized and isolated
- All medium pipes were flushed and are free from residues and foreign matter.
- The system is properly filled with medium (see „Proper use“ on page 10).

**NOTICE!**

Prior to commissioning ensure that

- the unit discharge (heat exchanger),
- coil drip tray and suction area of the condensate pump
- and filter are clean.

If necessary, these components must be cleaned or the filter replaced.

7.1.2 The following pre-commissioning checks must be performed:

- Check that the HyPower-Geko (ceiling mounting) is properly secured.
- Manually check the mounting of actuators (Fig. 7-1, Pos. 1 sample).
- Tighten all screw connections on medium connections (Fig. 7-1, Pos. 2).
- Check all electric connections according to the available wiring diagrams and check all terminal connections for secure seating.
- Proceed with commissioning (see chapter 7.2).
- Check all built-in components for soiling and clean if necessary.

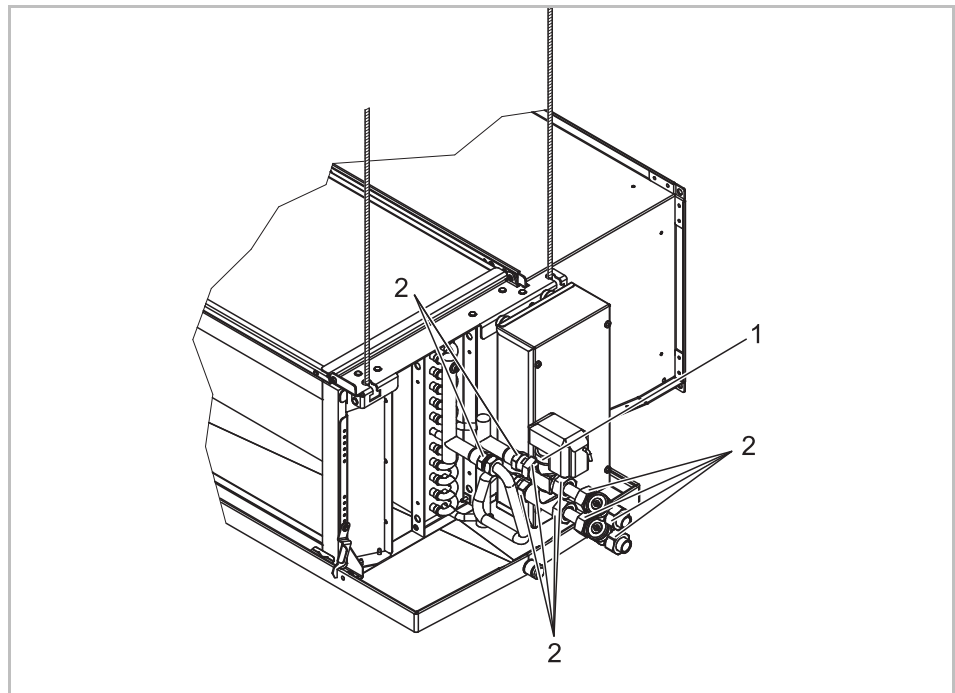


Fig. 7-1: Pre-commissioning checks:

Pos. 1: Actuators

Pos. 2: Screw connections medium connection

7.2 Checking the control and shut-off valves

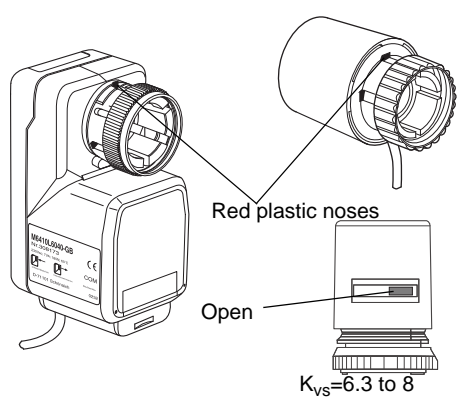
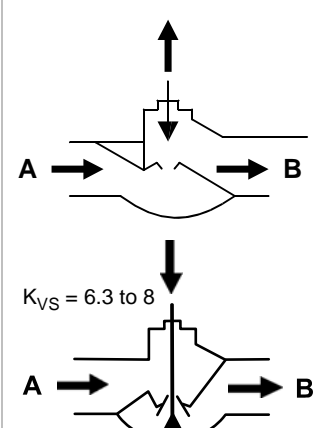
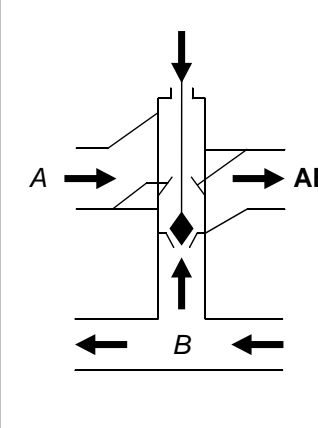
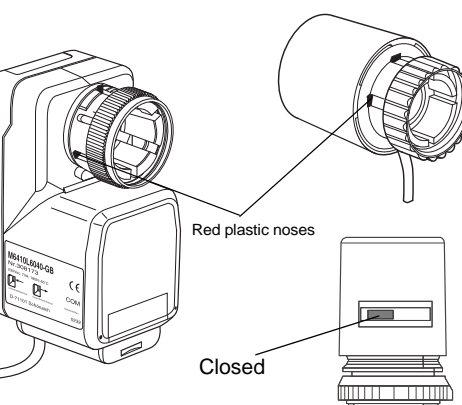
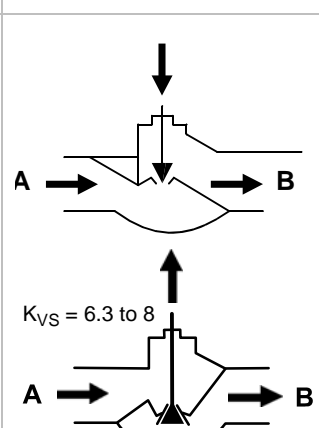
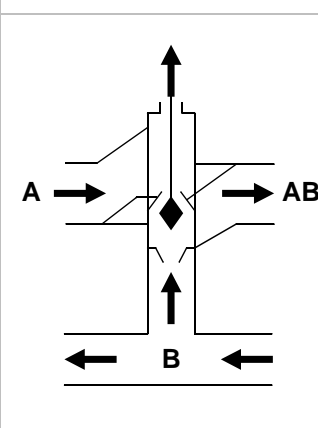
Check all on-site valves according to the regulations of the manufacturer.

7.2.1 Checking the control valves

2 or 3-way valves with modulating actuators or 2 and 3-way valves with thermoelectric actuators.

Actuators of 2 and 3-way valves have a position indicator in the form of a red plastic nose that is placed in the relevant slots.

Depending on the model as a 2 or 3-way valve the latter is open or closed if the red plastic noses are in one of two possible end positions (refer to Tab. 7-1).

Position indicator of drive screw	2-way valve	3-way valve
 <p>Red plastic noses</p> <p>Open</p> <p>$K_{VS}=6.3 \text{ to } 8$</p> <p>Setting 1</p>	 <p>$K_{VS} = 6.3 \text{ to } 8$</p> <p>Valve OPEN</p>	 <p>Valve CLOSED</p>
 <p>Red plastic noses</p> <p>Closed</p> <p>$K_{VS}=6.3 \text{ to } 8$</p> <p>Setting 2</p>	 <p>$K_{VS} = 6.3 \text{ to } 8$</p> <p>Valve CLOSED</p>	 <p>Valve OPEN</p>

Tab. 7-1: Position indicator with 2 and 3-way valves



NOTICE!

Thermoelectric actuators for 2-way valves are marked with a black label and 3-way valves - with a red label.

7.2.2 Shut-off valve settings (variants)

Check whether the shut-off valves are opened.

- Unscrew the protective cap (Fig. 7-2, Pos. 2).
- Close the valve by tightening the internal flow-control screw (Fig. 7-2, Pos. 3) using a 4 mm hex key until the stop position on the right side.
- Tighten the pre-setting screw (Fig. 7-2, Pos. 4) until the stop position on the right side.
- Perform adjustment by rotating as specified in the diagrams (see Fig. 7-3 with Tab. 7-2 and Fig. 7-4 with Tab. 7-3). Turn the pre-setting screw in a counter-clockwise direction (max. 8 turns).
- Use the hex key to open the flow-control screw (Fig. 7-2, Pos. 3) until the stop position.
- Screw the protective cap back on.

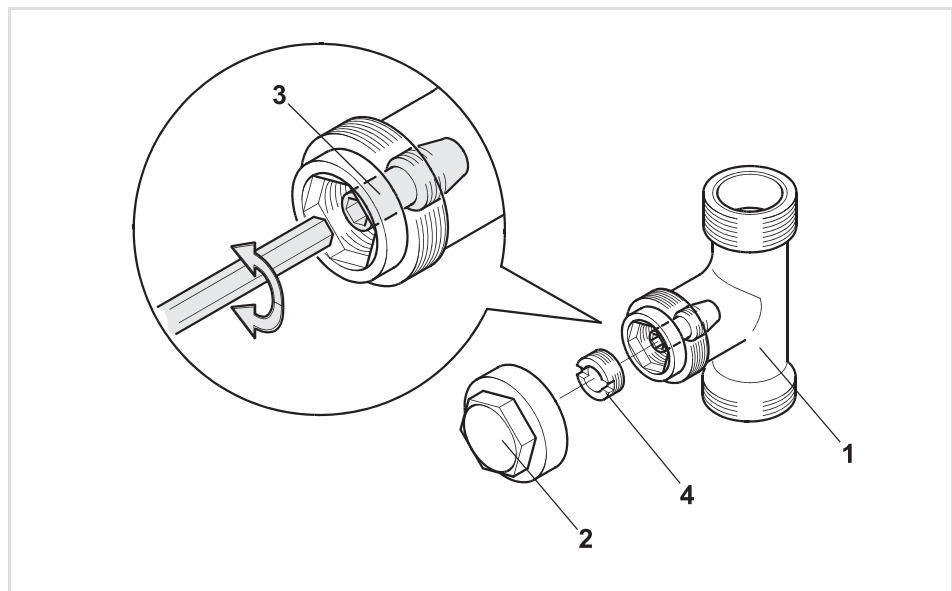


Fig. 7-2: Adjusting shut-off valves

Pos. 1: shut-off valve

Pos. 2: Protective cap

Pos. 3: Flow-control screw

Pos. 4: Pre-setting screw



NOTICE!

The flow of the medium through the unit can be limited by the regulated opening of the shut-off valve.

7.2.3 Shut-off valve for control valves up to 1.6 k_{vs} (1/2") value for fan coil units

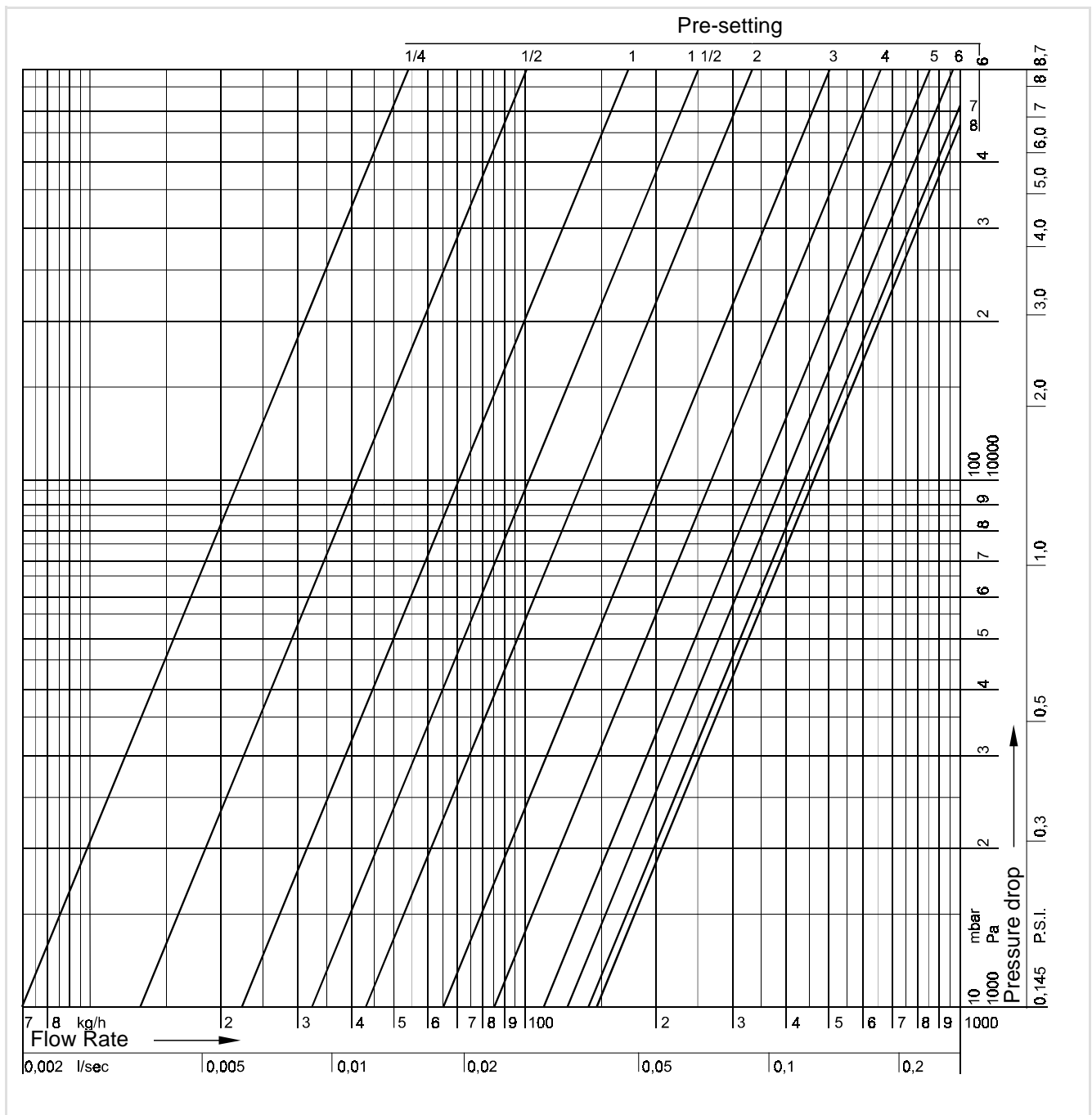


Fig. 7-3: Flow rate diagram V9400

Pre-setting	1/4	1/2	1	1 1/2	2	3	4	5	6	7	8
k_{vs} -values	0,07	0,13	0,22	0,32	0,43	0,65	0,85	1,10	1,25	1,40	1,45

Tab. 7-2: Pre-setting = turns of the pre-setting screw from the right stop position

7.2.4 Shut-off valve for control valves from to 2.5 k_{vs} (3/4") to 4.0 k_{vs} (3/4") value for fan coil units

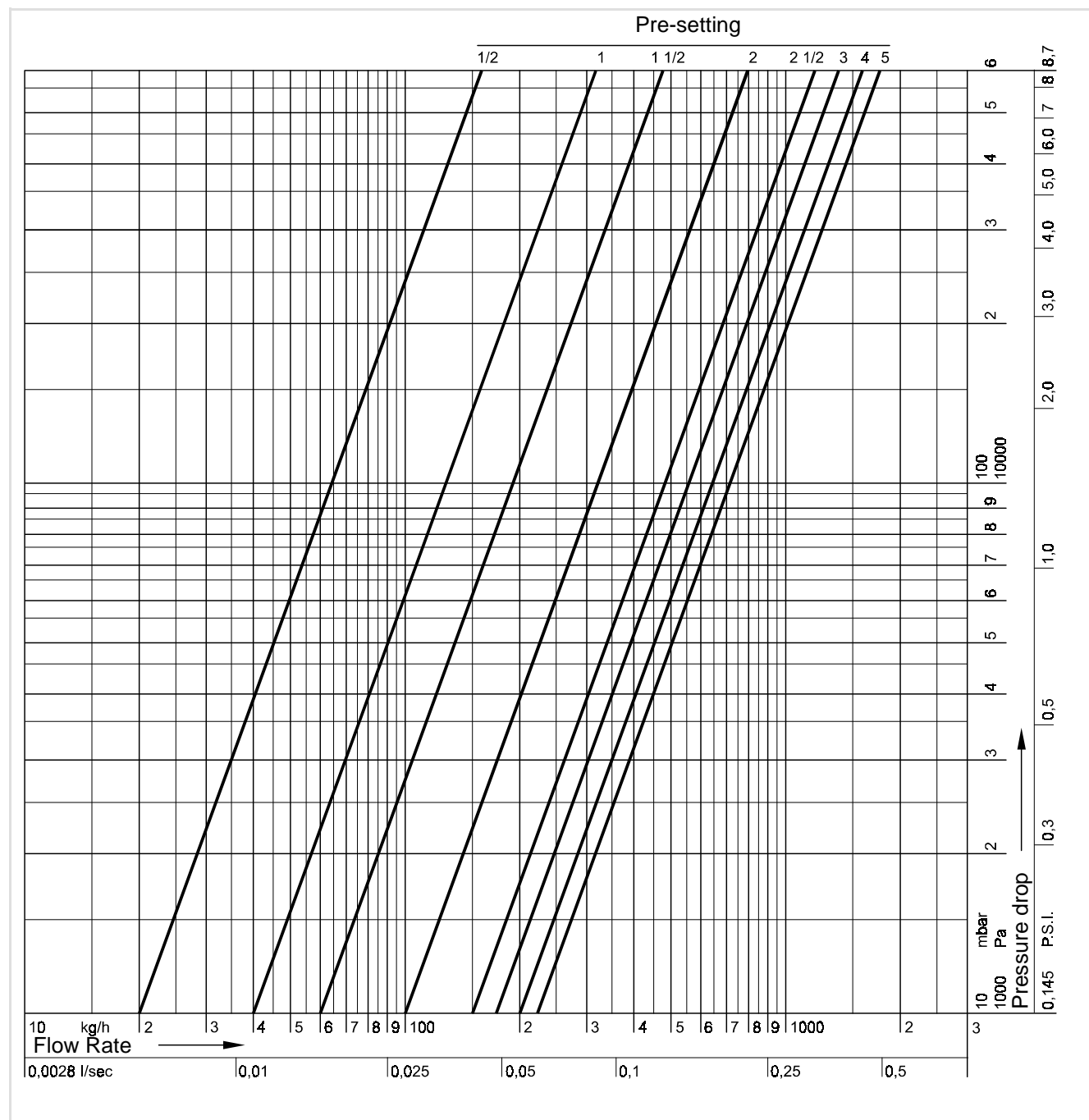


Fig. 7-4: Flow rate diagram V9441

Pre-setting	1/2	1	1 1/2	2	2 1/2	3	4	5
k_{vs} values	0,2	0,4	0,6	1	1,5	1,7	2	2,2

Tab. 7-3: Pre-setting = turns of the pre-setting screw from the right stop position

7.2.5 Shut-off valve for control valves from to 6.3 k_{vs} (5/4") to 8.0 k_{vs} (5/4") value for fan coil units

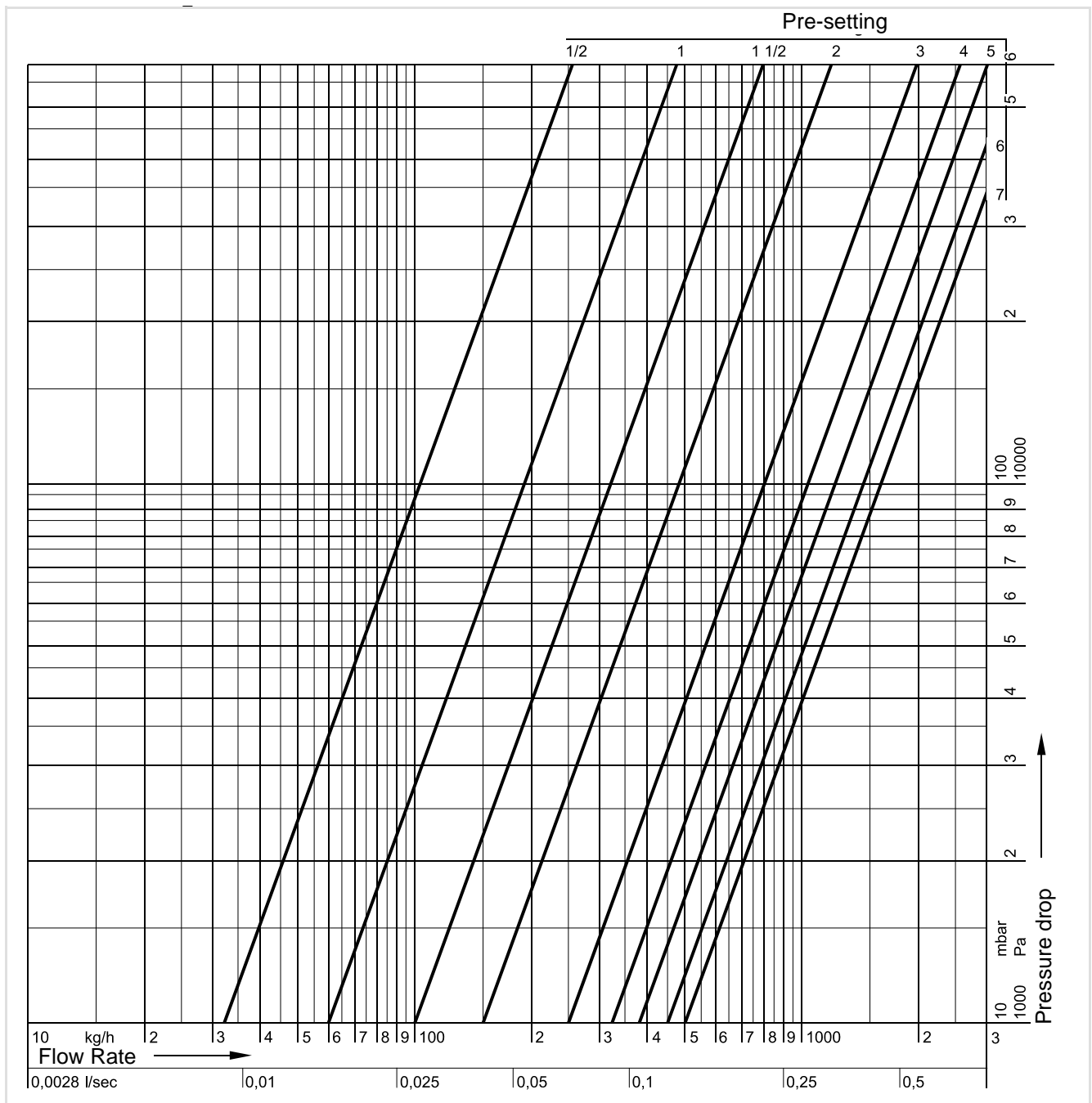


Fig. 7-5: Flow rate diagram V9440

Pre-setting	1/2	1	1 1/2	2	3	4	5	6	7
k_{vs} values	0,32	0,60	1,00	1,50	2,50	3,20	3,80	4,50	5,00

Tab. 7-4: Pre-setting = turns of the pre-setting screw from the right stop position

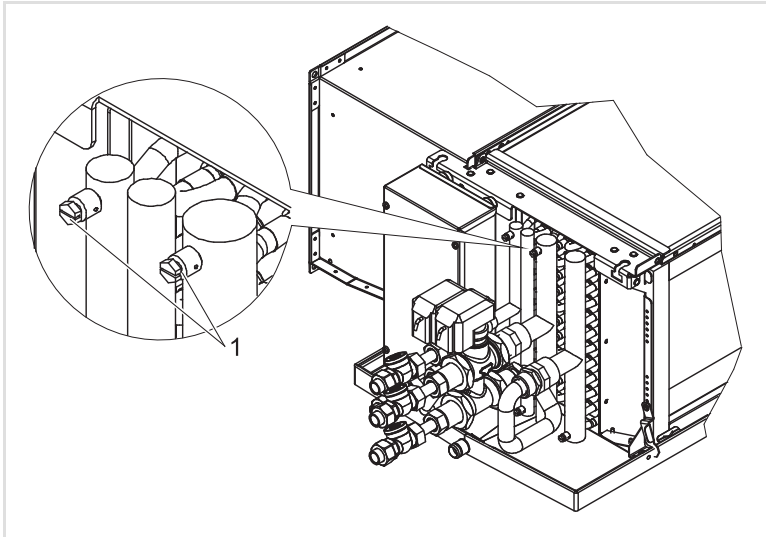
7.3 Unit air venting

To ensure that the exchanger is charged with heating/cooling medium, it must be air vented.



NOTICE!

Protect electrical hardware and furniture from escaping splash water.



- Open all shut-off and control valves.
- Open the venting screw(s) with a suitable tool (see Fig. 7-6).
- Close the air vent screw again only if heating/cooling medium is still pouring out.
- Proceed in the same way with all remaining air vent screws. Depending on the unit model, there are additional 1 or 2 air vent screws.

Pos. 1: Air vent screws

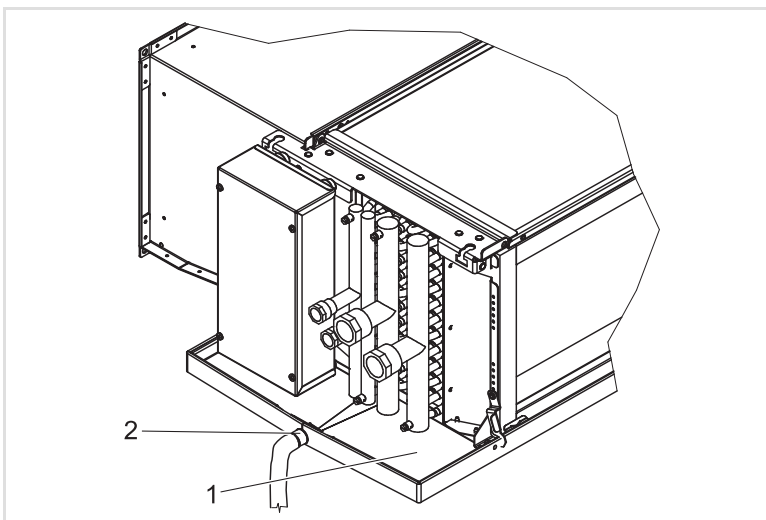
Fig. 7-6: Air venting heat exchanger

7.4 Checking the condensate drain

This checkpoint only applies to cooling units without condensate pump!

Condensate forms as a result of unit operation in cooling mode, the same applies to non-insulated pipes. Check

- that the connection of the condensate tray (Fig. 7-7, Pos. 1) is laid so that condensate can drain freely. At the same time a sufficient slope of the condensate line must be considered.



Pos. 1: Coil drip tray

Pos. 2: Condensate drain

Fig. 7-7: Drainage of the condenser water

7.5 Terminating resistors

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

Unit printed circuit boards of the MATRIX 3000 control system and MATRIX OP3X/44/5X control panels are equipped with terminating resistors.

Terminating resistors are placed at line start and end (Fig. 7-8):

- Activate the DIP switch on both users (e.g. control panels, unit MCBs or modules) to "ON".

The line beginning and line end correspond to the start and end of the bus cable. The terminating resistors must also be switched on for stand-alone units.

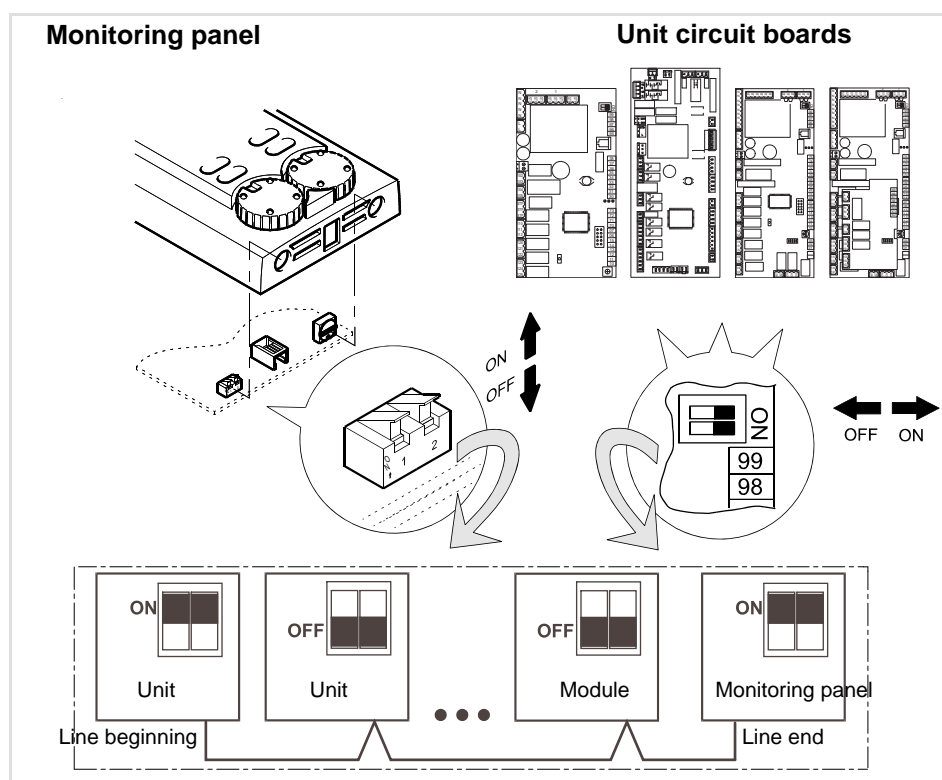


Fig. 7-8: Setting terminating resistors

DIP switch		Function
1	2	
OFF	OFF	No terminating resistor
ON	ON	Terminating resistor switched on (default setting)



NOTICE!

With default settings the DIP switches are set to "ON/ON" and must be switched off if used as an intermediate unit.

7.6 Address setting

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

The appropriate group address must be assigned to the control panels and units of a group.

Single group (without networking multiple unit groups)

- On the control panel, set the address "0" (manufacturer's default setting).
- On the unit PCB(s), set the "0" address (manufacturer's default setting).

Networking multiple groups

- On the control panels and all unit PCBs assigned to the individual groups, set the addresses to 0 -15. Each group is assigned its own address. The labels A to F correspond to the addresses 10 to 15.



NOTICE!

Assigning duplicate addresses on the control panels can cause malfunctions. The default setting for the group address switch is "0" and must be changed, if necessary.

Monitoring panel

Unit circuit boards

Group addresses

0	Group 0	8	Group 8
1	Group 1	9	Group 9
2	Group 2	A	Group 10
3	Group 3	B	Group 11
4	Group 4	C	Group 12
5	Group 5	D	Group 13
6	Group 6	E	Group 14
7	Group 7	F	Group 15

Fig. 7-9: Set address on the control panel

Pos. 1: Control panel, MPower-Geko(s) Group 0 (Address 0)

Pos. 2: Control panel, MPower-Geko(s) Group 1 (Address 1)

Pos. 3: Control panel, MPower-Geko(s) Group 2 (Address 2)

7.7 Setting limitation functions

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

Limit values of the supply air temperature can be set for heating and cooling operation.

- Minimum and maximum limit (limit type: rigid or variable)
- Cooling operation: Minimum limitation

These limit values and limitation type can be set using “MATRIX.PC” service software. (See online help of the service software for further procedures).

When using a control panel with display (MATRIX OP50 or OP51), the limit values can also be set here (See MATRIX OP50/OP51 operation manual).

General functions of supply air temperature limitation

If a supply air temperature limit is either not reached or exceeded, the controller automatically switches to supply-air mode. The supply-air temperature with relevant control settings is regulated to reach this limit value.

With the room temperature and cascade control types, this temporary supply-air control remains active until the main control setpoint, i.e. particular room temperature, is reached. The unit then switches back to the main control mode.

Minimum heating temperature

If this function is activated and a temperature sensor is present in the supply-air duct, a temperature value must be entered here. Supply air must not fall below (rigid limitation), or be only slightly below the limit (variable limitation).

Factory setting and entered limit values:

- Default value: 18.0 °C
- Minimum enter value: 10.0 °C
- Maximum enter value: 35.0 °C

If this function is activated and a temperature sensor is present in the supply-air duct, a temperature value must be entered here. Supply air cannot fall below (rigid limitation), or be only slightly below the limit (variable limitation).

Minimum heating limitation (rigid):

The set minimum temperature value is maintained (value does not fall below limit).

- Advantage: Air draughts are largely avoided.
- Disadvantage: The room can be slightly overheated if values are set too high, because the controller cannot avoid overheating by supplying cooler air.

Minimum heating limitation (variable):

Value can fall below the set minimum temperature value if the current room temperature value exceeds the setpoint by a value that is calculated as room temperature difference multiplied by effective factor.

- Advantage: Overheating of the room can be prevented or minimized by means of the minimum limitation.
- Disadvantage: The supply-air temperature can fall below the minimum limitation temperature value.

Factory setting and enter limits for effect factor:

- Default value 1.0
- Minimum entered value 0.4
- Maximum entered value 4.0

Maximum heating temperature

If this function is activated and a temperature sensor is present in supply air, a temperature value can be entered here. This value should not exceed the supply-air temperature.

Factory setting and entered limit values:

- Default value 60.0 °C
- Minimum enter value 25.0 °C
- Maximum enter value 60.0 °C

Minimum cooling temperature

If this function is activated and a temperature sensor is present in supply air, a temperature value can be entered here. This value should not fall below the supply-air temperature.

Factory setting and entered limit values:

- Default value 10.0 °C
- Minimum entered value 10.0 °C
- Maximum entered value 20.0 °C

7.8 Switch on unit

**HAZARDOUS VOLTAGE!**

The electrical control box is open.

Direct interventions in the electrical control box are not permitted!

Before completing work on the air handling unit, ensure that the electrical control box (terminal box) is properly closed (see „Terminal box or electrical control box“ on page 53).

- Apply mains supply voltage.
The unit is switched on with a control panel of the MATRIX series, the small switch CET-EC or a remote control.
For instructions, refer to the operation manual enclosed with the relevant control panel.
- Switch the unit on using the control panel.
- Test the fan speeds.

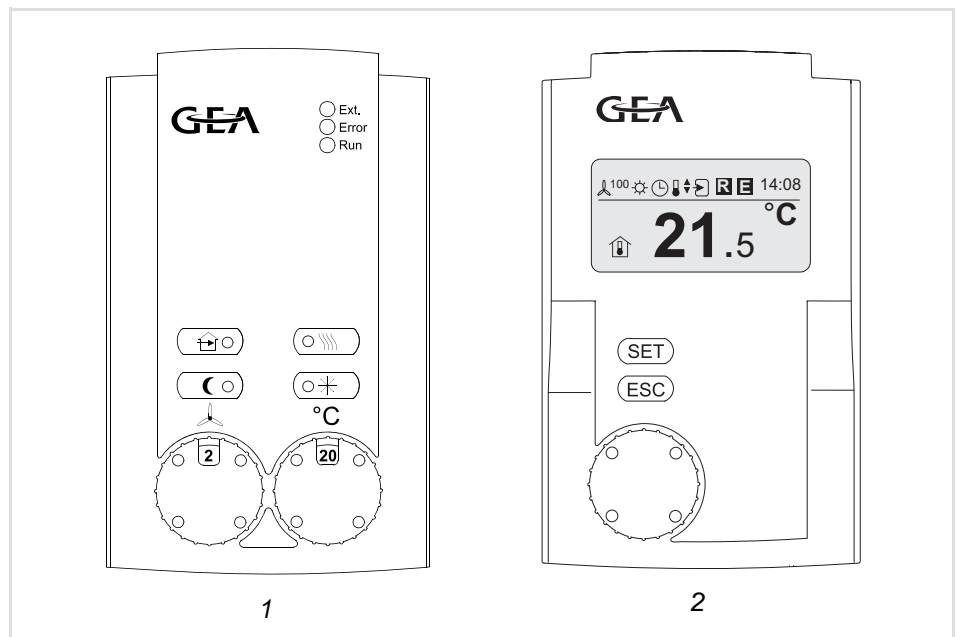


Fig. 7-10: Switching the unit on using the control panel

Pos. 1: Control panel MATRIX OP44C

Pos. 2: Control panel MATRIX OP51C



NOTE!

The position of the speed selection switch (only OP3XX/OP4XX) can be mechanically limited.

The limitation should be set so that the maximum adjustable fan speed corresponds to that of the unit.

For details on the limitation, refer to the operation manual for the control panel.

7.9 Checking data connection



HAZARDOUS VOLTAGE!

Before correcting an error in the data connection, de-energize and isolate the entire plant. Ensure that the unit is properly secured against being switched on again at an appropriate point of the on-site power supply.

7.9.1 Checking data connection

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

Data are communicated via a 2/4-wire data cable. This cable must be connected and/or checked in accordance with the wiring diagram attached to the unit connection box (see „Completing bus connection“ on page 61).

LEDs on the unit printed circuit board signal the operating status of the unit

LED	LED status	Operating state	ACTION
Yellow	On	Power supply to electronics OK	–
	Off	Power supply to electronics not OK	Check 230 V power supply for the unit
Green	On	Operating system and controller software have been started and are working properly	–
	Off	Faulty software or processor	Replace PCB
Red	Continuously on	Error in electronics	De-energize PCB and wait for a short time. Power the PCB on again. If the error message is still present, replace the PCB.
	Flashes	Data bus interruption	Examine the connection of the data lines and the setting of the terminating resistances at all devices.

Tab. 7-5: Operation status and troubleshooting of the data connection (MATRIX 3000)

7.10 Checking control inputs and outputs

The MATRIX 3000/3500/4000 control systems are fitted with inputs and/or outputs. Consider the factory-performed configuration for checking control inputs and outputs. Refer to the unit connection diagram (attached to the connection box) for the relevant controller function.

Changes in the configuration performed by others on-site (via MATRIX.PDA service tool or MATRIX.PC service software) have to be considered separately.

7.10.1 Functional input

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

Depending on the control system, the input can be assigned with the following functions as required:

Window contact (unit OFF with room frost protection)

- Couple input terminals.
- Turn the unit on and change the setpoint as required to activate the fan.
- Remove the jumper. The fan must switch off, the valves close (unit remains in frost protection monitoring mode).

Economy mode

- Turn the unit on and change the setpoint as required to activate the fan.
- Couple input terminals.
The fan must switch off and valves close
Requirement: economy mode setpoint adjusted accordingly (unit continues to operate in frost protection monitoring mode, if this function is available).

**NOTE!**

If multiple inputs of different configuration are used within one group, then "economy mode" input has priority over "window contact" input.

7.10.2 Operating programs

MATRIX			
3001	3501	4001	4001+IO
	✓	✓	✓

The operating programs described can be switched on with the 2 or 4 additional inputs. 2 outputs are available for messages.

Switch on operating program "Normal operation" (not at MATRIX3501):

- Switch the unit on.
- Switch the unit into economy mode (See operation manual for control panel).
- Couple input terminals.
- ✓ The unit switches into normal mode.

Switch on operating program "Free operating mode" or "Economy mode" (Economy mode not available with MATRIX3501):

- Switch the unit on.
- Couple input terminals.
- ✓ The unit switches into "free operating mode" or "economy mode".

Operating program: switch on "Unit OFF"

- Switch the unit on.
- Couple input terminals.
- ✓ The unit switches off (attention: no frost protection function).

Operating program: switch on "Require heat"

- Switch the unit on and increase the setpoint until the unit starts heating.
- ✓ Contact "heat request" closes.

Switch on operating program "Cooling request":

- Switch the unit on and decrease the setpoint until the unit starts cooling.
- ✓ Contact "cooling request" closes.

7.11 Check condensate pump (applies only to cooling units with condensate pump)

**NOTE!**

Lay the pressure lines so that no structure-born vibration can be transferred to the basic unit or to on-site facilities

Prior to commissioning, ensure that

- the unit discharge (heat exchanger)
- coil drip tray and suction tube of the condensate pump
- and filter are clean.

If necessary, these components must be cleaned or filter medium replaced.

Condensate forms as a result of unit operation in cooling mode, the same applies to non-insulated pipes.

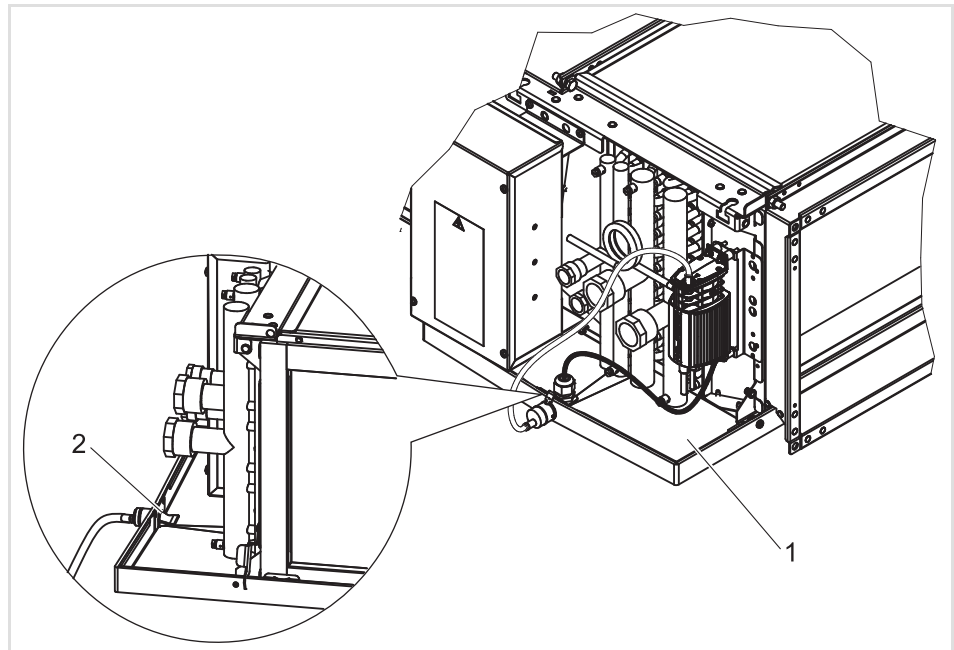


Fig. 7-11: Check condensate pump

Pos. 1: Coil drip tray

Pos. 2: Suction basket

- Check
 - that the coil drip tray is properly secured and stable.
 - the suction basket (Fig. 7-11, Pos. 2) is clean and has a firm seat.
- Unless already done, apply mains supply voltage.
- Checking condensate pump function
 - Carefully fill the drip tray with some water (Fig. 7-11, Pos. 1) until the pump switches on.
 - After some time, when the water is drained, the pump must switch off again.
 - At this point, increase the water supply to activate the alarm sensor (fan must switch off and cooling valve close)
- Check all hydraulic connections for tightness during this test phase.

7.12 Functional characteristics for the use of GEA MATRIX

7.12.1 Fan

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

Fan control depends on the configured control type and selected operating mode on the control panel. The following fan modes can be set:

- Manual fan control
- Automatic fan control
- Automatic fan control in “mute” mode (only OP50/OP51/OP71)

The fan switches off irrespective of the selected mode if one of the following errors has occurred:

- Motor thermal monitoring triggered
- Insufficient operating data due to sensor error
- Defective hardware

Automatic

The fan is regulated depending on the difference from the setpoint (temperature).

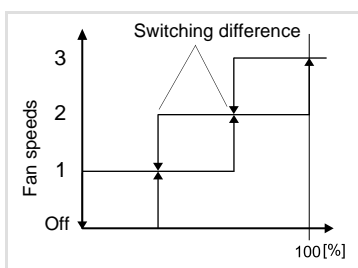
In “mute” mode the highest fan speed is blocked for stage fans. If the unit is fitted with EC fans, the speed - specified as “mute” value - is not exceeded.

The fan stages or speed are controlled on the basis of the difference between actual and setpoint readings. Both size and duration of the current difference influence the control performance. With stage fans the switch points are determined by differential gaps. The number of available fan speeds or continuously variable fans depends on the unit type.

Possible configurations:

- Speed number: 0 ... 3 - speed-stage fan
- Fan speeds 0 ... 5 (only MATRIX 4000 with IO add-on card)
- continuously variable: minimum speed ... 100% (only MATRIX 3000, 3500, 4000)

Manual



The fan is operated at the pre-set fan speed. The fan speed can be pre-set via the control panel, building management system or external modules (e.g. MATRIX.DI digital input module).

Air change function

This function enables the fan to operate irrespective of the selected control system and regardless if the setpoint temperature is reached. In this case the fan stage must be selected manually. This should provide an optimal air change in the room. This function can only be selected using the MATRIX OP50 and MATRIX OP51 control panel or the MATRIX.PC service software.

7.12.2 Valves

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

Depending on the selected controller, the integrated valve controller supports open/close and modulating valves.

The valves can be controlled in the following modes:

- Heating
- Cooling
- Cooling or heating
- Heating and cooling

In order to reach a common starting position, the factory set synchronisation mechanism moves all connected valves (only modulating valves) to OPEN or CLOSE position every 12 hours.

7.12.3 Condensate pump

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

The condensate pump drains the condensate that forms on cooling units. Depending on requirements, the condensate pump is activated by a float switch.

When a limit value is exceeded, the fan is switched off, the cooling valve is closed and an error message is displayed on the control panel.



NOTE!

After the first triggering of the condensate pump, an automatic alarm fault is displayed for about 30 s while the fan and the actuator are at a standstill. After this time has expired, the sensor is brought to working temperature, the errors are eliminated and the unit can be controlled without limitation.

7.12.4 Standby mode

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓

Standby mode is only available with room temperature control option. This does not regulate the temperature to a fixed setpoint, but instead to a pre-set setpoint range. The MATRIX.PC service software enables to change this setpoint.

The standby mode is activated if a room temperature sensor is connected but no room temperature setpoint, i.e. no control panel, is available (e.g. during construction phase and drying of building).

The “standby mode” function is terminated if a specific room temperature setpoint is set.

7.12.5 Indoor Anti-Freeze Protection

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓



NOTE!

This note is only valid for units with a heating function.

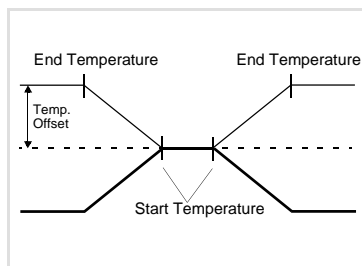
This function ensures a frost-free condition when the unit is switched off.

At room temperatures below 4 °C, the valve is fully opened or electric heater on. The fan is activated at the lowest speed, regardless of the inlet temperature.

If room temperatures exceeds 6 °C, the valve is closed and fan deactivated. Normal regulation mode is activated.

7.12.6 Summer / winter compensation

MATRIX			
3001	3501	4001	4001+IO
✓	✓	✓	✓



This function requires connection to an external sensor.

This function enables a shift in the room temperature setpoint depending on the ambient temperature.

Application example:

Starting from 26 °C outdoor temperature, it is requested to increase the room temperature setpoint by 0.5 °C per 1 °C rise of outdoor temperature. The setpoint should not be increased any further if outdoor air temperature reaches 32 °C. Thus 26 °C as the start temperature and 32 °C as the end temperature should be entered.

The setpoint offset is calculated as follows:

(End temperature - start temperature) * 0.5 °C (the increase per °C external temperature increase)

$$(32 - 26) * 0.5 = 6 * 0.5 = 3$$

The factory-set parameters can only be changed via the MATRIX.PC service software.

8 Maintenance and Troubleshooting

**NOTICE!**

Maintenance may only be performed by qualified licensed staff in observance of this operation manual and current regulations.

**WARNING: RISK OF ROTATING COMPONENTS!**

Danger of injury from rotating fan wheel

Before performing any work on the unit, ensure that the unit is de-energized. Ensure that the unit is secured against subsequent switch-on at a suitable location in the area of the on-site electrical power supply.

**DANGER OF SCALDING!**

Before completing any kind of job on fan coil units:

Seal off the heating medium inlet before performing work on the valves or the inlet or outlet pipes and secure this sealing from being opened unintentionally. Do not commence work before the heating medium has cooled down.

**HAZARDOUS VOLTAGE!**

Power the unit down before carrying out any kind of work that involves removing of covers. Ensure that the unit is properly secured against being energized at an appropriate point of the on-site power supply.

8.1 Maintenance

The HyPower-Geko is a high-grade and reliable unit. In order to guarantee the durability and trouble-free performance of the HyPower-Geko unit, regular maintenance and inspection must be performed by technical experts.

**NOTICE!**

The manufacturer's warranty will become void if unit damage is attributed to the failure in completing regular maintenance and inspections. Keeping a written maintenance report according to the following table is required for the validity of the warranty.

List of regular maintenance work

The following maintenance tasks must be performed at the indicated time intervals.

Components	Maintenance frequency			
	Quarterly	Semi-annually	Annually	Before cooling season
Checking filter	x			
Checking fan or fan chamber *		x		
Variant: checking intake and/or discharge sound attenuator *			x	
Checking screw connections of medium lines **			x	
Checking electrical connections			x	
Checking earthing			x	
Air venting heat exchanger			x	
Checking heat exchanger and main condensate tray for dirt/mold and, if necessary, clean and disinfect.			x	
Checking fans			x	
Checking internal insulation for dirt and mould and, if necessary, cleaning and disinfecting **			x	
Checking settings of all valves **			x	
Level sensor for drip tray **				x
Checking condensate pump function **				x
* Clean if necessary and remove objects **Depends on the model				

Tab. 8-1: Regular maintenance

8.2 Quarterly maintenance

8.2.1 Examine filter

Check the filter for contamination, damage, and odors and exchange if necessary.

8.2.2 Replacing filter

In order to carry out the exchange of the filter according to Fig. 8-1, proceed as follows:

- Release the sash fasteners on the filter flap by a half-turn counter-clockwise (refer to Fig. 8-1; and open the flap by turning downward (refer to Fig. 8-1, Pos. 1).
- Remove the filter evenly from the unit (refer to Fig. 8-1; Pos. 3).
- Pull away the terminal strips left and right of filter frame (refer to Fig. 8-1; Pos. 4).
- Pull the filter material from frame (refer to Fig. 8-1; Pos. 5).



NOTICE!

Replacement filter set (5 units) can be ordered from GEA using the following order numbers ZGH.#A823 (filter class G2) or ZGH.#A833 (filter class G4). The symbol "#" is a placeholder for the size to be specified.

- Once again insert the new filter element in reverse sequence.
- Close the filter flap and lock the fasteners by pushing into the lock position.

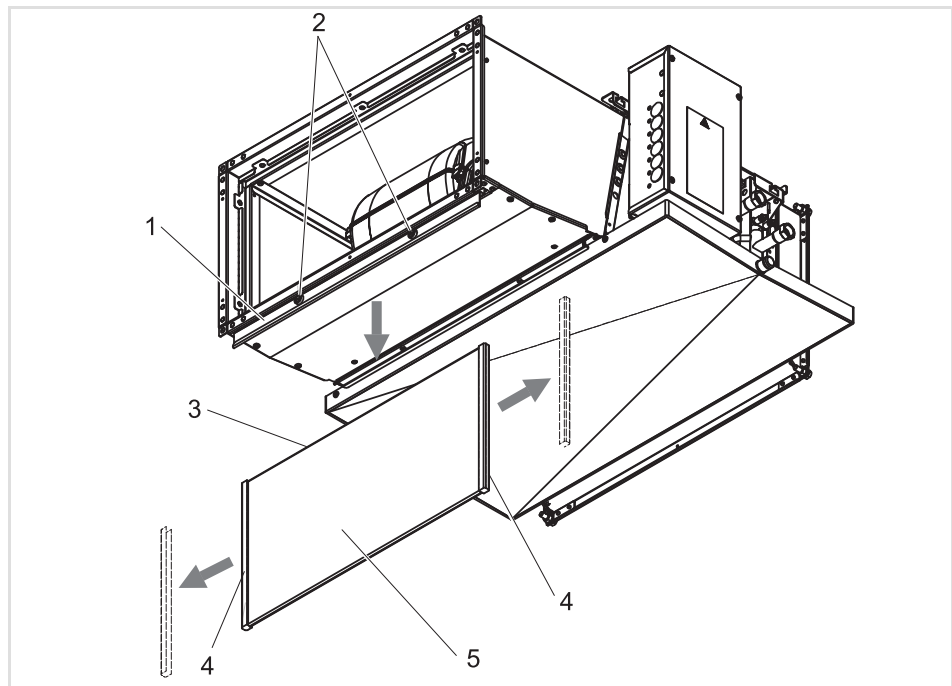


Fig. 8-1: Removing filter, replacing filter element

- Pos. 1: Filter flap
 Pos. 2: Quick fasteners
 Pos. 3: Filters
 Pos. 4: Terminal strips
 Pos. 5: Filter material

8.2.3 Examine WAT and condensate tray

Visually inspect WAT and condensate tray for contamination, damage, corrosion and leak tightness, and clean and repair if necessary.

8.3 Annual maintenance

8.3.1 Clean accessory modules (sound absorber, intake/discharge boxes) (optional)



DAMAGE TO UNIT AND PERSONAL INJURY

Danger of personal injury by falling unit components! Consider the unit weight! Before disassembling a module make sure that other modules in the ceiling are firmly secured. If necessary, take measures to secure such modules.



PERSONAL INJURY!

Injury may be caused by falling parts and sharp edges! Upon disassembly of the unit, wear helmet, safety shoes and protective gloves. Carry out the disassembly only with two persons.

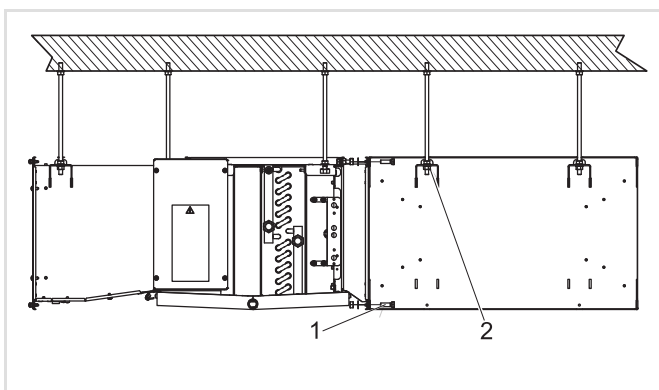


Fig. 8-2: Cleaning the sound attenuator

Pos. 1: Connection screws

Pos. 2: Nut M8

- Release the center and connecting bolts (Fig. 8-2, Pos.1) on both sides of the add-on modules and remove them.
- Loosen nuts (M8) of the associated threaded rods which fasten the module until the module can be disconnected (Fig. 8-2, Pos. 2).
- Remove the module. Consider the module weight.
- Clean the add-on module from inside as well as casing by vacuum and dry cleaning.
- Place the module back in the ceiling bracket in the sequence opposite to disassembly.
- Ensure correct seat of the module.

8.3.2 Checking bolt and screw medium connections

- Check the firm seat of all screws of the medium connections (see Fig. 8-3, Pos. 2 for example).
- Manually verify the fastening of the actuators (see Fig. 8-3, Pos. 1 for example).

Pos. 1: Actuator

Pos. 2: Screw connections
medium connections

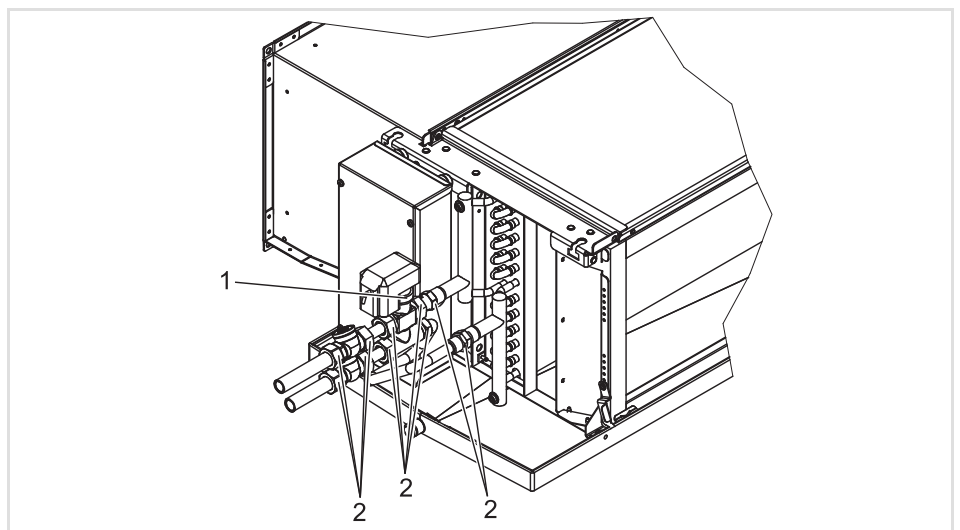


Fig. 8-3: Checking bolt and screw medium connections

8.3.3 Checking the electrical connections and earthing



HAZARDOUS VOLTAGE!

Before completing the following work, ensure that the unit is powered down and secured against being energized at an appropriate point of the on-site power supply.

Before completing work on the unit, ensure that the electrical control box is properly closed (see Chapter 6.2)

- Open the terminal or electrical control box (see Chapter 6.2).
- Check that all electrical connections are securely seated in the terminal strips.
- Use a suitable measuring device to check for proper earthing of the unit.
- Close the terminal box or the electrical control box.

8.3.4 Air venting the heat exchanger

- Air vent the heat exchanger as specified in Chapter 7.3

8.3.5 Check the heat exchanger and drip tray for dirt/mold, and clean and disinfect if required.



PERSONAL INJURY!

Injury may be caused by falling parts and sharp edges! Wear a helmet, safety boots and protective gloves when dismantling the unit. Disassembly should always be performed by two persons



DAMAGE TO THE UNIT!

Do not use chemical detergents or disinfecting agents that cause acid or alkaline reactions and can lead to aluminum or zinc corrosion. Make sure that no residual water can discharge from the drain pan!

- Dismount the drain pan (see Fig. 8-4, Pos. 1 and Pos. 2, 2 screws right and left) and the arrester straps (see Fig. 8-4, Pos. 3). Depending on the installation situation and model, the disassembly of the on-site condensate drain pipe and the sensor of the condensate pump might be required.
- Check the heat exchangers (see Fig. 8-4, Pos. 4) and the condensate tray for contamination or microbial growth and clean/disinfect these if necessary. Depending on the installation situation, it might be required to remove the heat exchanger. In this case, please follow the instructions in Chapter 8.3.7.

Pos. 1: Condensate tray
 Pos. 2: Fastening
 screws (4 parts)
 Pos. 3: Arrestor straps
 Pos. 4: Heat exchangers

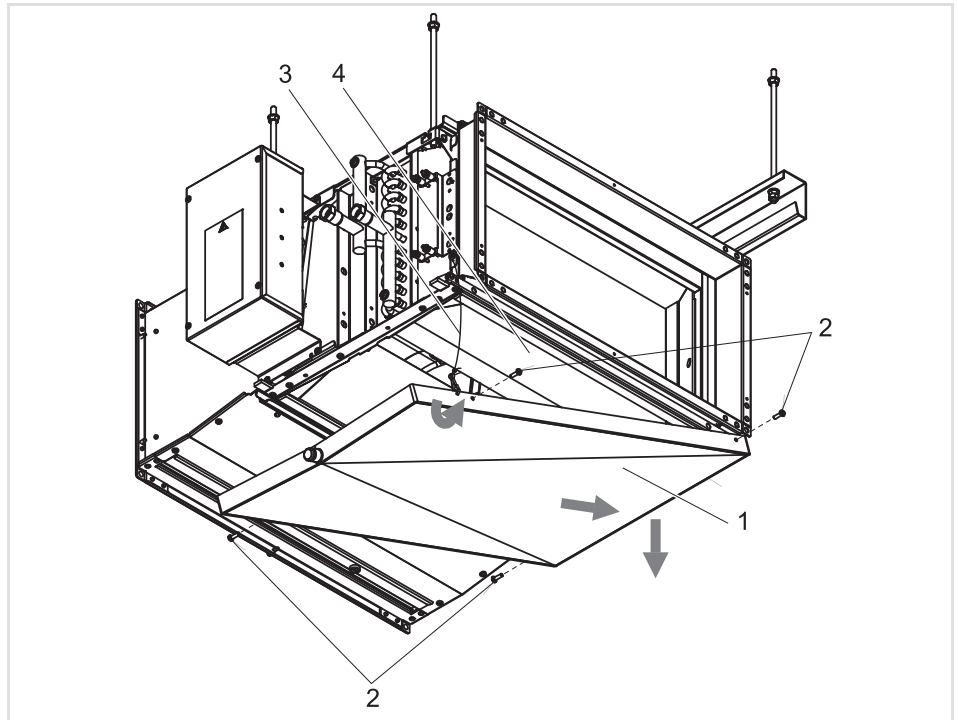


Fig. 8-4: Checking heat exchanger and drain pan

- Mount all components in the reverse order.



NOTICE! ONLY FOR UNITS WITH CONDENSATE PUMP!

Lubricate the drain connection of the condensate tray including the O-ring (see Fig. 8-12, Pos. 7) with lubricant. Set the plastic end piece of the suction hose of the condensate pump (see Fig. 8-5, Pos. 3) on the fittings of the condensate tray outflow (see Fig. 8-5, Pos. 2) until it sits firmly. Note for the assembly of the end piece that the half-round hole at the edge of the end piece (see Fig. 8-5, Pos. 1) is on the upper side.

Pos. 1: Half-round hole at the
 edge of the end piece
 Pos. 2: Condensate tray
 Pos. 3: Plastic-end piece
 of the intake hose of the conden-
 sate pump

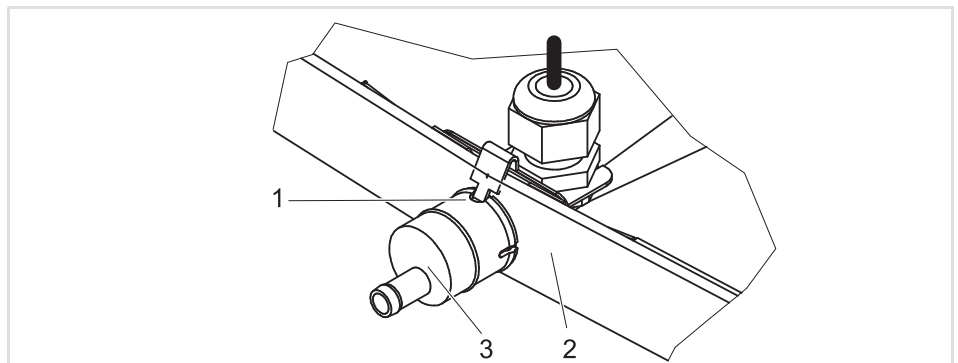


Fig. 8-5: Assembly of the plastic end piece of the suction hose of the condensate pump

- Subsequently, check the proper operation of condensate drainage from the coil drip tray and the on-site trap, if there is one.



NOTICE!

Do not mount components if you want to subsequently check the fans!

8.3.6 Check fan



PERSONAL INJURY!

Injury may be caused by falling parts and sharp edges! When dismantling the unit, wear helmet, safety shoes and protective gloves. Disassembly should always be performed by two persons

- Dismount the drain pan as described in Chapter 8.3.5
- Open the filter flap (see Fig. 8-6, Pos. 3) as described in Chapter 8.2.1 and remove the filter if necessary.
- Disassemble the cover panel of the fan chamber (see Fig. 8-6, Pos. 1, 3 screws each right and left).
- Check the fan(s) for ease of movement (see Fig. 8-6, Pos. 4).
- Remove soiling within the casing with a vacuum cleaner.

Pos. 1: Cover panel
Fan room

Pos. 2: Fastening
screws (6 parts)

Pos. 3: Filter flap

Pos. 4: Fan

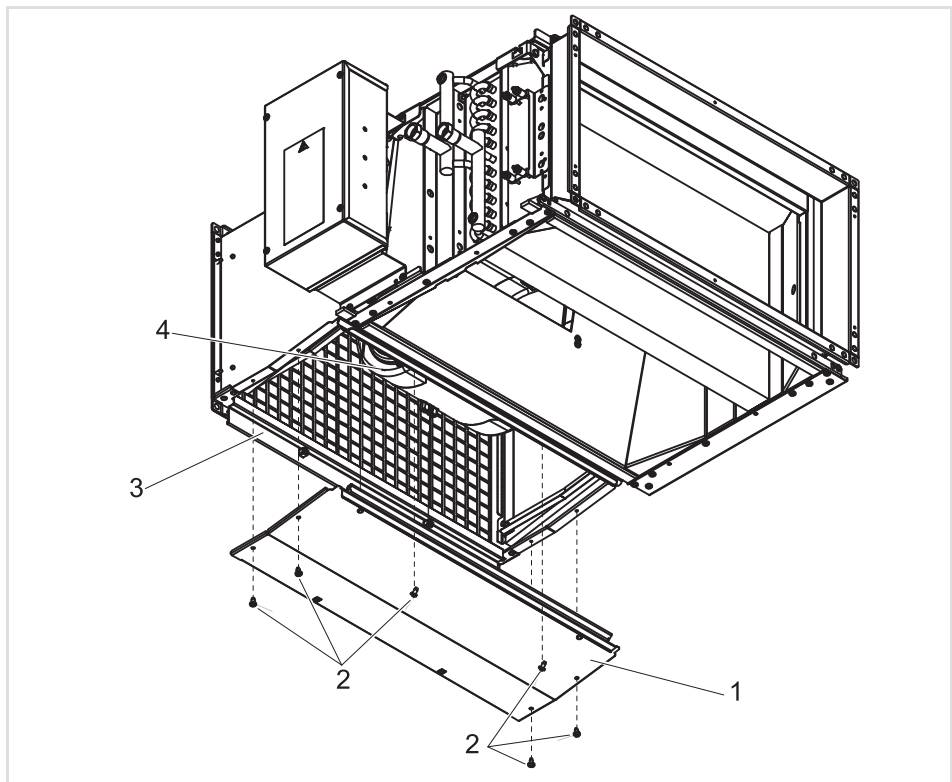


Fig. 8-6: Check fan

- Mount all components in the reverse order



NOTICE!

Do not install the components if you want to carry out the subsequent examination of the interior insulation and the heat exchanger!

8.3.7 Check internal insulation for dirt and mould and, if necessary, clean and disinfect



PERSONAL INJURY!

Always wear protective gloves to prevent injury caused by sharp edges!



DAMAGE TO THE UNIT!

Do not use chemical detergents or disinfecting agents that cause acid or alkaline reactions and can lead to aluminum or zinc corrosion.

Use disinfectants that are free of aldehyde.

- Shut off all medium supply of unit.



DAMAGE TO THE UNIT!

Protect electrical devices and furniture from escaping splash water!

- Empty the heat exchanger by opening all venting and draining screws at the heat exchanger connections (see Fig. 8-7, Pos. 1 and Pos. 2) and loosen the screw connectors of the medium connections at the heat exchanger (see Fig. 8-7, Pos. 3).

Pos. 1: Vent screws
Pos. 2: Drain screws
Pos. 3: Heat exchanger connections

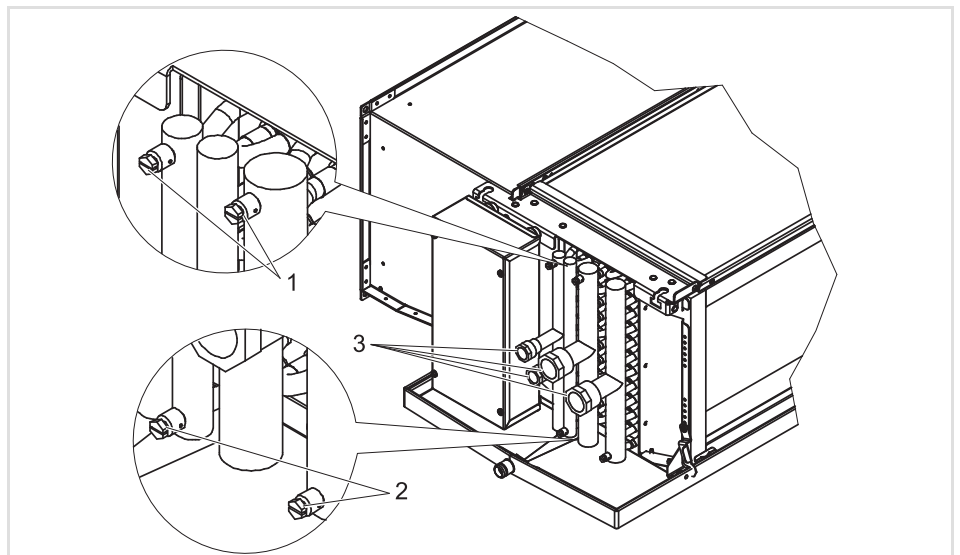


Fig. 8-7: Draining heat exchangers



PERSONAL INJURY!

Injury may be caused by falling parts and sharp edges! When dismantling the unit, wear helmet, safety shoes and protective gloves. Disassembly should always be performed by two persons

- Dismount the condensate tray according to the instructions in Chapter 8.3.5.
- Dismount the heat exchanger. To do so, unscrew the 6 screws on both sides of the unit (refer to Fig. 8-8, Pos.1) and below the unit on one side of the rail (refer to Fig. 8-8, Pos. 2) and carefully remove the heat exchanger in the downwards direction.
- Check the heat exchanger for soiling or microbial growth and clean/disinfect it if necessary by rinsing or vacuuming/blowing out.

**DAMAGE TO THE UNIT!**

Do not use a high-pressure washer for cleaning the heat exchanger, since this can lead to deformations and damage of the aluminum fins!

Pos. 1: Fastening screws (6 parts per side)
Pos. 2: Fastening screws (6 parts)

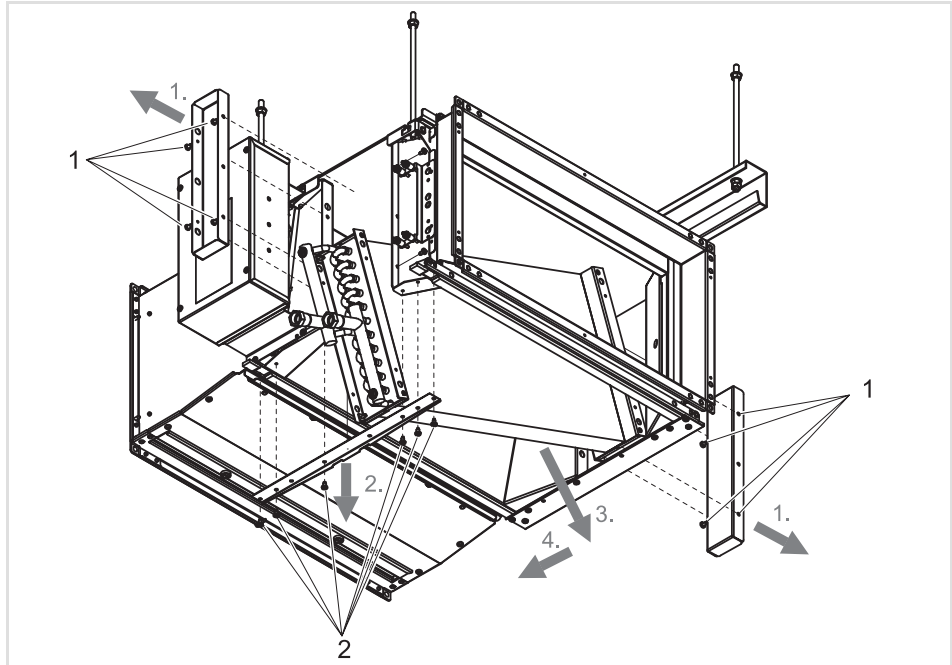


Fig. 8-8: Dismounting heat exchanger

- Check the inner wall insulation (see Fig. 8-9, Pos. 1, applies only to basic units with fan section type "C") on all sides for soiling/microbial growth. In the event of the strong microbiological contamination of the insulation of type C, please exchange the entire fan section (Spare part No. ZGH.#A0C1).

Pos. 1: insulation

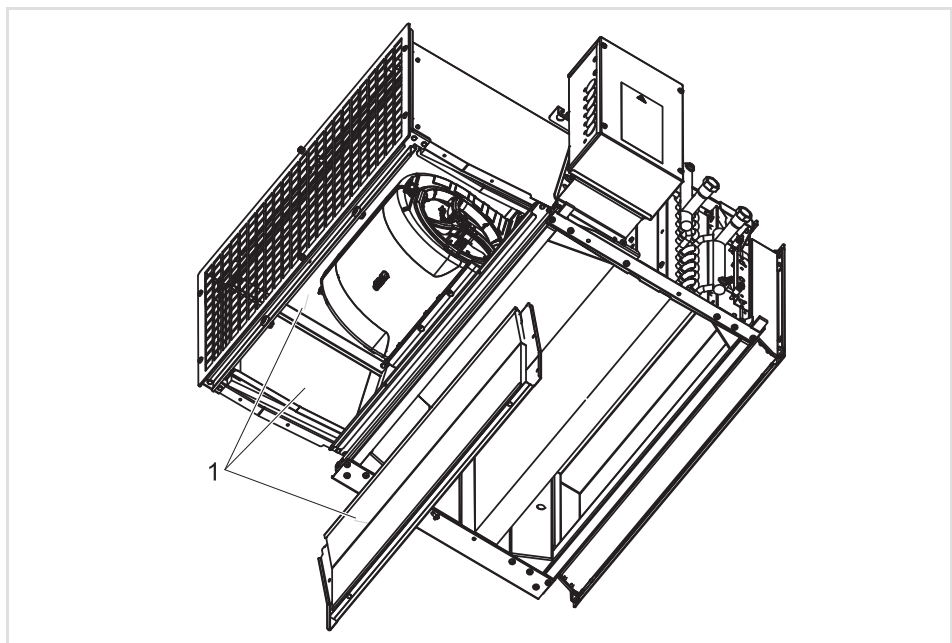


Fig. 8-9: Checking insulation

- Mount all components in the reverse order
- After that, check the heat exchangers and valve connections if required for firm seat and tightness.
- Check proper operation of condensate drainage and if applicable, the on-site trap provided by others.

8.3.8 Check the valves

- Check the proper operation of valves as described in Chapter 7.2

8.4 Before cooling season

8.4.1 Clean the sensor of the condensate pump

Only applicable to units with an integrated condensate pump.



NOTICE!

Protect the sensor of the condensate pump from dust and aggressive liquids.

Pos. 1: Condensate tray
 Pos. 2: Condensate drainage - fittings
 Pos. 3: Suction hose
 Pos. 4: Condensate pump
 Pos. 5: Pressure hose
 Pos. 6: Fill level sensor with support bracket

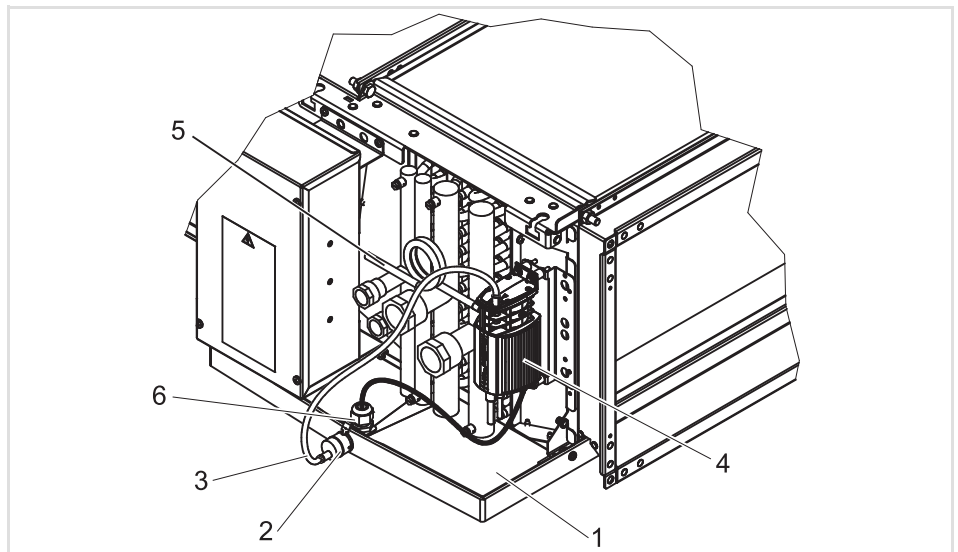


Fig. 8-10: Cooling units with condensate pump

- Dismantle the condensate drain outlet (see Fig. 8-10, Pos. 2)



NOTICE!

Never clean contact surfaces with thinners or hard/sharp tools. Use only water and soap for cleaning.

- Loosen and remove nut of the cable passage (see Fig. 8-11, Pos. 3), the cable passage (see Fig. 8-11, Pos. 2) along with cable and sensor (see Fig. 8-11, Pos. 4), this way it can be detached from the sensor holder (see Fig. 8-11, Pos. 1).
- Rinse the cable penetration including sensor with water, withdraw cable with sensor from the sleeve if necessary, and clean the cable with a soft cloth.
- Fix the cable and sensor again in the lead-through so that the cable sits in the lead-through with its broader part (refer to Fig. 8-11, Pos. 6); make sure that the sensor position is correct (refer to Fig. 8-11, Pos. 5).
- Once again fasten sleeve including sensor to the holder and then fasten with the nut.

Pos. 1: Sensor holder
 Pos. 2: Cable penetration
 Pos. 3: Nut of the cable sleeve
 Pos. 4: Cable with sensors
 Pos. 5: Sensors (ON/OFF + ALARM)
 Pos. 6: Cable widening
 Pos. 7: Seal - O-Ring

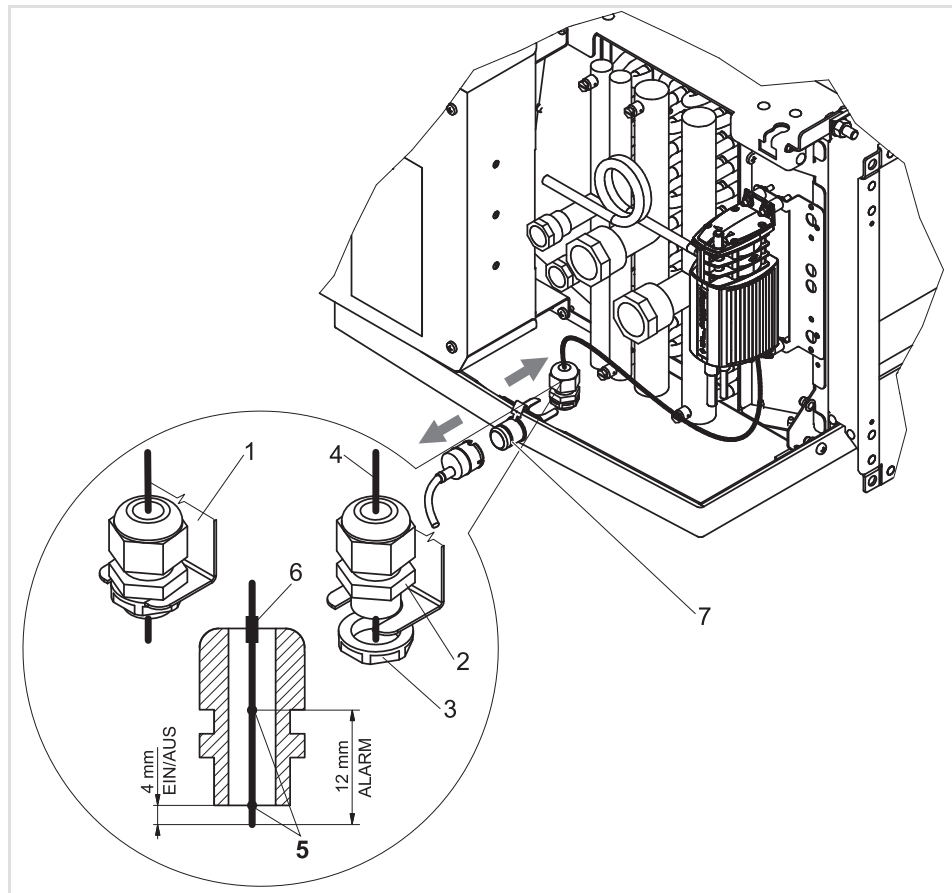


Fig. 8-11: Clean the humidity sensor

- Lubricate the drain connection of the condensate tray including its O-ring (see Fig. 8-11, Pos. 7) with lubricant. Set the plastic end piece of the suction hose of the condensate pump (see Fig. 8-12, Pos. 3) on the intake fitting of the condensate tray (see Fig. 8-12, Pos. 2) until it sits firmly. For the assembly of the end piece of the condensate pump, make sure that the half-round hole at the edge of the end piece (see Fig. 8-12, Pos. 1) is on the upper side.

Pos. 1: Half-round hole at the edge of the end piece
 Pos. 2: Condensate tray
 Pos. 3: Plastic end piece of the suction hose of the condensate pump

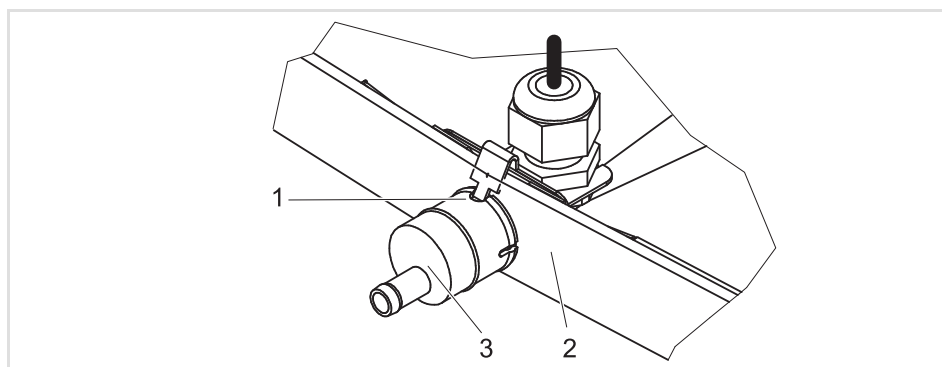


Fig. 8-12: Assembly of the plastic end piece of the suction hose of the condensate pump

8.4.2 Checking condensate pump function

Only applicable to units with an integrated condensate pump.

Check the function of the condensate pump as described in Chapter 7.11.

8.5 Break-downs

Deviations from normal operating conditions of fan coil units testify to malfunctions that must be investigated by the maintenance personnel.



The following table should serve as a starting point for maintenance personnel regarding possible causes of malfunction and their remedy.

Malfunction	Possible cause of break-down	Action/remedy
Fan fails to start	Unit not switched on	Switch on unit
	No mains voltage	Check fuse/circuit breaker/power supply (technical personnel only)
	Electrical cables not connected	Connect electrical pipes (technical personnel only)
	Faulty unit fuse	Replace fuses (technical personnel only)
	Controller deactivates fan after room temperature is reached	See operation manual MATRIX control panels
Fan fails to start OP3x/ yellow LED OP4C "Ext" lights OP5x: "R" in the display	Input window contact is activated	Deactivate input – see "Connection function inputs and outputs" on page 63
Unit too noisy	Unit running at too high RPM	Set a lower RPM
	Air intake or discharge areas blocked	Clear discharge/air intake of obstructions or bends
	Noisy fan bearings	Replace faulty fan (technical personnel only)
	Filter is dirty	Clean/replace filter

Malfunction	Possible cause of break-down	Action/remedy
Unit fails to heat/heats insufficiently (pumped warm water)	Fan not switched on	Switch on fan
	Air flow rate of unit too low	Select higher speed
	Air intake or discharge areas blocked	Clear or clean air flow paths
	Fan blocked/faulty	Examine fan, replace if necessary (technical personnel only); also see page 97
	Filter is dirty	Exchange filter
	Heating medium is not hot	Switch on the heating system (boiler)
		Switch on the circulating pump
		Vent the unit
Unit fails to heat/heats insufficiently (pumped warm water)	Water flow rate too low	Check pump capacity (technical personnel only)
		Check pipe run balance and adjust using calculated pressure drop (technical personnel only)
	Low temperature setpoint selected on control panel	Adjust higher setpoint temperature at the controller
	Control panel is located above a heat source or exposed to direct sunshine	Place control panel in appropriate position (technical personnel only)
	Control valve fails to open	Replace faulty control valve (technical personnel only)

Malfunction	Possible cause of break-down	Action/remedy
Unit does not cool/cooling insufficiently (chilled water)	Fan not switched on	Switch on fan
	Air flow rate of unit too low	Select higher speed
	Air intake or discharge areas blocked	Clear or clean air flow paths
	Fan blocked/faulty	Check fan, replace if necessary (technical personnel only) ; also see page 97
	Filter is dirty	Replacing filter
	Cooling medium is not cold	Switch on chiller unit
		Switch on the circulating pump
		Vent the unit
	Water flow rate too low	Check the pump line (technical personnel only)
		Check pipe run balance and adjust using calculated pressure drop (technical personnel only)
	Too high setpoint temperature adjusted on control panel	Decrease setpoint temperature on control panel
	Control panel placed in cold air, e.g. near a door	Place control panel in appropriate position (technical personnel only)
	Control valve fails to open	Replace faulty control valve (technical personnel only)

Malfunction	Possible cause of break-down	Action/remedy
Water leakage around unit	Condensate tray drainage blocked	Clean condensate drain and check for sufficient pitch, then clean and fill trap (completed by technical personal if necessary)
	Chilled water lines not (correctly) insulated	Insulate chilled water lines (technical personal, if required)
	Unit is not hung horizontally	Align the unit and hang it horizontally (technical personnel only)
	Leaking heat exchanger or hydraulic connections	Check heat exchanger, vent and valve connections for leak-free state
		If necessary, re-tighten connections, clean screw insert or reseal connections (nur Fachpersonal)
		On valves, check screw connections for ease of movement, clean sealing surfaces and replace seals, if necessary (technical personnel only)
Controller switches on continuously	Control panel located in the wrong place (e.g. near open door or window)	Check soldered joints between collector and heat exchanger tubes and on heat exchanger deflection bends for leaks; if any leaks found, replace heat exchanger (technical personnel only)
		Position control panel in appropriate location where room temperature can be measured representatively (qualified technical personnel only)
	Heating medium temperature too high/low	Correct the external temperature curve on the controller of the boiler system. Check the control mode and adjust accordingly (technical personnel only)
	Cooling medium temperature too high/too low	Correct the inlet temperature on the controller of the refrigeration system. Check the control mode and adjust accordingly (technical personnel only)
	Other heating elements with individual control are in the same pipe run (e.g. radiators with thermostat valves)	Separate medium supply if necessary. Check the control mode and adjust accordingly (technical personnel only)

Malfunction	Possible cause of break-down	Action/remedy
Condensate pump		
Fan fails to start Red LED of the control panel is flashing: Flash codes:  = TK failure  = Malfunction condensate pump	Thermal contact (TC) of fan motor and/or alarm contact of humidity sensor of condensate pump tripped Fan was switched off Power electronics/controller and/or fan faulty	Check thermal contact of fan motor (through connection). Replace the power electronics/controller and/or fan motor (technical personnel only)
	T500 mA fuse is faulty	Replace fuse (technical personnel only)
	Condensate pump coil faulty	Replace condensate pump (technical personnel only)
	Diode of pump overheating protection is damaged	Replace overheating protection (technical personnel only)
	Intake basket clogged	Clean intake basket
	Pump humidity sensors dirty or faulty	Clean or replace humidity sensors (technical personnel only)
Water leakage near unit; no fault reported	T500 mA fuse is faulty	Replace fuse (technical personnel only)
	Diode of pump overheating protection is damaged	Replace overheating protection (technical personnel only)
	Intake basket clogged	Clean intake basket
Water leakage in unit area, pump (almost) always runs	Pressure-side pump resistance too high	Reduce pump head/resistance
	Pressure-side pump hose clogged	Clean or replace hose
Condensate pump does not run	Pump fuse is faulty	Replace fuse (technical personnel only)
	Pump humidity sensor is faulty	Replace humidity sensors (technical personnel only)
	Pump coil is faulty	Replace pump (technical personnel only)
	Wiring has become loose	Reconnect the wiring (technical personnel only)

Malfunction	Possible cause of break-down	Action/remedy
Condensate pump		
Unusually loud pump noise	Pump not sucking in any condensate	Replace pump (technical personnel only)
	Intake basket clogged or dirty	Clean intake basket
	Suction or pressure hose not properly attached (possible structure-borne noise)	Connect mountings and hoses properly; prevent structure-borne noise
	Pump mounting loose	Re-tighten pump mounting
Humidity sensors not energised	T500 mA fuses defect	Replace fuses (technical personnel only)
	Wiring loose or detached	Ensure proper wiring (technical personnel only)
Unit and pump unit make excessive noise (vibration).	Pump mounting loose	Re-tighten pump mounting
	Pump sucks in air	Position pump suction hose correctly; clean if necessary
	Unit mounting position not level	Align unit level

Tab. 8-2: Causes of malfunctions and remedies

If the fault cannot be eliminated by the maintenance personnel, please consult our authorized service department.



EC Declaration of Conformity

pursuant to Directive 2006/42/EC of the European Parliament and of the Council
(original EC Declaration of Conformity)/.

Manufacturer:

GEA Heat Exchangers a.s., Slovanská 781, 463 12 Liberec XXV-Vesec, Czech Republic, ID No.: 46708375

Entity authorized to compile technical documentation:

GEA Heat Exchangers a.s., Slovanská 781, 463 12 Liberec XXV-Vesec, Czech Republic, ID No.: 46708375

Description and identification of machinery:

Fan coil units

GEA HyPower-Geko®

Size 1 to 4, type designation **GH XX.XXXX.XXXXX** incl. accessories

GEA HyPower-Geko air-conditioning units, size 1 to 4 with MATRIX 3000, 3500, 4000 regulation and CET-EC controls, type designation GHXX.XXXX.XXXXX including electro/ water/ air accessories, type designation DX.XXX.XX / VGH.XXXXXXXXXX.XX / ZGH.XXXXX, serve for the heating, ventilation, cooling and filtering of indoor and outdoor air.

Declaration:

The machinery complies with all relevant provisions of Directives 2006/42/EC, 2006/95/EC and 2004/108/EC.

List of harmonized standards applied in the conformity assessment:

EN ISO 12100:2010, EN 953+A1:2009, EN ISO 13857:2008, EN ISO 11202:2010, EN ISO 3746:2010,
EN 60335-1:2002, EN 60335-2-40:2003, EN 62233:2008, EN 55014-2:1997.

This declaration relates exclusively to the machinery in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user.

Issued in Liberec: 12.12.2013

Name, Title: Ing. Ivan Polívka, Director of joint-stock company


Signed

Year of manufacture:



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