STULZ

CLIMATE. CUSTOMIZED.

CyberAir Mini CW

Original instructions

Precision Air Conditioning Units
400V/50Hz/3Ph/N/PE

Index G23
Issue 6-2021

ABOUT STULZ

Since it was founded in 1947, the STULZ company has evolved into one of the world's leading system suppliers of air-conditioning technology.
Since 1974 the group has seen continual international expansion of its air conditioning technology business, specialising in A/C for data centres and telecommunications installations.
STULZ has ten production plants (2 in Germany, Italy, the USA, Great Britain, Spain, 2 in China, Brazil and India) and twenty subsidiaries (in Germany, France, Italy, Great Britain, Belgium, Brazil, the Netherlands, New Zealand, Mexico, Austria, Poland, Spain, Singapore, China, India, Indonesia, South Africa, Sweden, Australia and the USA). The company also co-operates with sales and service partners in over 140 other countries, and therefore boasts an international network of air-conditioning specialists.

Editor

STULZ GmbH
Holsteiner Chaussee 283
22457 Hamburg

EN/06.2021/G23

Precision air conditioning for small to medium heat loads

Dear customer,

thank you for having chosen the CyberAir Mini CW from STULZ.
CyberAir Mini is an energy-efficient and noise-optimized unit series for small to medium heat loads. These modern and maintenance-friendly units require only a small footprint and can be easily installed in existing rooms thanks to their compact dimensions.

For general inquiries our hotline is available at **+49 40 5585-5000**
Our service hours are weekdays from 7am – 4pm.

For further information concerning our products and services visit our website :
www.stulz.com

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Contents

Subject to technical modifications.

1. Safety

1.1 Marking

DANGER	threatening danger, grievous bodily harm and death
WARNING	dangerous situation, grievous bodily injury
CAUTION	dangerous situation, light bodily injury
NOTICE	material damage, important information and application notice
ESD NOTE	risk of damaging electronical components

1.2 Safety instructions

These operating instructions contain basic information which is to be complied with for installation, operation and maintenance. They must therefore be read and complied with by the fitter and the responsible trained staff/operators before assembly and commissioning. They must be permanently available at the place where the system is used.

DANGER

- Works have to be carried out by competent staff only.
- Safety devices may not be bypassed.

1.3 Duties of the operator

The following requirements relate to the operation of refrigerating plants within the European Community.

- The used components must correspond to the pressure equipment guide-line 2014/68/EU and EN 378 part 1-4.
- Independent of the design, the equipment and inspection before the delivery, also the operator of such plants has duties according to EN 378 and national regulations.
  This concerns the installation, the operation and the repeated inspection:
    - Installation: according to EN 378
    - Operation: Determination of emergency measures (accidents, malfunctions)
      Creation of an abbreviated instruction and notification (template page)
      a. A unit protocol must be kept.
      b. To be stored in the proximity of the unit
      c. Access for competent staff in case of repairs and repeated inspection must be ensured.
    - Repeated inspection: according to EN 378
      The operator is responsible for the execution.

The operator must ensure that all maintenance, inspection and assembly work is carried out by authorised and qualified specialist staff who have made an in-depth study of the operating instructions.

Independent conversion and manufacture of replacement parts
The system may only be converted or modified after consultation with STULZ. Original replacement parts and replacement parts/accessories authorised by STULZ are an aid to safety.

2. Transport / Storage

2.1 Delivery of units

Stulz A/C units are mounted on pallets and packed several times in plastic film.

Construction of protective covering:
(from inside to outside)

1. Neopolene cushioning
2. Shrink film

The following information can be found on the packing:

1) Stulz logo
2) Stulz order number
3) Type of unit
4) Packing piece - contents
5) Warning symbols

NOTICE

When delivery is accepted, check the unit against the consignment papers for completeness and for external damage and record it on the consignment note in the presence of the freight forwarder.

- You receive the consignment papers with the delivery of the A/C unit.
- The shipment is made ex works, in case of shipment damages, please assert your claim towards the carrier.

2.2 Transport

DANGER

Mortal danger by crushing
A defective lifting device can lead to the uncontrolled fall of the A/C unit.
Do not stay under suspended loads!

The Stulz A/C units can be moved by lifting devices with belts or ropes.

- fix the belts or ropes at the pallet,
- protect the upper unit edges by wooden laths or metal brackets in such a way that they could not be caved in.

NOTICE

Risk of distorting the frame
Never move the unit on rollers and never transport it on a fork lift without pallet.

You can move the unit still packaged on the pallet with a fork lift.

- take care that the centre of gravity is within the fork surface.
- take care that the unit is in an upright position at the transport.

2.3 Storage

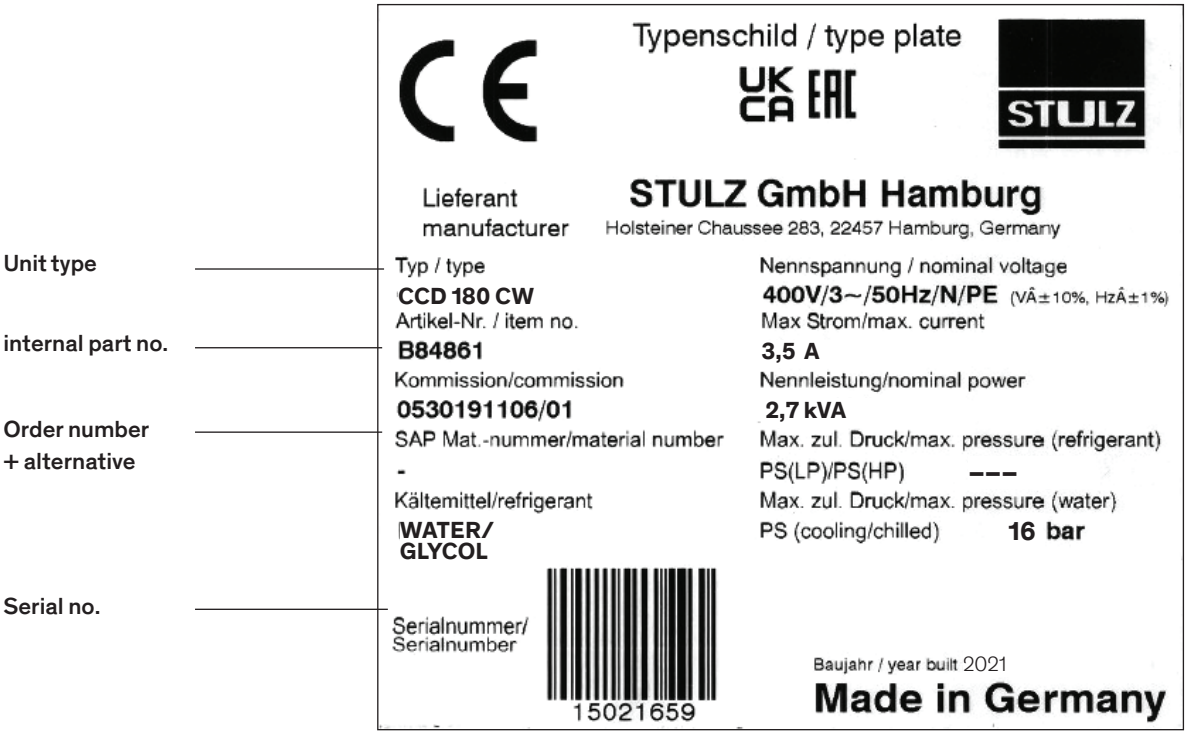
If you put the unit into intermediate storage before the installation, the following measures have to be carried out to protect the unit from damage and corrosion:

- the storage point must not be exposed to direct sunlight. Observe the storage conditions in the chapter “Application limits“.
- store the unit packaged to avoid the risk of corrosion.
- make sure that the water connections are provided with protective hoods.

3. Description

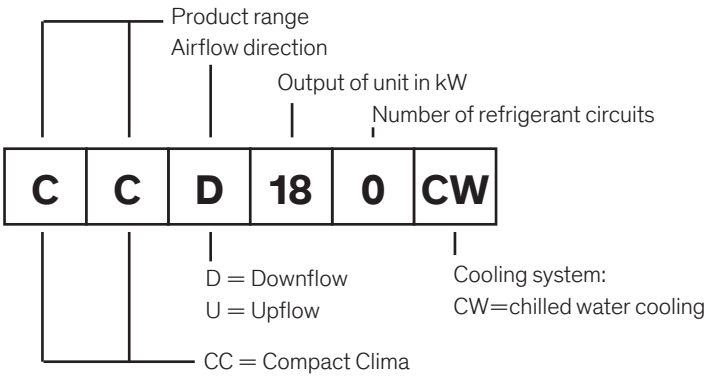
3.1 Type code

The type code represents the unit variant of your A/C unit and can be found on the rating plate. The rating plate is located in the door in front of the electric box.

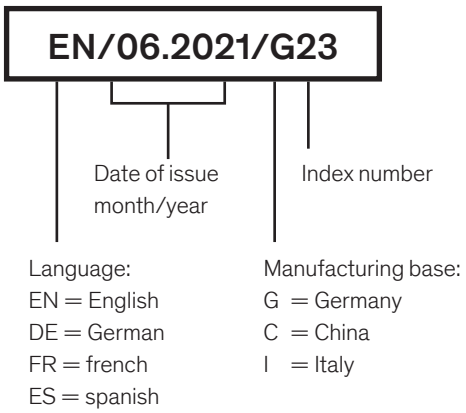


Explanation

Unit variants



Page code



3.2 Intended use

This A/C unit serves to control room temperature and air humidity within the application limits stated in chapter 4.1. The A/C unit is designed for indoor installation. Any use beyond this is not deemed to be use as intended.

3.3 Function of the A/C unit

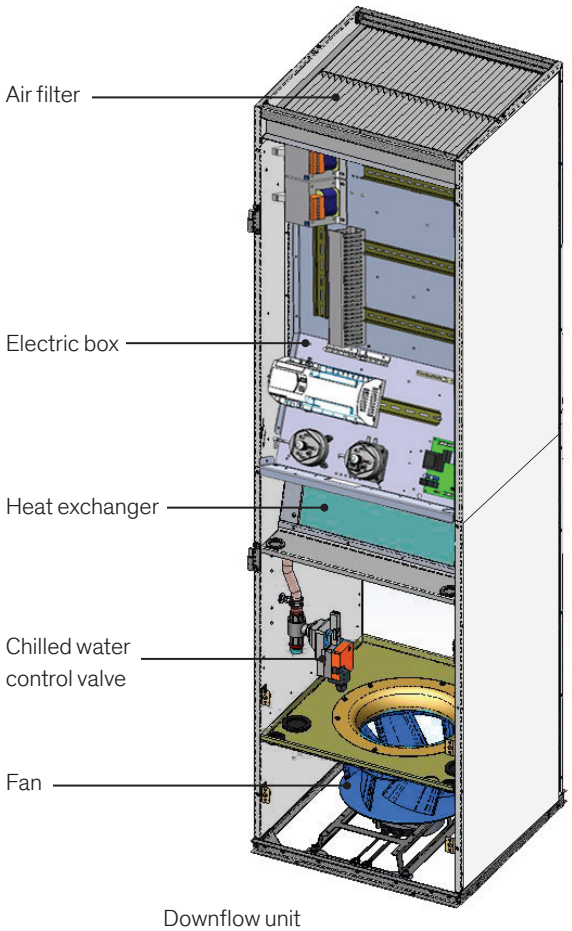
The A/C unit is exclusively operated by the controller in the front panel and the main switch in the electric box. To adapt the airflow to the needs of the system the fan speed can be adjusted gradually at the controller by means of a 0-10V signal.

At the air inlet a temperature and humidity sensor is installed.
The setpoints can be set at the controller.

To control the supply air temperature the controller adjusts the 2 way valve, which is part of the chilled water circuit and controls the amount of chilled water which flows through the chilled water coil.
For optional heating the hot water reheat option is available. For optional reheating the electrical reheat option is available (only as a support for dehumidification).

To achieve a dehumidification, the fan speed is reduced.
A humidification can be obtained by using the optional humidifier.

The A/C unit control is effected by the on board controller.



Downflow unit

4. Technical data

4.1 Application limits

Admissible return air conditions:

Temperature:	Lower limit:	16 °C
	Upper limit:	40 °C
Humidity:	Lower limit:	5,5 °C dew point
	Upper limit:	60 % r. h. and 15 °C dew point

Storage conditions:

Temperature [°C]:	-20 - +60
Humidity [% rel. h.]:	5 - 95
Atmosphere pressure [kPa]:	70 - 110

Chilled water conditions:

min. temperature at the unit inlet:	5 °C
min. temp. difference with 5 °C EWT:	4 K
max. head pressure:	16 bar

Water conditions for optional hot water reheat:

max. water inlet temperature:	110 °C
max. water head pressure:	16 bar

Type of network:
TN-S; TN-C-S

Voltage:
400V/50 Hz/3ph/N/PE

Voltage tolerancy:
+/- 10 % (not for permanent operation)

Frequency tolerancy: +/- 1 %

The following voltages are also available for this A/C unit series:

230V/50Hz/3Ph/PE
208V/60Hz/3Ph/PE
230V/60Hz/3Ph/PE
380V/60Hz/3Ph/N/PE
460V/60Hz/3Ph/PE
Other voltages on request.

Voltage/frequency tolerances as for 400V/50Hz/3Ph.

The cooling capacity, air flow, water flow, pressure loss, sound pressure level and valve sizes change with a voltage different from the standard voltage (400V/50 Hz/3Ph). In this case, see the technical data by the help of the „Stulz Select“ planning tool.
The unit design, the external dimensions, the weight, the position and size of the supply connections are independent of the supply voltage and can be found in this manual.

Requirements for electric network and UPS systems:

- the output voltage of the electric network or UPS system must be grounded neutral (wye).
- the voltage distortions must be within the limits stated below and no inadmissibly high DC voltage portions may exist.

transient peak over-voltage phase to ground:
max. 4 kV (1,2/50µs wave form; Z=12 Ohms in acc. to ANSI)

transient peak over-voltage phase to phase:
max. 2 kV (1,2/50µs wave form; Z=2 Ohms in acc. to ANSI)

ripple voltage phase to ground:
dV/dt < 1V/µs (≡1000V/ms)
voltage harmonics: THD(V) < 8%

- all-pole sinus filters must be provided at the UPS system output.

The warranty is invalidated for any possible damage or malfunction that may occur during or in consequence of operation outside the application limits.

Design conditions

Electrical connection:	400V/50 Hz/3ph/N/PE
Downflow units with an external static pressure:	20 Pa
Upflow units with an external static pressure:	50 Pa
Return air conditions for cooling capacity:	26 °C, 40 % rel. h.
Water inlet temperature:	10 °C
Water outlet temperature:	15 °C
Cooling fluid:	Water, 0 % glycol

The sound pressure levels are valid at a height of 1m and distance of 2m in front of the unit under free field conditions and with nominal data. The values take into account the effects of all installation and design parts contained in the standard unit. The values for upflow units assume an installed discharge duct.

NOTICE

Observe the following limits for the water circuit of the A/C unit.

Cooling water quality

Water properties and ingredients		
Carbonate hardness	°dH	<4
Carbonate hardness when adding inhibitors	°dH	<20
Total hardness	°dH	<15
pH value		7.0 - 9.0
pH value with light metal*		7.0 - 7.5
Chloride content	mg/l	<100
Chloride content with austenitic steels	mg/l	<50
Free chlorine	mg/l	<0.05
Hydrogen sulphide	mg/l	<0.05
Ammonia (NH_3/NH_4^+)	mg/l	<0.05
Sulphate	mg/l	<100
Manganese	mg/l	<0.05
Iron	mg/l	<0,2
Sulphide	mg/l	<0.05
Free aggressive carbonic acid	mg/l	<15
Suspended solids	mg/l	<20
Number of germs	cfu/ml	<1000
Electric conductivity without inhibitors	µS/cm	10 - 500
Electric conductivity with inhibitors	µS/cm	<2200

cfu - colony forming units
*aluminium or titanium.

All data refer exclusively to the A/C unit.

NOTICE

- Check the water quality regularly.

4.2 Performance data - CCD ... CW

Type		90	180	260	350
CW-cooling capacity total 26 °C/40 % r. h. sensible	**kW**	**8,9 8,9**	**16,0 16,0**	**24,5 24,5**	**34,7 34,7**
Air flow	m³/h	2800	4500	6600	9200
Return air filter class		G4	G4	G4	G4
Water flow	m³/h	1,5	2,7	4,2	6,0
Pressure loss, water side	kPa	18	22	33	41
CW valve size (2 way)		DN20	DN25	DN32	
Content of water in heat exchanger	dm³	5	9	12	14
Sound pressure level	dBA	46	53	55	58
Cabinet size		1	2	3	4
Weight	kg	139	169	204	237

4.3 Performance data - CCU ... CW

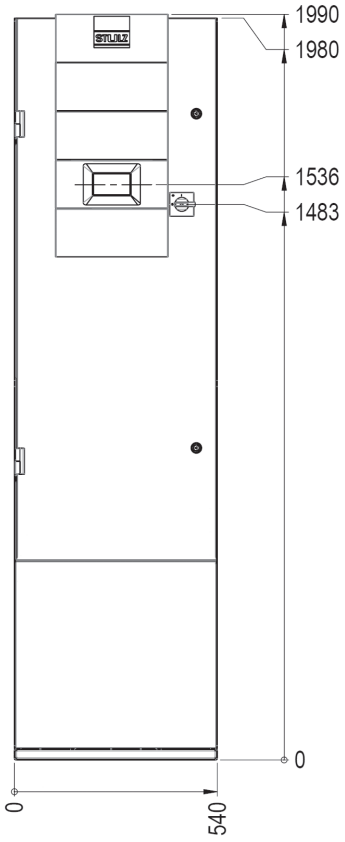
Type		90	180	260	350
CW-cooling capacity total 26°C/40 % r. h. sensible	**kW**	**8,9 8,9**	**16,0 16,0**	**24,5 24,5**	**34,7 34,7**
Air flow	m³/h	2800	4500	6600	9200
Return air filter class		G4	G4	G4	G4
Water flow	m³/h	1,5	2,7	4,2	6,0
Pressure loss, water side	kPa	20	23	35	65
CW valve size (2 way)		DN20	DN25	DN32	
Content of water in heat exchanger	dm³	6	10	13	15
Sound pressure level	dBA	50	54	56	59
Cabinet size		1	2	3	4
Weight	kg	153	184	220	254

For electrical data, (fan power consumption) see e-data sheet.
The electrical power consumption of the fans must be added to the room load.

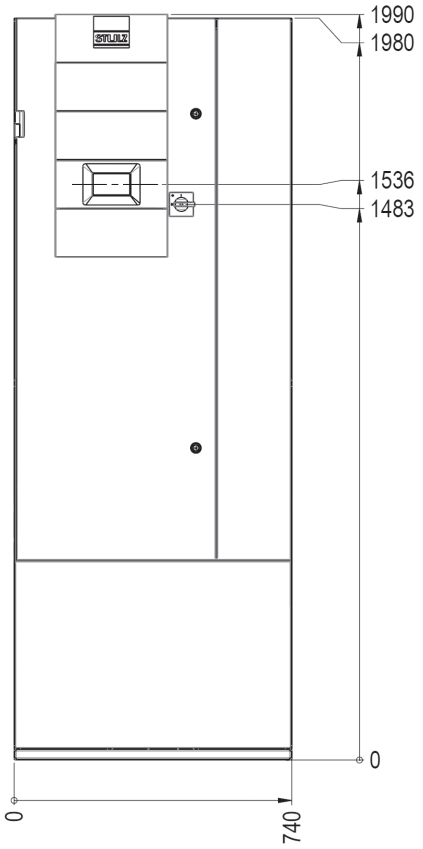
4.4 Dimensional drawings

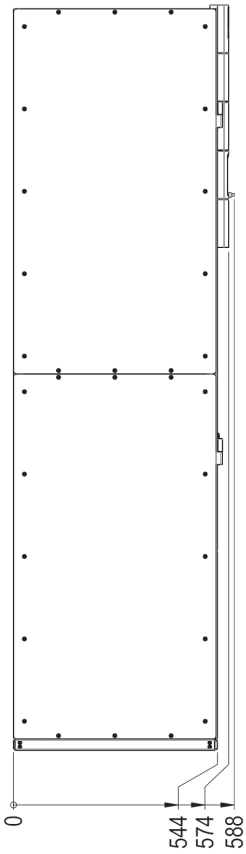
Downflow

Cabinet size 1

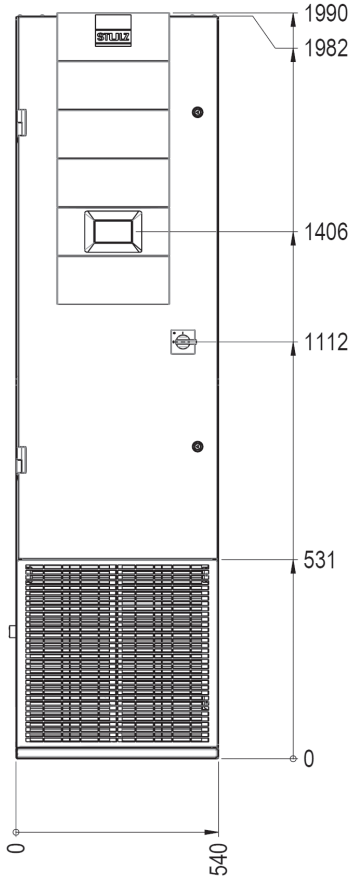


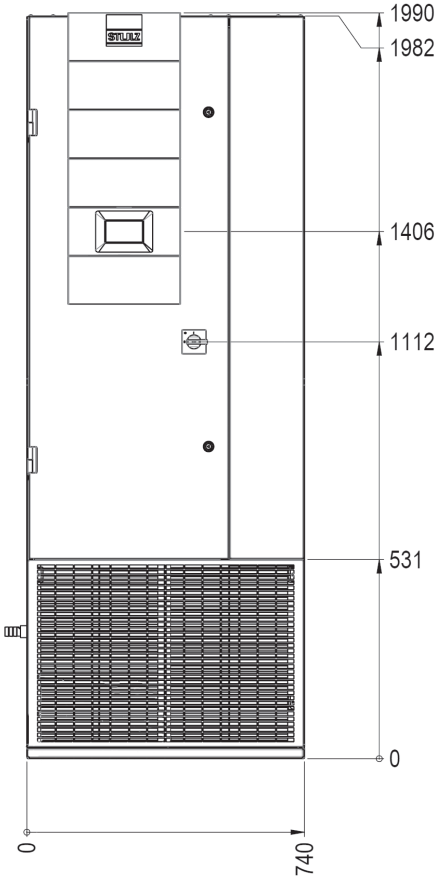
Cabinet size 2

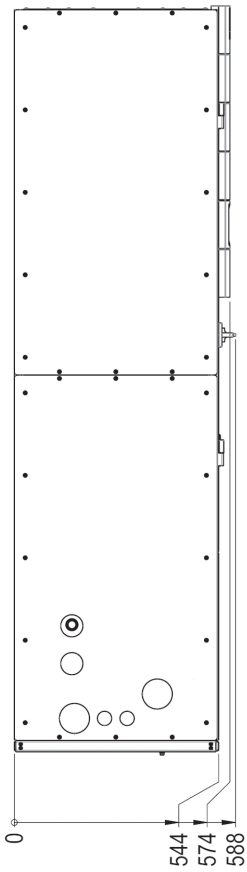


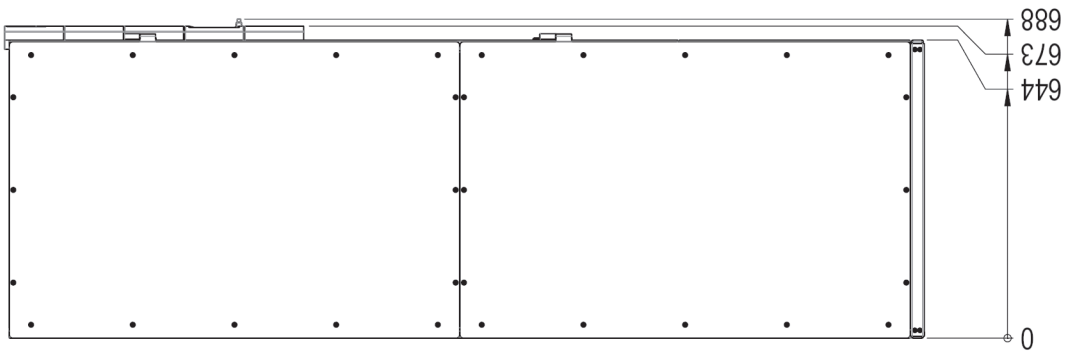


Upflow

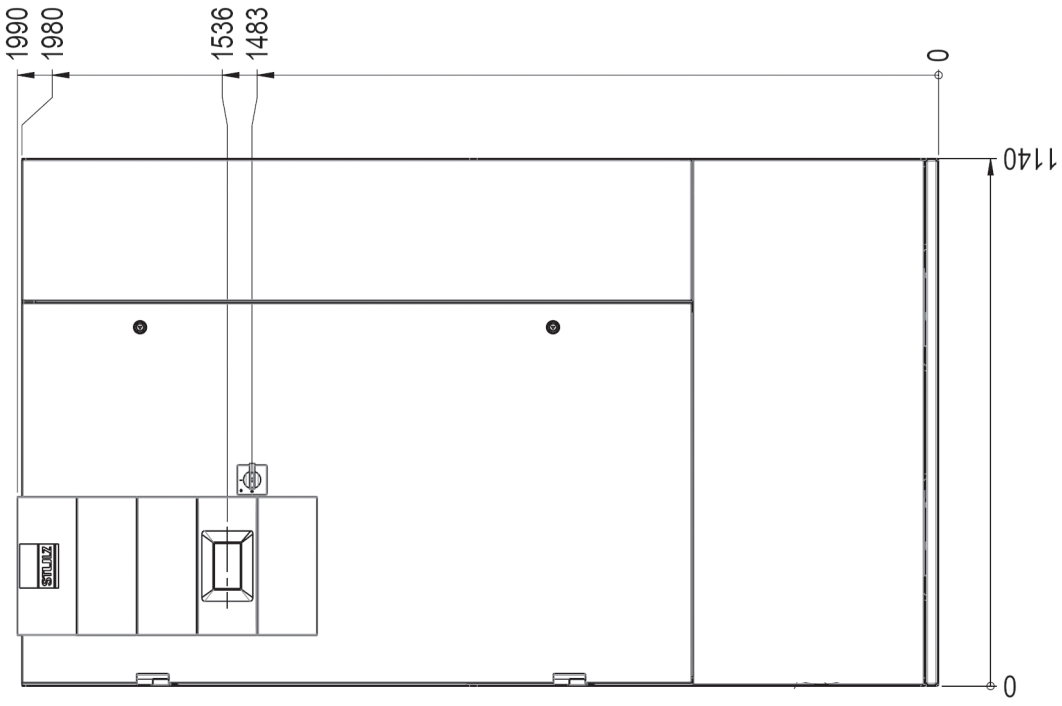






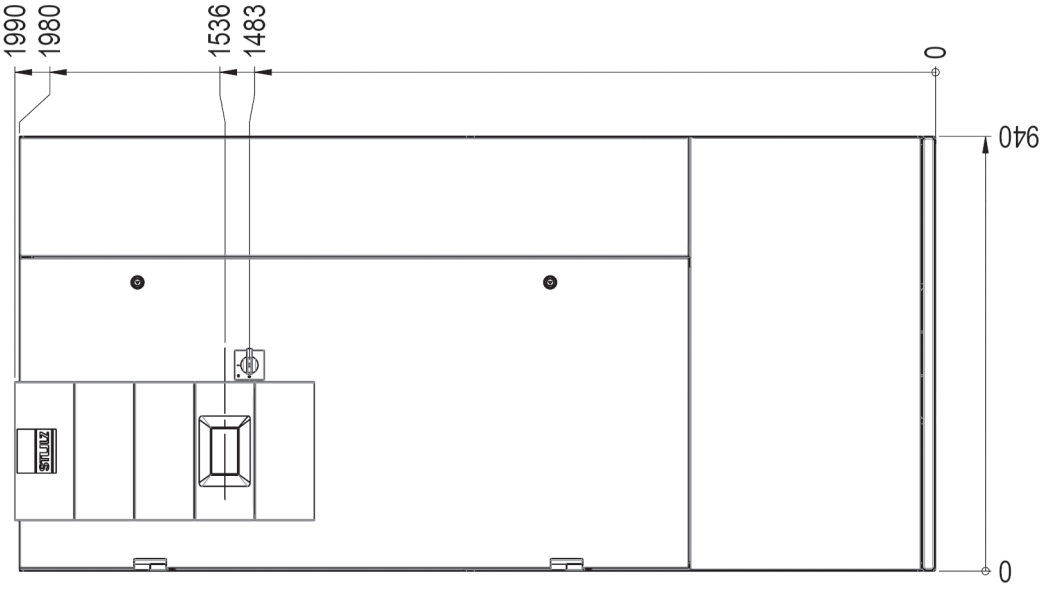


Cabinet size 4



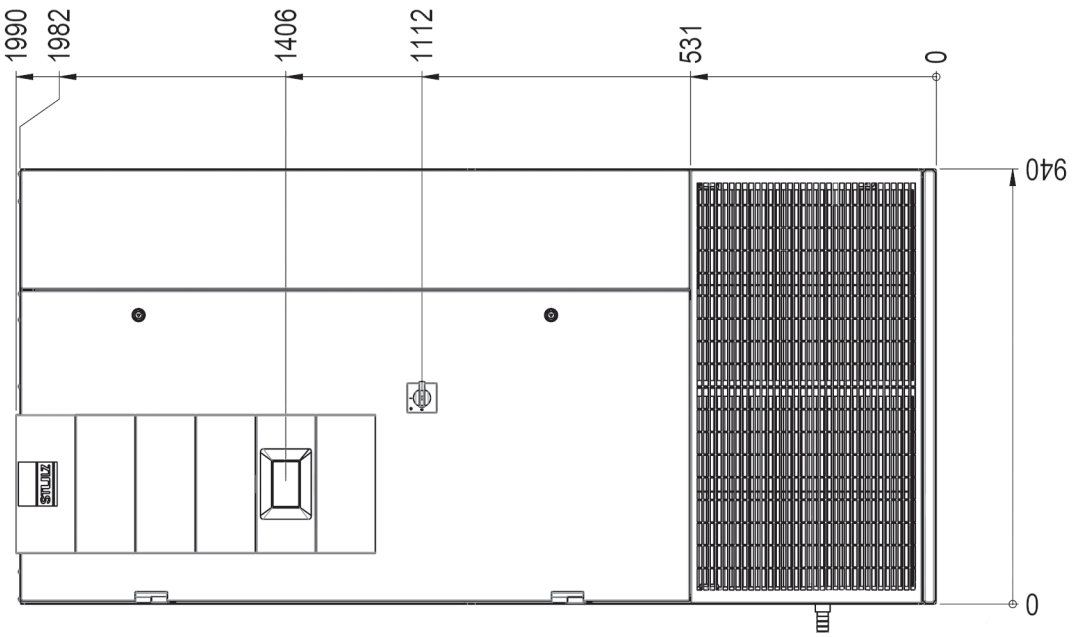
Downflow

Cabinet size 3

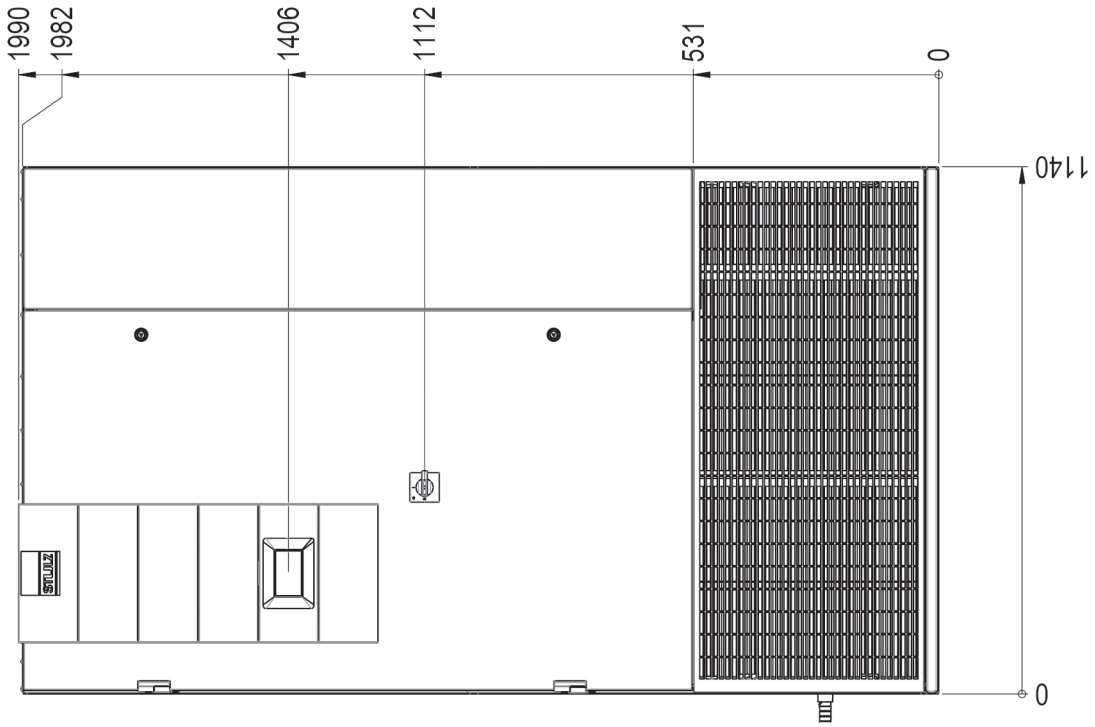


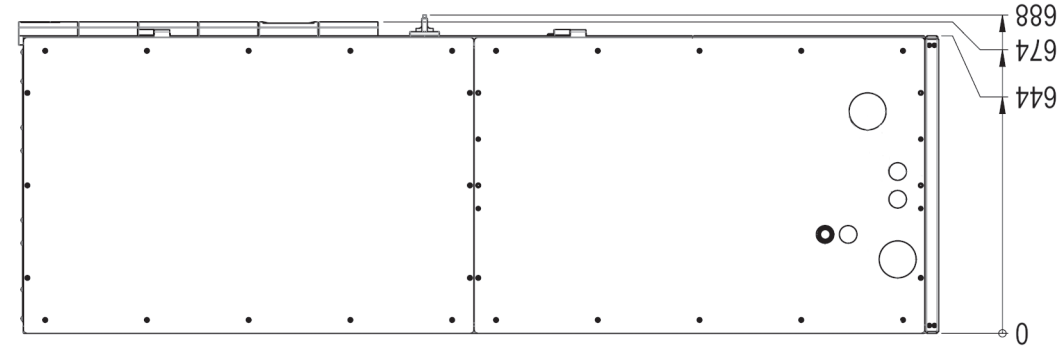
Upflow

Cabinet size 3



Cabinet size 4





5. Installation

5.1 Selection of the installation site

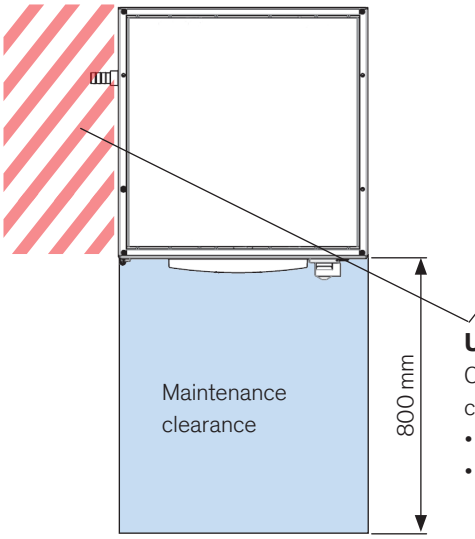
The A/C unit is designed for the inside installation on a level base. The A/C unit is not appropriate for operation in office rooms or other rooms sensitive to noise.

⚠ DANGER

Risk of explosion
The unit may not be operated in an explosive atmosphere!

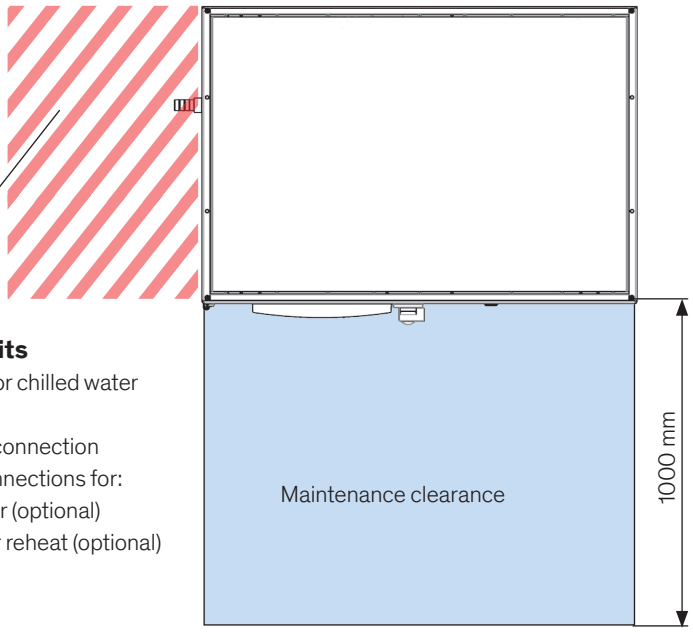
- children, unauthorized persons and animals may not have access to the installation site of the A/C unit.
- check that the installation site is appropriate for the unit weight, which you can read in the technical data.
- take into account the necessary clearances for the maintenance and the air flow.

Size 1-2



Upfow units
Clearance for chilled water connection
- Electrical connection
- Supply connections for:
  - humidifier (optional)
  - hot water reheat (optional)

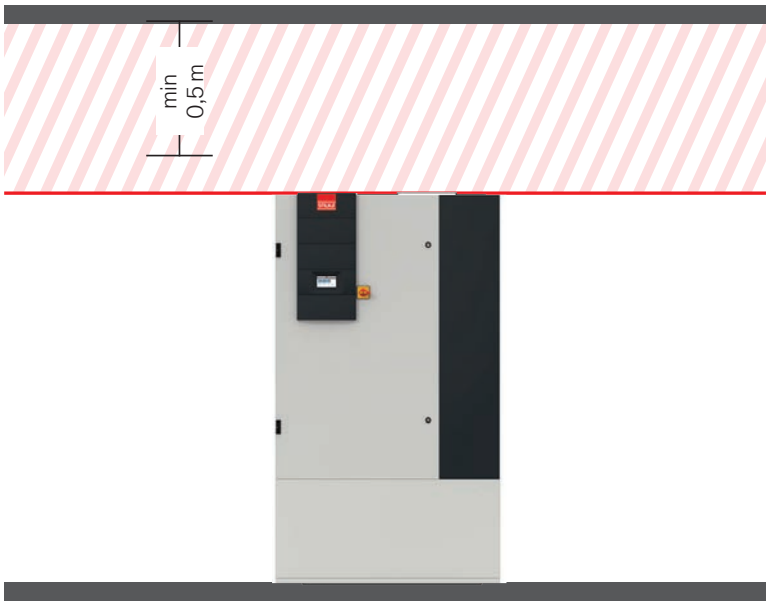
Size 3-4



Downflow unit
The A/C unit must be accessible from the front.

Upflow unit
The A/C unit must be accessible from the front and requires space on the left side for the supply connections.

Air intake area for Downflow units
Air outlet area for Upflow units without duct connection



5.2 Positioning the unit

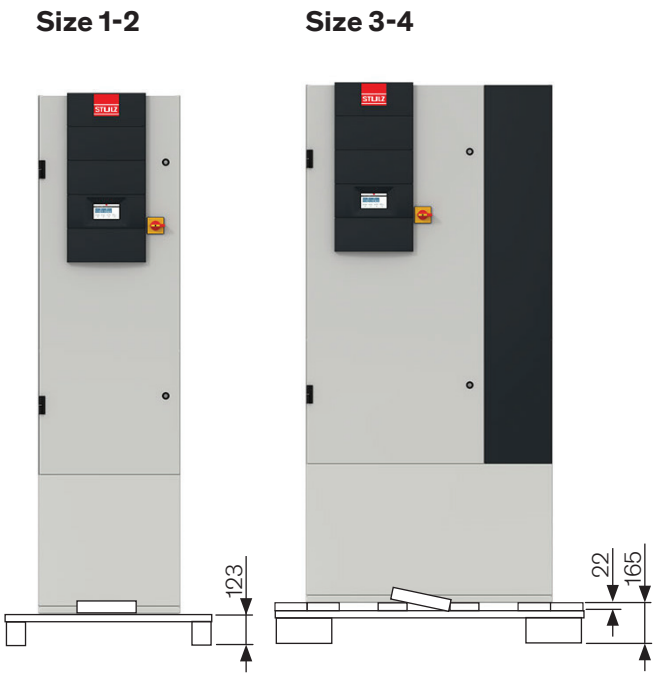
You will need two mounting aids as shown below.
When placing the unit on a raised floor stand, this must be installed first. Refer to the instructions in the chapter „Raised floor stand“.

⚠ WARNING

Risk of crushing limbs
A defective lifting device can lead to the uncontrolled fall of the A/C unit.
Do not stay under suspended loads! Wear safety boots, safety gloves and helmet.

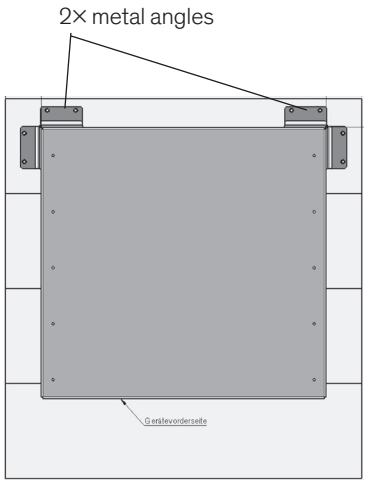
Transport with a fork lift

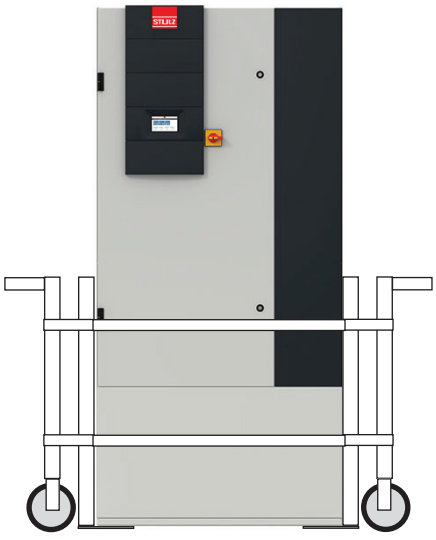
- transport the A/C unit on the pallet as close as possible to the installation site.
- unscrew transport lock (2 metal angles) from the pallet.
- adjust the mounting aids at the left and right unit side to pallet height.
- push mounting aids under left and right side of the unit.
- secure the mounting aids by belts around the unit.
- lift the A/C unit.
- remove the pallet.
- drive the unit by the mounting aids to the installation site.
- drop the unit, loosen the belts and pull away the mounting aids.



Pallet height

Mounting aids



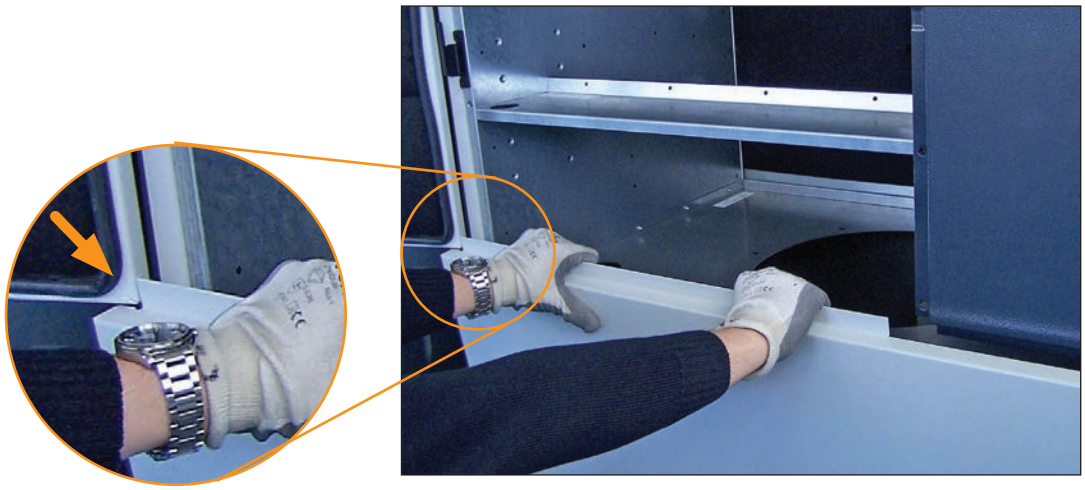


A/C unit transport with mounting aids

5.3 Opening the A/C unit

The lower panel is secured by ball pins and can be removed without auxiliary equipment. To remove this panel, first open the door using the male triangular wrench provided.

- Open the door wide and secure it against swinging shut again. This is the only way to pull off the lower panel without the lower left corner of the door getting in contact with the panel (see arrow).
- Grasp the panel from above with both hands.
- Pull it towards you with a jerk.
- The lower side can then be easily removed.



NOTICE

Place the male triangular wrench in a visible location in the immediate vicinity of the A/C unit.

5.4 Water piping connection

External water circuit

To close the water circuit you must connect the unit to a chilled water ring mains, which contains either a chiller or a dry cooler or cooling tower for the generation of cold water. If the water quality is insufficient, install a fine mesh strainer at the water inlet of the A/C unit.

NOTICE

Respect material compatibility in the whole hydraulic circuit, when installing additional components.

DANGER

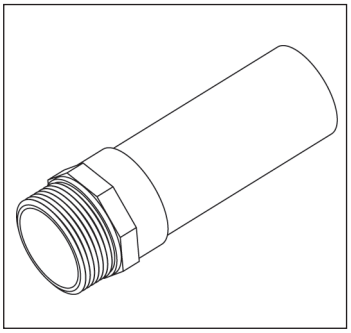
Mortal danger by electric hazard

Do not connect the power supply until the installation work has been completed. Secure the main switch against being switched on again.

Connecting the A/C unit to the external system

The water connections end with an external thread.

- read the thread size and the diameter of the chilled water lines out of the drawings on the following pages, to establish the lines between the external system and the A/C unit.
- take the position of the connections out of these drawings, to conduct the lines to the unit.



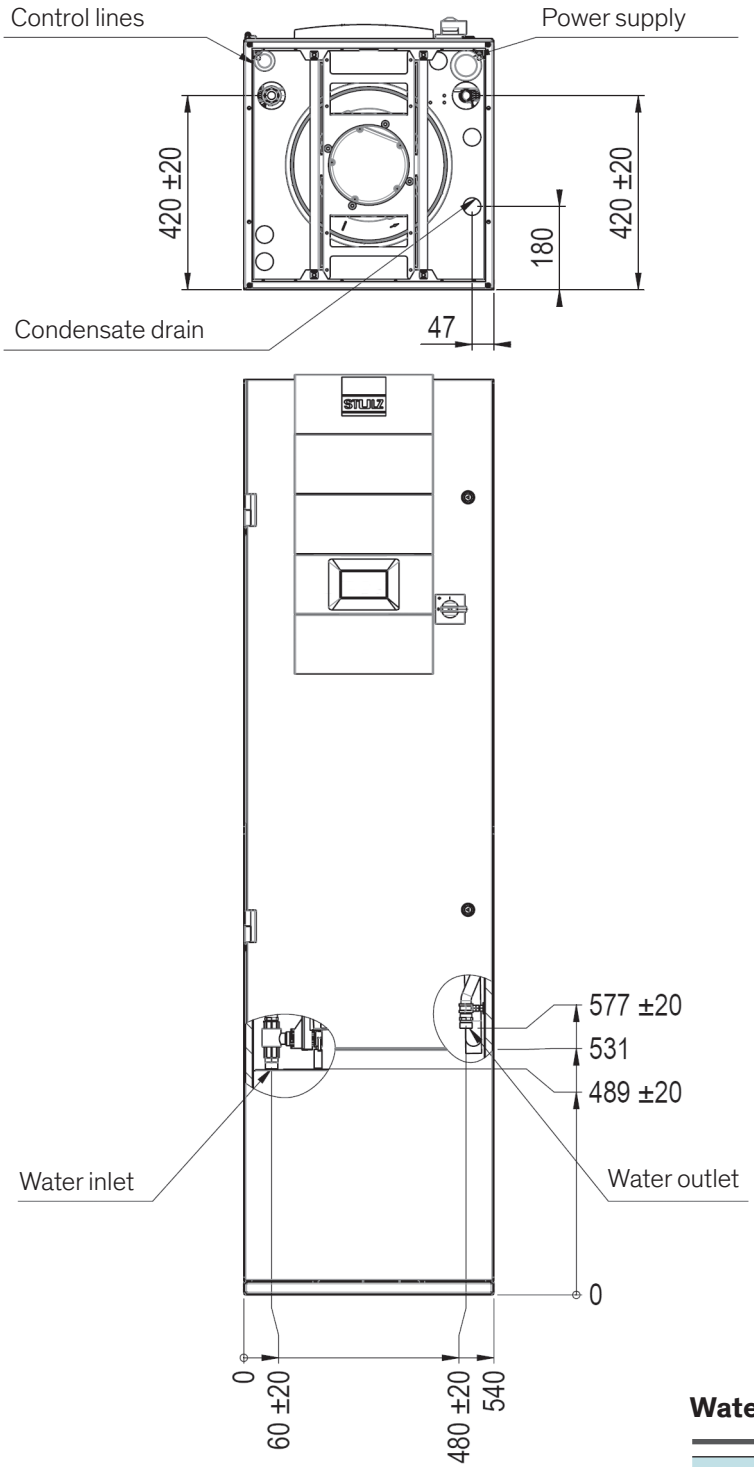
Connection with external thread

NOTICE

Water remaining from the test run may escape when the protective caps are removed.

- remove the protective caps or sealing disks of the screwed connections.
- screw the lines of the external system to the lines of the unit respecting the designation at the unit (inlet/outlet).
- insulate the water pipes with the diffusion tight insulating material, to prevent the introduction of ambient air heat and the formation of condensate at the pipes.

CCD 90 CW



Water connections

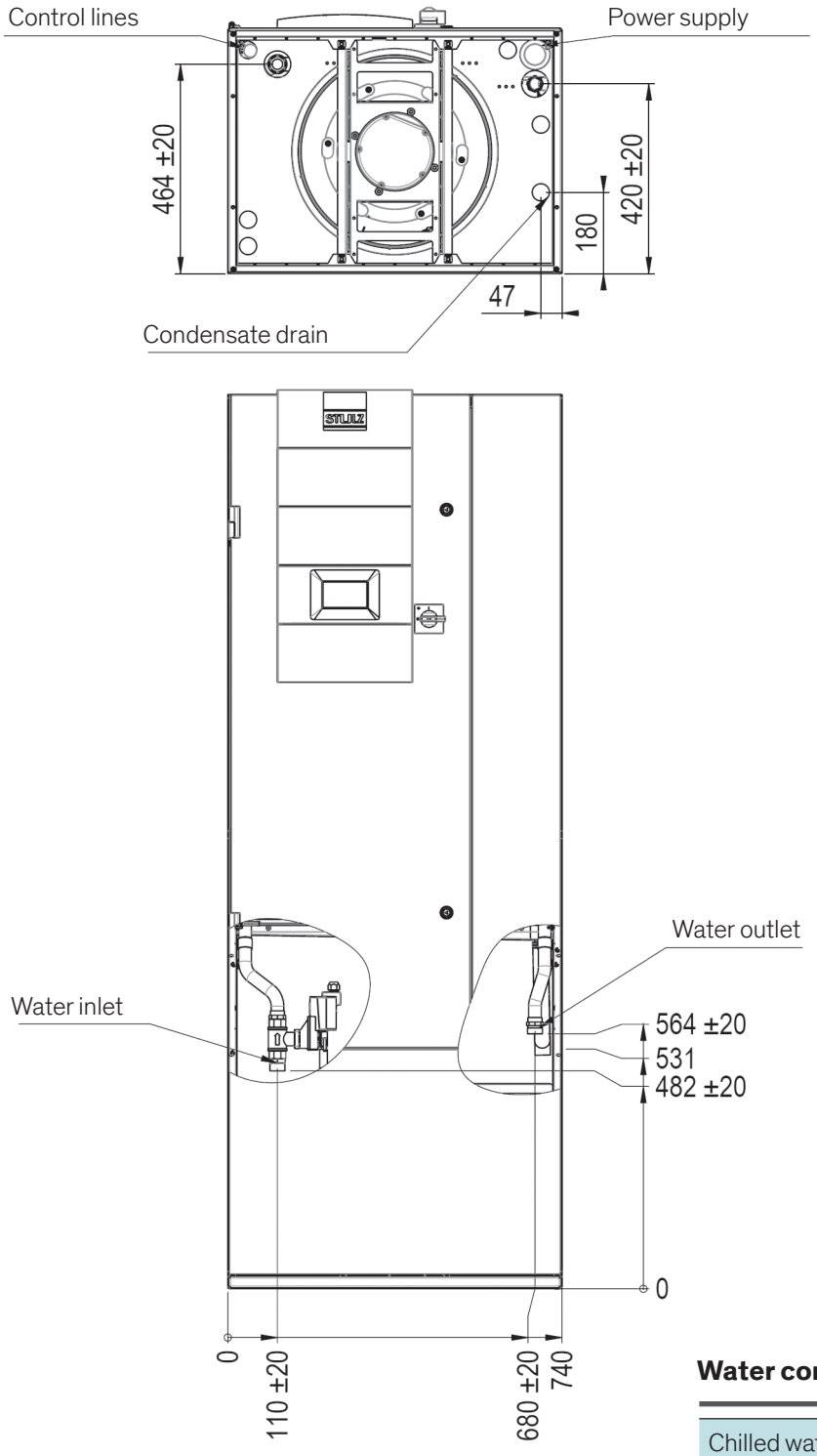
Chilled water line	DN	20
Male thread	inch	3/4
Condensate drain Ø inside	mm	22

All dimensions in mm.

To connect the piping notice the labels on the pipe ends.

- Route the external chilled water lines through the raised floor into the A/C unit.

CCD 180 CW



Water connections

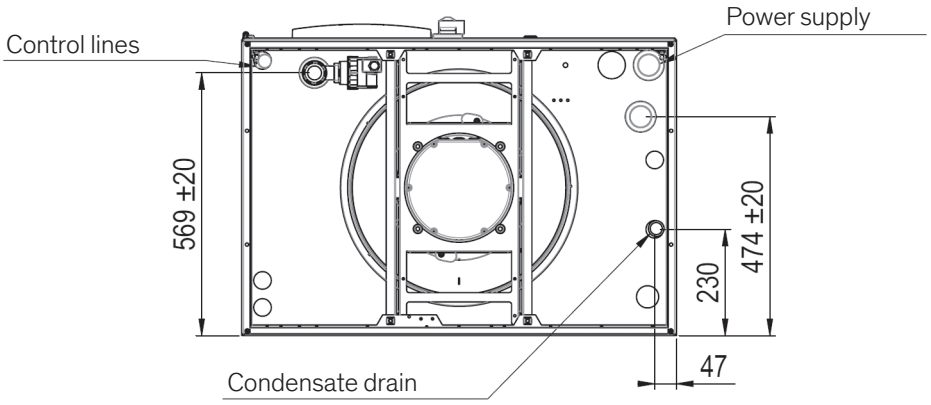
Chilled water line	DN	25
Male thread	inch	1
Condensate drain Ø inside	mm	22

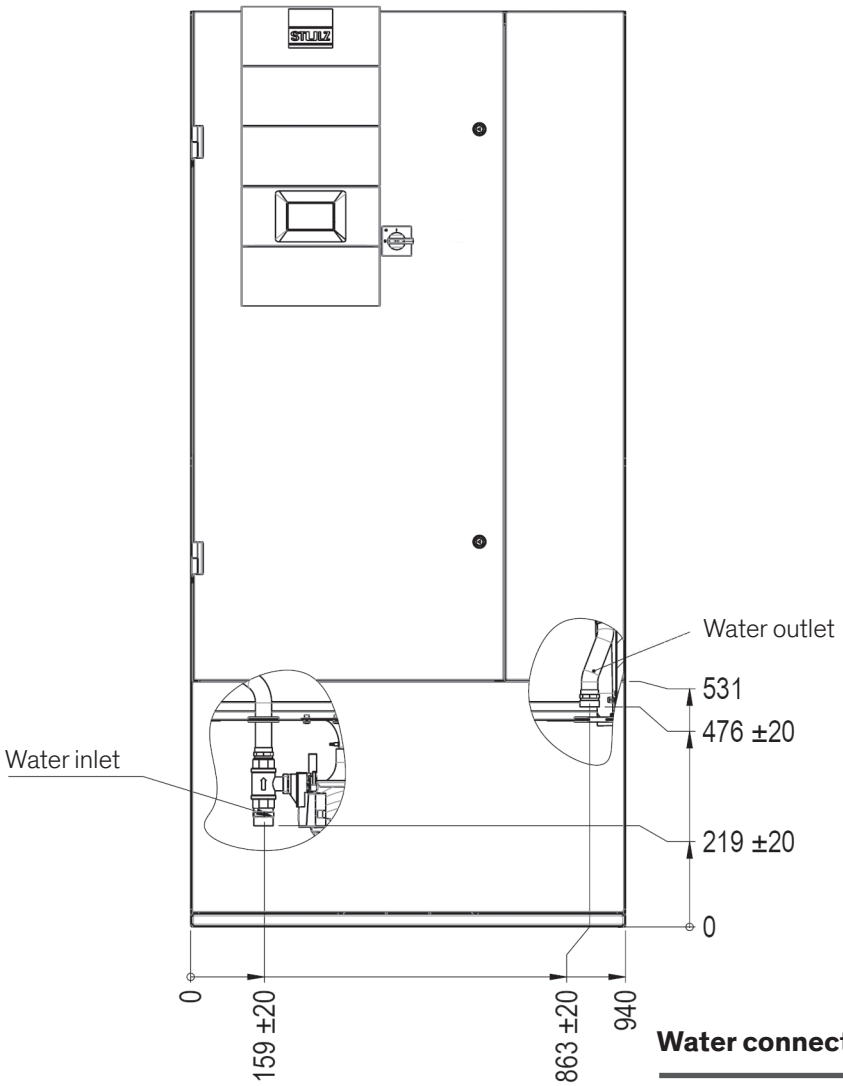
All dimensions in mm.

To connect the piping notice the labels on the pipe ends.

- Route the external chilled water lines through the raised floor into the A/C unit.

CCD 260 CW





Water connections

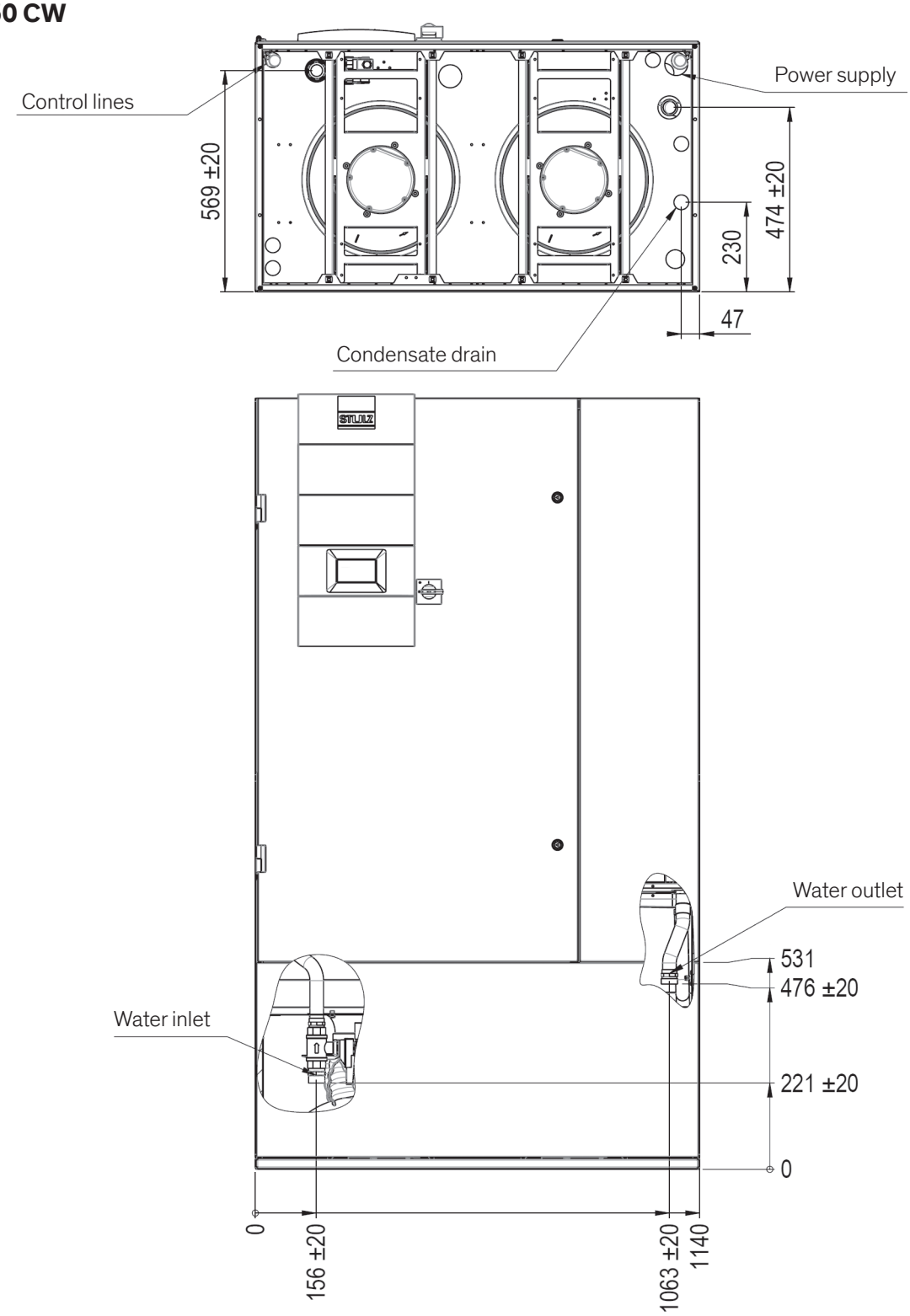
Chilled water line	DN	32
Male thread	inch	11/4
Condensate drain Ø inside	mm	22

All dimensions in mm.

To connect the piping notice the labels on the pipe ends.

- Route the external chilled water lines through the raised floor into the A/C unit.

CCD 350 CW



All dimensions in mm.

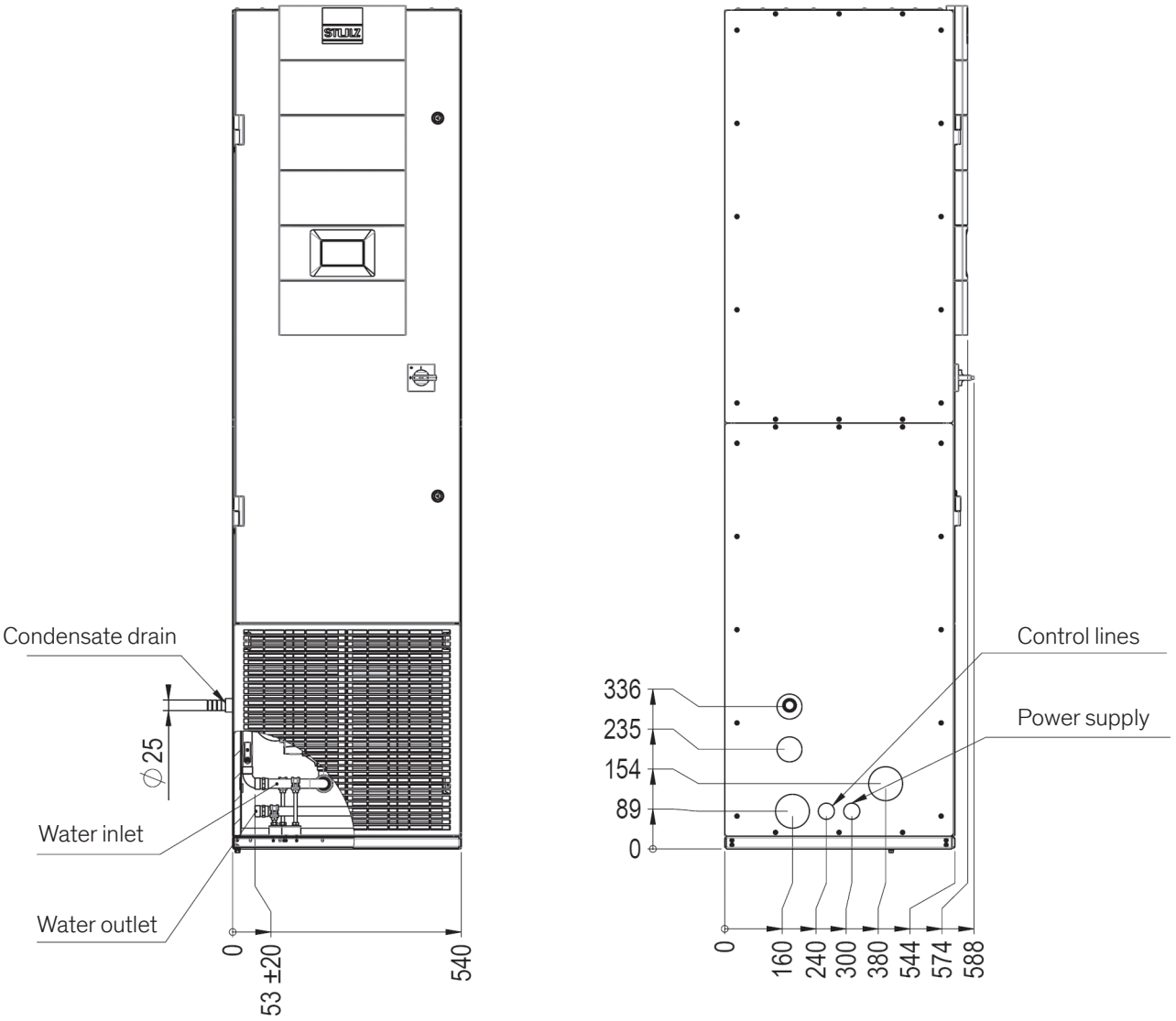
To connect the piping notice the labels on the pipe ends.

- Route the external chilled water lines through the raised floor into the A/C unit.

Water connections

Chilled water line	DN	32
Male thread	inch	11/4
Condensate drain Ø inside	mm	22

CCU 90 CW



Water connections

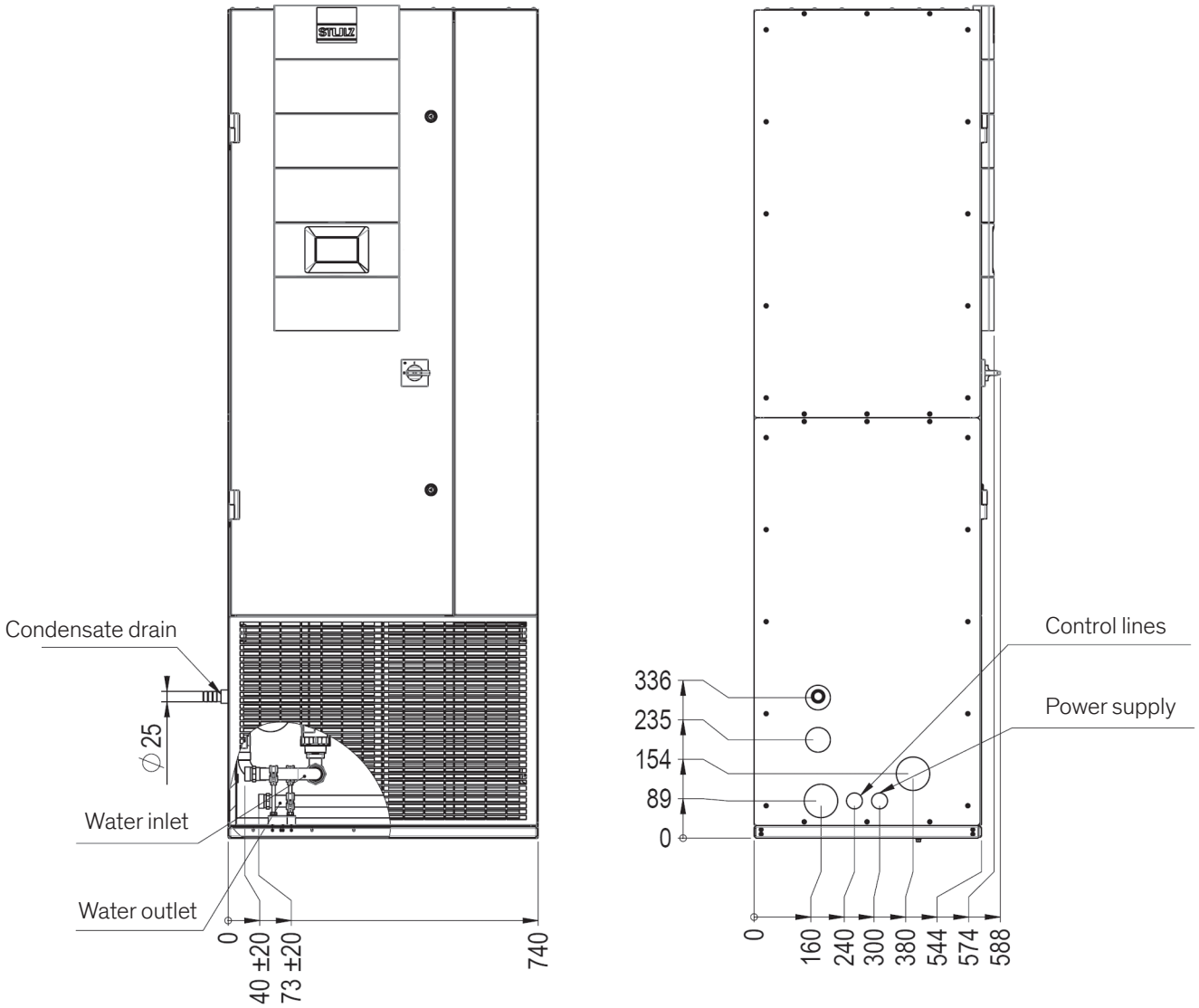
Chilled water line	DN	20
Male thread	inch	3/4

All dimensions in mm.

To connect the piping notice the labels on the pipe ends.

- Route the external chilled water lines through the left side panel into the A/C unit.

CCU 180 CW



Water connections

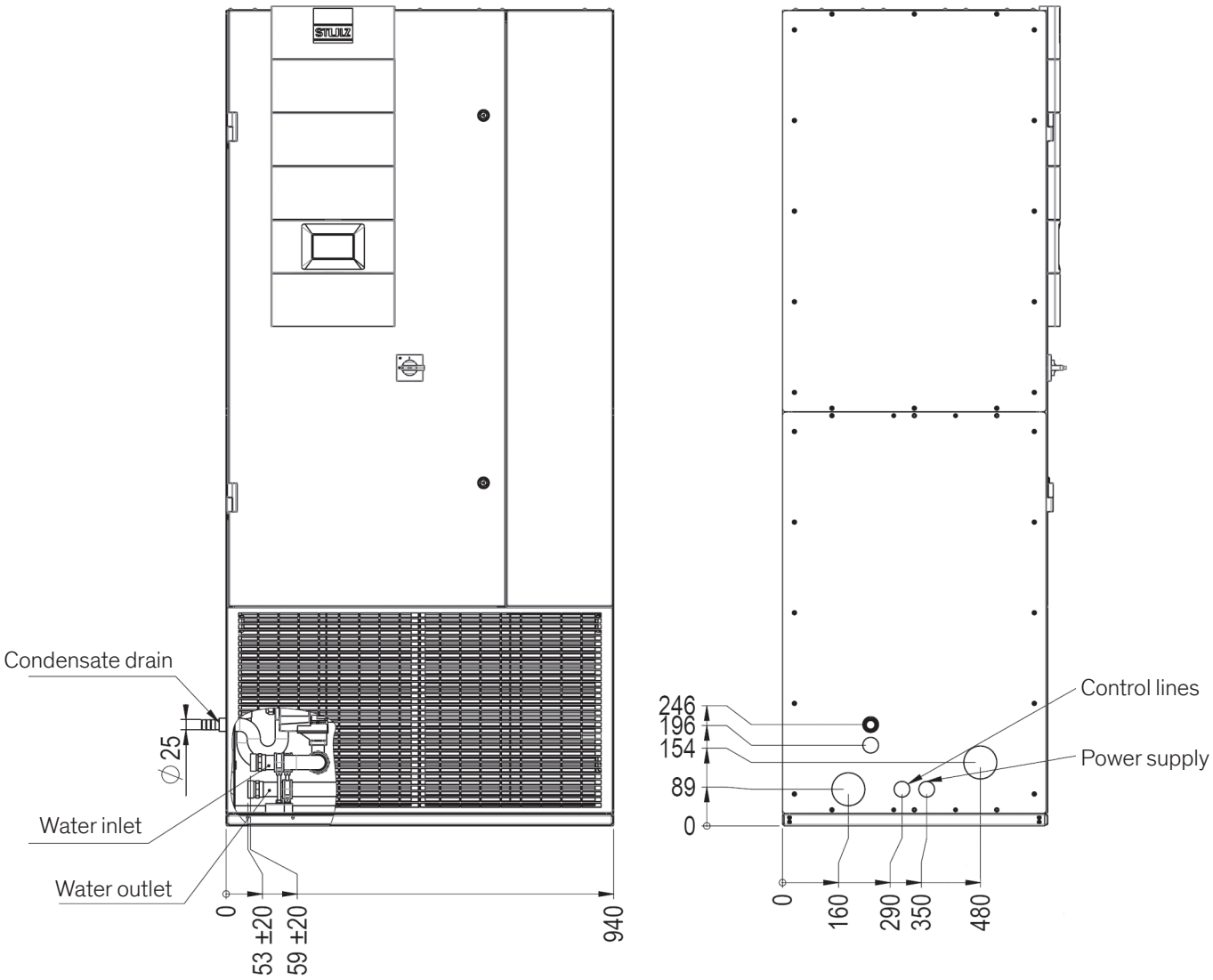
Chilled water line	DN	25
Male thread	inch	1

All dimensions in mm.

To connect the piping notice the labels on the pipe ends.

- Route the external chilled water lines through the left side panel into the A/C unit.

CCU 260 CW



Water connections

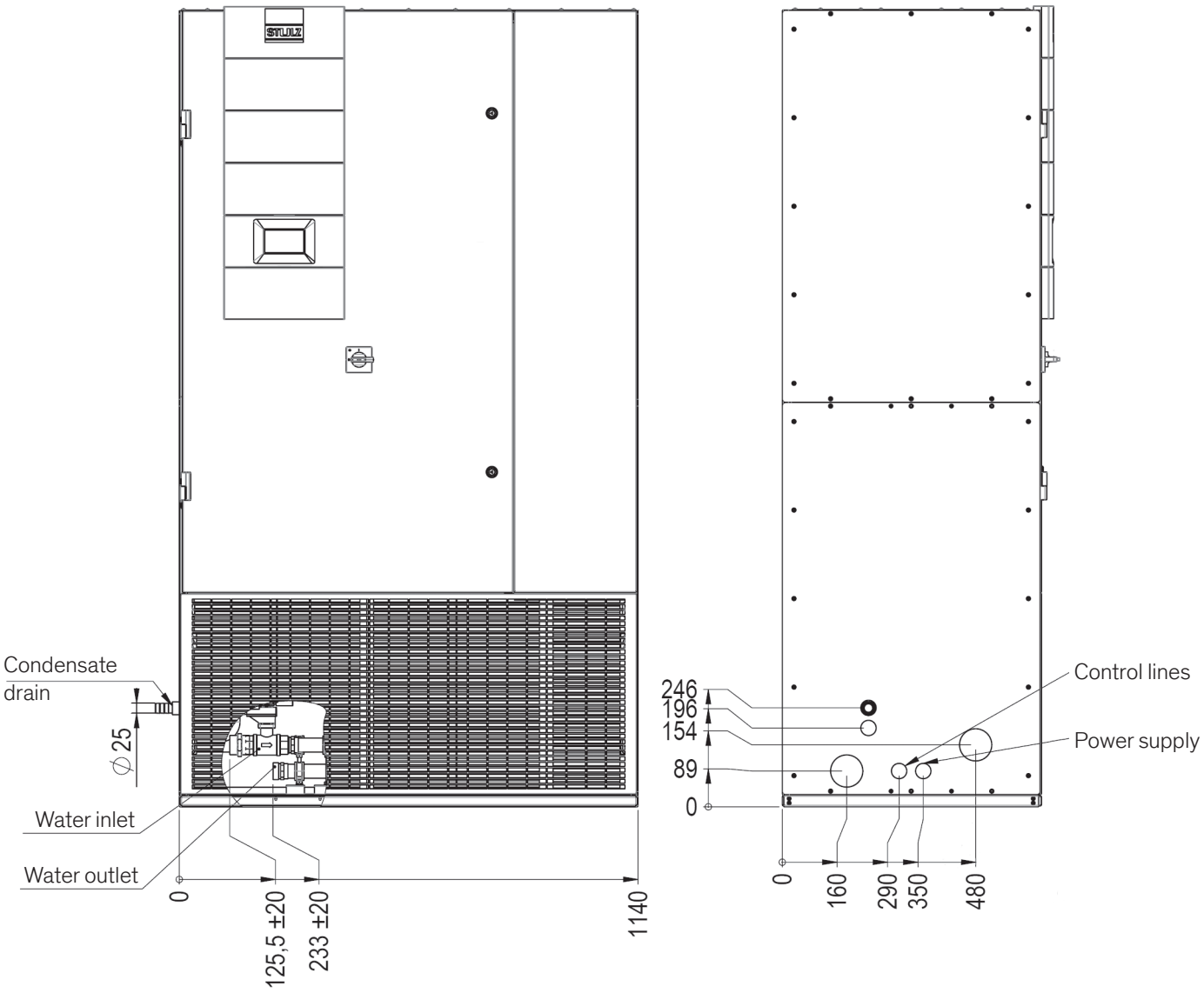
Chilled water line	DN	32
Male thread	inch	1 1/4

All dimensions in mm.

To connect the piping notice the labels on the pipe ends.

- Route the external chilled water lines through the left side panel into the A/C unit.

CCU 350 CW



Water connections

Chilled water line	DN	32
Male thread	inch	11/4

All dimensions in mm.

To connect the piping notice the labels on the pipe ends.

- Route the external chilled water lines through the left side panel into the A/C unit.

5.4.1 Condensate drain connection

⚠ CAUTION

Risk of injury from sharp edges
The fins of the heat exchanger and the condensate drip tray are sharp-edged. Wear safety gloves and cover forearms.

The position of the condensate drain is marked in the preceding schemes for the pipe entrance areas.
The internal diameter of the syphon is 22 mm.
In upflow units the condensate connection is designed in the form of a plastic hose nozzle with an external diameter of 22 mm.

- Connect the condensate water drains to the local waste water system.

i INFORMATION

Comply with the regulations of the local water supply authority.

5.5 Electrical connection

The power supply system on site and the pre-fuse must be designed for the total current of the unit (see e-data sheet).
Make sure that the power supply corresponds to the indications on the rating plate and that the tolerances according to the „Application limits“ are not exceeded.
The asymmetry of phase between the conductors may amount to 2% maximally.
To determine the asymmetry of phase measure the voltage difference between the phase conductors (L1-L2, L2-L3, L1-L3) and calculate the average value of the measured voltages. With a voltage supply of 400V, the maximum deviation to the average value of the voltages may not exceed 8 V.

DANGER

Mortal danger by electric hazard
Ensure that the power supply at the connection cable is de-energized.
The electric cables are only to be connected by an authorized specialist.

NOTICE

Make sure that the phase rotation is correct, the rotating field must turn right! Otherwise a three phase control device (optional) triggers an alarm.

NOTICE

For use of leakage-current (FI) circuit breakers, take into account the EN 50178 5.2.11.2 .
Only type B pulse-current FI circuit breakers are permitted. FI circuit breakers do not provide protection against bodily harm during operation of the unit or frequency converters.

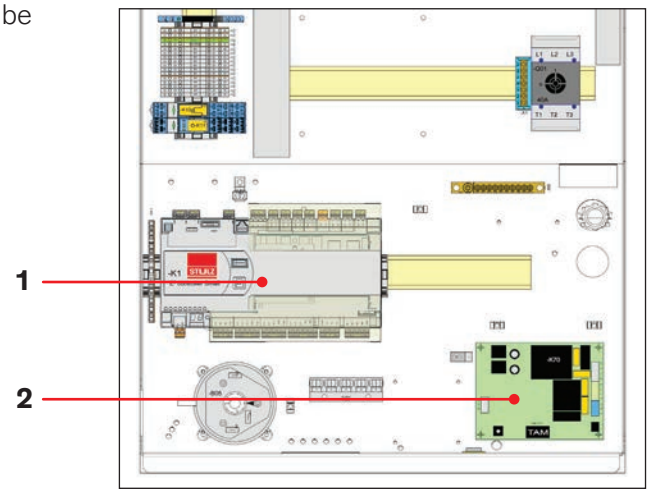
- open the unit door, on which the main switch is located.
- establish an effective equipotential bonding to the unit frame.
  The connection bolt provided for this purpose is marked with this symbol:

- check that the feedthrough openings in the unit are provided with rubber grommets. If the rubber grommets are lacking, the cable insulation can be damaged.

ESD NOTE

Do not touch electronical components, without taking care of protective ESD measures.

Electronical components:
- Controller (1)
- Humidifier board (option) (2)

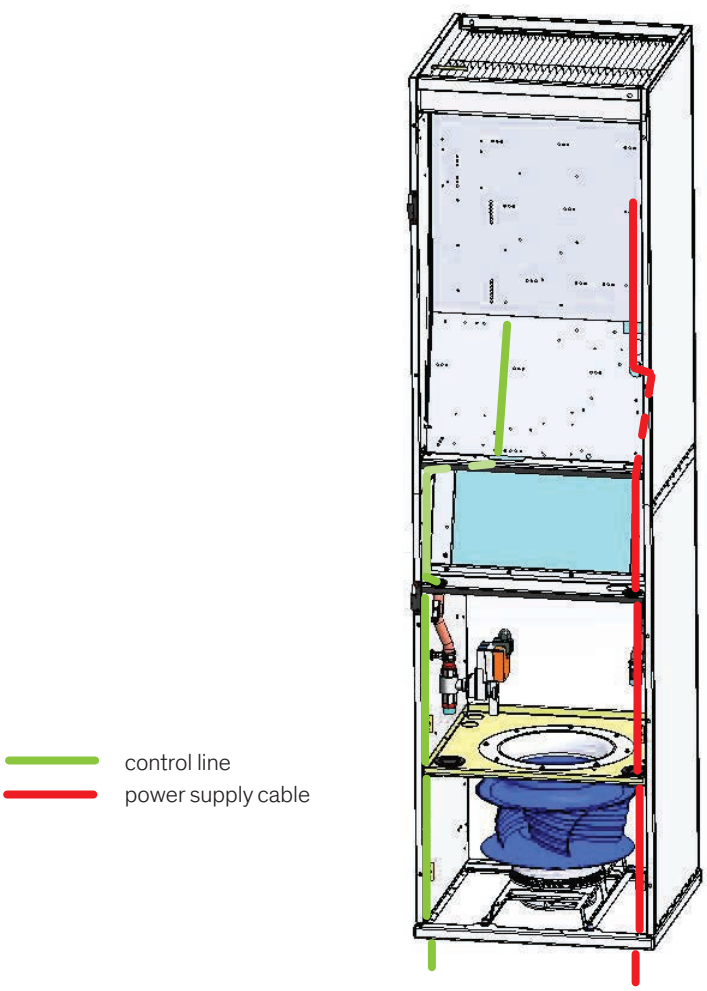


Connection of the power supply cable

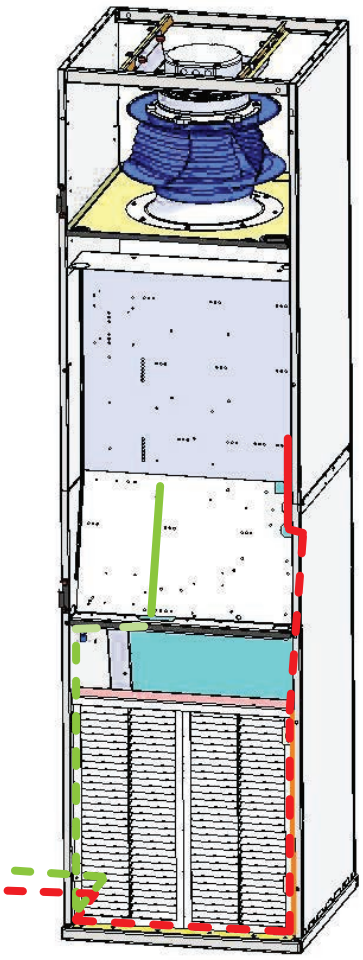
- route the power supply cable in the unit as shown in the following illustrations and fix it at the unit frame.
- route the electric cable into the electrical box from below and connect it, in accordance with the wiring diagram (part of the unit documents).
- secure these cables by the pull relief screw.

- Check the continuity of the protective conductor.
- Measure the loop impedance and compare it with the quotient of rated voltage and cut-off current of the protective device. A too high loop impedance leads to delayed tripping of the protective device and increases the risk of cable fire.

CCD 90 CW



CCU 90 CW

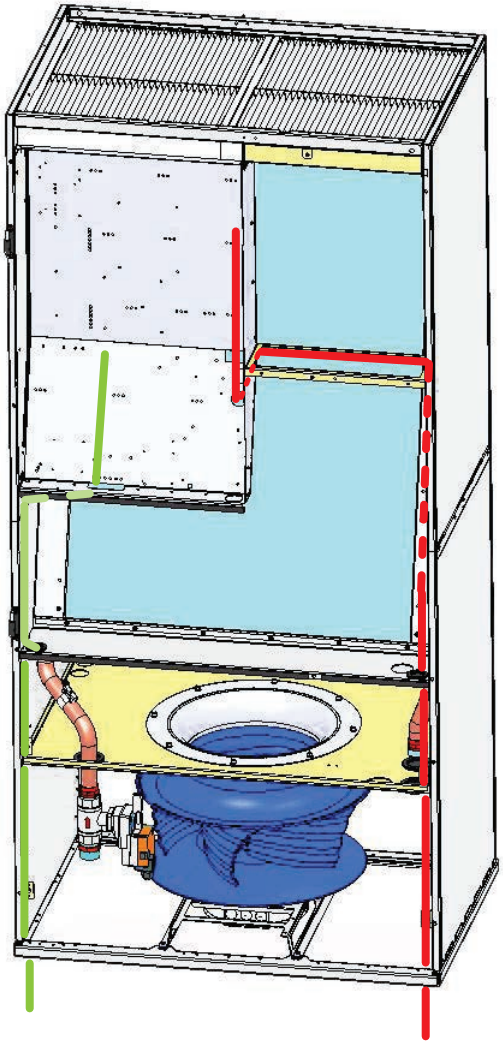


Connection of control lines (optional)

If the A/C unit shall be connected to other Stulz units by the pLAN bus, to a BMS or contains opional extensions as dampers, you must route control lines and connect them in the electric box of the A/C unit.

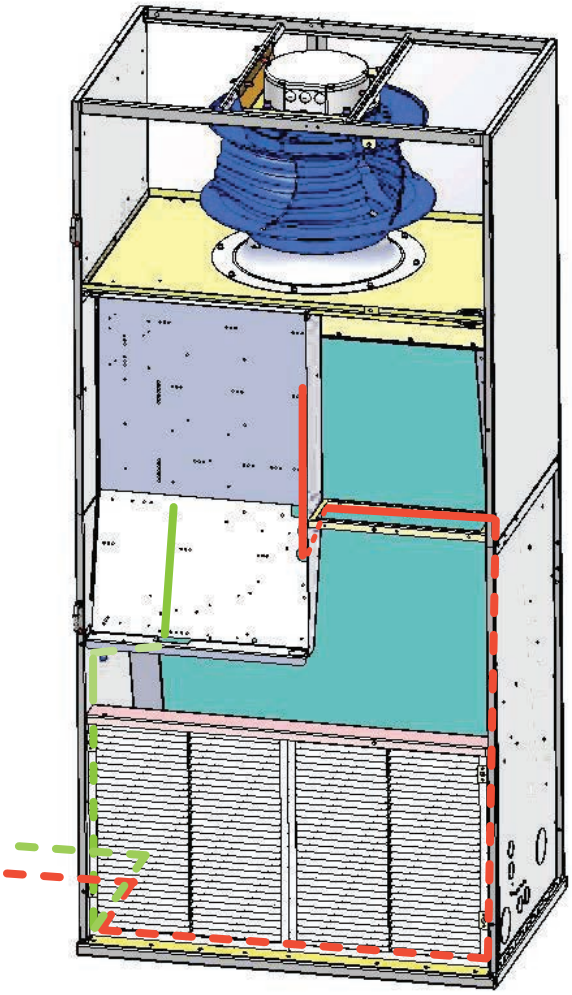
- route the control lines in the unit as shown in the illustrations and fix them at the unit frame.
- route the control lines into the electrical box from below and connect them in accordance with the wiring diagram (part of the unit documents).

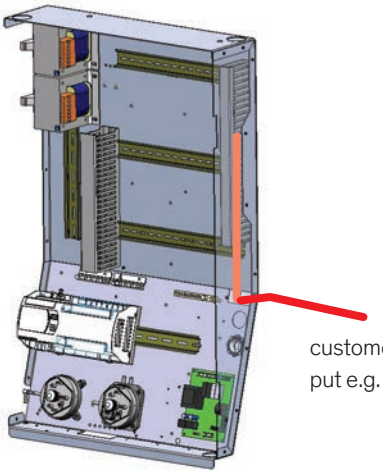
CCD 180-350 CW



control line
power supply cable

CCU 180-350 CW





customer power output e.g. for pump

6. Commissioning

NOTICE

The A/C unit must be installed and connected in accordance with the chapter on „installation“ before initial commissioning.

It is not necessary to supply the A/C unit with electricity to fill the water circuit.

DANGER

Mortal danger by electric hazard
When filling the water circuit, water can leak out and reach places that are live.
Do not connect the power supply until the filling is complete. Secure the main switch against being switched on again.

6.1 Filling of the water circuit

- Check whether you need an anti-freezing agent.

If the water temperature passes under 5°C or if the outside temperature is less than 0°C, you must add an anti-freezing agent. We recommend to add the following quantities of glycol (indicated as percentage of weight of the water quantity):

Ethylene glycol	Water or outside air temperature
20%	until -9,0°C
25%	until -12,3°C
30%	until -16,1°C
35%	until -20,4°C
40%	until -25,2°C
45%	until -30,8°C
50%	until -37,6°C

Propylene glycol	Water or outside air temperature
25%	until -10,7°C
30%	until -14,0°C
35%	until -17,6°C
40%	until -21,5°C
45%	until -26,0°C
50%	until -32,4°C

It is difficult to produce a homogeneous glycol mixture. You can purchase ready-made glycol mixtures.
- calculate the water content of the water circuit and the required amount of glycol.

⚠ WARNING

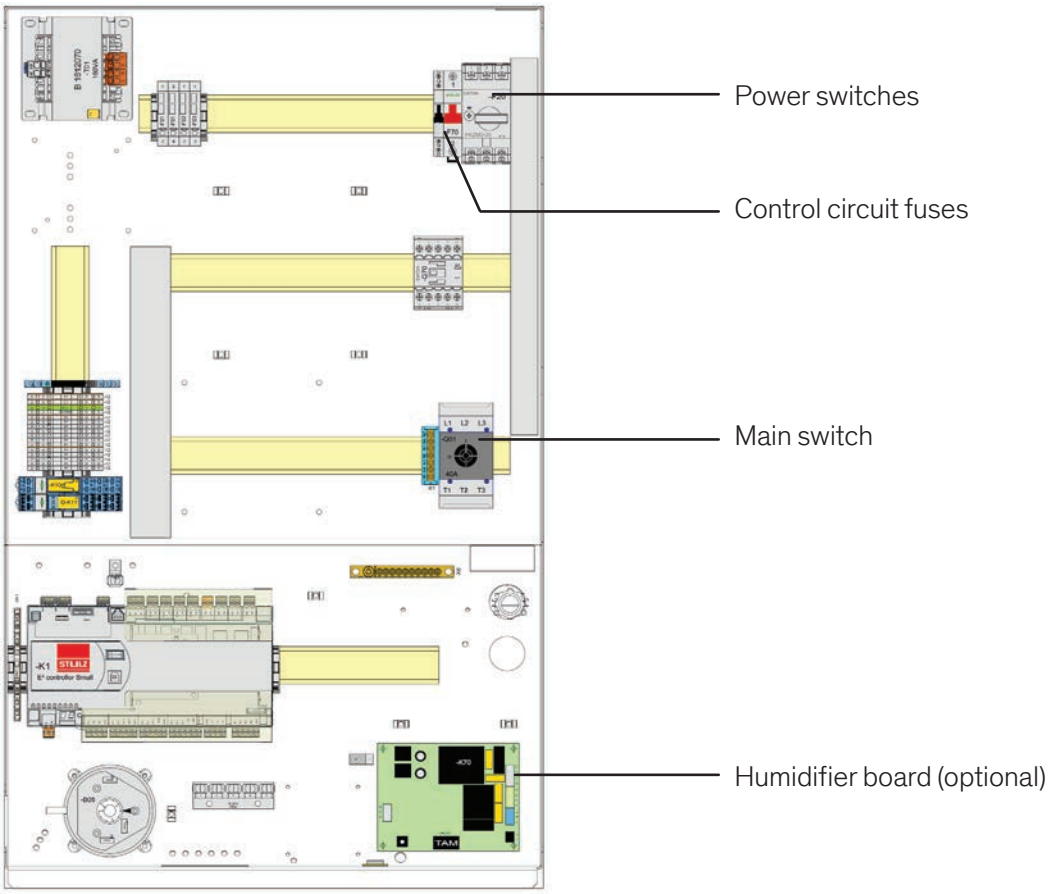
Risk of glycol intoxication
Do not swallow ethylene glycol. Ethylene glycol is highly toxic in oral ingestion.
Lethal dose: 0,4 g ethylene glycol/kg body weight, severe intoxication: already at 0,1 ml/kg.
Glycol is absorbed through the skin. Therefore immediately change clothing soaked with glycol.
Wear protective gloves made of rubber.

- fill the chilled water circuit by means of the filling connections (see hydraulic diagram, part of the unit documents).
- bleed air from the chilled water circuit by means of the schrader valves for bleeding.

6.2 Control of the electric box

- make sure that the main switch is off and the unit is de-energized.
- open the front door using the key provided.
- check whether all power switches and control-circuit fuses in the electric box are switched off.
- retighten all screw connections in the electric box.
- verify the smooth function of the contactors.

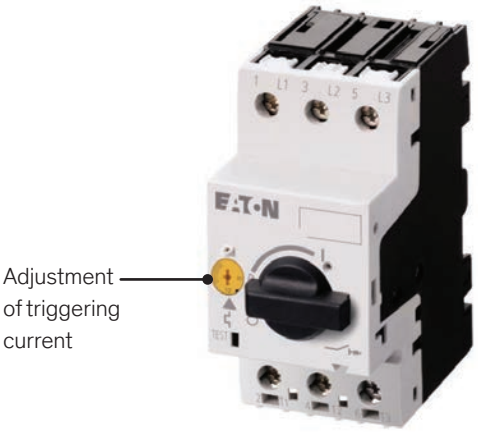
Electric box



- check the settings of the power switches according to electrical data sheet (part of the unit documents).
- switch on the control-circuit fuses and the power switch of the fan.
- close the front door of the A/C unit.
- switch on the power supply for the A/C unit.
- switch on the A/C unit at the main switch.

The controller is now supplied with power, so you can use it for adjustments.

- make sure that the heat rejecting system (chiller) is operating.



Power switch in position “off“

⚠ CAUTION

Risk of injury by fan rotation
The front door and the lower panel represent a protective device. During operation the front door/panel and the rear panel may not be removed.

A/C unit with optional “E² controller display 4.3 touch“ or “E² controller display 7“ touch“:

- familiarize yourself with the operation of the controller. To do this, there is a separate manual.
- adjust the desired return air temperature at the controller.
- A/C units which only have a “E² controller small“ or “E² controller medium“ and are connected with an A/C unit with Touch display, can be operated by the Touch display.

- start the A/C unit by pressing the Start/Stop-key on the Touch display.

7. Maintenance

7.1 Safety instructions

All maintenance work has to be carried out under strict compliance with the country-specific accident prevention regulations. In particular we refer to the accident prevention regulations for electrical installations, refrigerating machines and equipment. Non-compliance with the safety instructions can endanger people and the environment.
Maintenance work is only to be carried out on the units by authorized and qualified specialist staff.

Procedure instructions

- carry out work on the system only when it is shut down.
- switch off the A/C unit at the controller and at the master switch.
- display a „DO NOT SWITCH ON“ warning sign.
- switch off power conducting cables to the unit and secure them against being switched on again.
- check to ensure that they are in the de-energized state.

Note on compliance with DGUV Regulation 3 (DGUV-German social accident insurance)

- Perform a loop impedance or earth measurement after replacing electrical components or safety-relevant components.

NOTICE

Only use the spare parts listed in the spare parts list. The spare parts list is part of the unit documentation enclosed with the unit.

7.2 Maintenance intervals

Component	Maintenance interval		
	quarterly	half-yearly	yearly
Air circuit			
Heat exchanger			X
Fan			X
Air filter	X		
Water circuit			
Tightness		X	
Unit housing			
Electrical box			X
Unit interior			X

7.3 Air circuit

⚠ CAUTION

Risk of injury from sharp edges
The fins of the heat exchanger and the condensate drip tray are sharp-edged. Wear safety gloves and cover forearms.

Heat exchanger
The heat exchanger consists of copper tubes with aluminium fins. If leaks occur, they should be searched for at the heat exchanger. Beyond that, the heat exchanger is exposed to the air pollution, the particles of which settle at the fins and reduce the heat transmission the same as raise the air resistance.

i NOTICE

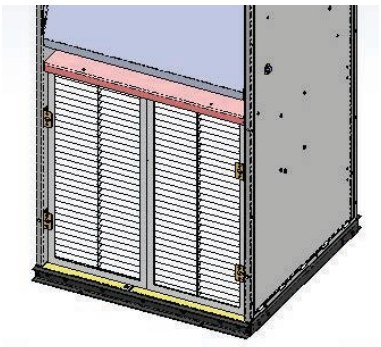
Do not distort the fins while cleaning, this also increases the air resistance.

- clean the heat exchanger by pressurized air by blowing it opposite to the normal air flow direction along the fins.

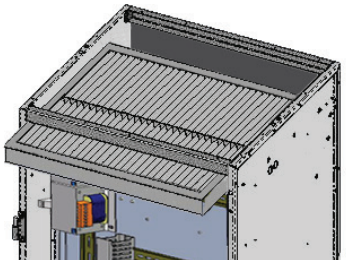
Air filter
A filter monitor controls the state of the filter. As soon as the pressure loss exceeds an adjustable value, a filter alarm via the controller is released. The controller can be configured such as to compensate the pressure loss by a higher fan speed, however you should not wait too long for exchanging the filter.

In upflow units the filters can be accessed by the lower front panel. In downflow units, the filters can be pulled out to the front after opening the front door. If there is a second filter element (for sizes 2-4), this can only be pulled out after the first element has been removed.

The clogged filter elements can not be cleaned with pressurized air, as the filter structure would be destroyed otherwise.
When you re-install the filter elements after the exchange, take care that the side with the coloured mark (dirt side) is turned away from the heat exchanger.



Filter position in upflow unit



Filter position in downflow unit

Fan

⚠ CAUTION

Injury to the eyes by dust and dirt
Before starting the unit, make sure that no person is at the outlet area of the fan. The outlet area is in the raised floor for downflow units and above the unit for upflow units.

⚠ CAUTION

Fracture or loss of limbs
The running fan can suck in and draw in loose clothing.
Before starting the unit, make sure that there is no person at the inlet area of the fan. In upflow units the inlet area is only accessible when the rear panels are removed.

The bearings of the fans are lifetime lubricated and do not need maintenance.

- Check the operation current. An increased operation current indicates a winding short circuit in the fan motor.

⚠ WARNING

Risk of injury by burns and rotation
The electronics housing of the fan motor can get hot.
The fans have an operation delay after the unit is stopped !

7.4 Water circuit

Tightness

A lack of water in the circuit is replaced by air, which reduces the heat capacity of the chilled water circuit and is detrimental to the pump. A level indication at the storage tank, if existant, can give information about changes of the water quantity.

- check the water circuit visually for tightness.

7.5 Unit housing

⚠ DANGER

Mortal danger by electric hazard

When the master switch is switched on and the controller is stopped, the power contactors are live, even if the components are not operating.

At the fan contactor, dangerous voltages occur. Do not open the unit within the first 5 minutes after disconnection of all phases.

In units with 2 fans dangerous charges of >50µC can occur between AC line terminals and PE after disconnection.

Electrical box

- check the connection terminals for tight fixation when the unit is installed and once again after an operation time of 30 days.

Unit interior

Clean pipes simplify the search for leaks.

- clean the unit's inside with a vacuum cleaner.

Vibrations of pipes and circuit components can result in leaks.

- check the pipes for a tight seat.

Condensing air humidity on cold water pipes means a loss of cooling capacity.

- check the insulation of the water piping.

8. Malfunction

Alarm message	Cause for alarm	Cause	Elimination
Airflow failure	Differential pressure for airflow switch has triggered.	1. Fan motor defective. Fan speed too low.	Check fan motor on voltage continuity and current consumption. Check if fan is mechanically blocked.
		2. Air filter extremely clogged.	Check air filter.
		3. Hoses to the airflow monitor dirty or kinked.	Clean hoses and check whether they are kinked .
Sensor # error	The tolerance to the average value adjustable in the controller has been exceeded.	1. Big difference of measured values in selected zone.	Check room on Hotspots or chilled air zones, moist zones. Check measured value with an external measuring instrument.
		2. sensor defective.	Replace defective sensor.
Sensor # defective	The measured voltage/current is outside the range defined in the controller.	1. electrical connection defective.	Check connections.
		2. sensor cable defective.	Check cable on continuity.
		3. sensor defective.	Replace defective sensor.

Depending on the option configured in the controller further alarm messages exist.
stands for a number in case of several components of the same kind.

9. Dismantling and disposal

The A/C unit may only be dismantled by qualified specialists.

- switch off the A/C unit at the controller and at the master switch.
- switch off power conducting cables to the unit and secure them against being switched on again.

⚠ DANGER

Mortal danger by electric hazard
At the fan contactor, dangerous voltages occur. Do not open the unit within the first 5 minutes after disconnection of all phases.
In units with 2 fans dangerous charges of >50µC can occur between AC line terminals and PE after disconnection.

- disconnect the A/C unit from the de-energized network.

⚠ CAUTION

If glycol or similar additives had been used, this liquid has to be collected and disposed in an appropriate manner and may under no circumstances be introduced in the local waste water system.

- disconnect the unit from the external water circuit by closing the shut-off valves and drain the water circuit of the unit.
- disconnect the depressurized chilled water pipes of the unit from the external system.

- move the unit, as described in the chapter „transport“, with a lifting device of sufficient load-carrying capacity.

- dispose of the A/C unit in accordance with the disposal and safety regulations applicable on site.

We recommend a recycling company for this. The unit basically contains the raw materials aluminium (heat exchanger), copper (pipelines, wiring), and iron (panelling).

10. Contents of the CE Declaration of Conformity

The undersigned

STULZ GmbH
Klimatechnik
Holsteiner Chaussee 283
22457 Hamburg

CE
2021

hereby confirms that the units listed below, in the version marketed by us, fulfil the requirements of the harmonised EC directives and EC safety standards listed below.

In the case of a modification of the equipment not co-ordinated with us this declaration loses its validity.

Air conditioning unit

CyberAir Mini ... CW

CCD 90	/	CCU 90
CCD 180	/	CCU 180
CCD 260	/	CCU 260
CCD 350	/	CCU 350

EC-Directives
EC machinery directive 2006/42/EC
EC directive for low voltage 2014/35/EU
EC EMC directive 2014/30/EU
RoHS directive 2012/50/EU
EC pressure equipment directive 2014/68/EU

National regulation
BGR 500 chapter 2.35
BGV A3

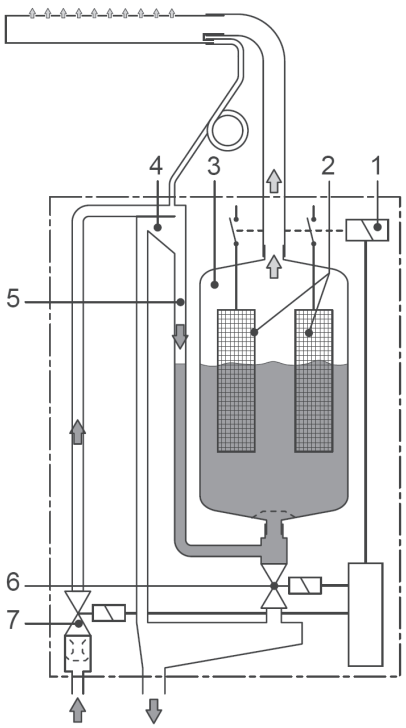
Harmonised EN
EN 378 -1, -2, -3, -4
EN ISO 12100
EN ISO 13857
EN 60204 -1
EN 61000-6-2
EN 61000-6-4

11.1 Steam humidifier

The steam humidifier is an optional extra for your A/C unit. It is installed complete and integrated within the function and method of operation of the A/C unit. Details concerning the connection assignment for the power supply can be found in the electrical diagrams in the appendix.

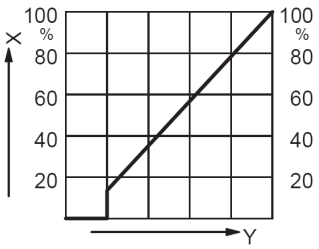
11.1.1 Description

The steam humidifier OEM2 is a pressureless steam generator that utilizes an electrode heating and is designed for air humidification via a steam distributor (steam distribution pipe, steam nozzle).



On/Off control

Proportional control



X = steam capacity in %
Y = Output signal controller

Steam generation

Any time steam is requested, the electrodes (2) are supplied with voltage via main contactor (1). Simultaneously, the inlet valve (7) opens and water enters the steam cylinder (3) from the bottom via water cup (4) and supply line (5). As soon as the electrodes come in contact with the water, current begins to flow between the electrodes, eventually heating and evaporating the water. The more the electrode surface is exposed to water, the higher is the current consumption and thus the steam capacity.

Upon reaching the requested steam capacity, the inlet valve closes. If the steam generation decreases below a certain percentage of the required capacity, due to lowering of the water level (e.g. because of the evaporation process or drainage), the inlet valve opens until the required capacity is available again.

If the required steam capacity is lower than the actual output, the inlet valve is closed until the desired capacity is achieved by lowering of the water level (evaporation process).

Level monitoring

A sensor provided in the steam cylinder cover detects when the water level gets too high. The moment the sensor comes in contact with water, the inlet valve closes.

Drainage

As a result of the evaporation process, the conductivity of the water increases due to an escalating mineral concentration. Eventually, an inadmissibly high current consumption would take place if this concentration process were permitted to continue. To prevent this concentration from reaching a value, unsuitably high for the operation, a certain amount of water is periodically drained from the cylinder and replaced by fresh water.

During the drainage process, the drain valve (6) is opened. Following a predetermined time of drainage, the drain valve is closed again.

Control

With the ECCM/S control unit either On/Off control or proportional control can be employed for steam production.

Below a minimum controllable steam output, proportional control will work in two-point operation (on/off control).

11.1.1.1 Technical data

Steam capacity [kg/h]	Nominal power [kW]	Nominal current [A]	Max. current [A]
200 ... 230V / 1N~ / 50 ... 60Hz			
2.0	1.5	7.5 ... 6.5	9.4 ... 8.2
4.0	3.0	15.0 ... 13.0	18.8 ... 16.3
200 ... 230V / 3~ / 50 ... 60Hz			
4.0	3.0	8.7 ... 7.5	10.8 ... 9.4

Operating conditions

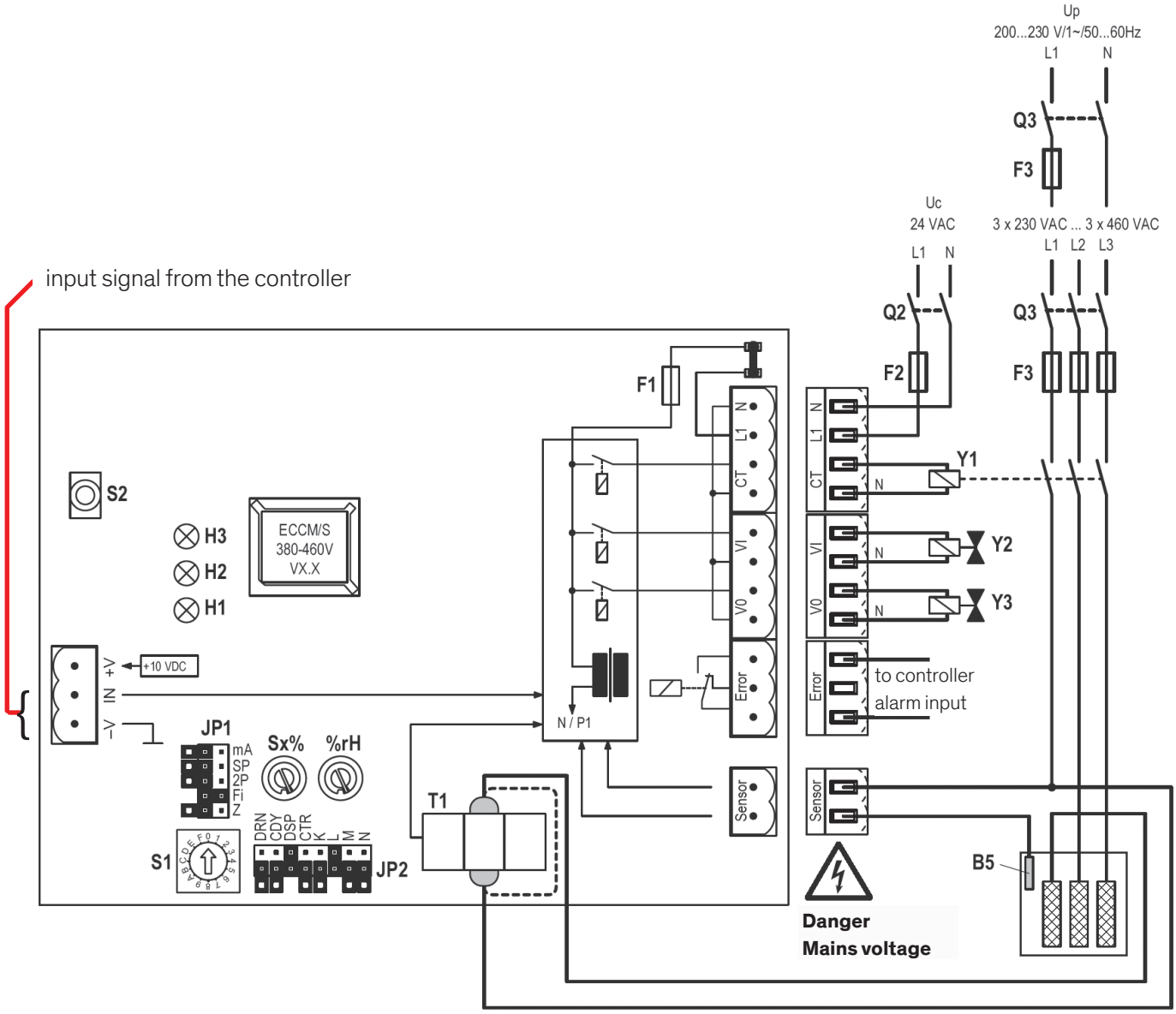
Admissible water pressure	1 ... 10 bar
Water quality	Drinking water with a conductivity of 125 - 1250µS/cm
Admissible water temperature	1 ... 40 °C
Admissible ambient temperature	1 ... 50 °C (control unit 1 ... 40 °C)
Admissible ambient humidity	max. 75% rh, non-condensing
Adm. back pressure at steam connection	- 0.5 kPa ... 1.0 kPa
Type of protection	IP00
Conformity	produced according VDE regulations 0700 and 0700 part 98
Maximum discharge water flow	0.5 l/min (1.2 l/min for the model with 15 kg/h)

NOTICE

Do not treat the water with softeners !
This results in corrosion of the electrodes and in the formation of foam with insufficient filling of the steam cylinder.

A reverse osmosis plant (ROP) can be used to soften water. The water from the ROP has a low conductivity and must be mixed with raw water for evaporation.

11.1.1.2 Wiring diagram of the control unit ECCM/S



B5	Level sensor steam cylinder	S1	Rotary switch unit type
F1	Fuse control board (2 A, time-lag)	S2	Drain/Info key
F2/Q2	Automatic fuse control voltage	Sx%	Potentiometer power limitation
F3/Q3	MCB humidifier	%rH	Potentiometer humidity value
H1	Red LED: Error	Y1	Main contactor heating voltage
H2	Yellow LED: Service, Warning	Y2	Inlet valve
H3	Green LED: Steam production	Y3	Drain valve
JP1	Jumper block 1	T1	Current sensor
JP2	Jumper block 2		

11.1.1.3 Configuration of the control unit ECCM/S

⚠ DANGER

Mortal danger by electric hazard

The steam humidifier OEM2 is operated with mains voltage. One may get in touch with live parts when the unit is open. Touching live parts may cause severe injury or danger to life.

- Before carrying out any work set the steam humidifier OEM2 out of operation as described in chapter 11.1.3.5 (switch off the unit, disconnect it from the mains and stop the water supply) and secure the unit against inadvertent power-up.

Setting the capacity limitation “Sx%”

Use the potentiometer “Sx%” to set the capacity limitation in % of the maximum capacity (setting range: 25...100%, factory setting: 100%).

Setting the control signal

With the jumpers on jumper block “JP1” you can set the control signal. The control signal is adjusted on 0-10V, none of the jumpers „mA“, „SP“, „2P“ on jumper block „JP1“ may be set for this.

General unit settings

With the jumpers on the jumper blocks “JP1” and “JP2” you can set different unit parameters.

Pos.	with jumper	without jumper
FI	Connection to a mains supply with ground fault circuit interrupter **	Connection to a mains supply without ground fault circuit interrupter
DRN	Increased drain operation factor	Regular drain operation factor **
CDY	Low water conductivity (<125 µS/cm)	Normal water conductivity (≥125 µS/cm) **
DSP	Exchangeable steam cylinder **	Cleanable steam cylinder
K	Fault No. 4 “steam cylinder maintenance due”: the unit triggers a warning only (the error switch on the control unit ECCM/S is not activated).	Fault No. 4 “steam cylinder maintenance due”: 72 hours after the warning an error is triggered and the unit is switched off (red LED lights). However, the error switch on the control unit ECCM/S is activated already in warning status. **
L	Fault No. 3 “Fill time”: a warning is triggered after 20 minutes filling time exceeding. After 220 minutes filling time exceeding an error is triggered and the unit is switched off (red LED lights and the error switch on the control unit ECCM/S is activated). **	Fault No. 3 “Fill time”: the unit directly triggers an error after 20 minutes filling time exceeding (red LED lights and the error switch on the control unit ECCM/S is activated). However, the unit is switched off after 220 minutes filling time exceeding.
Z, M, N	no function (spare)	

** Factory settings

Setting the rotary switch S1

Power supply	Steam capacity [kg/h]				
	2	4	8	10	15
200V 1N~	0	0	-	-	-
208V 1N~	1	1	-	-	-
220V 1N~	2	2	-	-	-
230V 1N~	3	3	-	-	-
200V 3~	-	4	-	-	-
208V 3~	-	5	-	-	-
220V 3~	-	6	-	-	-
230V 3~	-	7	-	-	-
380V 3~	-	0	-	-	-
400V 3~	-	1	-	-	-
415V 3~	-	2	-	-	-
460V 3~	-	3	-	-	-

11.1.2 Supply connections

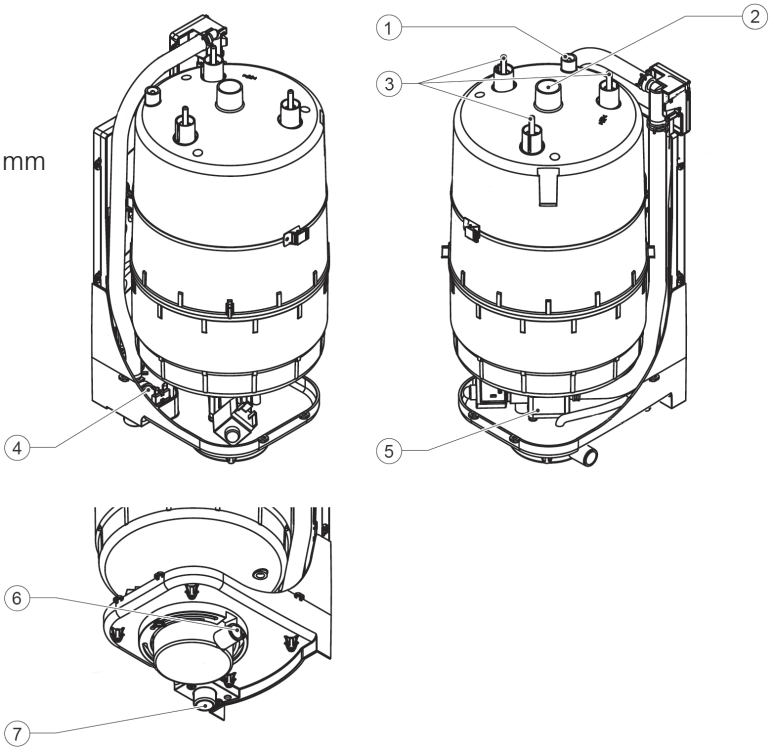
The steam humidifier is installed and electrically connected in the A/C unit. The local regulations of the water supply company are to be complied with when making the hydraulic connection.

NOTICE

We recommend the installation of an Aqua-stop valve in the water supply of the humidifier. In addition to this, the room, in which the A/C unit with the humidifier is installed, should be equipped with a water detection system.

Legend:

1 Level sensor
2 Steam outlet connector ø22.5 - 30 mm
3 Heating electrodes
4 Inlet valve
5 Outlet valve
6 Drain connector ø30 mm
7 Water supply connector G 3/4“



Water supply

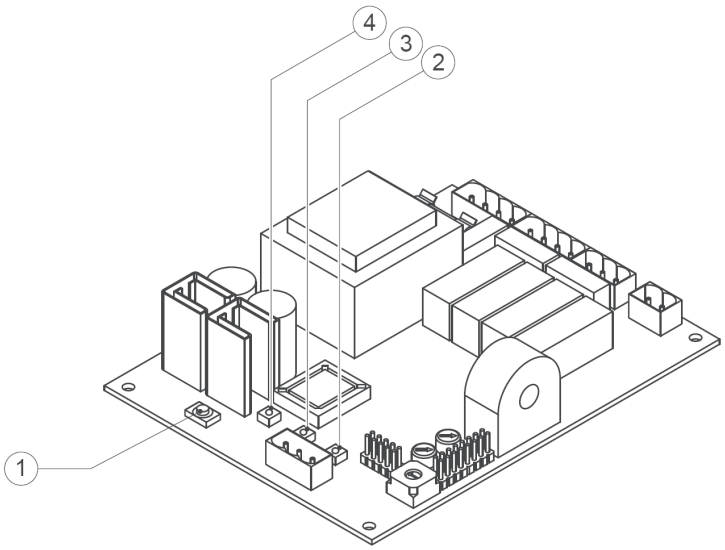
The water connection at the cold water mains must be equipped with a shut-off valve and must be carried out according to the EU directive 98/83/EC and EN1717. It is recommended to install a filter to retain solid particles of pollution. The humidifier can be connected directly to the mains by a threaded tenon of 3/4“ when the water pressure is between 1 and 10 bar. The pipe should have a diameter of at least 6 mm.
If the line pressure is more than 10 bar, the connection must be made via a pressure reducing valve (set to 4-6 bar). In each case it is to be ensured that the manufactured water pipe upstream of the connection to the humidifier is flushed properly. We recommend only using copper pipes. The water supply temperature must not exceed 40°C.

Water drain

The drain connection has an outside diameter of 30 mm. A plastic hose can be connected to the drain connection which can be routed out of the unit by means of the openings in the unit provided for this purpose. When creating the drain, attention is to be paid to provision for cleaning.
As the water drain is depressurized, we recommend routing the drain hose first into an open collector funnel and then passing through a syphon to the drainage system to ensure free discharge.
The drainage pipe should be routed to the sewerage system with sufficient gradient (at least 5%) and should be located approx. 30 cm below the humidifier. Attention is to be paid to temperature resistance when plastic pipes are used. If copper pipe is used, it must be earthed. For the drainage pipe an inside diameter of at least 30 mm is required.

11.1.3 Operation

11.1.3.1 Function of the display and operating elements on the control unit ECCM/S



1 Drain/Info key

- press key shortly: opens and closes the drain valve (manual draining).
  Note: the drain valve is automatically closed after 10 minutes.
- press key for a extended period of time: activating the info mode

2 Error indication (red LED)

- in normal operating mode
  The LED lights in case of a malfunction of the unit. Further operation is no longer possible, the heating voltage is interrupted. An alarm signal is sent to the A/C unit controller. At the controller the alarm „HUMIDIFIER 1 FAILURE“ is displayed.
- in info mode
  LED blinks in intervals if a malfunction is present. The number of “blinks” per interval indicates the number of the error (see chapter 11.1.4.4).

3 Warning and info indication (yellow LED)

- in normal operating mode
- The LED blinks, if manual draining is in progress.
- The LED lights if the cylinder maintenance is due or the maintenance indication is not reset after the maintenance.
- in info mode
  LED blinks in intervals if a malfunction with status warning is present. The number of “blinks” per interval indicates the number of the error (see chapter 11.1.4.4).

4 Steam production (green LED)

- in normal operating mode
  The LED lights if the unit produces steam.
- in info mode
  LED blinks in intervals. The number of “blinks” per interval multiplied by 10 indicates the current steam output in % (see chapter 11.1.3.3).

⚠ WARNING

Risk of burns

The steam humidifier OEM2 produces steam. When producing steam, the steam cylinder inside the humidifier gets very hot (up to 100 °C). If the unit is opened immediately after having produced steam there is danger of burning when touching the steam cylinder.

- Before carrying out any work set the steam humidifier OEM2 out of operation as described in chapter 11.1.3.5, then wait until the steam cylinder has cooled down sufficiently thus preventing danger of burning.

11.1.3.2 Commissioning

Proceed as follows when putting the unit into operation:

1. Examine the steam humidifier and installation for possible damage.
2. Open the shut-off valve (if existant) in the water supply line.
3. Switch on control fuse and humidifier power switch in electric box. Switch on main switch.
4. Adjust the humidity set value at the A/C unit controller. To force humidifer operation for a functional test you can either increase the set value or start the humidifier by the manual operation function of the A/C unit controller.

After switching on the control unit ECCM/S carries out a system test, during which all the LEDs on the control unit light up in sequence. If, after the system test (or during operation) the yellow or red LED lights up, an error has occurred (see information in chapter 11.1.4 “Fault elimination”).

After switching on the steam humidifier is ready for operation. As soon as the A/C unit controller requires humidity, power is switched on and the green LED lights on the control unit ECCM/S. The inlet valve opens after approx. 60 seconds and the steam cylinder fills with water. The submerged electrodes heat the water up and after a few minutes (approx. 5–10 minutes, depending on the conductivity of the water) steam is produced.

NOTICE

If the water has low conductivity, it is possible in the first few hours of operation that the maximum steam output is not achieved. This is normal. As soon as the water reaches adequate conductivity through the vaporization process, the steam humidifier will work at maximum output.

11.1.3.3 Function of the LEDs in info mode

The info mode is activated by pressing the drain/info key for an extended period of time (> 3 seconds). In info mode the LED's on the control unit indicate the current operating status of the steam humidifier.

NOTICE

The info mode is automatically reset after 15 minutes, or manually by pressing the drain/info key again.

- the green LED blinks. The number of blinks indicates the current steam output in % of the maximum steam capacity:

green LED blinks...	1×	2×	3×	4×	5×	6×	7×	8×	9×	10×
steam capacity in %	10	20	30	40	50	60	70	80	90	100

11.1.3.4 Manual draining

1. Briefly press the drain/info key. The heating voltage is interrupted and the drain valve opens. The yellow LED blinks. Note: the drain valve closes after 10 minutes automatically
2. To stop the drain cycle briefly press the drain/info key again.

11.1.3.5 Taking the unit out of operation

1. If the unit has to be switched off because of a malfunction, please activate the info mode and note the number (number of blinks of the red LED) of the actual error.
2. Close the shut-off valve in the water supply line.
3. Start manual draining and wait until the steam cylinder is empty (approx. 5-10 minutes).
4. Disconnect the steam humidifier from the mains: Switch off the humidifier power switch in the electric box.

11.1.4 Fault elimination

Important! Most operational malfunctions are not caused by faulty equipment but rather by improper installation or disregarding of planning guidelines. Therefore, a complete fault diagnosis always involves a thorough examination of the entire system. Often, the steam hose connection has not been properly executed, or the fault lies with the humidity control system.

11.1.4.1 Fault indication

LED on control unit ECCM/S		Description
yellow	red	
blinks permanently	–––	Drain/info key has been pressed shortly (manual draining in progress)
lights	–––	Steam cylinder maintenance due or maintenance indication not reset.
lights	lights	Steam cylinder maintenance not executed or maintenance indication not reset.
–––	lights	Fatal malfunction.

If the yellow or red LED lights, press drain/info key (at least 3 seconds) until yellow (“Warning”) or red (“Error”) LED starts blinking intermittently (info mode). The amount of “blinks” per interval indicates the type of malfunction.

– Yellow LED “Warning” blinks intermittently
A malfunction is present. The control unit checks whether there is a temporary problem (e.g. water supply interrupted for a short time) or whether it can resolve the problem by taking necessary measures.

– Red LED “Error” blinks intermittently
The control unit, after several attempts, fails to solve the problem (number of attempts depends on the type of malfunction) or the problem obstructs further operation. In this case the heating voltage is interrupted via the main contactor.

11.1.4.2 Resetting the maintenance indication

After completing maintenance work, the maintenance indication (yellow LED) must be reset as follows:

- De-energize the humidifier board.
- Press drain key and keep pressed.
- Switch on humidifier board.
- Keep drain key pressed until the system test is completed (approx. 10 seconds).

11.1.4.3 Notes on fault elimination

⚠ DANGER

Danger of electric hazard

The steam humidifier OEM2 is operated with mains voltage. One may get in touch with live parts when the unit is open. Touching live parts may cause severe injury or danger to life.

- For the elimination of faults set the steam humidifier out of operation as described in chapter 11.1.3.5, separate the unit from the mains (test with voltage tester) and secure it against inadvertent power-up.

11.1.4.4 Malfunction lists

"Warning" yellow LED blinks	"Error" red LED blinks	Cause	Remedy
1× Control board defective	---	Control board defective	Please contact your unit supplier.
2× Max. filling level of steam cylinder reached	---	Water conductivity too low (after initial operation). Water conductivity too low for type of steam cylinder. Phase failure heating voltage.	Wait. Select correct steam cylinder type. Check mains fuse(s) and replace if applicable.
3× Permissible filling time exceeded for more than 20 minutes (first automatic cleaning cycle)	3× Permissible filling time exceeded for more than 220 minutes.	Phase failure heating voltage. Water supply obstructed, water pressure too low, inlet valve defective. Excessive steam back pressure, causing water loss via filling cup. Drain valve is leaking.	Check mains fuse(s) and replace if applicable. Open shut-off valve in the water supply pipe, clean water inlet filter, check water pressure, inspect/replace inlet valve. Inspect steam installation. Clean/replace drain valve.

i NOTICE

If the Jumper "L" is removed from the ECCM/S control unit, the unit automatically triggers an error without prior warning if the admissible filling time has been exceeded for more than 20 minutes (red LED lights and the error switch on the control unit ECCM/S is activated). However the unit switches off after 220 minutes of filling time exceeding (see chapter 11.1.1.3).

4× Steam cylinder needs servicing	4× Interval for steam cylinder service exceeded for more than 72 hours	Interval for steam cylinder service exceeded. Mineral deposits and/or electrodes spent.	Replace steam cylinder type A, clean steam cylinder type D (see chapter 5, humidifier service manual). Important! Refer to chapter 11.1.4.2 for resetting the maintenance indicator.

i NOTICE

If the Jumper "K" is installed on the ECCM/S control unit, the unit remains in warning status even if the interval time has been exceeded for more than 72 hours. No error is triggered (red LED does not light) and the error switch on the control unit ECCM/S is not activated (see chapter 11.1.1.3).

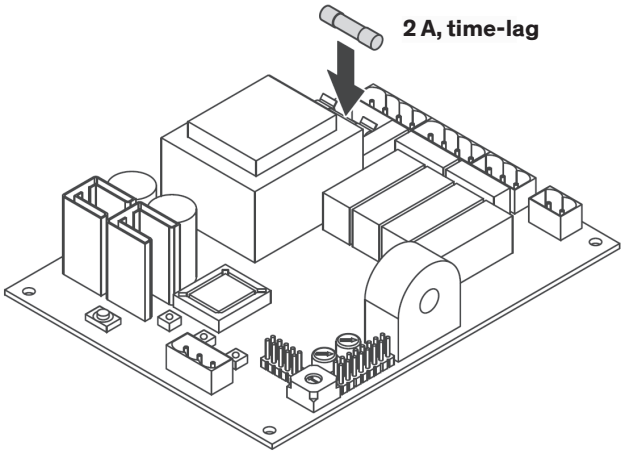
6× Electrode current too high	6× Electrode current too high	Steam cylinder (electrodes) defective. Faulty auto-drain function. Faulty drain valve/coil. Steam cylinder outlet obstructed. Water conductivity too high for type of steam cylinder.	Replace steam cylinder or electrodes. Inspect installation/control system. Replace drain valve/coil. Clean/replace steam cylinder. Select correct steam cylinder type.

7× Foam detection in the steam cylinder	7× Foam control impossible	Formation of foam in steam cylinder.	Empty/flush steam cylinder. Set jumper on “DRN” (see chapter 11.1.1.3).
---	8× Main contactor jammed	Main contactor jammed in activated position.	Check/replace main contactor.
9× Drain valve blocked	9× Drain valve blocked	Drain valve blocked or defective. Steam cylinder outlet blocked.	Clean/replace drain valve. Clean steam cylinder outlet.
---	10× Rotary switch in wrong position	Rotary switch on control unit ECCM/S is set to an invalid position.	Set rotary switch on control unit ECCM/S to the position for the corresponding steam cylinder type (see chapter 11.1.1.3).

11.1.4.5 Replacement of fine-wire fuse on the control unit ECCM/S

If the fine-wire fuse on the control unit ECCM/S blows this is usually due to a faulty coil of the inlet or drain valve or the main contactor. Therefore you should test these components before replacing the fuse.
To replace the fine-wire fuse proceed as follows:

1. Set the steam humidifier OEM2 out of operation as described in chapter 11.1.3.5, separate the unit from the mains and secure it against unintentional switching on. Take care that the electricity supply to the control unit ECCM/S is disconnected (check with voltage tester).
2. Replace fine-wire fuse (see figure below) with a fuse of the given type with the specified nominal current rating.



⚠ CAUTION

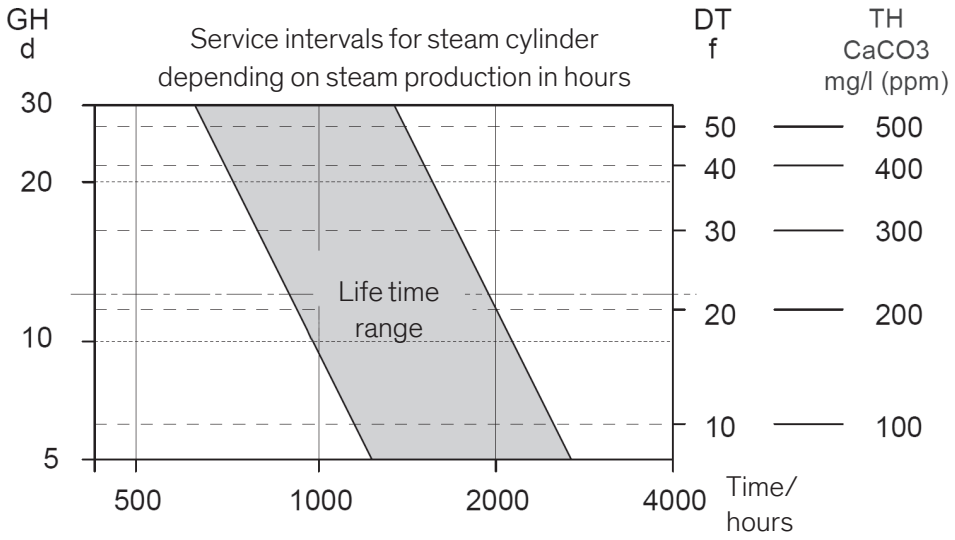
It is not permitted to use repaired fuses or to short-circuit the fuse holder.

11.1.4.6 Resetting fault indication (red LED lights in normal operating mode)

To reset the error indication:
Disconnect the steam air humidifier from the mains. Wait approx. 5 seconds, then reconnect the unit to the mains.
Note: If the fault has not been eliminated, the error indication reappears after a short while.

11.1.5 Maintenance

You find a detailed description of the maintenance procedures in chapter 5 of the humidifier service manual. This manual is available on the website www.stulz.com in the e-Stulz area under “Products→Condenser/ Humidifier“ as a pdf document.
Here you can only see a diagram, which shows the average life cycle of a steam cylinder in dependance of the runtime and the total hardness.
The humidifier runtime can be read on the A/C unit controller.



GH: Gesamthärte
DT: Dureté totale
TH: Total hardness

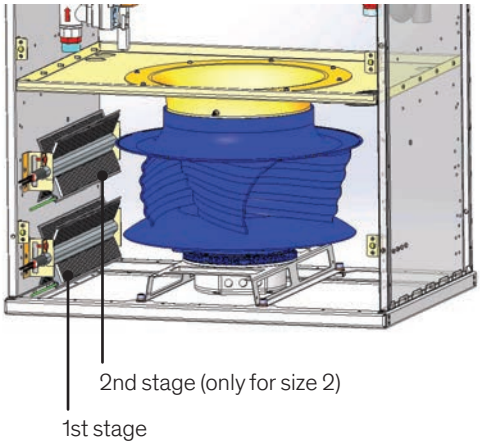
11.2 Reheat

The reheat is an optional extra for your A/C unit. It is installed complete and integrated in the function and method of operation of the A/C unit. The following versions of the reheat are available:

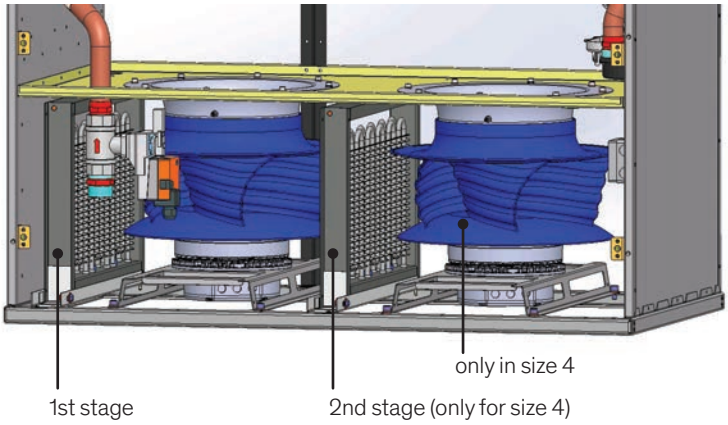
- Electrical reheat (only as support for dehumidification, not suitable for continuous operation)
- Hot water reheat (HWR)

Electrical reheat

Cabinet size 1-2



Cabinet size 3-4



Cabinet size		1	2	3	4
Heating power	kW	2	2/4	6	6/12

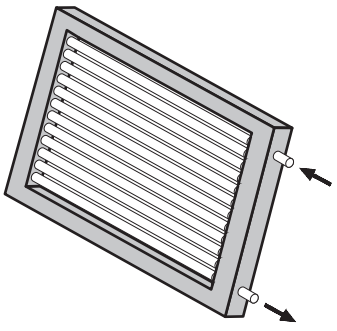
The electrical reheat is connected in accordance with the electric diagram. It is controlled and monitored by the controller.

- Set the values for switching on and off on the controller.
- Refer to the operating instructions of the controller.

Hot water reheat

The HW reheat is installed behind the heat exchanger.
The water supply of the HW reheat can be controlled via an electrically actuated HW valve as an option.
You can set the control parameters of the HW valve on the controller.

- Refer to the operating instructions of the controller.



Installation

The electrical reheat is installed and connected in the A/C unit.
The HW reheat is designed for the following temperatures and pressures.

Temperatures:

Water inlet:	60 °C	max. water inlet temp.:	110 °C
Water outlet:	40 °C	max. water pressure:	16 bar
Air inlet:	13 °C		
Glycol:	0 %		

The lines of the HW reheat end in the rear part of the A/C unit on the left side with a male thread.

- connect the pipelines to an external hot water circuit.

Connection		
Pipe diameter	mm	16
Thread size	inch	1/2

Commissioning

No measures are required for commissioning.

Operation

No further measures are required for operation.

Maintenance

Clean the reheat annually from contaminations and check it for damage.

Malfunction causes
Alarm: Reheat failure

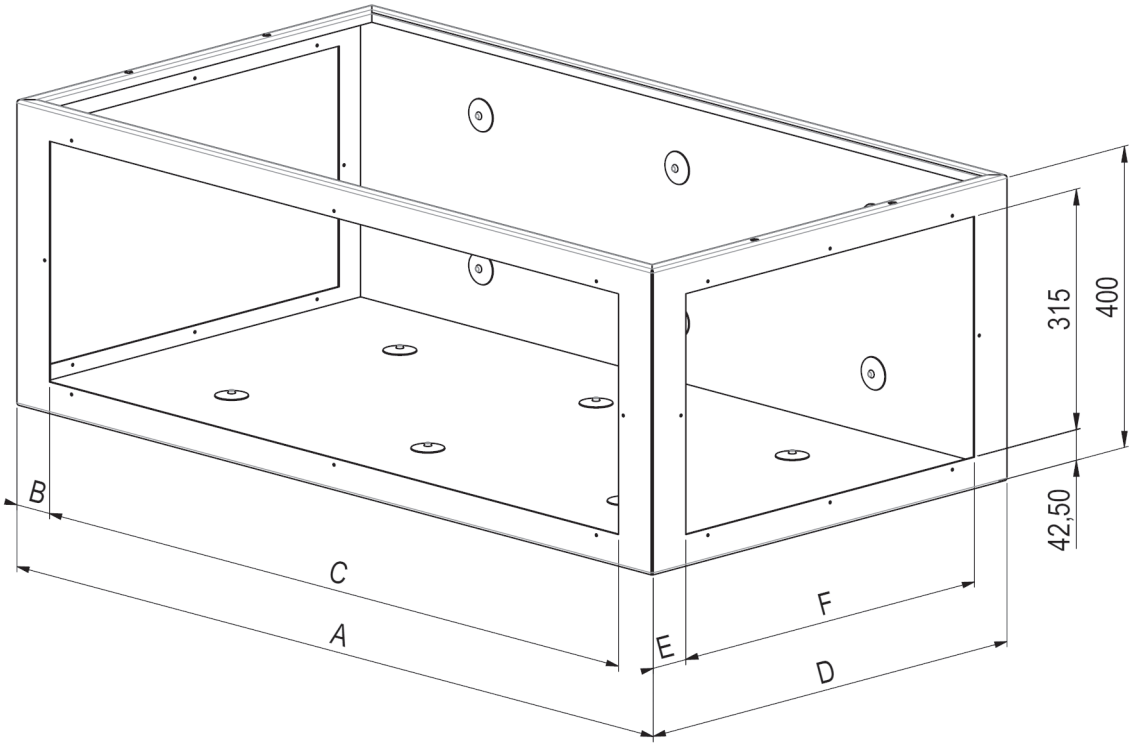
A heating alarm can only be displayed for electrical reheat by the controller. When the limit temperature is reached, an overheating element triggers a heating alarm. The controller then switches off the reheat. The limit temperature depends on the unit size.

Cabinet size	1-2	3-4
Limit temperature	60 °C	70 °C
Tolerance	±5 K	±5 K

11.3 Air side connection

11.3.1 Unit base

The unit base is available in the versions: open, with damper, with flexible connection or with supply grilles. The unit base can be installed in two ways, with the opening to the front or with the opening to the rear.

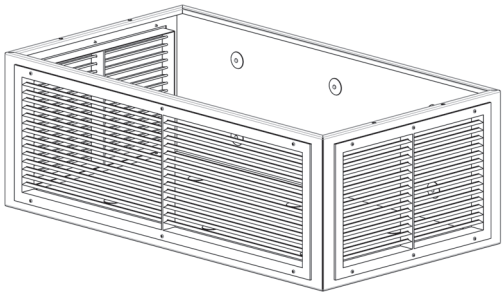


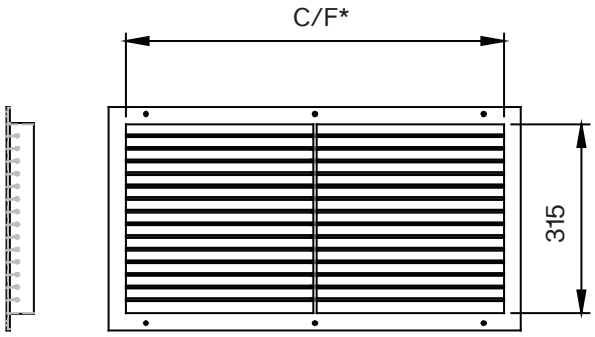
Cabinet size		1	2	3	4
A	mm	535	735	935	1135
B	mm	60	60	60	60
C	mm	415	615	815	1015
D	mm	535	535	635	635
E	mm	60	60	60	60
F	mm	415	415	515	515

NOTICE

- **Connect each of the unit base versions with the A/C unit by 4× M10 screws!**
- Also ensure vibration decoupling to the floor e.g. by Mafund strips.

Unit base with grilles

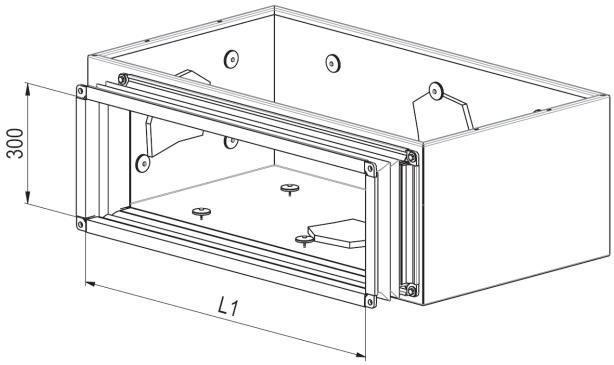


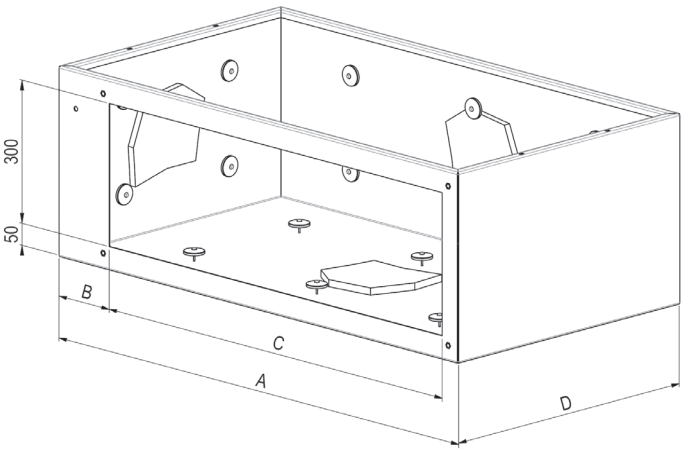


*see table on preceding page

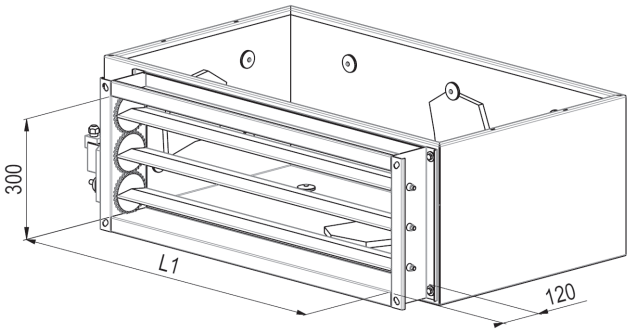
The standard grilles are equipped with horizontal fins which can be adjusted to conduct the air which is blown out.

Unit base with flexible connection



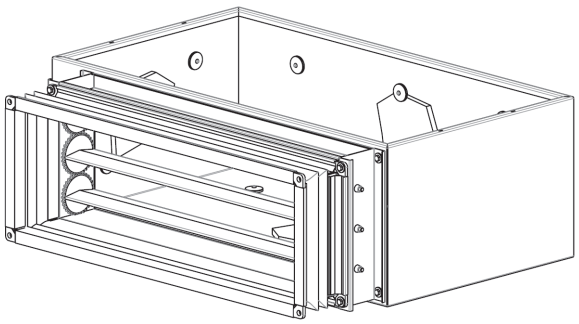


Unit base with damper



Cabinet size		1	2	3	4
A	mm	540	740	940	1140
B	mm	145	145	145	145
C	mm	350	550	750	950
D	mm	535	535	635	634
L1	mm	350	550	750	950

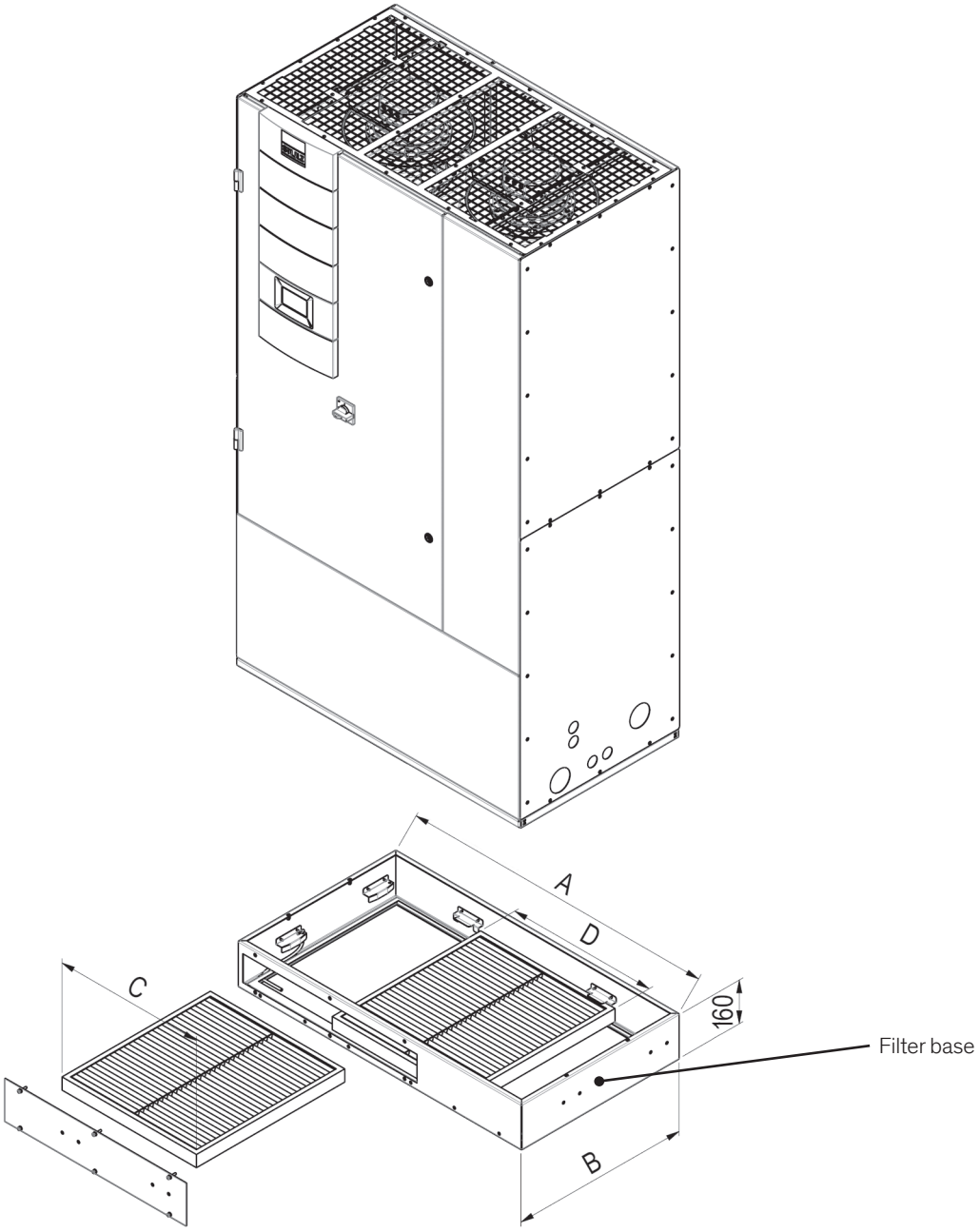
Unit base with damper and flexible connection



11.3.2 Filter base

The filter base is designed for the option “air intake from bottom“. With this option for upflow units the front panels are not provided with an air inlet perforation as otherwise usual. The air is drawn in from the bottom, in consequence there is no unit bottom plate.
The filter base is provided with 8× M6 cage nuts.

- Connect the unit base (if existant) and the filter base to each other by 4× M6 screws.
- Connect also the A/C unit and the filter base to each other by 4× M6 screws.

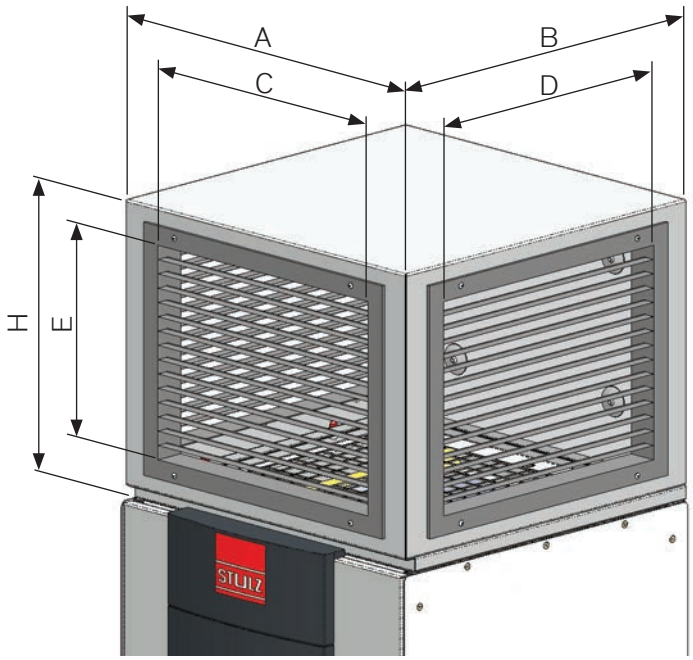


Cabinet size		1	2	3	4
A	mm	540	740	940	1140
B	mm	539	539	635	635
C	mm	477	477	440	540
D	mm	-	200	440	540
N° of filters		1	2	2	2

11.3.3 Plenum

The plenum has three air inlet/outlet openings that can be optionally equipped with grilles or blind sheets.
• Set the plenum on top of the unit, fixing it by screws is not necessary.

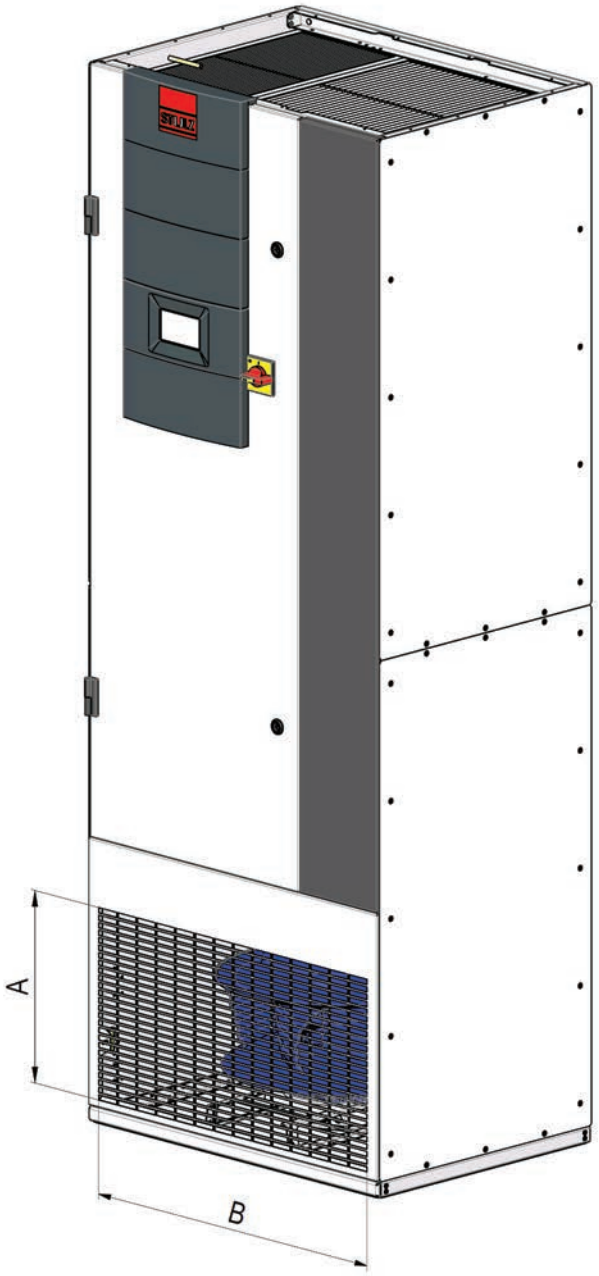
Discharge plenum with front and side grilles



Cabinet size		1	2	3	4
A	mm	545	745	945	1145
B	mm	540	540	640	640
C	mm	400	600	800	1000
D	mm	400	400	500	500
E	mm	300	300	300	300
H	mm	421,5	421,5	421,5	421,5

11.3.4 Air discharge to the front

The A/C unit features a closed unit bottom and a grille in the lower section of the front.



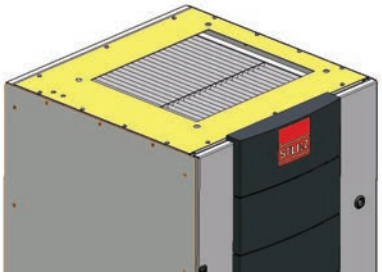
Air discharge zone, keep clear

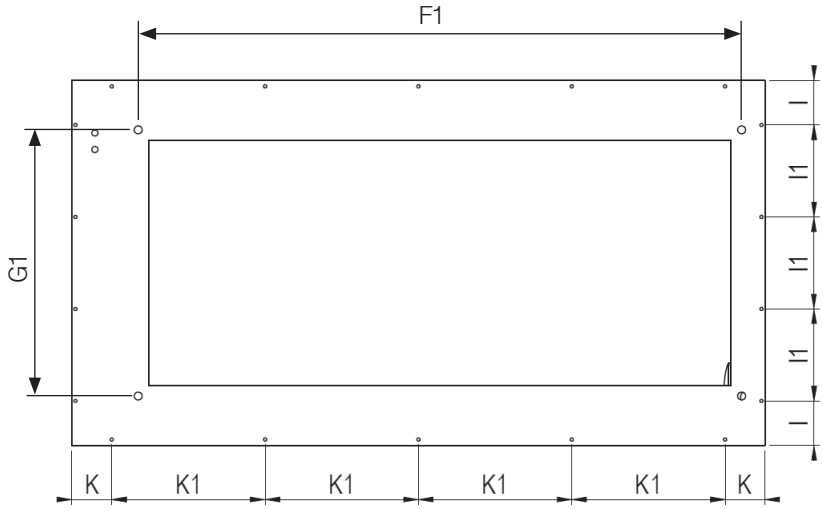
Cabinet size		1	2	3	4
A	mm		360		
B	mm	487	683	879	1075

11.3.5 Adapter plate for duct connection on unit top

The adapter plate serves to attach an air duct on top of the unit.

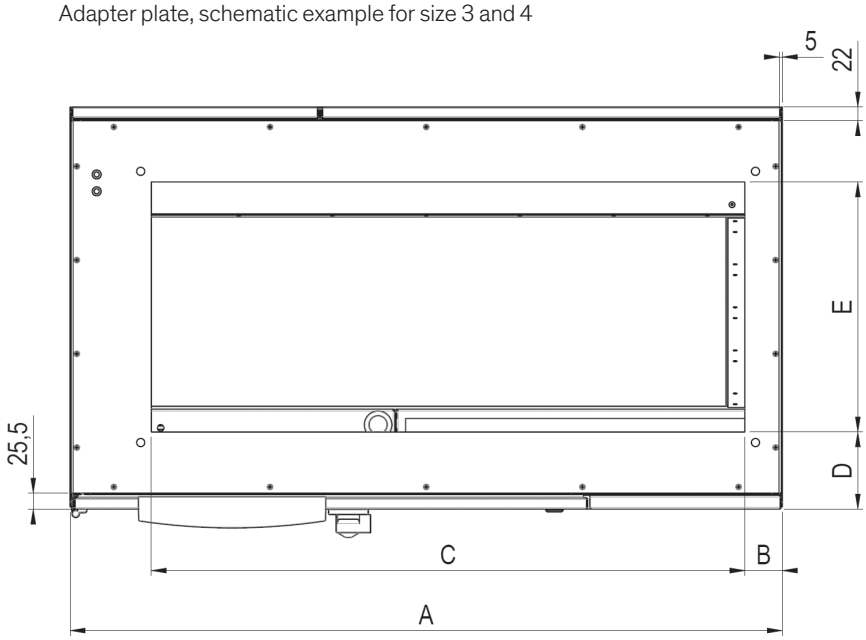
- Attach the adapter plate to the unit with the self-tapping screws provided.





Adapter plate, schematic example for size 3 and 4

- Open the front door.
- If it is a downflow unit, pull out the air filter(s) to the front.
- Fasten the air duct to the adapter plate with 4× M8 screw connections. The dimensions F1 and G1 are used for this. The values can be found in the table on the following page.



Unit with adapter plate, top view

Cabinet size		1	2	3	4
A	mm	540	740	940	1140
B	mm		60		
C	mm	350	550	750	950
D	mm		123,5		
E	mm		300	400	
K	mm		65		
K1	mm	200 (2×)	180 (2×) 240 (1×)	200 (4×)	250 (4×)
I	mm		68	73	
I1	mm		120	150	

11.3.6 Adapter plate with damper or flexible connection on unit top

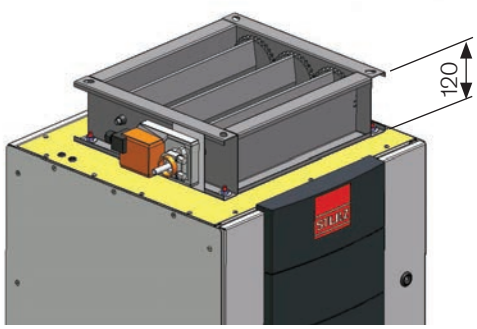
Damper

- Mount the actuator on the protruding axis of the damper according to the enclosed manufacturer's instructions.
- Mount the damper on the adapter plate with the enclosed screw connections so that the actuator is on the left and the orange housing is facing backwards.
- Route the cable as shown on the following page.
- Attach the adapter plate to the unit as shown on the previous page.

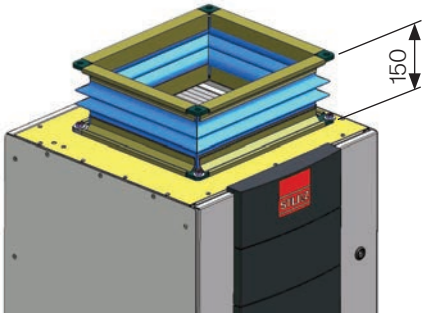
Flexible duct connection

- Attach the flexible duct connection to the adapter plate with the enclosed screw connections.
- Install an equipotential bonding on the flexible duct connection so that the duct is earthed.
- Attach the adapter plate to the unit as shown on the previous page.

Adapter plate with damper



Adapter plate with flexible connection



The hole dimensions F1 and G1 also apply to the flexible duct connection.

Cabinet size		1	2	3	4
F	mm		21		
F1	mm	388	584	784	984
G	mm		21		
G1	mm	338	334	434	434

Electrical connection of the actuator

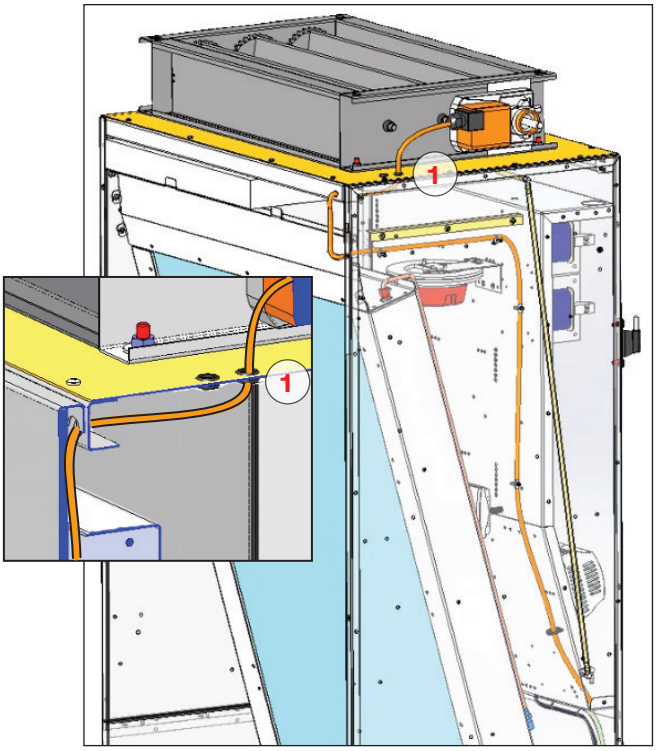
⚠ WARNING

Risk of bruising of limbs
Check that the power supply to the A/C unit is switched off so that the damper cannot be started.

Downflow unit

To clarify the cable routing, the rear panels and the side panels have been removed in the illustrations. This is not necessary in practice.
The adapter plate and damper are already shown in the illustration in their final position. However, it is first necessary to connect the pre-installed cable to the actuator.
The cable is already connected in the e-box and routed along the left side wall and lies rolled up on the filter element.

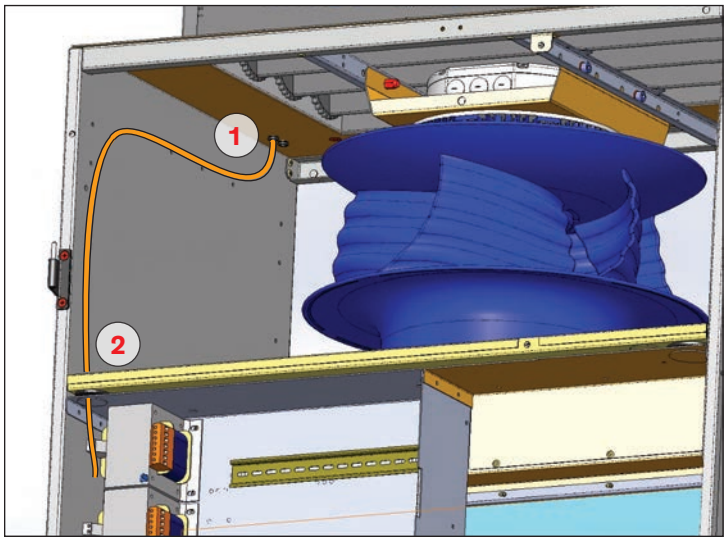
- Provide opening (1) with a rubber grommet from the accessory pack.
- Place the assembly of adapter plate and damper on the A/C unit and leave a free space on the side with the actuator so that you can push the free cable end from below through opening (1).
- Push the adapter plate into the final position and readjust the cable.
- Cut the cable to length and connect it to the actuator according to the enclosed manufacturer's instructions.



Downflow unit, view from the left rear

Upflow unit

- Connect the enclosed cable at the actuator according to the enclosed manufacturer‘s instructions.
- Place the assembly of adapter plate and damper on the A/C unit.
- Provide opening (1) with a rubber grommet from the accessory pack.
- Route the cable through opening (1) .
- Route the cable along the side panel and fix it with cable holders as shown in the illustration.
- Feed the cable through opening (2) into the E-box.
- Cut the cable to length and connect it according to the wiring diagram.



Upflow unit, front view

Operation

The damper is controlled by the controller. When the A/C unit is started, the damper is opened.
A pre-runtime after which the fan starts can be set on the controller. When the A/C unit stops, the damper is closed after the fan‘s overruntime has elapsed.

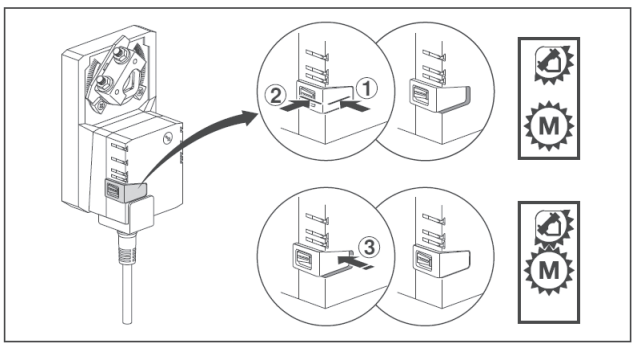
⚠ WARNING

Risk of bruising of limbs
Do not insert fingers between the damper blades or near the gears.

The actuator rotates slowly, the running time from „fully open“ to „fully closed“ is 150 seconds.
The torque of the actuator is 20 Nm. Due to the geometry of the blades, a force of 660 N is generated during closing when the blade ends of the damper are 20 mm apart from each other.

If you are trapped between the blades with an item of clothing, press the release button (1).
This separates the motor from the gearbox and the motor stops.

The release button can be locked by pressing the button (1) and pushing the latch in the release button sideways (2).
Now you can manually move the blades to the desired position.
Press the button again (3) to release the lock.



11.3.7 Adapter plate with damper below the unit

Adapter plate

The adapter plate has no openings for supply connections. You can also route the supply lines for downflow units through the left side panel into the unit. To do this, you must knock out the required knock-out openings. The side panel for downflow units is the same as for upflow units. The dimensions for the four sizes can be found on pages 27-30.

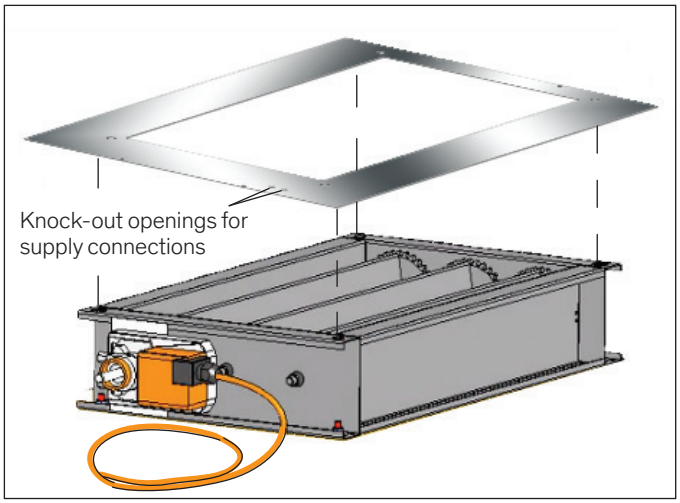
If you want to run the supply lines into the unit from below, you must drill the required openings in the adapter plate. You cannot always pass the pipes straight down.

- Refer to the drawings on the following pages.
- Provide membrane grommets for the drilled openings to seal the adapter plate.

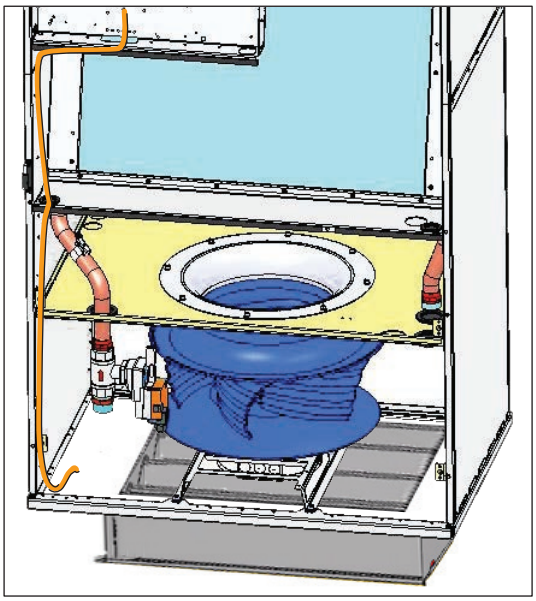
Damper

- Connect the enclosed cable at the actuator according to the enclosed manufacturer‘s instructions.
- Place the damper so that the protruding axis on which the motor has to be mounted is at the rear left.
- Mount the actuator on the left-hand side of the damper according to the enclosed manufacturer‘s instructions.
- Attach the prepared (with openings) adapter plate to the damper with the enclosed screw connections.
- Route the cable through the knock-out opening in the adapter plate.
- Place the adapter plate with the damper underneath on the raised floor stand.
- Place the A/C unit on the raised floor stand.
- Route the cable up the left side into the e-box.

The adapter plate can be fastened to the left and right of the unit frame with two self-tapping screws each. The fastening prevents the plate from slipping slightly due to vibrations.



Adapter plate + damper



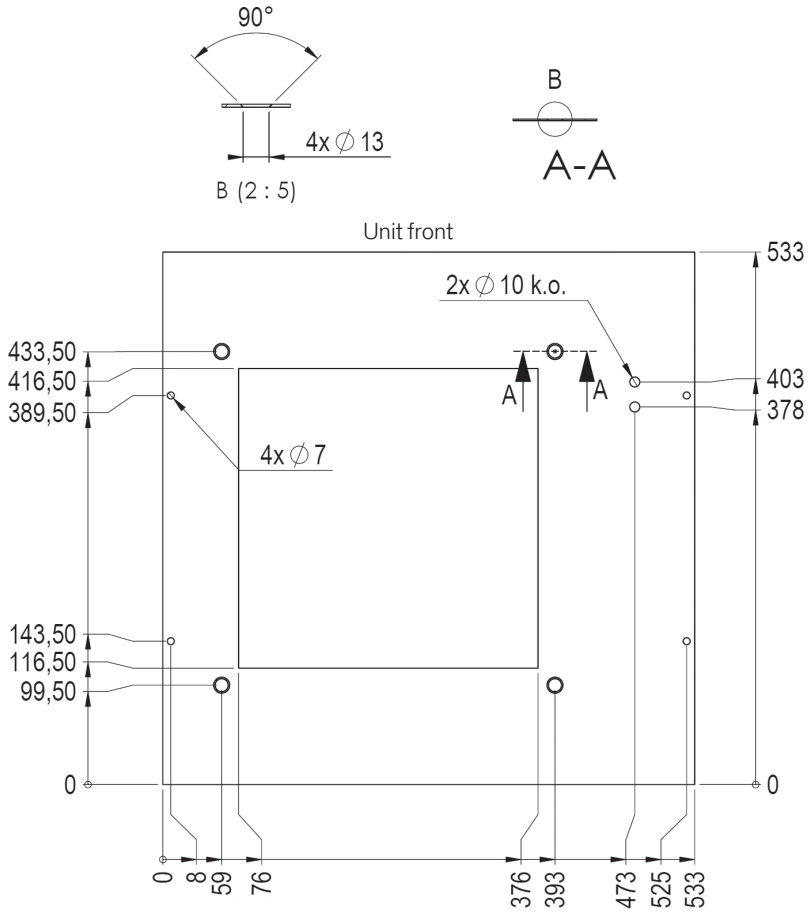
Cable routing with damper below

Operation

See notes on previous page.

Size 1 - CCD 90 CW / CCU 90 CW Adapter plate below

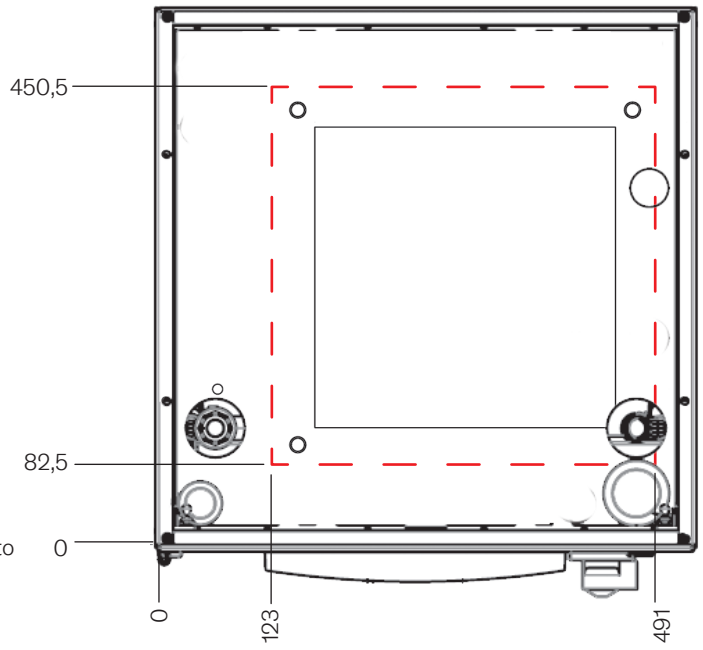
Top view



Example:

The picture shows the adapter plate with the outlines of the damper frame indicated by a dashed line.
A section through a downflow unit is projected onto it, on which you can see the position of the supply lines in the standard version.

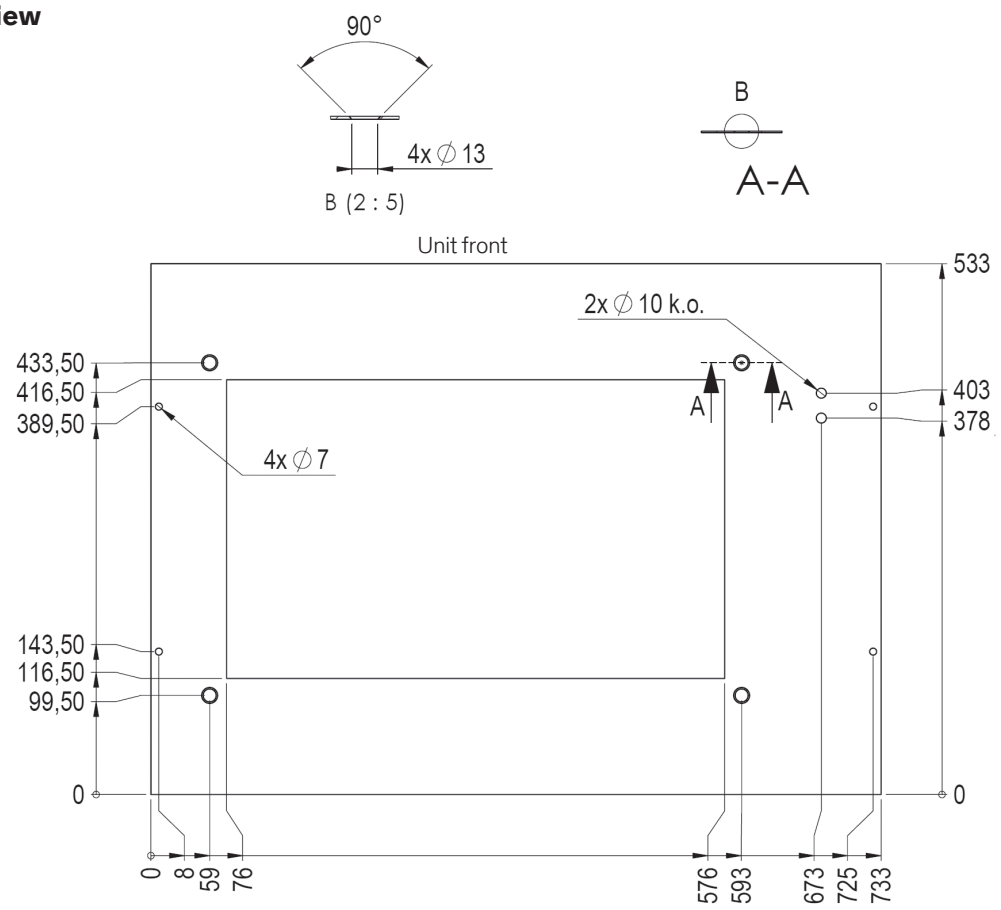
- When planning, also take into account the width of the raised floor stand profiles (40 mm).



The point of origin refers to the adapter plate.

Size 2 - CCD 180 CW / CCU 180 CW Adapter plate below

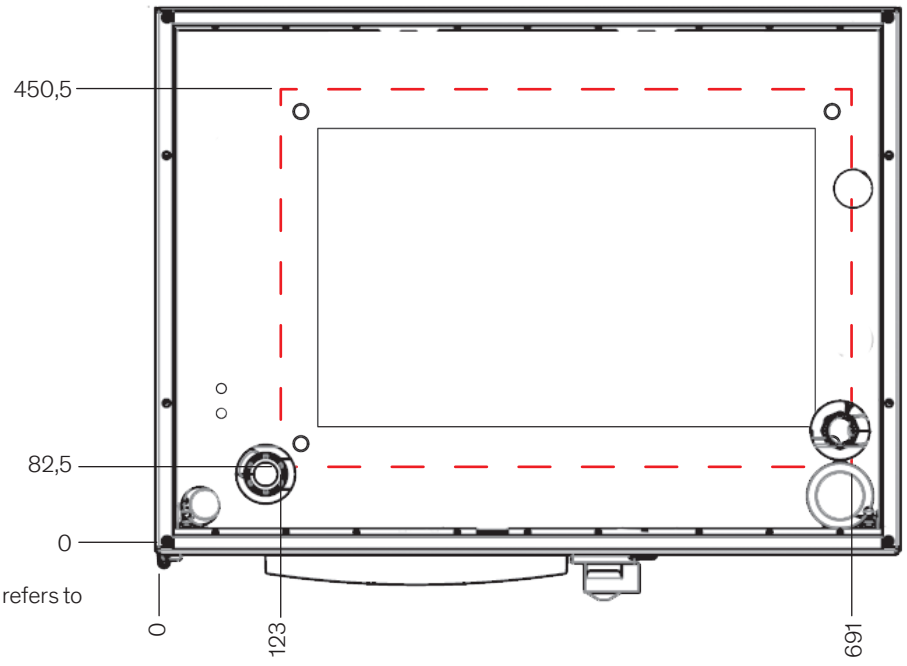
Top view



Example:

The picture shows the adapter plate with the outlines of the damper frame indicated by a dashed line.
A section through a downflow unit is projected onto it, on which you can see the position of the supply lines in the standard version.

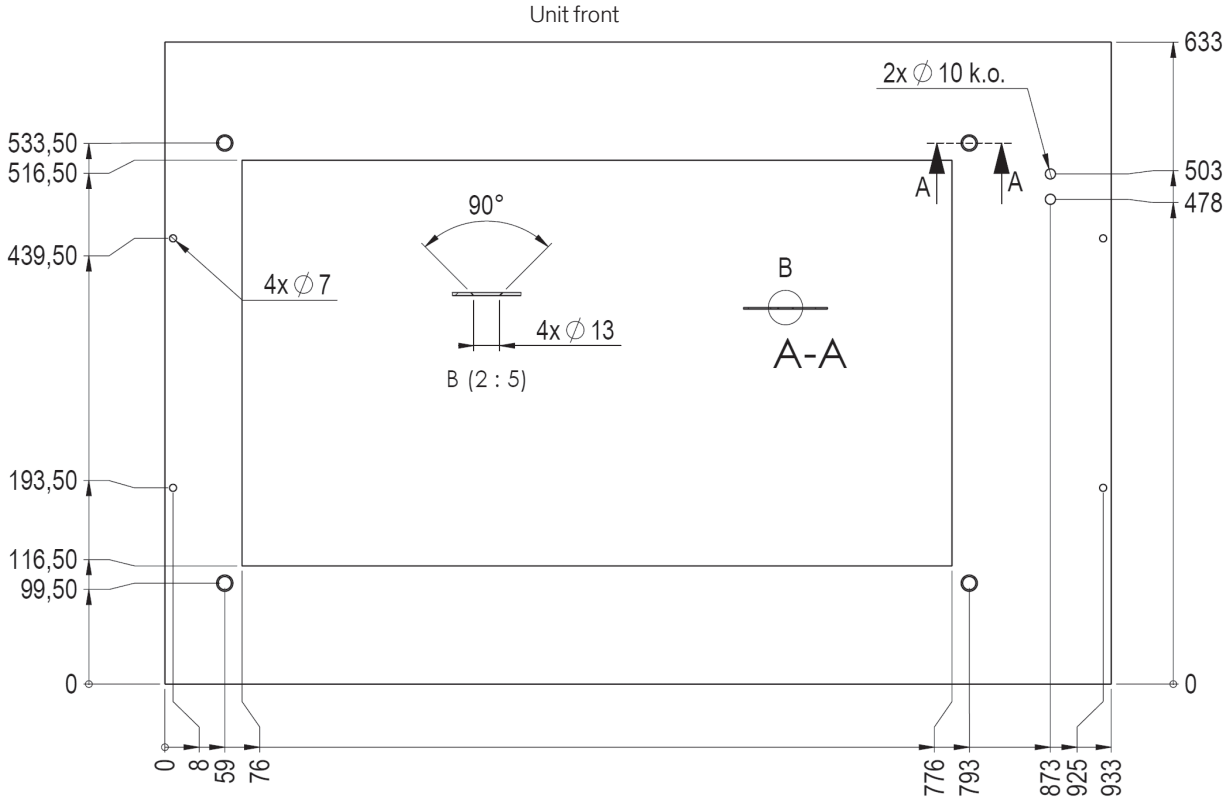
- When planning, also take into account the width of the raised floor stand profiles (40 mm).



The point of origin refers to the adapter plate.

Size 3 - CCD 260 CW / CCU 260 CW Adapter plate below

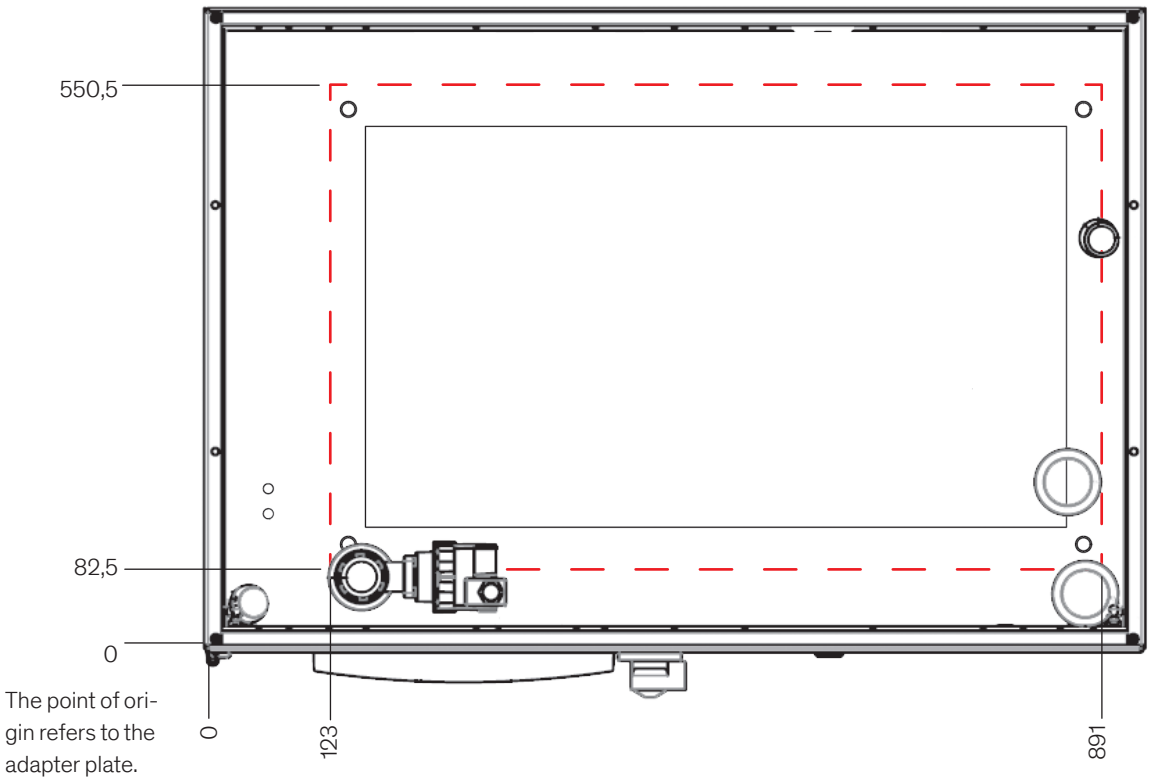
Top view



Example:

The picture shows the adapter plate with the outlines of the damper frame indicated by a dashed line.
A section through a downflow unit is projected onto it, on which you can see the position of the supply lines in the standard version.

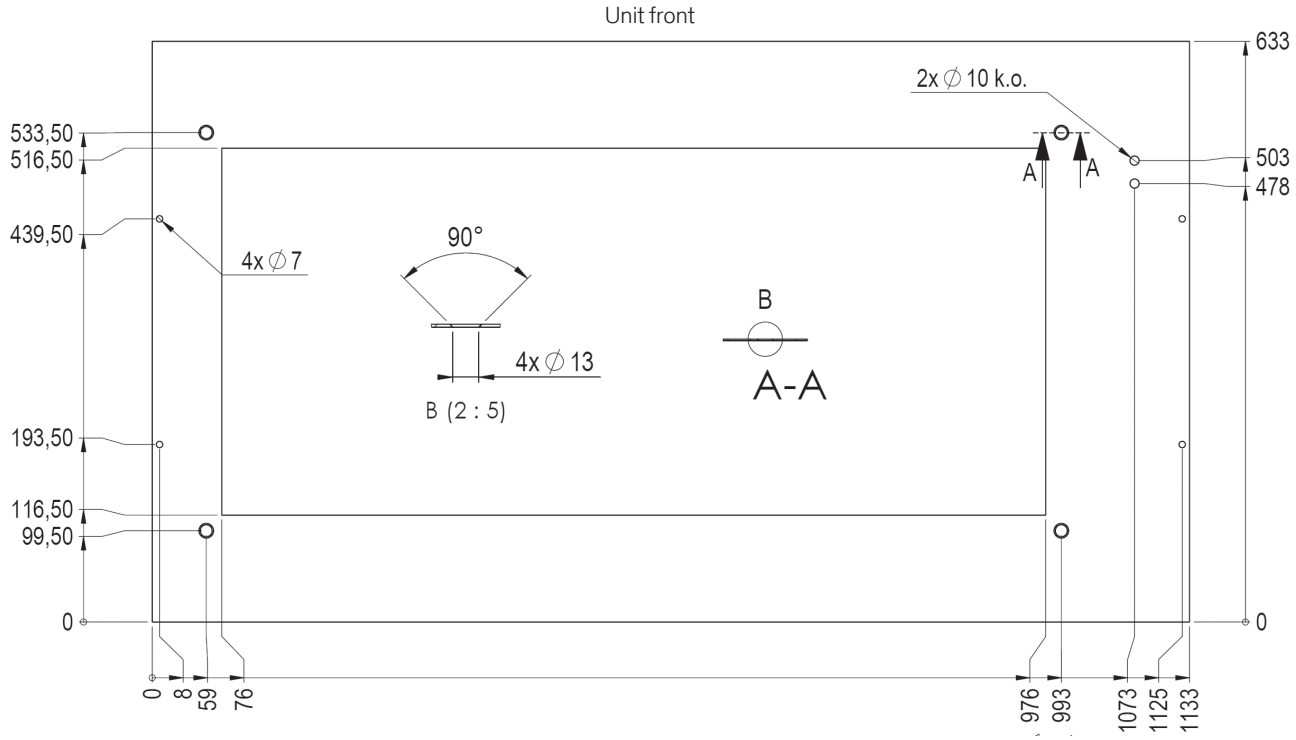
- When planning, also take into account the width of the raised floor stand profiles (40 mm).



The point of origin refers to the adapter plate.

Size 4 - CCD 350 CW / CCU 350 CW Adapter plate below

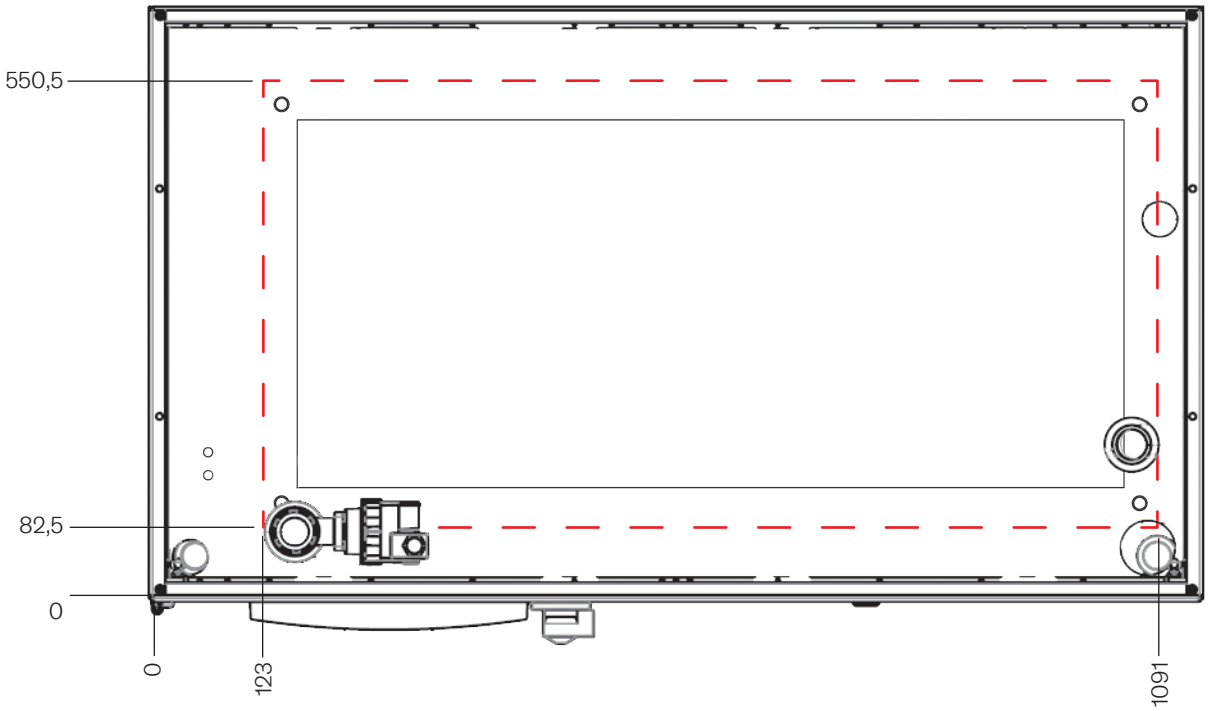
Top view



Example:

The picture shows the adapter plate with the outlines of the damper frame indicated by a dashed line.
A section through a downflow unit is projected onto it, on which you can see the position of the supply lines in the standard version.

- When planning, also take into account the width of the raised floor stand profiles (40 mm).

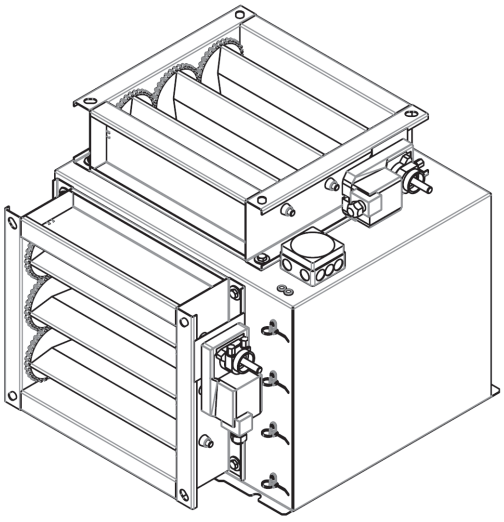


The point of origin refers to the adapter plate.

11.3.8 Free cooling - FCP (Free Cooling Plenum)

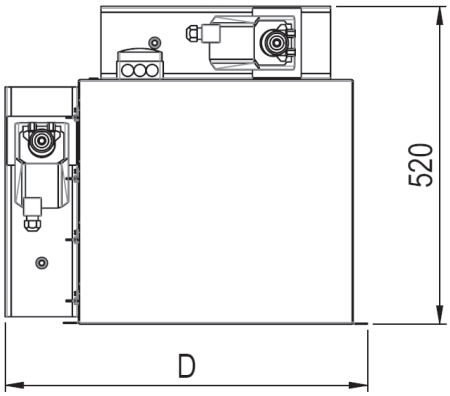
The FCP is an option for downflow units.
It is possible to mix outside air with return air via a damper on the back of the FCP.
You receive the FCP as an assembled unit, as shown opposite.
The FCP must be placed on the A/C unit, fastened with screws and electrically connected.

See installation description on the next page.

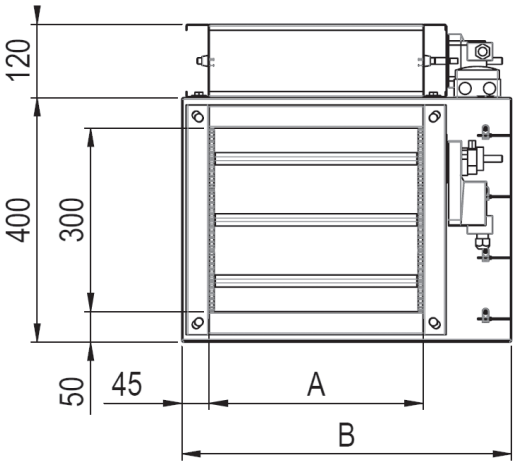


Rear view

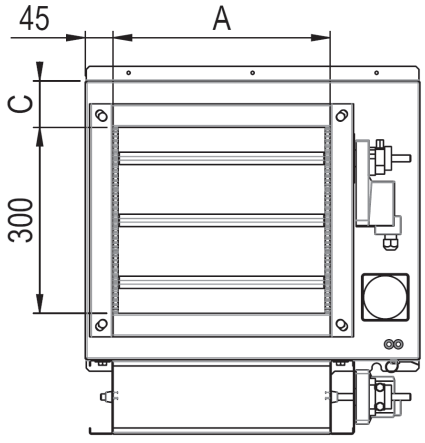
Side view, left



Rear view



Top view



Cabinet size		1	2	3	4
A	mm	350	550	750	950
B	mm	540	740	940	1140
C	mm	75		127	
D	mm	594		694	
Weight	kg	24	30	39	45

⚠ WARNING

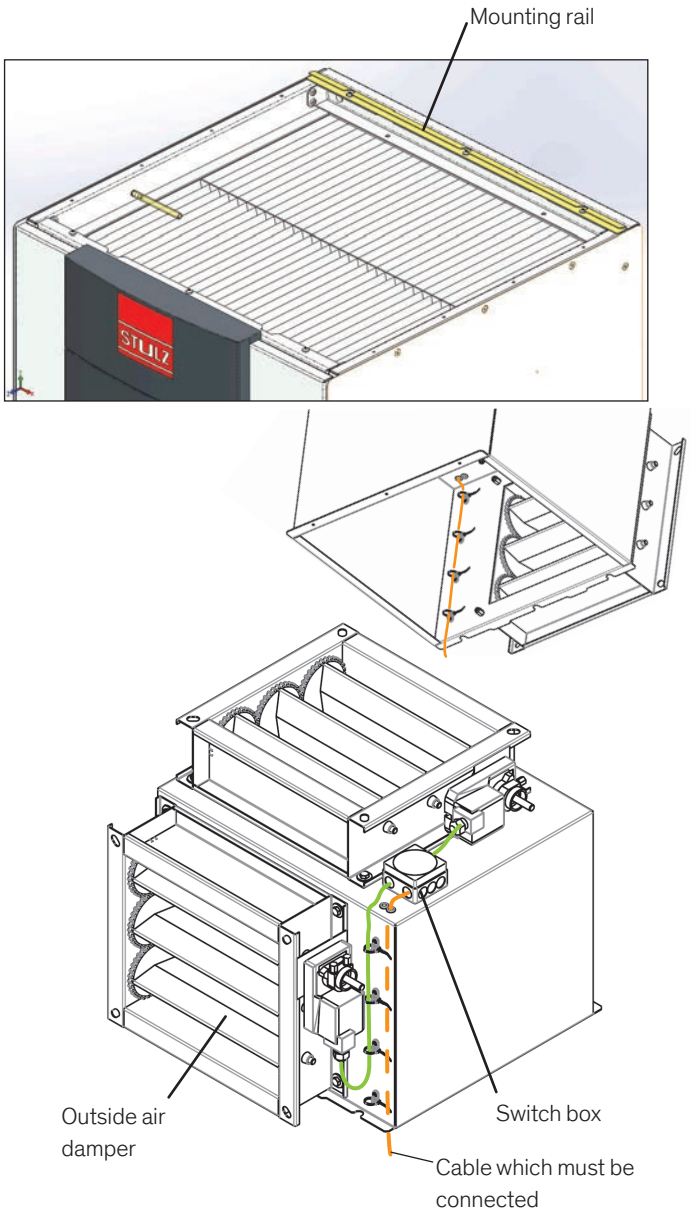
Risk of bruising of limbs
Check that the power supply to the A/C unit is switched off so that the damper cannot be started.

Installation

- Place the mounting rail, which is supplied loose with the FCP, on the rear cross strut of the A/C unit.
- Secure the mounting rail to the cross strut with the enclosed self-tapping screws (Size 1: 3 screws, size 2: 4, sizes 3-4: 5).

To place the FCP on the A/C unit, you need another person due to the weight.
The cable is already connected in the E-box and routed on the left side wall and lies rolled up on the filter element.

- Place the FCP on the A/C unit.
- Push the FCP into the mounting rail from the front.
- Lift the FCP at the front by 150-200 mm and place it on square timbers. Feed the cable end through an opening at the top left rear.
- Fix the cable with the cable ties on arrowhead.
- Pull the cable from the outside.
- Check that the cable inside the FCP is not pulled too tight.
- Remove the square timbers and place the FCP front side on the A/C unit.
- Cut the cable to length and connect it to the switch box according to the electric diagram.
- Screw the FCP to the front cross strut with the remaining self-tapping screws.
  (Size 1: 3 screws, size 2: 4, sizes 3-4: 5).



- Install the fresh air connection (e.g. in the form of a duct) to the rear damper. For the dimensions of the damper, see the previous page.

Operation

The damper is controlled by the EcoCool function of the controller.

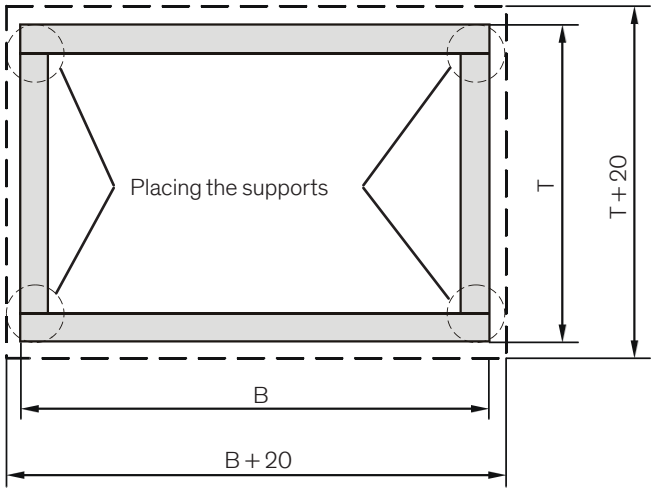
⚠ WARNING

Risk of bruising of limbs
Do not insert fingers between the damper blades or near the gears.

See notes on page 9.

11.4 Raised floor stand

The floor stand is used to adjust the height of the A/C unit to the existing raised floor and consists of an encircling rectangular profile of galvanized steel with adjustable screw sockets. Anti vibration compound is recommended between concrete floor and base plate.

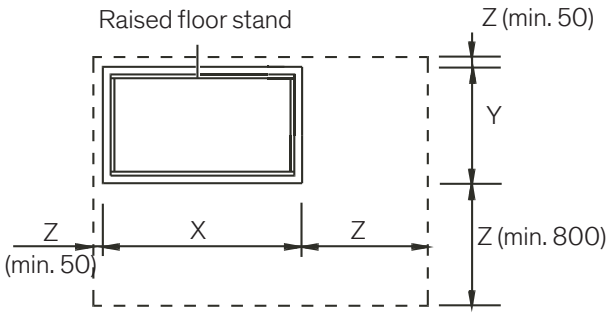


Cabinet size		1	2	3	4
B	mm	540	740	940	1140
T	mm	544	544	644	644
Supports	n°	4	4	4	4
Rectangular profiles 70×40	n°	4	4	4	4
Mafund strips	n°	4	4	4	4
Screws M8×30	n°	8	8	8	8

Mounting

- A concrete foundation is recommended in the area of the raised floor supports.
- If the floor stand is placed near a wall, a minimum distance of 50 mm must be respected. The gap between wall and floor stand must be closed by tin stripes.
- Choose the dimensions of the openings in the raised floor (X and Y) 10 mm longer than the raised floor stand dimensions.
- Close the joint with a continuous seal.
- The raised floor cutting (notch) should at least be 15° and must not have any contact to the raised floor stand, which could result in bone-conduction.

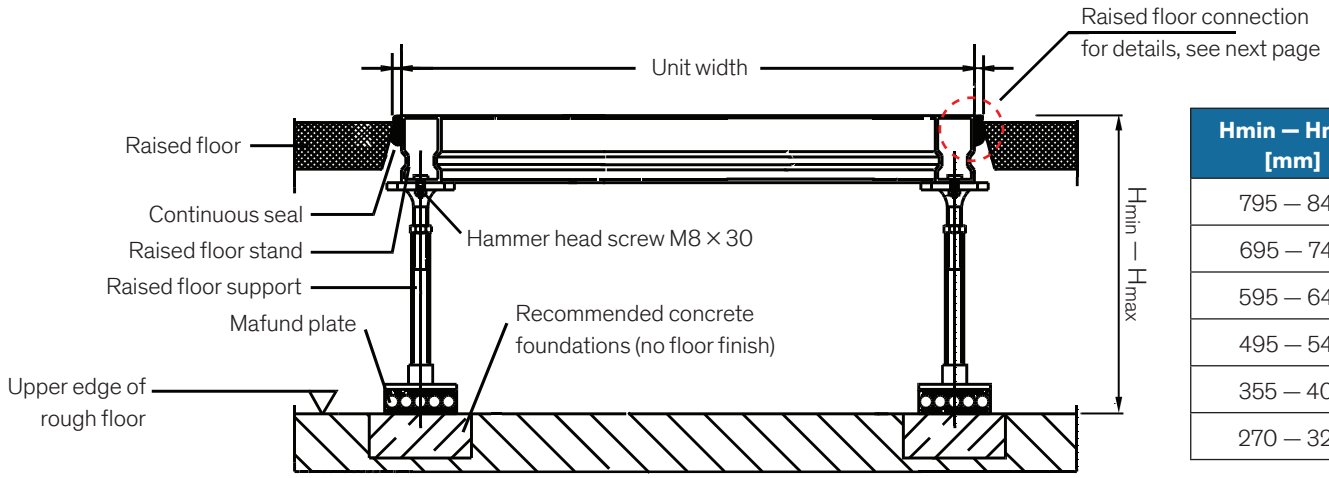
- Install the raised floor supports on vibration dampening material (Mafund plate) (do not screw down the supports!).



X/Y = Opening in raised floor
Z = Limit of distance

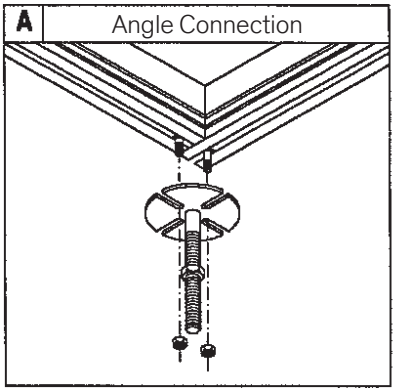
- Prior to installation of the A/C unit, install the raised floor 7 mm higher than the raised floor plates, as the mafund plates are compressed by the weight of the A/C unit.

General design of the raised foor stand

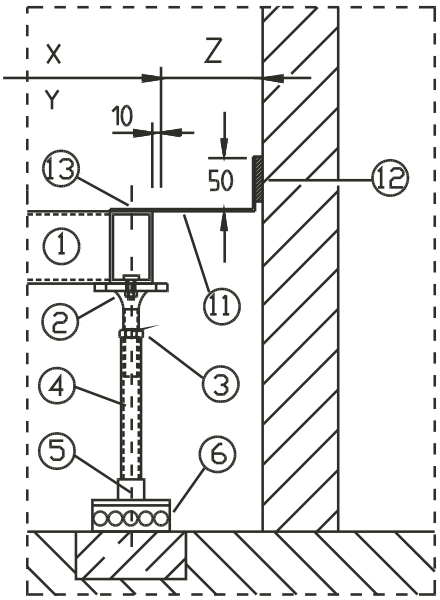


Hmin — Hmax [mm]
795 — 845
695 — 745
595 — 645
495 — 545
355 — 405
270 — 320

Connecting the bars (View from below)

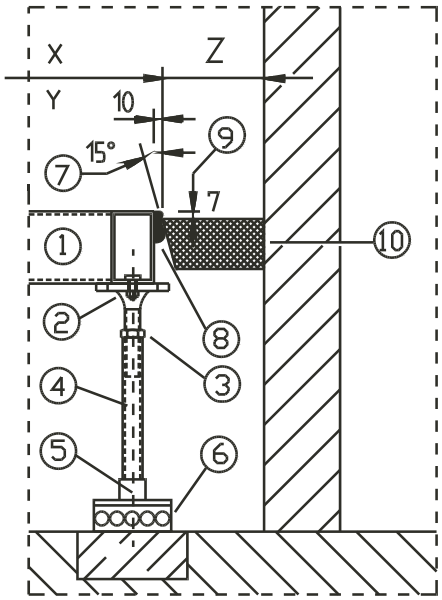


Detail of raised floor connection



when distance Z < 100 mm

1 Raised floor stand
2 Adjustable support plate
3 Adjusting nut
4 Support pipe
5 Support base
6 Mafund plate
7 Raised floor cut out angle
8 Continuous seal profile (use closed-cell material only)
9 Before unit installation
10 Raised floor plate
11 Angled bracket
12 Permanently elastic seal
13 Fixing



when distance Z ≥ 100 mm

Other mounting options (e.g. louvers)

If a damper shall be installed beneath the unit, this must be first mounted onto the adapter plate.
- route the cable through the knock out hole to the top.
- install the damper actuator on the shaft, so that it will be on the left unit side.

Positioning of the A/C unit on the floor stand

When positioning the A/C unit on the floor stand, it must be brought precisely into the correct position above the floor stand from the front (under no circumstances diagonally).

- use mounting aids to bring in the unit and secure these by fixing belts at the A/C unit.
- lay at least two securing instruments (e. g. square steel bars) on the stand to avoid a slip-off.
- when the unit is in the right position take away the securing aids and set down the unit.
- now pull away the mounting aids under the unit.

Mounting aid

11.5 Electrical Options

11.5.1 Second Power Supply

This option provides the connection of a second power supply. Both power supplies are switched on to the A/C unit by two main switches. An internal circuit ensures that the priority is set on power supply 1.

All three phases of both power supplies are checked constantly on excess voltage, undervoltage, phase failure, phase balance and correct rotation. In case of failure of supply 1 the unit is switched off. After a lapse of time which can be set at the time relay (preadjusted: 10 seconds) power supply 2 is switched onto the unit. The unit starts by the automatic restart which is integrated in the controller.

When the voltage of power supply returns, the unit is switched off again. On a second time relay a delay can be set (preadjusted: 10 seconds), after which power supply 1 is switched onto the unit. The unit starts by the automatic restart.

Maximum cross-section of the supply lines

Main switch		40A	63A	80A
single-wire or multi-wire	mm²	16	16	50
finely stranded conductor	mm²	16	16	35

Requirements:

- Network configuration TN-S, TN-C-S (400V +/-10%, 3 phases, N, PE, 50/60 Hz)
- Use only copper conductors for 75°C.
- Install two pre-fuses in the supply lines.The size of the pre-fuses depends on the terminal equipment (A/C unit).
- Choose the cable cross-sections in accordance with local standards, the laying method and line lengths.

11.5.2 Three Phase Control

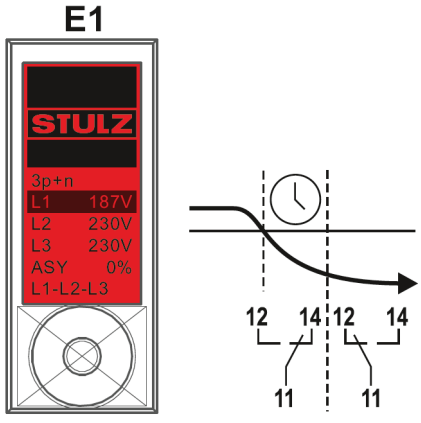
The phase monitoring relay monitors a phase failure and a phase reversal. Excess voltage, undervoltage and the phase imbalance are monitored in relation to the set values.
In case of a phase failure the phase monitoring relay is de-energized without delay and triggers an alarm. If the monitoring relay detects a wrong phase sequence during the A/C unit start, it is not energized and prevents the unit start.
You can adjust a triggering delay on the relay for the errors excess voltage, undervoltage and phase imbalance (excess of the adjusted limit values).

Automatic restart
When the defective phase returns and if the voltage is within the limit values and the phase imbalance within the adjusted tolerance, the A/C unit is restarted automatically.
For this the parameter „Phase restart“ must be set to „1“, in the controller.

Error	Adjustment range	Factory setting	Relay
Excess voltage (upper limit value)	off, 106-173%	108%	1
Excess voltage (restart value) *	off, 103-173%	105%	
Undervoltage (lower limit value)	off, 50-94%	92%	
Undervoltage (restart value) *	off, 50-97%	95%	
Phase imbalance	off, 4-40%	5%	
Phase imbalance (restart value) *	off, 1-40%	3%	
Triggering delay Relay 1	0,1-20s	3s	
Rotating field control 1	5-45°	35°	2
Rotating field control 2	off, L1-L2-L3, L3-L2-L1, L-L-L	L1-L2-L3	
Triggering delay Relay 2	0,1-20s	0,1s	

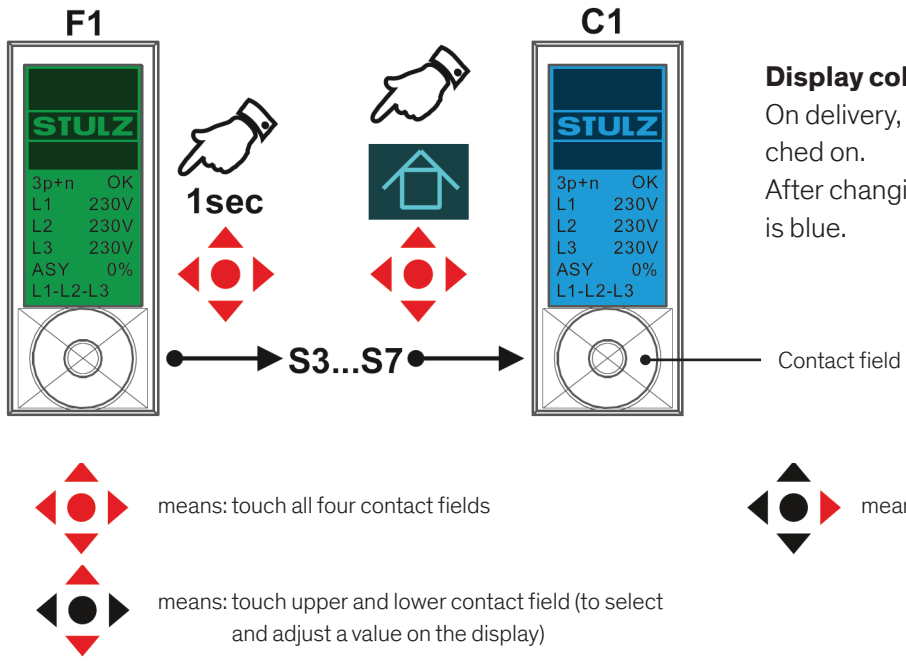
*The restart value can be set on maximum 3% hysteresis from the triggering value.

When a limit value is exceeded the display lights up in red.
Only when the corresponding restart value is reached again, the display colour changes to green.
The original display dimensions are 32×16mm.



Modification of the adjusted values

- touch all four contact fields for 1 second to enter the change mode.
- after having completed the modifications select the „House“ icon on the display using the contact fields (the symbol flashes) and then touch all four contact fields.



Display colour
On delivery, the display is green when switched on.
After changing the basic setting, the display is blue.

S1: Selecting the mains form
With the setting „3p+n“, the voltage between neutral and the phase conductors (230V) is displayed for L1, L2 and L3 on the display F1 resp. C1. With the setting „3p“, the voltage between two phase conductors (400V) is displayed for L1, L2 and L3 on the display F1 resp. C1.

S2: Selecting the nominal voltage
If there is no neutral conductor, the delta voltage must be set.
Example:
- Network: 3~ 400V/PE → setting: 400V
- Network: 3~ 480V/PE → setting: 480V

If there is a neutral conductor, the phase to neutral voltage must be set.
Example:
- Network: 3~ 400V/N/PE → setting: 230V
- Network: 3~ 480V/N/PE → setting: 277V

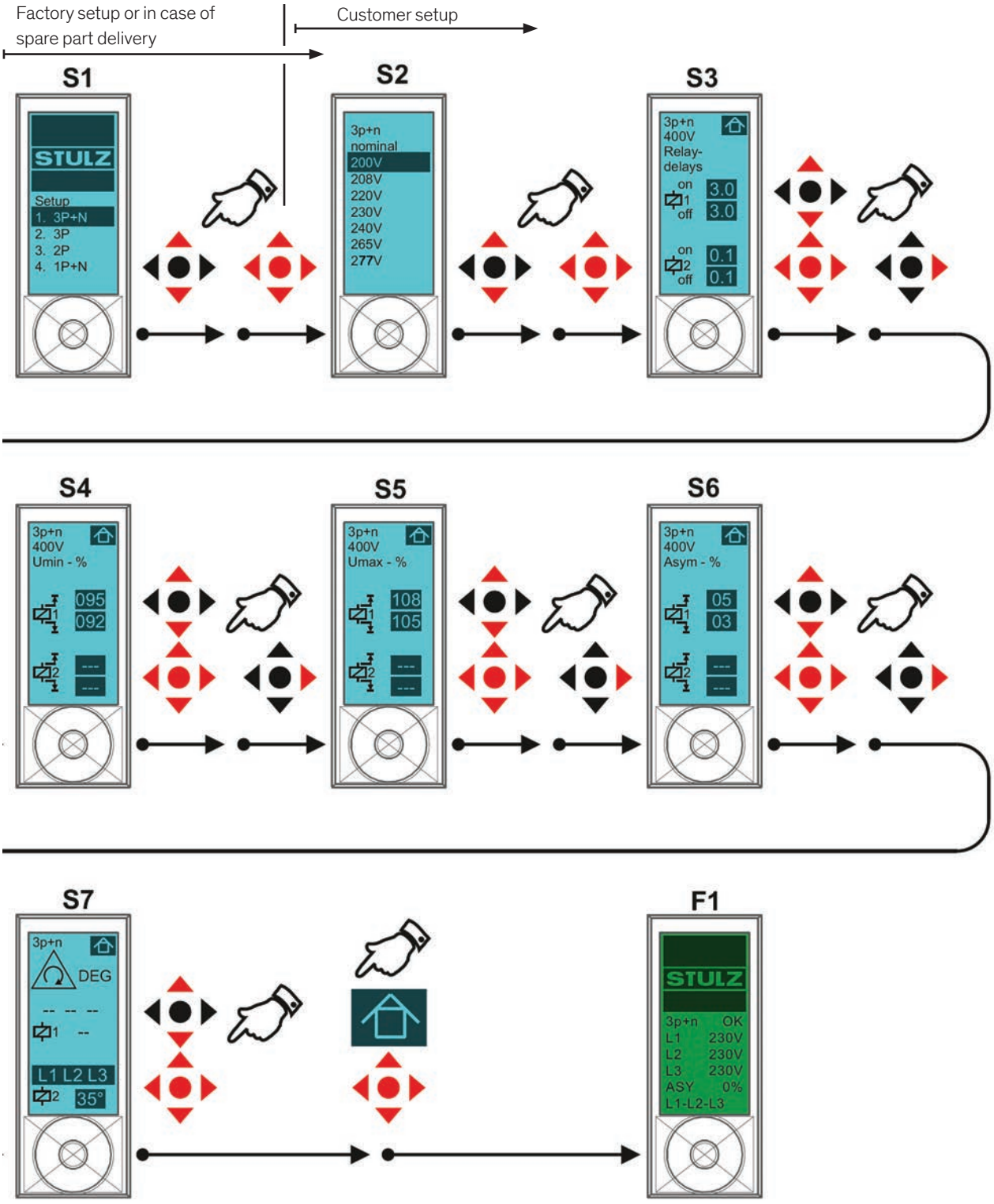
S3: Setting the delay times
for relay 1 (releases at S4, S5, S6) and relay 2 (releases at S7).

S4: Setting the limit values for undervoltage release

S5: Setting the limit values for excess voltage release

S6: Setting the limit values for phase imbalance
Function only for three-phase networks available.

S7: Setting the rotating field control
Function only for three-phase networks available.

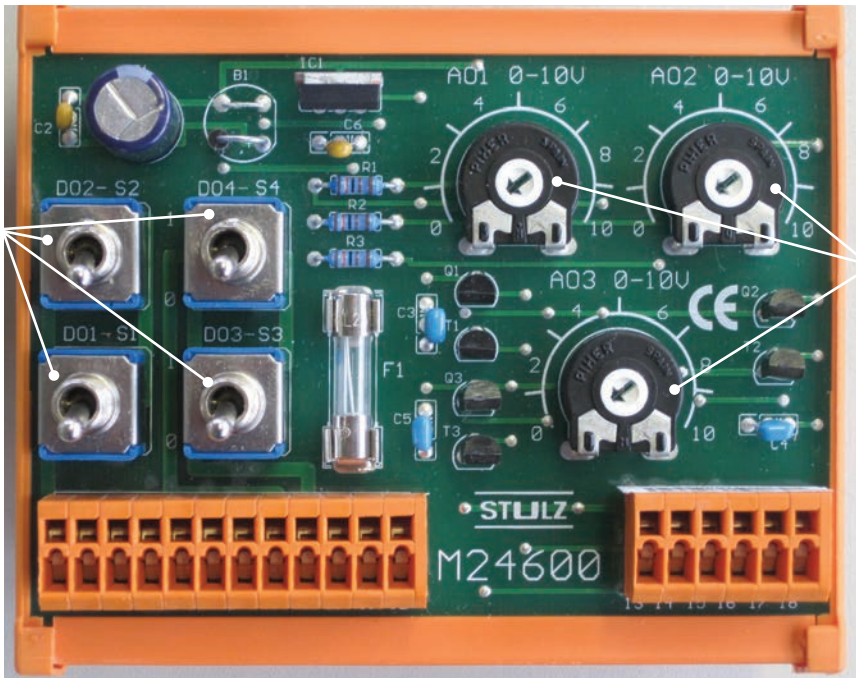


11.5.3 Manual override board

The manual override board is located in the E box and is used for the manual control of components in the event of a controller failure. With the help of this board, 4 digital outputs and 3 analog outputs can be operated manually. If the A/C unit is equipped with a damper, a timer in the E-box ensures the delayed start of the fans, after the damper is opened.
The assignment of the outputs can be set customer-specifically and is documented in the E-plan.

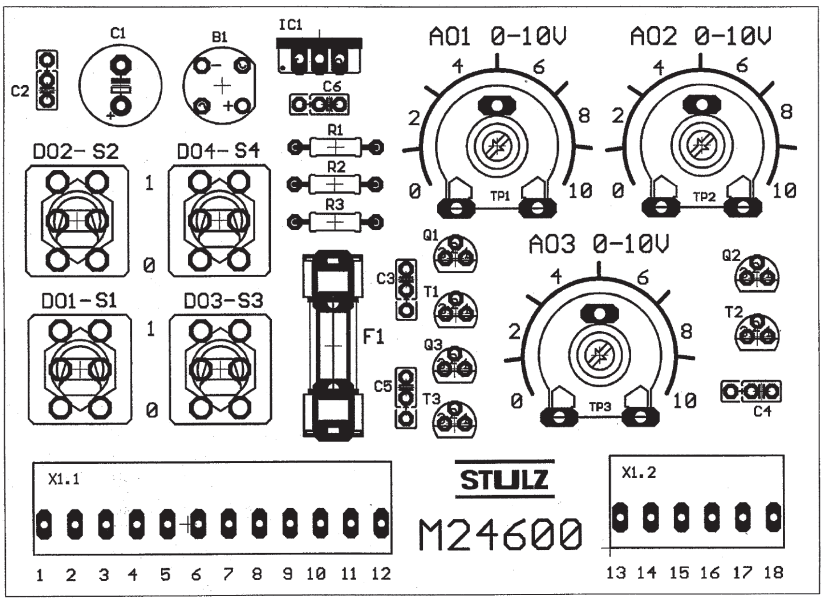
Stop the manual control, as soon as the controller is ready for use again by setting all toggle switches into the „off“ position.

Toggle switches for digital outputs in „off“ position

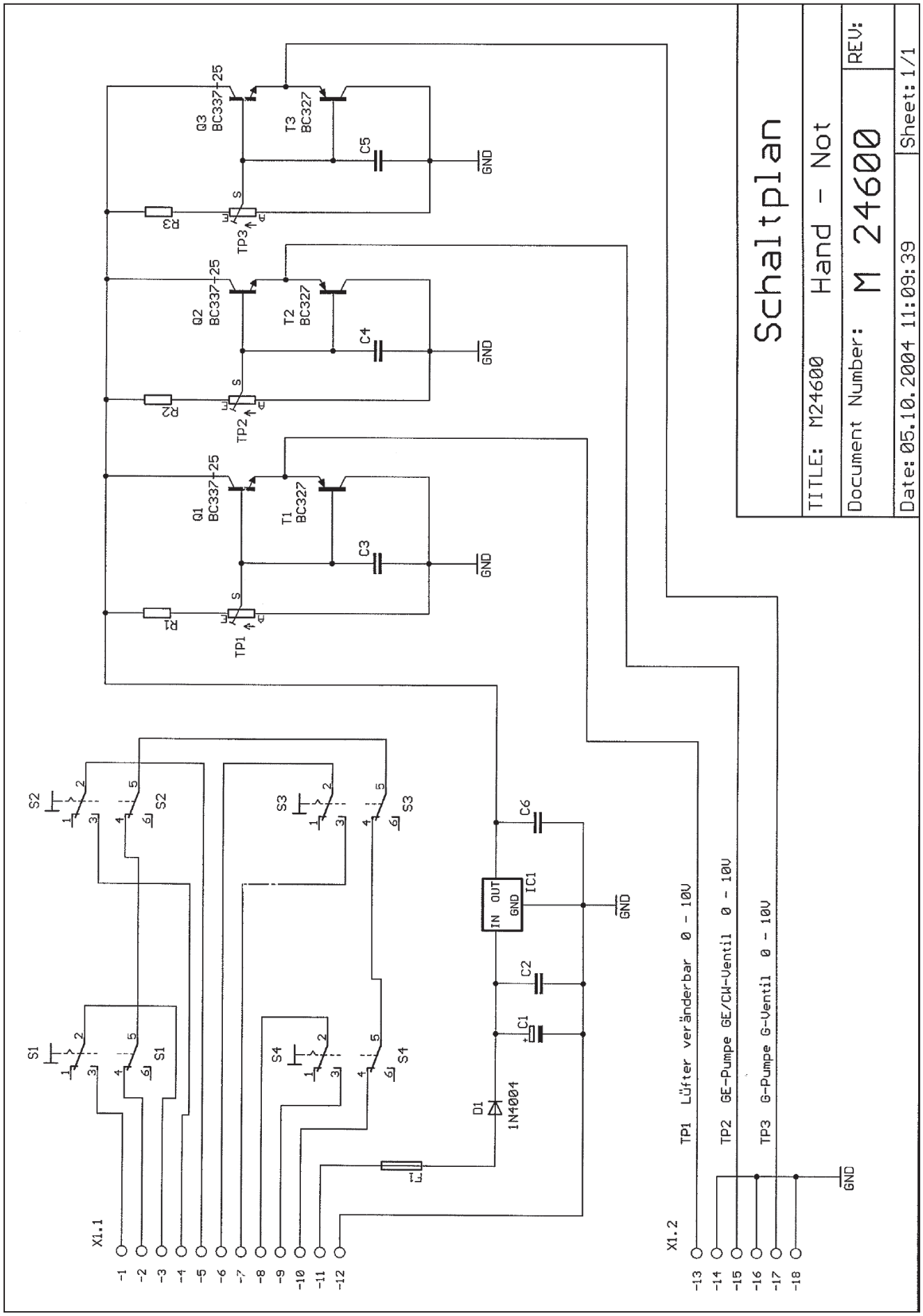


Potentiometers for analog outputs

The image shows the board in the delivery condition, all toggle switches for the digital outputs are switched off.



Wiring diagram of the circuit board

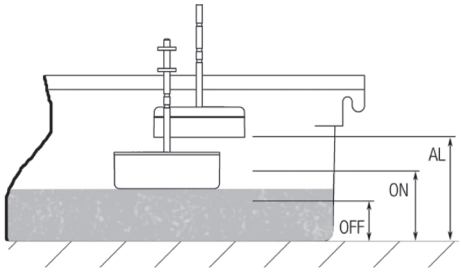


11.6 Condensate pump

Cold water condensate pump

The condensate pump conveys condensed water, which occurs in A/C units during cooling and dehumidification. The operation is controlled by a float switch depending on the level. An alarm contact is triggered at a water level of 40 mm inside the pump tank.

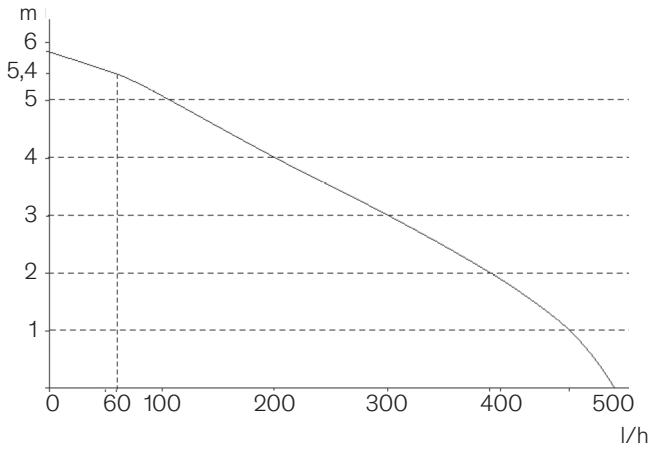
The pump motor is protected by a thermal fuse. At a temperature of 130 ° C, the motor is switched off and automatically switched on again, as soon as the temperature has dropped.



Technical data

Pump data		
Volume flow, max.	l/h	500
Delivery head, max.	m	5,4
Power consumption	W	90
Current consumption	A	0,8
Protection degree		IP20
Power supply	V	230
Frequency	Hz	50-60
Length	mm	135
Width	mm	175
Height	mm	195
Tank volume	l	0,5
Medium temperature, max.	°C	80

Pump diagram

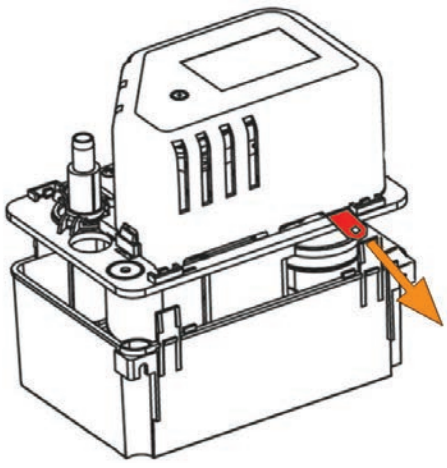


Installation

The pump must stand horizontally.

- Remove the transport safety device by pulling out the plastic strip (see illustration).
- Place the pump in a frost-proof and water-free place.

For Downflow units: in the raised floor
For Upflow units (if there is no raised floor): on the floor next to the air conditioning unit.



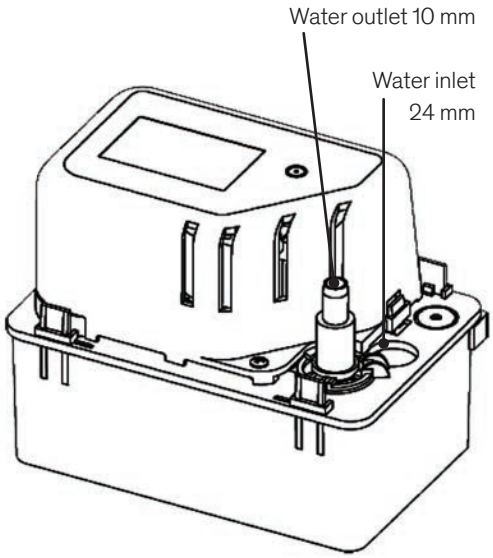
Water connection

Two adapters for the water inlet with diameters 25 mm and 32 mm are supplied with the pump.

- Lay a pipe from the condensate drain of the A/C unit to the water inlet of the pump. The piping must have a slope.

The drain pipe must have an internal diameter of 10 mm.

- Connect a flexible plastic hose at the water outlet of the pump.
- Consider the performance data of the pump according to the diagram when installing the hose.
- Ensure that the hose is free of kinks and connect it to the local sewage network.



Electrical connection

- Connect the pump to a power supply via an earth leakage circuit breaker according to the standard IEC 345. For a power supply out of the A/C unit, you can use the option “M99209 - Power supply for condensate pump”.
- Connect the lines of the alarm contact (black-grey) to an alarm device (e.g. digital input on the controller). When the water level is too high the contact is opened and an alarm is triggered.

Start-up

- Pour some water into the pump and check whether the pump is switch on and off.
- Pour continuously water into the pump until the alarm is triggered. In case of an alarm, the pump continues operating, if it is still functional.

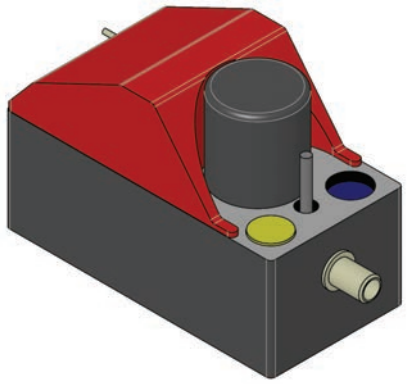
After the check, the pump is ready for operation.

Maintenance

- Disconnect the pump from the power supply.
- Open the pump housing.
- Clean the pump tank with a cleaning solution (potassium hypochlorite KClO) annually, to prevent bacterial infection. Make sure that the floating module remains clean.
- After reassembling the pump, check the function.

Condensate pump for hot water

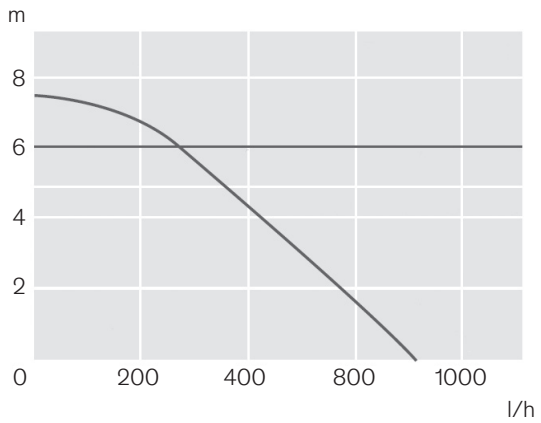
The condensate pump is suitable to convey the warm drain water of a steam humidifier and condensed water, which occurs during cooling and humidification in air-conditioning units. The operation is controlled by a float switch depending on the level. An alarm contact is triggered when the water level inside the pump tank is too high.



Technical data

Pump data		
Volume flow, max.	l/h	900
Delivery head, max.	m	6,0
Power consumption	W	157
Current consumption	A	1,5
Protection degree		IPX1
Power supply	V	230
Frequency	Hz	50-60
Length	mm	300
Width	mm	150
Height	mm	205
Tank volume	l	4,0
Medium temperature, max.	°C	100

Pump diagram



Installation

The pump must stand horizontally.

- Place the pump in a frost-proof and water-free place.

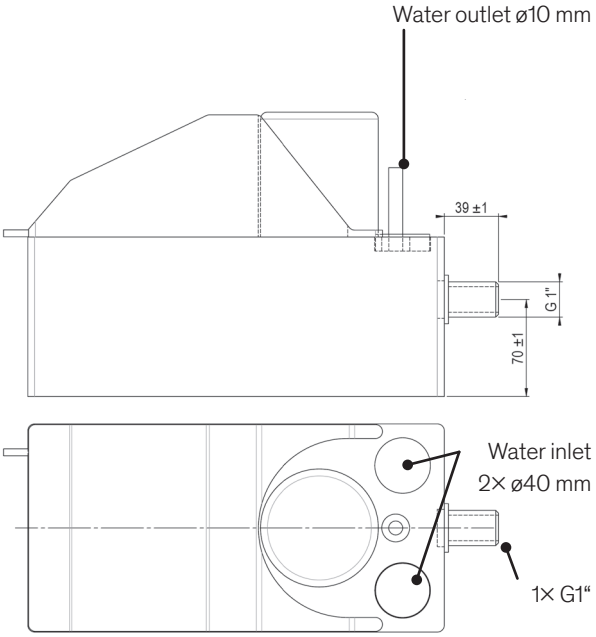
For Downflow units: in the raised floor

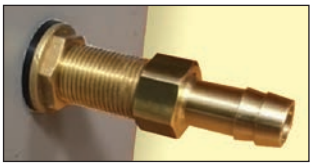
For Upflow units (if there is no raised floor): on the floor next to the air conditioning unit.

Water connection

There are three possible openings for the water inlet: two on the top of the pump housing and a lateral opening. An adapter is supplied for this opening, so that a plastic hose with an internal diameter of 12 mm can be connected.

- Lay a pipe from the condensate drain of the A/C unit to the water inlet of the pump. The piping must have a slope.
- Close the openings which are not used.

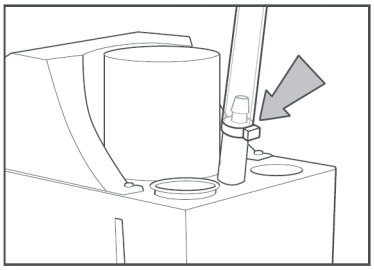




Water inlet with adapter

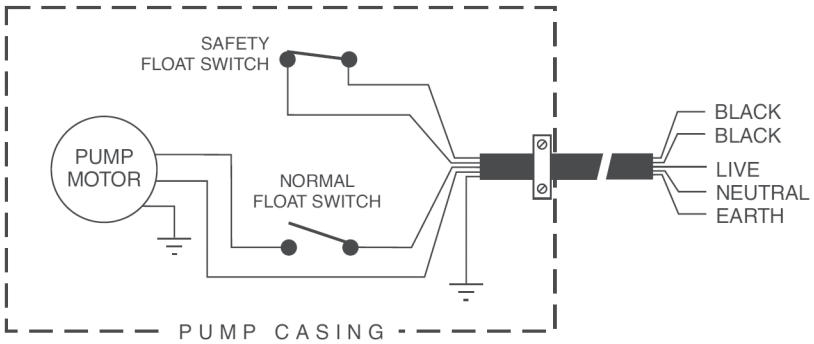
The drain pipe must have an internal diameter of 10 mm.

- Connect a flexible plastic hose at the water outlet of the pump.
- Consider the performance data of the pump according to the diagram when installing the hose.
- Ensure that the hose is free of kinks and connect it to the local sewage network.



Electrical connection

- Connect the pump to a power supply via an earth leakage circuit breaker according to the standard IEC 345. For a power supply out of the A/C unit, you can use the option “M99209 - Power supply for condensate pump”.
- Connect the lines of the alarm contact (black-black) to an alarm device (e.g. digital input on the controller). When the water level is too high the contact is opened and an alarm is triggered.



Start-up

- Pour some water into the pump and check whether the pump is switch on and off.
- Pour continuously water into the pump until the alarm is triggered. In case of an alarm, the pump continues operating, if it is still functional.

After the check, the pump is ready for operation.

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