

Technical Manual

Operation and installation cooling units **DTS 3000 SERIES 115V / 230V / 460V**

June 12, 2023





Preface

The skills and information provided in the ORIGINAL OPERATING MANUAL are required for assembly and safe operation of Pfannenber's DTS 3000 Series Cooling Units.

The information is presented in a brief, clearly arranged format. The chapters are numbered throughout. If you have the operating manual in digital format, the links are interactive.

Various unit types are documented in this operating manual.

Pfannenber cooling units are subject to continuous improvement. Please understand that we reserve the right to make changes to the design, equipment and technology. For this reason, no claims to specific features of the unit can be derived from the content of this operating manual.

Safety Instructions and Symbols



DANGER

Identifies an exceptionally hazardous situation. Severe, irreversible injuries or death will occur if this notice is not observed.



DANGER

Identifies an exceptionally hazardous situation in connection with electrical voltage. Severe, irreversible injuries or death will occur if this notice is not observed.



WARNING

Identifies an exceptionally hazardous situation. Severe, irreversible or deadly injuries could occur if this notice is not observed.



CAUTION

Identifies a hazardous situation. Minor or moderate injuries could occur if this notice is not observed.





NOTICE

Notice is used to address practices not related to physical injury.

Digital operating manual:

If you have the operating manual in digital format, the links are interactive.

Clicking   on links takes you to the target text position.

- The table of contents is also interactive.
- The key combination ALT ← brings you back to the starting point.



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1 : INTENDED USE

1.1 General overview

The Pfannenberger attachment and installation cooling units of the DTS series are stationary cooling units for the dissipation of heat from switch cabinets.

The cooling units have different cooling outputs. For exact specifications power consumption, see [Technical data](#). Use of aluminum filters, fleece filters and fluted filters is possible with an additional adapter.

The cooling units are available with thermostat controllers. These controllers are regulating units for the adjustment of refrigeration functions and operating data.

- For detailed specifications for the controller, see [Technical data](#) and [Operation](#).

All Pfannenberger cooling units are ROHS-compliant and free from:

- Silicone connections
- PCT, asbestos, formaldehyde, cadmium
- Moisture-impairing substances

1.2 Duty of the operator

The operator must ensure that the cooling units are used exclusively as intended and dangers of all types to the life and limb of users or third parties are avoided. In addition, accident prevention regulations and recognized safety rules are to be observed.

The operator must ensure that all users have read and understood this operating manual. Non-observance of this operating manual will void the warranty. The same applies if improper work has been carried out on the unit by the customer and/or third parties without the approval of the manufacturer.

2 : UNIT DESCRIPTION

2.1 Description of use

Pfannenberger DTS series cooling units are designed to dissipate heat from switch cabinets. Sensitive components in the switch cabinet are protected.

2.2 Scope of delivery

The shipment consists of the following contents:

- DTS cooling unit
- Cooling unit quick guide
- Accessory kit: Appropriate seal, fastening material, electrical plug connector, etc. for the specific unit type
- Special accessories, if applicable

2.3 Order options



NOTICE

Spare parts from third-party manufacturers can damage the unit

- Only original parts are subject to the manufacturer's quality control.
- Only use originally manufacturer parts for safe and reliable operation.
- For Pfannenberger spare part numbers, see [Technical data](#).
- For Pfannenberger part numbers for accessory orders, see Ordering of [accessory parts](#).



WARNING

Hazardous due to impermissible use of units

Inappropriate use of the units can cause severe accidents.

- Cooling units must only be used in stationary operation.

Pfannenberger cooling units are only approved for stationary operation. As cooling units with protection rating IP 54, the cooling units are essentially dust-protected. Limitation: Dust can still penetrate after continuous exposure. The cooling units are resistant to spray water, but not a constant water jet.

2.4 Functional description

2.4.1 Air flow functional principle (See Section 2.6 for Each Unit Type)



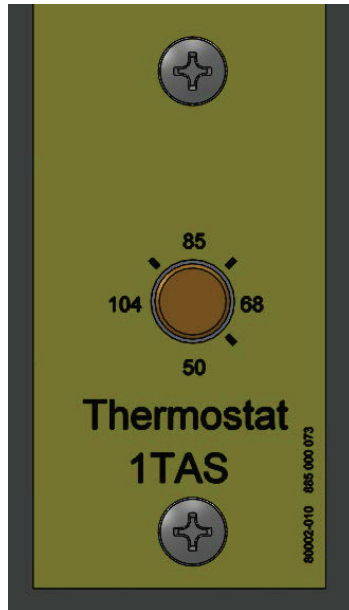
CAUTION

Danger due to the release of very warm air.

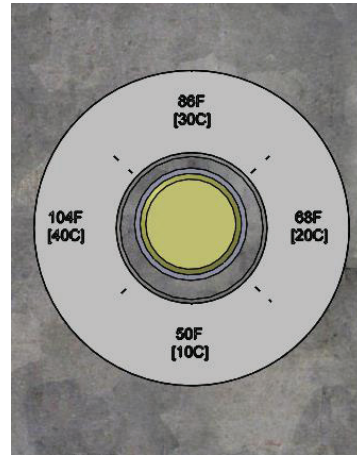
- The air outlet can become very warm.
- Keep body parts away from the air outlet.
- For the ambient temperature and air outlet ratio, see Technical data.

2.4.2 Temperature Regulation

The thermostats are for the adjustment of refrigeration functions and operating data.



DTS 3021/3031



DTS 3041/3061/3081

TEMPERATURE		DIP-SWITCH		
REF	ALARM	Position		
°C/°F	°C/°F	1	2	3
25/77	45/113	OFF	OFF	OFF
30/86	45/113	OFF	OFF	ON
35/95	45/113	OFF	ON	OFF
35/95	50/122	OFF	ON	ON
40/104	50/122	ON	OFF	OFF
40/104	55/131	ON	OFF	ON
45/113	55/131	ON	ON	OFF
45/113	60/140	ON	ON	ON



Standard setting
Ref: 35°C/95°F
Alarm: 50°C/122°F

DTS 31XX/32XX/34XX/36XX

2.4.3 Safety concept



WARNING

Hazards due to modified safety equipment

Non-functioning or defective safety equipment can cause severe accidents.

- Any changes to the unit, particularly the safety equipment, are prohibited.
- In case of defective safety equipment, shut down the unit and decommission it immediately.
- Fans and compressors are protected from overloading and overheating.

2.5 Type plate



WARNING

Hazards due to noncompliance with manual

Disregarding type plate specifications can result in severe accidents.

- Always observe the specifications on the type plate when installing and maintaining the units.
- The figure shows the standard version of type plate.

1 — **Pfannenber**
ELECTRO-TECHNOLOGY FOR INDUSTRY
www.pfannenbergusa.com

2 — Type DTS_XXXX_LITE XXX/XXXVXX/XXHzXX_XXXXXXXXXX

3 — P/N 133XXXXXXXXXX

4 — S/N SXXXXXXXXXXXXX
Weight: XXXXkg / XXXXlb

5 — **Electrical Data:**
Volt: XXX/XXX

6 — Hz: XX/XX Phase: XX

7 — Evap. Fan (FLA): XX.XXA
Cond. Fan (FLA): XX.XXA
Comp. (FLA): XX.XXA
Unit (MCA): XX.XXA
Heater (FLA): XX.XXA
Total Heater (MCA): XX.XXA

8 — Power Input A35/A35: XXXXXW
9 — Power Input A50/A35: XXXXXW
Fusing: Unit SCCR value 5KA
Cooling: XXXXXA
Heating: XXXXXA
(Use a Time Delay Fuse or Circuit Breaker)

14 — **Manufacturer: Pfannenber Manf. LLC**
68 Ward Road Lancaster, NY 14086
Importer: Pfannenber, GMBH
Werner-Witt Strasse 1, Hamburg DE-21035

Refrigeration Data:
Design Pressure High: XXbar Design Pressure Low: XXbar
Ref.: R134a XXXXXoz. / XXXXX grams
GWP: XXXXX CO2E: XXXX Metric Tonne
Cooling A35/A35: XXXXX BTUH XXXXX W
Cooling A50/A35: XXXXX BTUH XXXXX W
Heating: XXXXX BTUH XXXXX W

Environmental:
Inside/dedans (IP rating): XX IEC 60529
Outside/externe (IP rating): XX IEC 60529
Special purpose air conditioner
NEMA/EEMAC UL 50 by Underwriters Laboratories Inc.,
Type ?????? Interface to enclosure only.
Type 1 Special purpose air conditioner
equipment compartment only
Hermetical sealed. Contains fluorinated greenhouse gas according to Kyoto-Protocol
Assembled in the USA

12 —

17 —

19 —

16 —

11 —

13 —

Item Number	Designation	Item Number	Designation
1	Manufacturer logo	11	CE mark
2	Unit type	12	UL mark
3	Part number	13	QR code
4	Serial number	14	Coolant pressure
5	Rated operating voltage	15	Exterior / interior ambient conditions
6	Frequency	16	Cooling capacity
7	Nominal current	17	Coolant
8	Power rating	18	Global Warming Potential
9	Fuse	19	CO2 equivalent value
10	Protection type		



2.6 Technical data and spare parts

Technical data, spare parts, and cutouts can be found on our website here:

<http://pfannenbergerusa.com/thermal-management-downloads/>

3 : ASSEMBLY AND INITIAL COMMISSIONING

3.1 Transport



WARNING

Hazards due to uncontrolled movements

Improper securing of the unit can result in severe accidents.

- Loading must only be carried out by trained, qualified personnel.
- Lash the unit correctly for transport on a truck or trailer.
- Only use lashing straps with an adequate rated strength.
- Use slip-resistant materials for securing, e.g. anti-slip mats.
- When loading by crane, do not walk or stand under the raised units.



NOTICE

Danger of material damage during transport and setting down of the units.

- Improper device securing or uncontrolled movements can cause damage.
- Exercise maximum caution during movement and transport of the units.

Always transport the cooling units using the packaging provided by the factory.

Transporting cooling units

REQUIREMENTS:

- Cooling units must be in the packaging provided by the factory.
- Unit must be in the upright position.

REQUIRED TOOLS AND MATERIAL:

- Lashing straps, loading crane, if applicable

PROCEDURE:

- Always raise cooling units by the housing.
- Always raise cooling units slowly and evenly and set down safely.
- Secure correctly for transport with lashing straps.
- The cooling unit was transported and loaded correctly.

3.2 Storage

- Do not expose the cooling unit to temperatures below -40°C or above +70 °C during storage*.
- Unit must be in the upright position.

* The warranty will no longer apply if these instructions are not observed.

3.3 Unpacking



WARNING

Hazard of accidents due to the heavy weight of the units

Uncontrolled movements of the units during assembly can cause accidents.

- Use suitable lifting equipment and secure units to prevent accidents.
- Also secure assembled components.



CAUTION

Hazard of injury due to sharp edges

- For manufacturing reasons, the metal edges of the unit may have burrs.
- Wear gloves during service and assembly work.



NOTICE

- Perform a visual inspection for transport damage when unpacking the cooling units. Take note of any loose parts, dents, scratches, visible loss of oil etc.
- Inspect and secure the packaging material for any loose functional parts before disposal.
- Report any damages to the freight carrier immediately. Observe the "Terms for Cases of Damage".
- Precise information about defects, including possible photos must be provided for the handling of warranty claims. Always specify the type designation and serial number.

3.4 Assembly



DANGER

Life-threatening hazard due to electric shock

Live units and exposed connection cables can generate an electric shock and cause severe accidents.

- Work on electrical connections must be carried out exclusively by trained, qualified electricians.
- Before assembly, de-energize all supply lines to the separate fuse or a main switch, disconnect the system and secure to prevent re-connection.
- Test to ensure the absence of voltage on the unit.



CAUTION

Hazard of crushing during assembly of the unit

There is a hazard of crushing between the switch cabinet and frame of the unit during assembly.

- Keep body parts out of the space between the frame and unit cut-out.
- Work carefully and wear gloves.



NOTICE

Switch cabinet installation hazard due to assembly chips

When making the cooling unit cut-outs, assembly chips can fall into the switch cabinet.

- When assembling the switch cabinet, protect against contaminants and use protective covers.



3.4.1 General assembly requirements

- Select an assembly location for the switch cabinet which will guarantee adequate ventilation of the cooling unit. A minimum clearance of 200 mm between units and the nearest wall must be observed.
- Installed components in the switch cabinet must not impede air circulation.
- Protect the installation location from heavy contamination with covers.
- Inside of the switch cabinet a minimum clearance of 200mm between the back of the cooling unit to the nearest component must be observed to prevent obstruction of airflow and allow access to electrical panel of cooling unit during service and maintenance.



CAUTION

The following general requirements must be followed for safe and reliable operation of the cooling units:

- Secure the switch cabinet against tipping.
- Ensure that provided hinges can support the additional weight of the cooling unit.

3.4.2 DTS cooling unit assembly (side attachment)

Make cut-outs for the DTS cooling unit

REQUIREMENTS:

- All general requirements have been fulfilled; see [General assembly requirements](#)
- The unit is de-energized

REQUIRED TOOLS AND MATERIAL

- Saw
- Use a switch cabinet cutter, if applicable
- Protective covers

PROCEDURE

- Use a protective cover to protect the switch cabinet from chips.
- Provide the switch cabinet with cut-outs and holes. For the prescribed dimensions, refer to the figure exterior view of the switch cabinet.
- Deburr the cut edges.
- Remove chips and assembly waste from the switch cabinet.
- Cut-outs and holes have been made.

Install seal on the DTS cooling unit (side attachment)



DANGER

Hazard of accidents due to incorrectly installed seals

Leaky seals can allow moisture to penetrate and cause short-circuits.

- Install the seal so that it provides a tight seal to the switch cabinet.
- Always inspect seals during cleaning and maintenance.

Install seals and assembly

REQUIREMENTS:

- Cut-outs for the DTS cooling unit have been made; see section 2.6 for each unit.
- The cooling unit is de-energized.

REQUIRED TOOLS AND MATERIAL

- Installation tool
- Accessory kit: Threaded bolts, screws, nuts, washers

PROCEDURE

- Attach seals on the DTS unit. Fit the seals with the slotted holes over unit mounting holes.
- Screw in the two supplied threaded bolts (accessory kit) in the upper fastening points of the DTS cooling unit. Suspend the cooling unit on the switch cabinet with the threaded bolts installed from outside. Tighten the screws on the DTS cooling unit on the switch cabinet interior. Use the supplied screws, nuts and washers (accessory kit) to fasten the unit. Firmly tighten the screw fasteners so that the seal is pressed together.
- The DTS cooling unit is attached to the switch cabinet and ready for electrical connection; see [Electrical connection](#).



3.5 Electrical connection

3.5.1 Standard controller (SC) electrical circuit diagram



DANGER

Life-threatening hazard due to electric shock

Live units and exposed connection cables can generate an electric shock hazard and cause severe accidents.

- Work on electrical connections must be carried out exclusively by trained, qualified electricians.
- Ensure that the unit is voltage-free before routing all electrical connections.

3.5.2 Door contact switch



WARNING

Hazard due to connection of external voltage at the input of the door contact

External voltage can cause severe accidents.

- Connection of external voltage to the input for the door cabinet is prohibited.
Installation of a door contact switch increases safety and prevents increased accumulation of condensate.
- If a door contact switch has not been connected, the connection contact (S1) must be jumped.

Door contact switch installation

REQUIREMENTS:

- The cooling unit is de-energized.

PROCEDURE:

- The door contact switch is connected to the X54 connection at 3 & 4 or the electrical circuit diagram in the housing cover.
- The door contact is supplied with high voltage, from the cooling unit on the DTS 3021/31/31 SS and 30X1 series units.
- The door contact is supplied with low voltage from the control board on the DTS 31X1, 31X5, 32X1, 32X5, 34X1, 36X1, 34X1C and 36X1C series units.
- The door contact switch is connected. The motors switch off when the switch cabinet is opened.

3.5.3 Main supply connection



WARNING

Potential hazard due to incorrect cables

An incorrect cable cross-section will cause the cable to overheat. Scorched insulation can cause fires.

- The cable cross-section (4) matches the output required for the power consumption and is 1 – 2.5mm² or AWG 18 to AWG 14.



DANGER

Electric arcing can cause electric shock and burns.

When disconnecting and connecting the plug connector for mains connection under load or voltage, electric arcing, dangerous voltage and electric shock can occur.

- The plug connector for mains connection must never be plugged in or disconnected under load/voltage.
- Work on plug connectors must only be carried out with adequate lighting.
- Always disconnect power to unit.

The following general requirements must be ensured for safe and reliable operation of the cooling units:

- Upstream installation of a supply-side temperature regulator is prohibited.
- Connect the upstream fuse specified on the type plate as wiring protection; see [Type plate](#).
- Ensure that the type plate specifications for rated values match the present values for mains voltage and mains frequency; see [Type plate](#).
- Always connect the cooling unit to the mains by means of a separating device (switch/contactactor).
- Some units are phase sensitive, make sure to verify phasing is correct.

NOTE: To conform with EU Standards and maintain CE Conformity (For units with molded electrical plugs ONLY) the following modification must be completed:

- These steps should only be performed by a qualified person
- Using standard cable cutting tool, cut cable approximately 3.5" (89mm) from mold plug end
- Remove molded plug
- Using standard cable stripping tool, remove PVC cable jacket 2" (51mm) from cut end and discard
- Using standard wire stripper, remove the PVC jack from each individual wire 0.3" (8mm) from end
- Discard all removed materials
- Terminate the bare wire ends as local electrical codes and standard practices
- Wiring connections as follows
 - Line – Brown Wire
 - Neutral – Blue Wire
 - Ground – Green/Yellow Wire

Cooling unit electrical connection

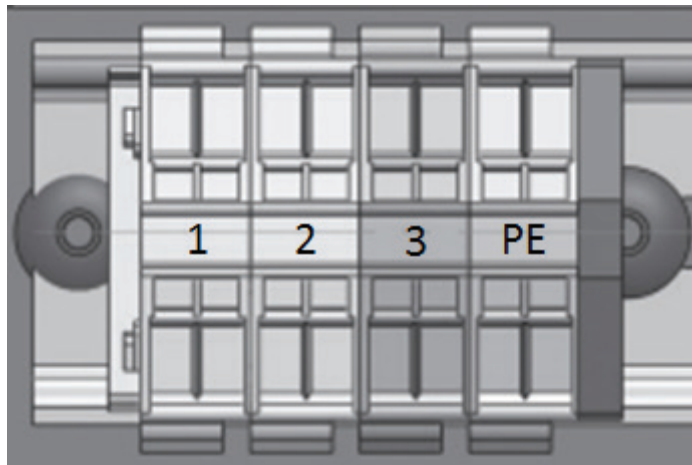
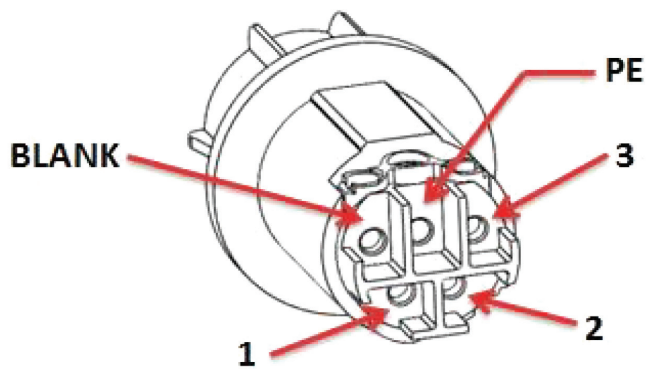


DANGER

Life-threatening hazard due to electric shock

Circuit breaker systems that are not connected or attached incorrectly can generate hazardous voltages and electric shock and cause severe accidents.

- Work on electrical connections must be carried out exclusively by trained, qualified electricians.
- Circuit breakers systems must be provided in accordance with DIN EN 60204-1, chapter 8.2.
- Each element of electrical equipment must be connected to the circuit breaker system.
- Never interrupt the circuit breaker system if electrical equipment is attached to covers, doors or cover panels.
- If parts are removed, e.g. for maintenance work, ensure that the circuit breaker system is not interrupted for the remaining parts

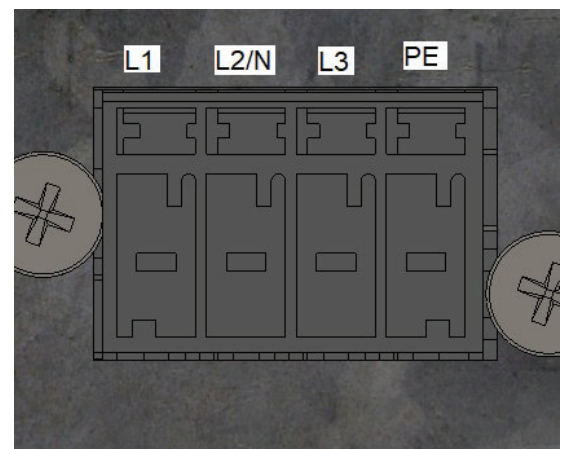
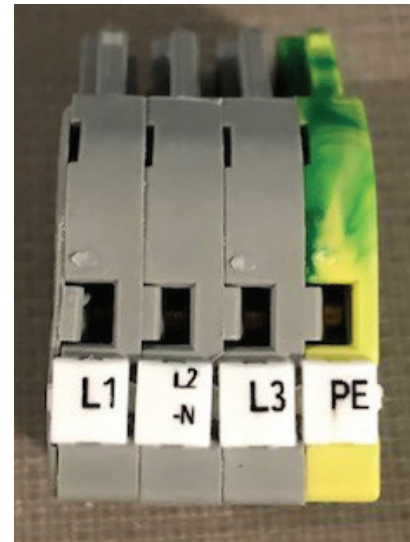


Refer to Connection Diagrams:

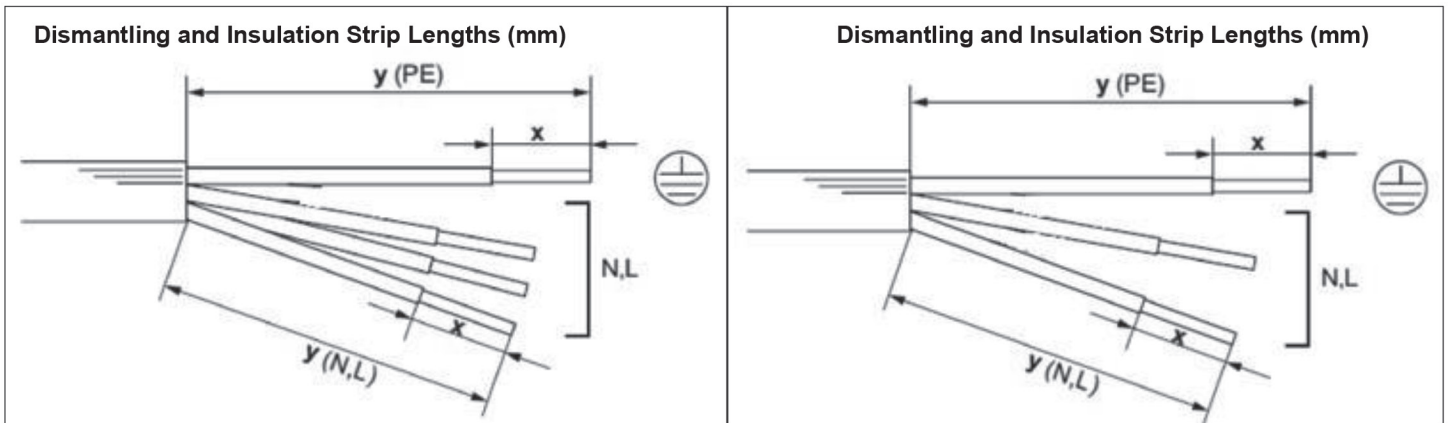
	115V	230V	230V	460V	460V*
1	L	L	L	L1	L1
2	N	N	L	L2	L2
3	----	----	----	----	L3
PE					

*Note: 460V units are phase sensitive, make sure to verify phasing is correct.

DTS 34X1C & DTS 36X1C Only

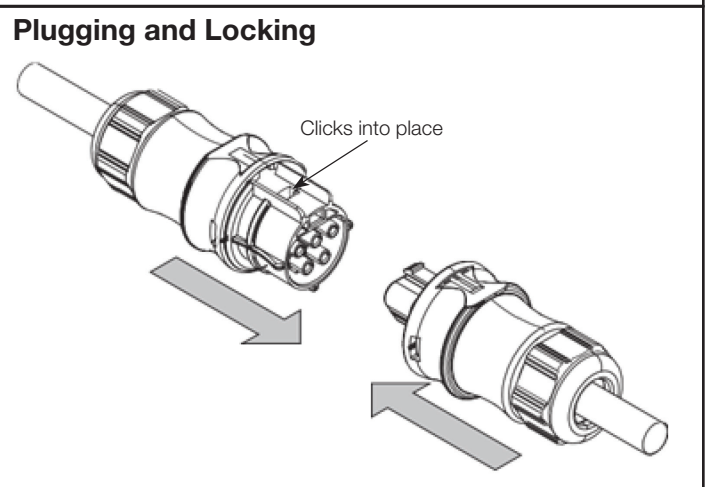
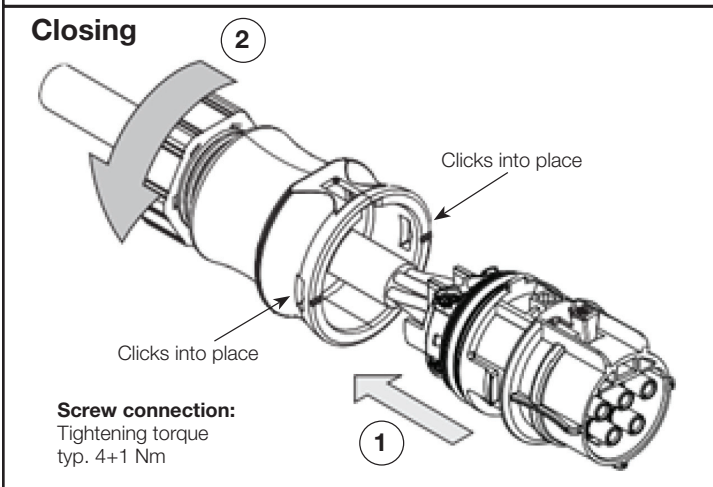
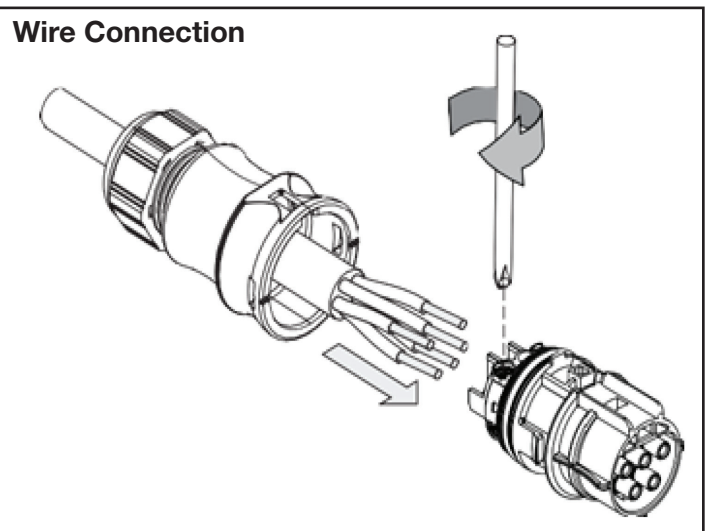
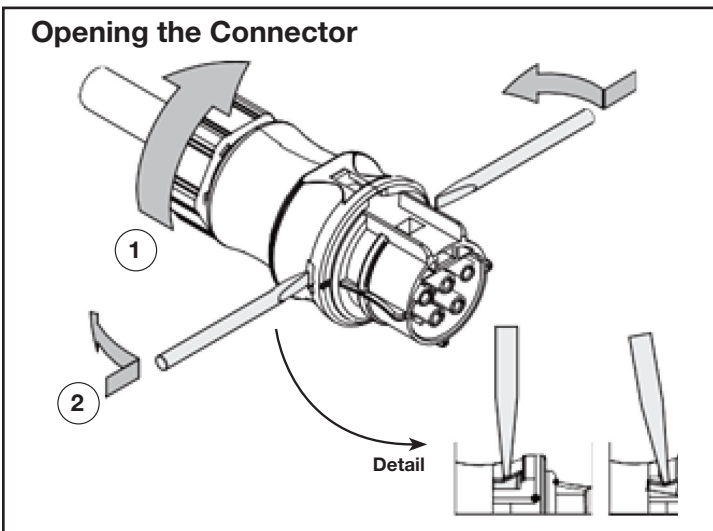


Part Description: Connection Instruction



Screw Connections

	Connector			
	Ø6...10 / Ø10...14		Ø13...18	
Strain Relief				
Conductor	PE	N,L	PE	N,L
Dismantling Length y (mm)	30	25	55	50
Dismantling Length y (splitter connector)	45	40		
Insulation Strip Length x (mm)	8 (conductor cross section 1,5 ... 4 mm²)			





CAUTION

To maintain the IP-rating type of enclosure, protective caps (accessory) must be mounted on all unoccupied connectors! Further the connectors must not be exposed to bending forces (e.g. do not attach loads to the cable, no free-dangling cable windings etc.). The connectors are not suitable for current interrupting. Never connect or disconnect under load!

Requirement

- All general requirements for safe and reliable operation are assured; see [Main supply connection](#).
- The cooling unit is de-energized.

Procedure

- Connect the cable with the connecting plug (accessory kit) as specified in the electrical circuit diagram; see [Electrical connection](#).
- For electrical connection, insert the screwdriver into the cage terminal and connect the cables to the cooling unit with the connecting plug .
- Insert the screwdriver firmly into the cage terminal. Never twist the screwdriver; otherwise the cage terminal will be damaged.
- Before switching on, ensure that the mains voltage matches the upstream fuse; see [Electrical connection](#).
- The cooling unit is connected electrically.

4 : OPERATION

4.1 General functions



NOTICE

Danger of damage to the cooling unit

Operation without the unit cover prevents the adequate supply of air to the condenser and limits the intended heating function.

- Only operate the cooling unit with the unit cover installed.
- Once assembly and installation work is completed, switch on the power supply to the cooling unit.
- After the supply voltage has been connected and the door is closed, the units run continuously.
- The cooling unit is equipped with an electronic control unit. A temperature sensor detects the temperature of the air sucked in from the interior of the switch cabinet.
- If the upper or lower limit temperature is exceeded or undercut, a fault indication is triggered.
- The ambient conditions and switch cabinet interior temperatures must correspond to the prescribed technical data; see [Technical data](#).
- The ambient temperature must be less than 55°C (45°C for the DTS 3021/3031/3031 SS & 3041).

4.2 Operation of the cooling unit

- After connection of the mains voltage, the device switches to operating mode.
- If cooling mode as needed; this will take place depending on whether a temperature switching threshold (TSet) is reached or undercut.
- Cooling mode switches off when the temperature switching threshold (TSet) is undercut.
- The evaporator fan (internal), condenser fan (external) switch off when the door is opened.

Operating conditions

- The mains voltage must lie within the specified range; see [Electrical data](#).
- A deviation of $\pm 10\%$ is permissible.
- The ambient temperature must be below 55 °C (45°C for the DTS 3021/3031/3031 SS & 3041). For further options, see [Technical data](#).
- The cooling unit must only be used in such a manner as to ensure that the specified cooling capacity is able to meet actual demands.
- Only the specified coolant may be used.



5 : SERVICE AND MAINTENANCE

5.1 General Cleaning



DANGER

Life-threatening hazard due to electric shock

Live units and exposed connection cables can generate an electric shock and cause severe accidents.

- Work on electrical connections must be carried out exclusively by trained, qualified electricians.
- Before working on the unit, de-energize all supply lines to the separate fuse or a main switch, disconnect the system and secure to prevent re-connection.
- Test to ensure the absence of voltage on the unit.



WARNING

Hazards of accidents due to component damage during cleaning

Cleaning of cooling units with water jet, steam jet, high-pressure washer or sharp objects can damage the electrical and electronic assemblies. Malfunctions can cause accidents.

- Do not clean with a water jet, pressure washer or flammable cleaning agents.
- Protect electrical components from the penetration of moisture.
- Do not use pointed or sharp-edged objects to clean the fins. They must not be pinched or damaged.



CAUTION

Hazards of crushing during removal of the unit cover

Hands and other body parts can be crushed during removal and re-installation of the unit cover.

- Keep body parts out of the space between the frame, springs and unit cut-out.
- Work carefully and wear gloves.

The frequency of cleaning intervals depends on the operating conditions in the individual case. The following cleaning work must take place regularly for safe and reliable operation of the cooling units:

- Remove dust or environmental residue from the heat exchangers.
- Check the condensate drain regularly.

5.2 Maintenance



DANGER

Life-threatening hazard due to electric shock

Live units and exposed connection cables can generate an electric shock and cause severe accidents.

- Opening, troubleshooting and replacement of components on the unit must only be carried out by qualified personnel.
- Always ensure that the unit is de-energized before working on the unit.



WARNING

Hazard due to improper maintenance work

Damage of components and faulty replacement of components can cause accidents.

- Always switch off the disconnecter/contactors before beginning maintenance work.
- Wait for unloading phase of 5 minutes for the electric components. Open only afterwards device.
- Ensure that the fans are in idle position and are no longer rotating.
- After replacement of defective parts or components, inspect the unit for correct and safe operation.
- After all maintenance or replacement of spare parts, check to ensure the full capability of the condensate drain.



WARNING

Spare parts from third-party manufacturers can damage the unit and cause accidents.

- Only original parts are subject to the manufacturer's quality control.
- Only use specially agreed manufacturer parts for safe and reliable operation.



NOTICE

Danger of unit damage due to incorrectly performed maintenance

Disregard of the recommended maintenance work reduces the cooling capacity of the cooling unit and could result in reduced machine availability.

- Maintenance work must be carried out regularly, as specified in the maintenance checklist.
- Warranty claims are only valid for units that have been maintained according to specifications.

Pfannenberg recommendation to the operator for maintenance work:

- Carry out maintenance work regularly, every 12 months, according to the maintenance checklist; see Maintenance checklist template.
- Shorter maintenance intervals are required for cooling units that cool in oil- and dust-laden ambient air. A reduced guideline value of two to six months between maintenance intervals applies.

5.3 Maintenance checklist template

Cooling Unit Maintenance Checklist				
Maintenance Interval: <ul style="list-style-type: none"> • Conduct maintenance every twelve months. • Conduct maintenance every two to six months in oil and dust-laden environmental air. 		Type: _____ Serial number: _____ Date of maintenance: _____ Technician: _____		
	Unit range designation/ Required maintenance tasks	Visual inspection	To Do	Result
1	Aggregate before maintenance			
1.1	General visual inspection of the aggregate			
1.2	Inspection for corrosion damage			
2	Condenser / heat exchanger			
2.1	Inspection for general corrosion damage			
3	Condenser fan (external)			
3.1	Inspect mount for loose parts			
3.2	Inspect the electrical connection for damage			
3.3	Check motor bearings for noises			
3.4	Check the drive for signs of overheating			
4	Evaporator fan (internal)			
4.1	Inspect mount for loose parts			
4.2	Inspect the electrical connection for damage			
4.3	Check motor bearings for noises			
4.4	Check the drive for signs of overheating			

* Maintenance intervals are more frequent, depending on the degree of contamination.

5.4 Decommissioning



WARNING

Hazard of injury due to materials and substances

Improper work on the unit can be damaging to health.

- Always ensure that the unit is de-energized before working on the unit.
- The unit must only be disposed of by qualified personnel and in accordance with applicable environmental regulations.

If the cooling unit is no longer needed for a longer period, it must be disconnected from the voltage supply.

- Ensure that improper start-up by third parties is not possible.

Final Decommissioning



CAUTION

Hazard of crushing during the decommissioning of units

Hands and other body parts can be crushed during removal of units.

- Keep body parts out of the space between the frame, springs and unit cut-out.

If cooling units are to be definitively decommissioned or disposed of, the following must be observed:

- Applicable statutory regulations of the user country and environmental protection regulations must be observed.
- Refrigerant must be professionally extracted from the refrigerant system. Avoid refrigerant emissions.
- The cooling unit must only be disposed of by authorized, qualified personnel.
- Waste equipment can be disposed of correctly by Pfannenberger. Freight charges for delivery to one of our manufacturing facilities must be pre-paid.

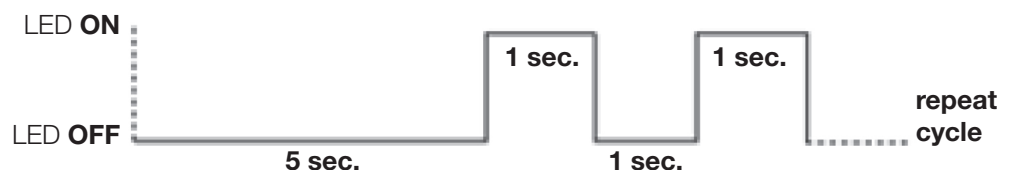
6 : TROUBLESHOOTING

Fault	Possible causes	Corrective measures
Unit does not cool; evaporator fan (internal) running	Temperature setting too high	Check the temperature setting
Unit does not cool sufficiently	Operating limits exceeded	Check the ambient temperature and internal load
	Too little coolant	Call in authorized qualified personnel; check the unit for leakage
	Heat exchanger dirty	Clean the heat exchanger
	Evaporator fan (internal) defective Condenser fan (external) defective	Call in authorized, qualified personnel; replace fan
	Disruption in the air circulation inside the cabinet	Check the installation and the path of air circulating in the switch cabinet
		Check the supply and outlet flow of air of the cooling unit to the inlet and outlet opening of the switch cabinet
Excessive Condensation is accumulating inside of the switch cabinet	Temperature setting is too low	Check the temperature setting
	Switch cabinet is not sufficiently sealed	Check that electrical enclosure is properly sealed
Condensate fails to drain	Condensate drain is clogged	Clean condensate drainage hose; ensure that drainage hose is angled downward without bending

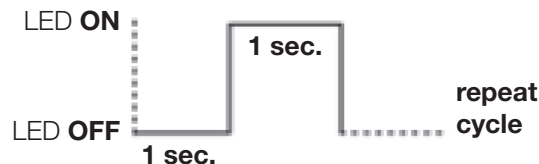
6.1 : LED STATUS SEQUENCES (BEFORE 09/2022 - ALL VOLTAGES --- AFTER 09/2022 - 115/230V ONLY)

Unit Characteristics	Technical causes	Fault Remedy
Compressor: ON Internal Fan: ON External Fan: ON Status LED: Sequence 3 Fault signal contact: Open	The unit is currently in test mode. On start-up of the unit it goes through a 60 second test mode. During the first 30 seconds only the LED is going through Sequence 3. After 30 seconds All fans and compressor kick on for 30 seconds	Unit just received power and is going through test mode. No remedy is needed
Compressor: OFF Internal Fan: OFF External Fan: OFF Status LED: Sequence 1 Fault signal contact: Closed	Door switch is open. Either X54 connector's 3 and 4 are not jumpered together or switch cabinet's door is open	Jumper 3 and 4 on the X54 connector or close the door that the unit is connected to
Compressor: OFF Internal Fan: ON External Fan: OFF Status LED: Sequence 2 Fault signal contact: Open	High pressure switch or motor protection switch has opened (overheating). Compressor will automatically switch on again 30 seconds after it has cooled.	Clean filter mat or heat exchangers to ensure air can freely flow through. Possible check heat dissipation in the switch cabinet to make sure properly sized unit is being used.
Compressor: ON Internal Fan: ON External Fan: ON Status LED: Sequence 1 Fault signal contact: Open	The temperature inside of the switch cabinet has gone above set alarm temperature (see section 2.4.2).	Clean filter mat or heat exchangers to ensure air can freely flow through. Possible check heat dissipation in the switch cabinet to make sure properly sized unit is being used.

Sequence 1: (User Error)



Sequence 2: (Unit Fault)



Sequence 3: (Test/start-up mode)



6.1 : LED STATUS SEQUENCES (AFTER 09/2022 - 460V ONLY)

The error numbers are not displayed in units with Standard Controllers. Using the ECoolPLANT software, it is possible to read out the error numbers on the computer

NOTE: Flashing of the **red LED light** on the controller card is not a fault indication or error message. The red LED light indicates that the cooling unit is carrying voltage.

Error no.	Fault/Unit Behavior		Possible causes	Corrective measures
Er00	LED:	flashes	Door contact: The door contact circuit is interrupted.	Close the door. Connect the door contact switch. Bridge the door contact. Check wiring.
	Compressor:	OFF		
	Evaporator fan (internal):	OFF		
	Condenser fan (external):	OFF		
	Fault signal contact:	closed		
Er01	LED:	flashes	Pressostat tripped: Too high pressure in the refrigeration circuit. The cooling unit cannot dissipate the heat from the refrigeration circuit.	Let the unit cool down. Clean the fins of the heat exchanger (internal/external). Check the function of the condenser fan (external).
	Compressor:	OFF		
	Evaporator fan (internal):	ON		
	Condenser fan (external):	OFF		
	Fault signal contact:	Open		
Er04	LED:	flashes	Phase sequence/phase failure: Failure of at least one phase or phase sequence is wrong (only in three-phase units with cam compressors).	Check field of rotation - (right-hand field of rotation is mandatory). All phases must carry rated voltage.
	Compressor:	OFF		
	Evaporator fan (internal):	OFF		
	Condenser fan (external):	OFF		
	Fault signal contact:	Open		
Er05	LED:	flashes	Sensor 1 (TS1) defective	Sensor 1 (TS1) defective. According to the unit type, replace sensor 1 (permanently soldered on the controller card) or the complete controller card.
	Compressor:	ON		
	Evaporator fan (internal):	ON		
	Condenser fan (external):	ON		
	Fault signal contact:	Open		
Er07	LED:	flashes	Sensor 1 Maximum: Maximum value of the switch cabinet temperature "Lit" (display) is reached or exceeded. The cooling unit cannot cool the air in the switch cabinet sufficiently.	Check settings of the cooling unit. Clean the fins of the heat exchanger (internal/external). Check the function of the evaporator fan (internal). Check the refrigeration circuit for spilled refrigerant or leakage. Install a cooling unit with a higher cooling capacity if necessary.
	Compressor:	ON		
	Evaporator fan (internal):	ON		
	Condenser fan (external):	ON		
	Fault signal contact:	Open		

Tab. 11: Possible error messages

6.1 : LED STATUS SEQUENCES (AFTER 09/2022 - 460V ONLY)

Error no.	Fault/Unit Behavior		Possible causes	Corrective measures
Er08	LED:	flashes	Sensor 2 (TS2) defective.	Replace sensor 2 according to the unit type. Sensor 2 is plugged to the card, not permanently soldered.
	Compressor:	ON		
	Evaporator fan (internal):	ON		
	Condenser fan (external):	ON		
	Fault signal contact::	Open		
Er15	LED:	flashes	Antifreeze (option): Antifreeze-Sensor $\leq 1^{\circ}\text{C}$. Safety cut-out because the evaporator is threatening to ice up.	Restart operation after condensate has evaporated. A restart is only possible by disconnecting and reconnecting the mains voltage. No other reset is provided for safety reasons. Clean the fins of the heat exchanger (internal/external). Check switch cabinet for leakages. Select a higher switch cabinet temperature setpoint. Check the evaporator fan (internal) function.
	Compressor:	OFF		
	Evaporator fan (internal):	OFF		
	Condenser fan (external):	OFF		
	Fault signal contact:	Open		

Tab. 11: Possible error messages (continued)



7 : ACCESSORIES

Item Number	Designation	Item Number	Designation
18881500008	Filter Kit DTS 3021/3031	18881500010	Filter Kit DTS 34x1, 34X1C, 36X1C
18881500005	Filter Kit DTS3041/3061	18881500004	Filter Kit DTS 36x1
18881500009	Filter Kit DTS 31x1	18314000100	Condensate Bottle All Units
18380000025	Filter Kit DTS 31x1 SL / 31x5	18314000001	External Condensate Evaporation System-KV PTC, 115 230 V 50/60 Hz
18881500001	Filter Kit DTS 32x1		
18881500007	Filter Kit DTS 32x5		

Note: Always specify the Pfannenber part numbers when ordering spare parts and accessory parts.

8 : TERMS OF WARRANTY

The warranty does not apply or is voided in the following cases:

- Improper use of the unit.
- Failure to observe operating conditions or disregard of the operating manual.
- Lack of regular maintenance on the cooling units.
- Damage due to disregard of maintenance recommendations.
- Damage to cooling units due to soiled or clogged filters.
- Damage due to unauthorized opening of the refrigerant circuit.
- Modifications carried out on the unit or a change to the serial number.
- In the event of damage during transport or other accidents.
- Replacement of parts by unauthorized personnel.
- Only original Pfannenber parts are permitted for use. Violations void the warranty.

For recognition of warranty claims and return of the unit, observe the following:

- Provide an exact description of the defect and the SRO (RMA) numbers specified by Pfannenber with the cooling unit.
- Include a reference document (delivery note or invoice copy).
- Forward the cooling unit to us, complete with all accessories, in the original box or in comparable packaging with freight and transport insurance pre-paid.
- Observe transport instructions; see [Transport](#).

9 : DISMANTLING AND DISPOSAL

The unit must be dismantled and disposed of in an environmentally friendly way at the end of its useful life.



Units marked by the symbol opposite may not be disposed of with unsorted domestic waste. They must be taken to a separate electrical and electronic waste collection depot. For further information about disposal, scan the QR code or call www.pfannenberg.com/disposal.

9.1 Safety information

All work may only be performed by persons with certified qualifications under consideration of:

- the minimum qualification
- this manual
- the valid local regulations and laws
- company-internal work, operation and safety regulations

Use the necessary personal protective equipment for the respective activity for all work.



DANGER

Danger of fatal injury due to electric shock!

Parts may be under voltage when the unit is opened and can cause an electric shock if touched. Observe the following points when working on the open unit:

- Work on the electrical system may only be carried out by authorized electricians.
- Before commencing work on the electrical system, switch off the power supply, check that no voltage is applied and secure against being switched back on.
- Cordon off the working area and post a warning sign.
- The electrical connection must be made according to nationally valid regulations.



CAUTION

Risk of cutting and injury!

Risk of cutting and injury due to production-related, sharp sheet metal edges on the unit.

- Use personal protective equipment (cut-proof gloves).
- Handle with care.



CAUTION

Risk of injury due to improper working!

Risk of injury due to improper working on the refrigeration unit.

- The refrigeration unit may only be dismantled by specialized refrigeration companies.



NOTICE

Hazards for the environment

Refrigerants are harmful to the environment as soon as they escape into the atmosphere.

- Only have work on the refrigeration unit carried out by experts in accordance with the chemicals climate protection directive.
- Do not damage refrigerant lines.
- Pass on refrigerants for professional treatment.

NOTE: Dismantling and disposal are to be carried out by the owner or persons authorized by him.

Contact the local authorities or special disposal companies for information on issues of environmentally friendly disposal.

9.2 Dismantling

All work may only be performed by persons with certified qualifications under consideration of:

- the minimum qualification
- this manual
- the valid local regulations and laws
- company-internal work, operation and safety regulations

Use the necessary personal protective equipment for the respective activity for all work.



DANGER

Danger to life due to electric shock. Make sure that the unit is voltage-free.

Procedure

1. Switch off the unit, secure against switching back on and wait until all parts have a temperature below 40 °C.
2. Physically disconnect all energy and media supplies from the unit, discharge stored residual energy.
3. Clean dirt and contamination from the unit.
4. Remove operating and auxiliary materials and dispose of them in an environmentally friendly way.
5. Dismantle the unit into the different separable materials.
 - Observe the valid work safety and environmental protection regulations.

9.3 Disposal

NOTE: Old units are also professionally disposed of by Pfannenber. Delivery to one of our manufacturing facilities shall be free of charge.

Dismantled components should be recycled unless return or disposal agreements have been made:

- Scrap metals
- Hand over plastic elements for recycling
- Dispose of other parts sorted according to their material properties



NOTICE

Hazards for the environment

Improper disposal of chemicals (e.g. additives) can cause environmental pollution.

- Chemicals must not be thrown in with the domestic trash and must not be allowed to get into the sewer system or ground.
- Wear appropriate protective clothing (gloves, eye protection, etc.) for disposal.
- Dispose of the used chemicals (as special waste if necessary) and pass on for recycling separately.
- Refrigerants may not escape into the atmosphere. Pass on refrigerants for professional treatment.
- Work on the refrigeration circuit may only be carried out by experts in accordance with the chemicals climate protection directive.
- Observe safety data sheets as well as valid national and local regulations.

The components of the plant or the unit basically consist of the following materials:

- plastic
- non-ferrous metals
- stainless steel
- steel and aluminum parts
- electronic sub-assemblies
- refrigerants in the refrigeration circuit (type and amount, see section "Refrigeration circuit", Page 22)

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All information contained was thoroughly checked in 2023.
However, we make no guarantee as to the completeness and correctness of the specifications.

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