ASSEMBLY INSTRUCTIONS FOR WATER/AIR SPLIT COOLING SYSTEM 12 kW / 17 kW / 20 kW

GDD – Part Numbers	Siemens – Part Numbers
2NK6746W	10589726
2NK67451W	10430821
2NK67451A	10743384
2NK6745S	07741577
2NK6751W	11331491

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This document was drawn up by the Technical Documentation Department of Glen Dimplex.

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1 FOR YOUR SAFETY

1.1 Regulations

The design, construction and development of the process cooler are in compliance with the following national and international regulations.

Directives / Standards
- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- Pressure Equipment Directive 2014/68/EU
- RoHS Directive 2011/65/EU

1.2 Signs and Symbols

Throughout this manual, the information and notices below are identified by graphical symbols:

Graphical Symbols

Danger!

Safety note pointing out an imminent danger. Failure to heed the warning may result in serious bodily injury and even death.

Caution!

Safety note to indicate the presence of a potential hazard. Failure to heed the safety notice may result in minor bodily injury or damage to the equipment.

Information!

This symbol identifies important information or a useful tip concerning the application of the equipment.

- Listing

This symbol identifies an enumeration or listing.

1.3 Safety Notices

For the installation, operation and maintenance of the process cooler, the following regulations and safety notices have to be observed:

- Any work on the process cooler may only be performed by qualified personnel.
- All relevant accident prevention regulations have to be observed

- The appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.
- Do not allow anybody to stand or pass underneath the forks when lifting and setting down the process cooler; stay clear of the danger area.
- The process cooler must be properly secured in order to prevent it from tipping over.
- The safety devices must not be deactivated.
- The electro-technical connections of the process cooler must be performed according to and conforming with all relevant VDE, EN and IEC standards. Beyond that, the technical connection requirements of the local electrical utility company have to be observed.
- Do not attempt to perform any work unless the power supply to the process cooler has been disconnected.

- Specific regional or national provisions applicable in the country where the unit will be installed must be adhered to.
- The closed refrigeration circuit contains refrigerants and refrigeration oil. These must be properly disposed of when performing service work or placing the unit out of service (environment).
- Anyone working on the refrigeration circuit must wear personal protective equipment.
- The process cooler is to be used exclusively for the cooling of air in accordance with predefined specifications.

1.4 Handling of Refrigerant

When handling refrigerants, all legal provisions and guidelines must be complied with. Only qualified personnel may perform these activities.

The operator of the process cooler is responsible for the proper disposal of used refrigerants and system parts.

1.5 Safety Requirements

Safety requirements concerning the operation of refrigeration systems within the European Union.

The following information applies to refrigeration systems with closed refrigeration cycles that are used within the European Union. In some member states additional requirements may apply, e.g. due to environmental considerations.

In these refrigeration units working pressures occur that are subject to the regulations laid down in the Pressure Vessel Directive 97/23/EC and European standard EN 378 (Parts 1 – 4, version September 2000).

Apart from the requirements relating to the design, equipment and testing of the refrigeration systems prior to delivery to the customer, also the operator of such systems has to comply with requirements in accordance with European standard EN 378 and/or additional national regulations. These concern the installation, the operation and regular testing of refrigeration systems.

1.5.1 Installation

If the process cooler is installed below ground level or on upper floors of a building, without any adequate number of emergency exits, installation site requirements relating to the protection of people in accordance with EN 378 have to be complied with.

With respect to the actual refrigerant charge of the process cooler, a minimum room volume must be maintained and not be fallen short of.

Process Cooler	Refrigerant	m³
Cooling system 12 kW	134a	12
Cooling system 17 kW	134a	12
Cooling system 20 kW	134a	12

Minimum room sizes in [m³] are required for the installation of refrigeration units, depending on the refrigerant being used.

It can thus be ensured that in the case of refrigerant leaks caused by damage to the equipment - and thus the displacement of oxygen - will not have any detrimental effect on the health of people.

1.5.2 Operation

The owner and/or the operator of the process cooler is obligated to establish emergency practices (in the case of accidents and malfunctions). A short version of the operating instructions must be drawn up by the operator – based on this present Operating Manual – and made known to the employees.

The quick reference guide must be clearly legible and affixed in the immediate vicinity of the process cooler.

See Sample Quick Reference Guide.

The owner and/or operator of the system is obligated to keep a logbook for the process cooler.

The system logbook must either be available on site near the process cooler, or in the event that the data are stored in a computer of the owner or operator, a printout of the log must be kept in the vicinity of the process cooler. It must be ensured that these data are accessible to qualified persons for the performance of repairs and regular inspections/tests.

See Sample System Log

1.5.3 Regular leakage checks

The chiller contains fluorinated greenhouse gases listed in the Kyoto-Protocol. Chillers with one (1) compressor are performed as hermetically sealed system.

The operator is obliged to subject the cooling unit to regular leakage checks.

1.5.4 Regular Inspections and Tests

To ensure compliance with minimum safety and health requirements as set forth in standard EN 378, regular testing (routine inspections) of the process coolers must be carried out by competent personnel.

The operator is responsible for the performance of these periodic tests.
(See Chapter Regular Inspections and Tests).

1.6 Purpose of the Process Cooler

The process cooler described in this manual is designed exclusively for the cooling of Siemens Computer Tomographs (CT scanners) within the specified operating temperature limits.

2 DESCRIPTION OF THE PROCESS COOLER

The 12 kW water-/air split cooling system, 17 kW water/air split cooling system and the 20 kW water/air split cooling system are water-cooled chillers, ready for plug-in, in split-design incorporating a refrigeration circuit and cooling water circuits including all fittings and regulating/control devices required for automatic operation. The process cooler consists of an indoor unit with an active refrigeration circuit. The waste heat of the refrigeration circuit and/or the CT scanner is dissipated to the atmosphere through an air-cooled outdoor unit.

2.1 Refrigeration Circuit

The refrigeration circuit is a closed-loop system in which the refrigerant circulates as the working medium.

The water heated by the equipment to be cooled is recooled in the evaporator. In so doing, the liquid refrigerant flows in a counter-flow direction with respect to the water. The refrigerant evaporates as it absorbs heat from the cooling water heated by the equipment being cooled.

The refrigerant is now in a gaseous state and is drawn in and compressed by the compressor (rise in pressure and temperature). The refrigerant also absorbs the heat of the compressor motor; this heat is given off as waste heat to the cooling water circuit by the condensing unit.

The refrigerant is liquefied in the process and is passed to the inlet of the expansion valve via the liquid receiver, the shut-off valve and the filter drier. The expansion valve permits liquid refrigerant to enter the evaporator as a function of temperature.

The cycle is now complete.

2.2 Cooling Water Circuit

Primary Circuit
The heat produced upon cooling the water and to be given off in the evaporator, as well as the heat of the compressor motor are absorbed by the refrigerant and given off, in the condenser, to the cooling water circuit. The condensing pressure in the refrigeration circuit is kept constant by means of the pressure-controlled water regulation valve in the cooling water circuit.

Secondary Circuit
The heat of the equipment to be cooled (CT scanner) is dissipated via the secondary circuit and given off to the refrigeration circuit. The cold water temperature is kept constant at a defined flow temperature.

2.3 Electrical / Control Equipment

The E-box is located behind the front door on the operating side.
For the electrical connection, an all-pole disconnecting device with a contact gap width of at least 3 mm (e.g. power contactor, mains switch, or residual current circuit-breaker, if required) needs to be provided on-site. The technical requirements laid down by the relevant power supply company must be adhered to.

The power ratings of the system parts are shown on the rating plates of the individual system components. Earth, communication and power supply cables are to be installed separately. The wires enter the E-box from below.

3 TECHNICAL DATA

Type	Cooling system 12 kW	Coolingsystem 17 kW	Cooling system 20 kW
GDD part number	2NK6746W	2NK67451W	2NK6751W
Siemens part number	10589726	10430821	11331491
Net cooling capacity	12 kW	17 kW	20 kW
Voltage	3x 400V/50Hz / 3x 460-480V/60Hz		
Max. current consumption	19 A	23 A	
Max. electr. power input (50Hz)	10kW	12 kW	
Max. electr. power input (60Hz)	13 kW	15 kW	
Weight	410 Kg	413 Kg	416 Kg
Rated flow rate, primary circuit	2,7 m³/h		
Rated flow rate, secondary circuit	2,5 m³/h		
Rated temperature, secondary circuit	14 °C +1K / -2K		
Outside temperatures	-25°C to +50°C		
Outside temperatures with flow heater	-40°C to +50°C		
Installation area volume, indoor Unit	min. 12m³		
Maximum installation height:	2000 m (3000 m at max. ambient temperature of 40°C)		
Maximum operating pressure against closed slide valve (primary and secondary circuits)	3,0 bar (Pressure can be read off the pressure gauge on the unit)		

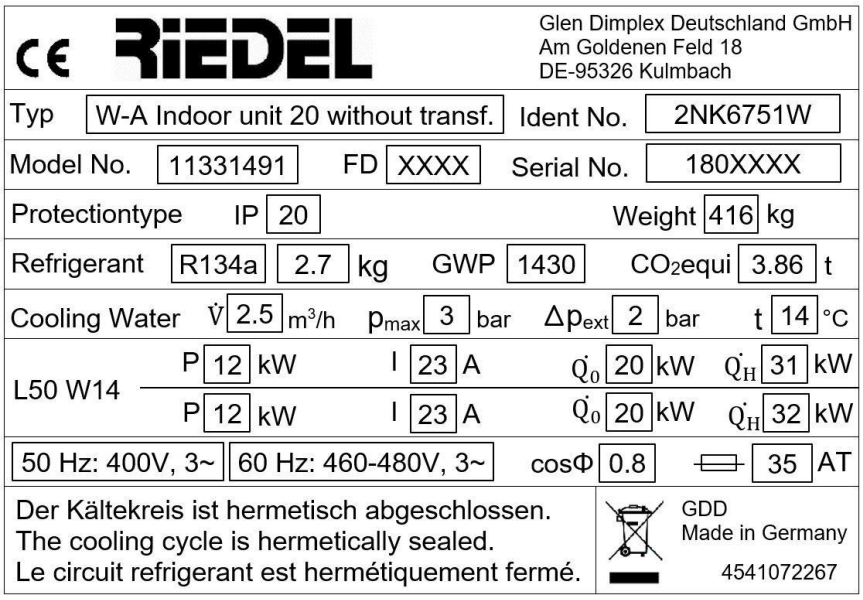


Figure 1: Example rating plate

4 TRANSPORT AND STORAGE

The safety notices contained in Chapter 1 must be complied with!

Additional safety notices in Chapter 4.4.

Caution: The Indoor-unit has a high center of gravity. Tilting of the device should be avoided if possible!

Incorrect use of unsuitable lifting equipment poses a risk of injury. Risk of falling and crushing!

During the transport, people are only permitted outside of the danger area.

Internal transport of the device can be carried out on the extendible rollers of the device or with a forklift truck or lift truck with the rollers retracted. The Transport on the extendible rollers must be pared down to the minimum.

The device must be transported on a smooth, even and horizontal substrate to prevent the device from tipping. If this is not possible, suitable safety measures must be taken to ensure safe transport. To get over minor inclines, it is essential to ensure that the device is only transported in longitudinal direction (see the following image). The cooling unit must be set down on an even, horizontal surface to prevent the lower frame from deforming.

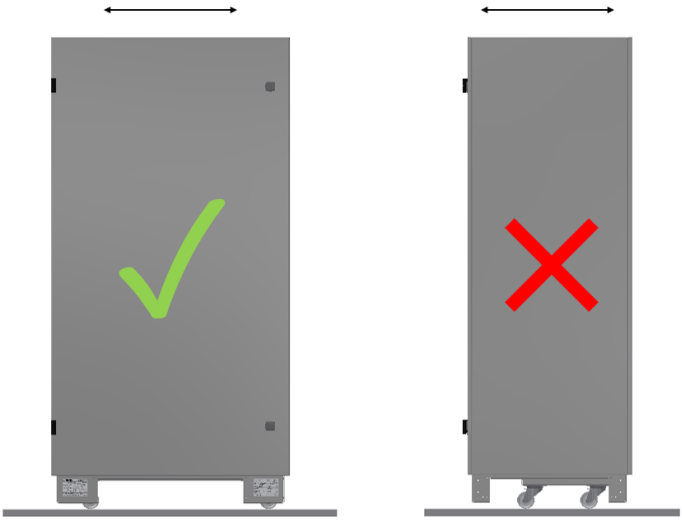


Figure 2: Left - correct transport in longitudinal direction,
Right - incorrect transport with risk of tipping

4.1 Transport Specifications

- Weight	see Technical Data
- Main Dimensions	see Appendix
- Ambient temperatures	-25 °C to + 50 °C
- Relative humidity	0 % to 95 % rel. humidity
- Air pressure	70 -106 kPa

4.2 Indoor Units 2NK6746W (10589726), 2NK67451W (10430821) and 2NK6751W (11331491)

The indoor unit of the split cooling system is designed exclusively for installation in enclosed and sheltered areas. The unit must not be installed outdoors as it cannot be guaranteed that the unit will function properly there (temperature effect, tightness of the housing).
The surface must be even, level and horizontal. For the installation of the „Seismic-Kit“ an additional hole needs to be drilled into the ground.
(see Installation Instructions, GDD number 454107.66.02).

To guarantee proper accessibility for the performance of maintenance and service work, the following minimum clearances need to be maintained:

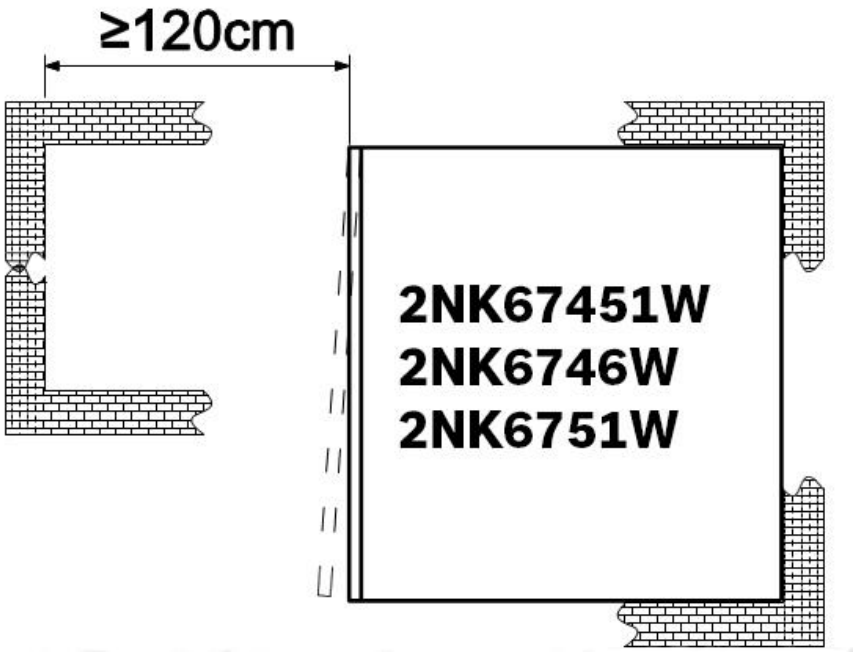


Figure 2: Min. distances

4.3 Outdoor Unit 2NK67451A (10743384)

The cooling unit is to be installed outdoors and there may be a height difference of ± 20 m between the outdoor and the indoor units. The surface must be even, level and horizontal. The direction of the air flow is from the bottom to the top.

Make sure that the air inlet and air outlet are not obstructed as otherwise it cannot be guaranteed that the entire cooling system will function correctly.

The operating side must be kept clear for minimum 1.2 m to ensure proper access for connecting, operating and any possible servicing activities.

A cover for the outdoor unit is also recommended, as snow or ice (frozen rain) can temporarily block the fans.

4.4 Installation

Extensible caster wheels are provided for transporting the unit inside the building to the installation site. The casters can be retracted and extended by means of hexagon screws.

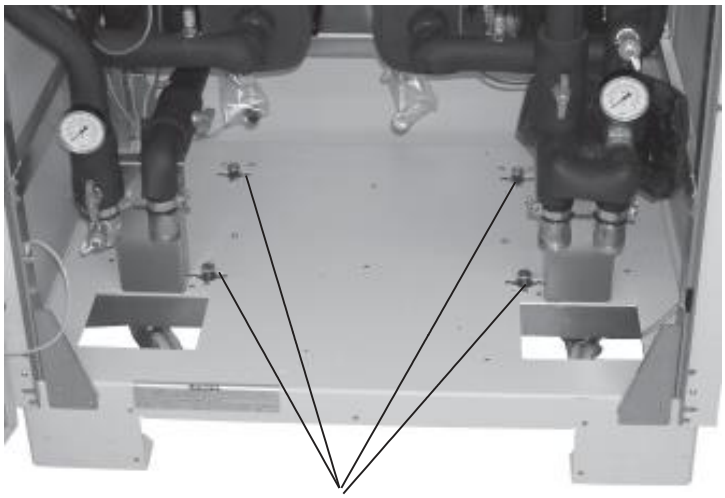


Figure 3: Caster wheels adjustment

The caster wheels are not suited for general transport of the unit on very uneven or rough surfaces as this may result in damage to the wheels!

The device **must not be tipped** in general during the transport. If it is still necessary, **suitable safety measures** must be taken to secure the device.

In principle, the load of the device must always be transported in a way, that the transport equipment is facing the gradient of the road.

The maximum tilt of the device is 45° (>45° leads to damages of the main components of the device).

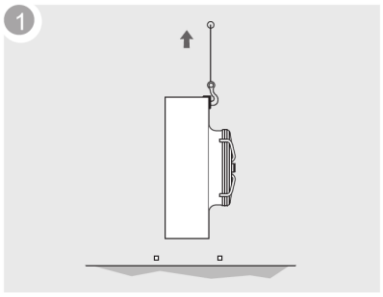
Wear protective gloves!

How to open the wooden box:
Remove the screws from the top by means of a cordless screwdriver first. Pull side panels apart. Use a crow bar if necessary.

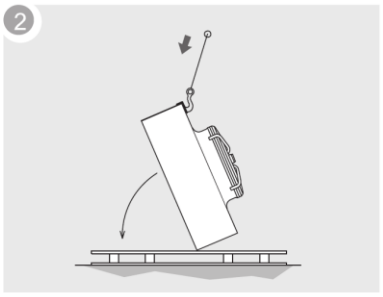
Remove all mounting brackets:

Figure 4: Mounting brackets

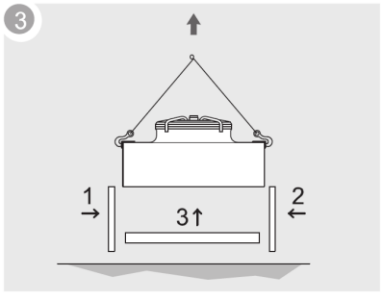
Erecting and transport via crane:



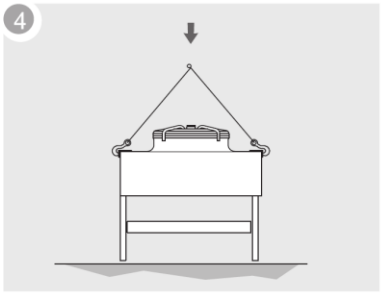
Remove the top, side, front and back panels of package, hook model to lifting brackets and lift it.



Hook model at lifting points, elevate it and mount the support legs supplied (1-2-3).



Place the model on two wooden beams then position it to the desired configuration.



Transfer model to installation site, secure it in position with adequate fastening screws.

Figure 5: taken from original manual KCE1502A04P_M by Luvata

Erecting and transport without crane:

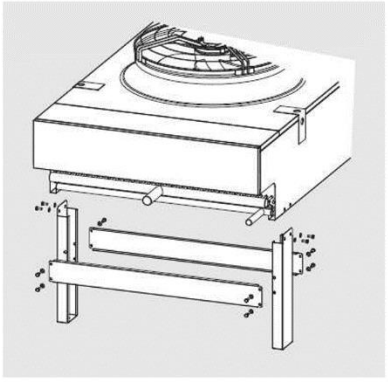
1

Remove both wooden blocks without removing/damaging the felt cover.

2

Move unit for attaching the support legs.

Mounting support legs:



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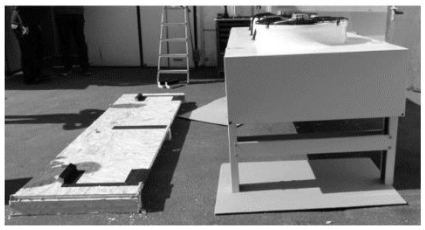


Figure 6: taken from original manual KCE1502A04P_M by Luvata

Tilt unit on the support legs. Fasten support legs at final position.

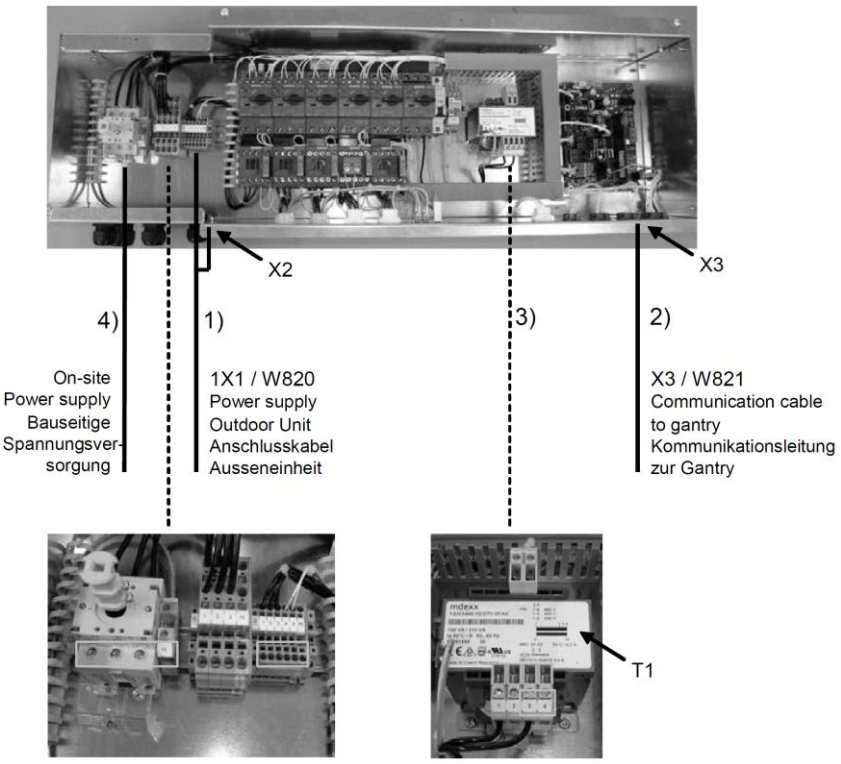
5 Assembly

The safety notices contained in Chapter 1 must be complied with!

5.1 Electrical Connection

The following electrical connections need to be made:
1) Connect power supply cable W820 to outdoor unit
2) Connect communication cable W821 to gantry
3) Check connection of control-power transformer
4) Connect process cooler to on-site power supply

Connecting the cables of the indoor unit / E-Box
Anschlüsse der Inneneinheit an der E-Box



1) Connect power supply cable to outdoor unit W820 to 1X1
(wire/clamp: 1/1, 2/2, 3/3, 4/4, 5/5, GNYE/PE)
Protective earth connection to X2 – earth bolt
2) Connect communication cable to gantry W821 to X3
3) Check connection transformer T1
(black wire between 1-3 at 50Hz; 1-4 at 60Hz)
4) Connect on-site power supply
(wire/clamp: L1/T1, L2/T2, L3/T3, GNYE/PE)

1) Anschluss des Anschlusskabels Ausseneinheit W820 an 1X1
(Ader/Klemme: 1/1, 2/2, 3/3, 4/4, 5/5, GNYE/PE)
Schutzleiterverbindung am Erdungsbolzen X2
2) Anschluss der Kommuniktionsleitung zur Gantry W821 an X3
3) Prüfen des Anschlusses des Steuertransformators T1
(Anschluss 1-3 bei 50Hz; 1-4 bei 60Hz)
4) Anschluss der bauseitigen Spannungsversorgung
(Ader/Klemme: L1/T1, L2/T2, L3/T3, GNYE/PE)

5.2 Hydraulic Connection

The connections for the primary and secondary circuits are located in the lower section of the indoor unit. When making the hydraulic connections, the hoses supplied with the unit must be used.

The mounting instructions supplied with the hoses and hose clamps must be observed. The hoses must also be neither kinked, twisted nor routed over sharp edges. The minimum bending radius of 320 mm specified by the manufacturer should also be observed.

Cutouts in the base plate are provided through which the two hose pairs are passed. The connections are accessible from the operating side (front side) of the indoor unit. The connections on the right-hand side (indoor unit <=> outdoor unit) are intended for the primary circuit and those on the left-hand side for the secondary circuit (indoor unit <=> gantry).

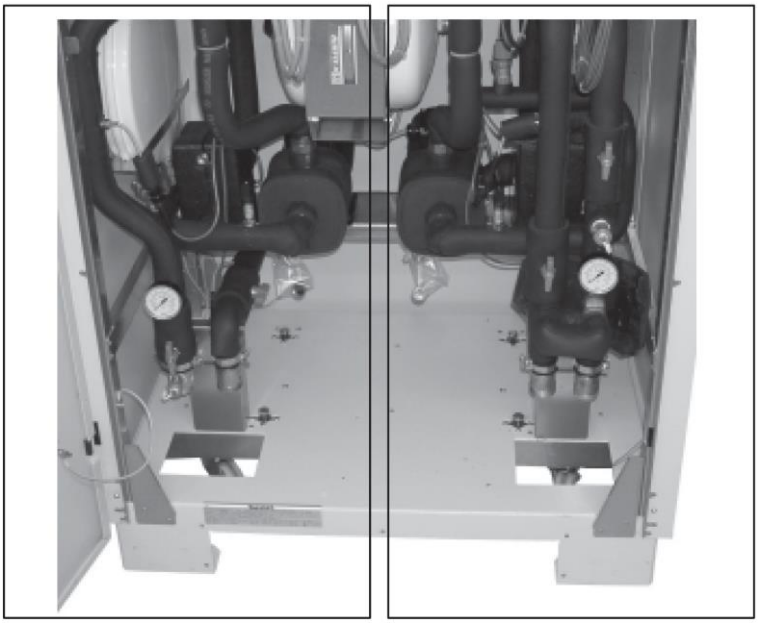
After connecting the hose sets fill the system according 5.3.1.

The safety valve opens when the safety valve threshold pressure is exceeded (if the threshold pressure is fallen short of, the safety valve closes automatically) and the medium is able to escape.

The primary circuit may only be filled with the water-glycol mixture included in the scope of supply. The secondary circuit can be filled with water in drinking water quality in consultation with the responsible Siemens Project Manager.

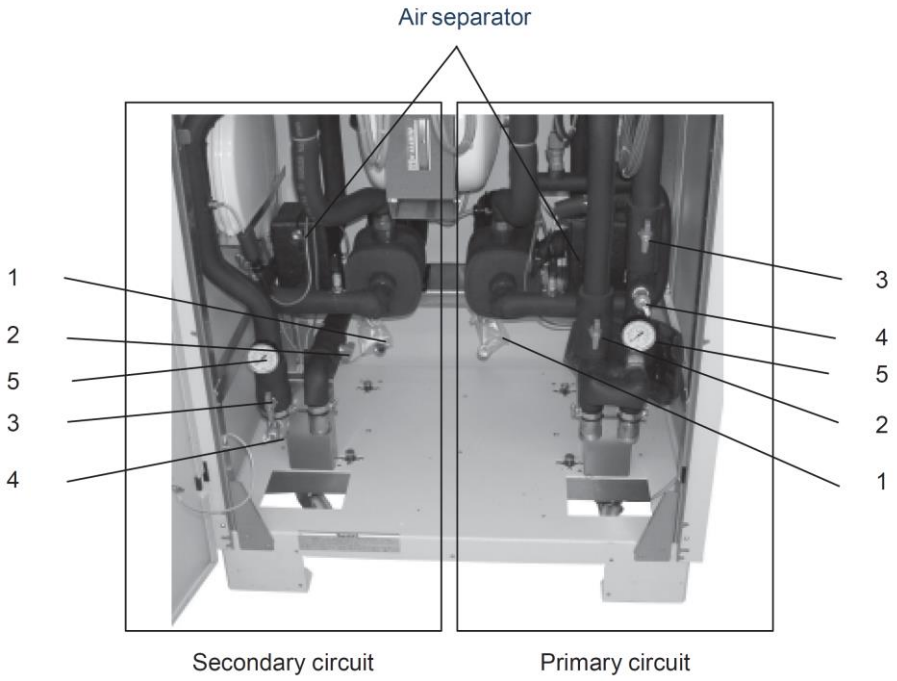
Minimum requirement for the water quality of the secondary circuit:

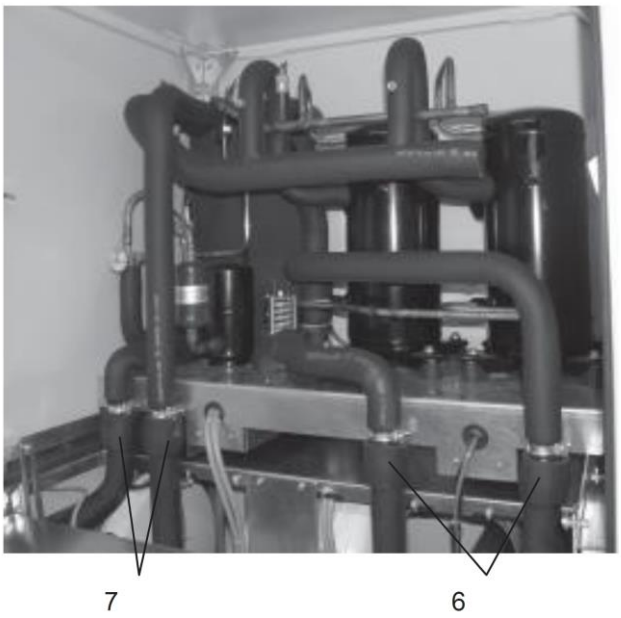
- Max. chlorine concentration 200 ppm
- Max. sulphate concentration 200 ppm
- pH value 6-8; <14 degrees of German hardness (corresponds to 250 ppm calcium carbonate)



Secondary circuit Primary circuit

5.3 Commissioning





5.3.1 Filling Both Cooling Circuits

Do not start filling the cooling circuits until the individual components have been incorporated as specified. Only genuine hoses are to be used in accordance with specifications.

We recommend the use of GDD fill pump sets (order number 4518109031).

Step	Primary Circuit	Secondary Circuit
1 of 12	Connect the pressure hose of the fill pump to the fill and drain valve (1) of the cooling circuit pump.	Connect the drinking water pressure hose to the fill and drain valve (1) of the cooling circuit pump. (Specifications per the Siemens Planning Guide to be used / any national laws concerning the Drinking Water Ordinance must be complied with)
2 of 12	Submerge the suction hose of the fill pump in the canister containing the water/glycol solution (the supplied water/glycol solution must be used).	Not applicable
3 of 12	Close ball valve (3) and open ball valve (2).	
4 of 12	Connect a flushing hose (use a transparent hose, if possible) to the fill and drain valve (4) and also place this hose either into an empty canister or into the canister containing the water/glycol solution. Open the fill and drain valve (4). **Caution:** Do not allow the water/glycol solution to get into the sewer system!	Connect a flushing hose (use a transparent hose, if possible) to the fill and drain valve (4) and place this hose into an empty vessel. Open the fill and drain valve (4).
5 of 12	Turn on the fill pump and slowly open the fill and drain valve (1) to prevent pressure shocks (water hammer) from occurring.	Open on-site drinking water supply line and then slowly open the fill and drain valve (1) to prevent pressure shocks (water hammer) from occurring.
6 of 12	To change the canister, slowly close the fill and drain valve (1) and immediately turn off the fill pump. The circuit is completely filled once filling medium flows back through the flushing hose. **Note:** In case medium emerges directly from the flushing port (4), check the 3-way valve (P&I flow diagram, part 22) at the outlet – manual switchover from bypass to two-way (see Fig. On page 17) **Caution:** The circuit must now be properly flushed (3-10min). The amount of time required for this procedure may vary depending on the hose length and the installation height difference. The more thoroughly the circuit is flushed, the earlier will the system be free of air and ready for operation.	The circuit is completely filled once the filling medium flows back through the flushing hose. **Caution:** The circuit must now be properly flushed (3-10min). The amount of time required for this procedure may vary depending on the hose length and the installation height difference. The more thoroughly the circuit is flushed, the earlier will the system be free of air and ready for operation. Inadequate rinsing and associated venting can cause damage to the pump.

	Inadequate rinsing and associated venting can cause damage to the pump.	
7 of 12	Once the medium flows out of the flushing hose with almost no air bubbles, close the fill and drain valve (4) as well as the flushing hose outlet and open valve (3).	
8 of 12	Any remaining air will be removed from the system via the air separator.	
9 of 12	A filling pressure of 3 bar. The fill pump may have to be turned on again and the fill and drain valve (1) opened until this pressure is reached, or else, the pressure needs to be relieved via the fill and drain valve (4). Turn off the fill pump and/or close the fill and drain valve(s) (1) & (4).	A filling pressure of 2 bar. To reach this pressure it may be necessary to continue filling the circuit via the fill and drain valve (1), or else to relieve the pressure via the fill and drain valve (4). Close fill and drain valves (1) & (4).
10 of 12	Activate the power supply. - Activate all motor protecting switches [Q1-Q6] and circuit-breaker F1 - Turn on main switch Q1: Outdoor Unit Q2: Compressor 1 Q3: Compressor 2 Q4: Secondary pump Q5: Primary pump Q6: Control-power transformer F1: Control circuit After an initialisation period of approx. 2 minutes, the cooling water pumps will start operating. Any air that may still be trapped in the circuit will be removed by the air separator. Should this cause the operating pressure to fall below the recommended pressure of 2bar or 3bar ±0.2bar, step 9 has to be repeated.	
11 of 12	Now disconnect the fill pump from the cooling system and screw the protective caps back on the fill and drain valves (1) & (4).	Screw the protective caps back on the fill and drain valves (1) & (4).
12 of 12	The cooling system is now ready for operation.	

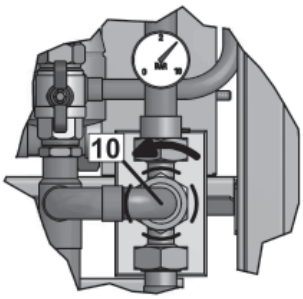


Figure 7: Direction of rotation of actuator handwheel

5.3.2 Draining Both Cooling Circuits

Do not drain the system before the unit has been switched off and disconnected from the power supply!
Do not allow the water/glycol solution to get into the sewer system!
Prior to opening the fill and drain valves make sure that the emerging cooling medium can be disposed of in a way that no damage to the unit and the connected components can occur!

Step	Primary Circuit	Secondary Circuit
1 of 8	Turn off cooling system using the main switch and take proper lock-out measures.	
2 of 8	Close ball valve (2)	
3 of 8	Connect suitable transparent hoses to the fill and drain valves (1) & (4) and submerge them in a canister. **Caution:** The water/glycol solution must not be disposed of in the sewer system!	Connect suitable transparent hoses to the fill and drain valves (1) &(4) and submerge them in a canister.
4 of 8	Open the fill and drain valves (1) & (4)	
5 of 8	Carefully open the screwed connections (6) Carefully open the screwed connections (7) once no more liquid emerges. **Caution:** Do not open the connections completely until the circuit has been completely drained.	Nachdem keine Flüssigkeit mehr austritt, sind die Schraubverbindungen (7) vorsichtig zu öffnen. **Caution:** Do not open the connections completely until the circuit has been completely drained.
6 of 8	Once no more liquid emerges at the fill and drain valves (1) & (4), re-close the ball valves (2) & (3) just like all the other fill and drain valves.	
7 of 8	The hose connections can now be removed from the unit.	
8 of 8	**Caution:** It is possible that minor residues of the cooling medium are still present in the system!	

6 ENVIRONMENTAL REQUIREMENTS

When repairing or placing the process cooler out of service (decommissioning), the environment-relevant requirements regarding recovery, reuse and disposal of fuels/oils and components according to DIN EN 378 have to be complied with.

The operator of the process cooler is responsible for the proper disposal of used fuels, oils and system components.

7 MAINTENANCE

The safety notices contained in Chapter 1 must be complied with!
Always disconnect the process cooler from the mains power supply before attempting to open the cabinet!

No specific refrigeration technology knowledge is required for the performance of maintenance activities. This work can be carried out by a properly trained person with appropriate knowhow.

Component	**Interval**	**Activity**
Process cooler in general	see Siemens Service Instructions	- Visual inspection of processcooler for contamination - Visual inspection of refrigeration circuit for leaks - In the case of oil leaks call Siemens Customer Service
Water circuit in general	see Siemens Service Instructions	- Visual inspection of the water circuit for leaks - Check water level, refill
Cooling water circuit in general	see Siemens Service Instructions	- Visual inspection of the water circuit for leaks
Expansion vessels	annually	- Check and adjust the filling pressures of the expansion vessels acc. to DIN EN 12828

8 REGULAR INSPECTIONS AND TESTS

The safety notices contained in Chapter 1 must be complied with!

During the lifetime of the process cooler, inspection and tests (not included in the scope of the warranty) must be carried out in accordance with national regulations!
If there are no relevant local regulations with respect to periodic testing, regular device-specific tests should be performed based on EN 378-2.

Scope of tests

Test Designations	Monitoring	Checks	
	Visual Inspection	Pressure test	Refrigerant leak test
M1	X	X	X
M2	X		X
M3	X		X
M4	X		X[1)]

The monitoring and testing has to be performed by qualified personnel in accordance with regulation (EU) No. 517/2014, the directives (EU) 2015/2067 and EN 13313 resp. by a specialised refrigeration engineering company, taking into account the environmental requirements regarding recycling and disposal of materials and components.

Definition of Test Designations

M1 Inspections/checks must be carried out following any intervention in the refrigeration circuit due to required repair or service activities (replacement of components, elimination of leaks, replacement of filter-drier cartridges).

M2 Inspections/checks must be carried out prior to recommissioning a process cooler following a shutdown period of more than 2 years.

M3 Inspections/checks must be carried out whenever - after the initial startup of the process cooler at the end customer's site - the unit is moved to a new location.

Due to special transport safety measures, the relocation of the process cooler from the manufacturer's plant to the end customer does not result in any increased failure rate and therefore requires no re-inspection to be carried out.

M4 This test must be carried out every year.

The refrigerant leak check must be performed in accordance with Regulation (EU) No. 517/2014. Refrigerant charge see name plate.

The visual inspection comprises the following:

- Checking the intactness of the joints seals in the refrigeration circuit (pipe joints at the compressor) (red seals)
- Visual inspection of the refrigeration circuit for oil leaks in the area of the compressor and condenser connecting lines (suction line, pressure line)
- Inspection of the condenser heat exchanger surface and the refrigerant piping for corrosion damage
- Inspection of the mounting and attachment of all piping and components for security
- Check that operating manual is available at the process cooler

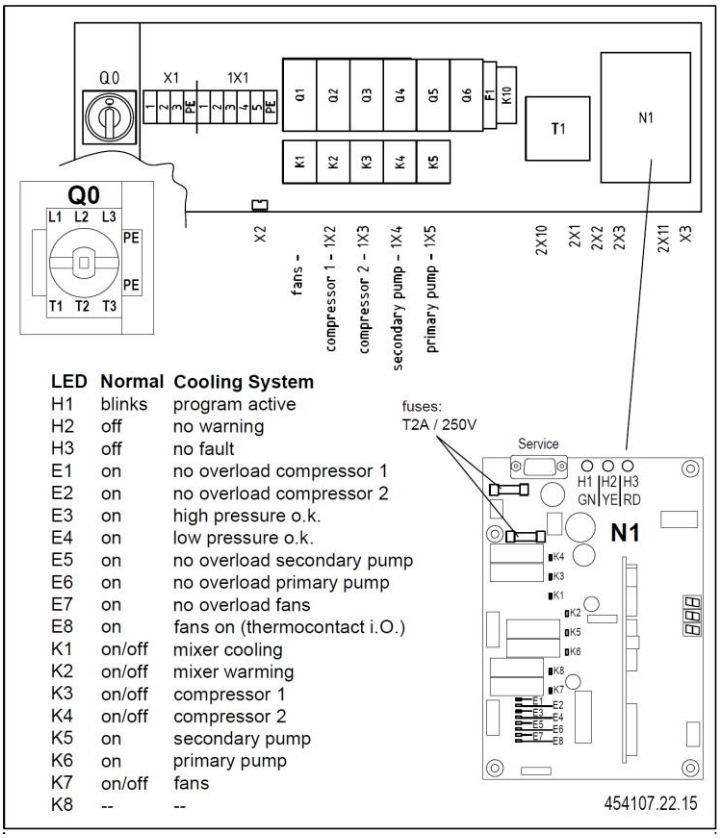
All inspections and tests must be documented in the system logbook.

9 MALFUNCTIONS / TROUBLESHOOTING

The safety notices contained in Chapter 1 must be complied with!

The basis for troubleshooting is the circuit diagram, the flow diagram and the messages displayed by the Siemens Software on the CT central computer.

Alarms and Errors Displayed on the Controller Board:

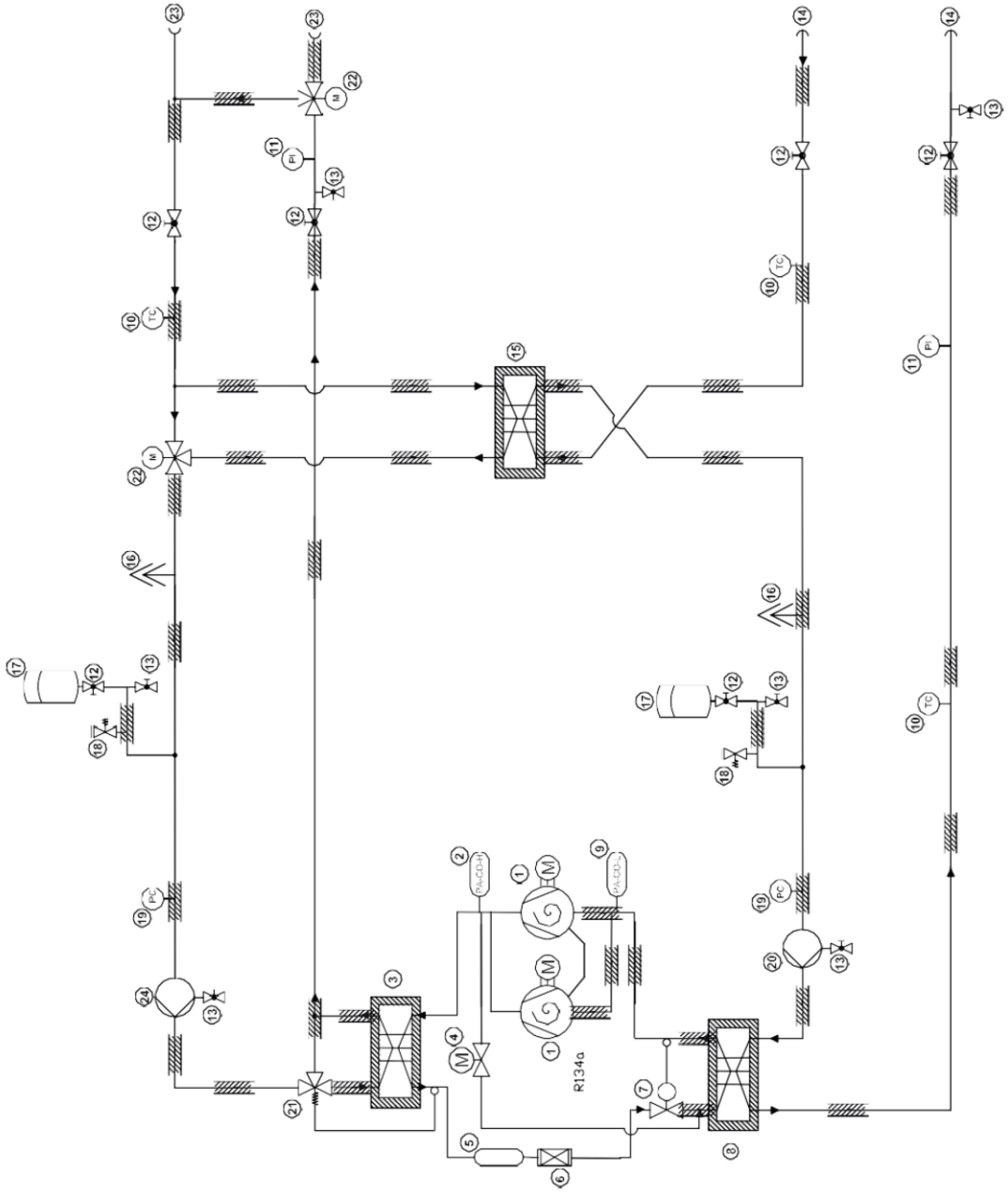


LED	Normal	Cooling System
H1	blinks	program active
H2	off	no warning
H3	off	no fault
E1	on	no overload compressor 1
E2	on	no overload compressor 2
E3	on	high pressure o.k.
E4	on	low pressure o.k.
E5	on	no overload secondary pump
E6	on	no overload primary pump
E7	on	no overload fans
E8	on	fans on (thermocontact i.O.)
K1	on/off	mixer cooling
K2	on/off	mixer warming
K3	on/off	compressor 1
K4	on/off	compressor 2
K5	on	secondary pump
K6	on	primary pump
K7	on/off	fans
K8	--	--

Error Codes on Display Controller Board:

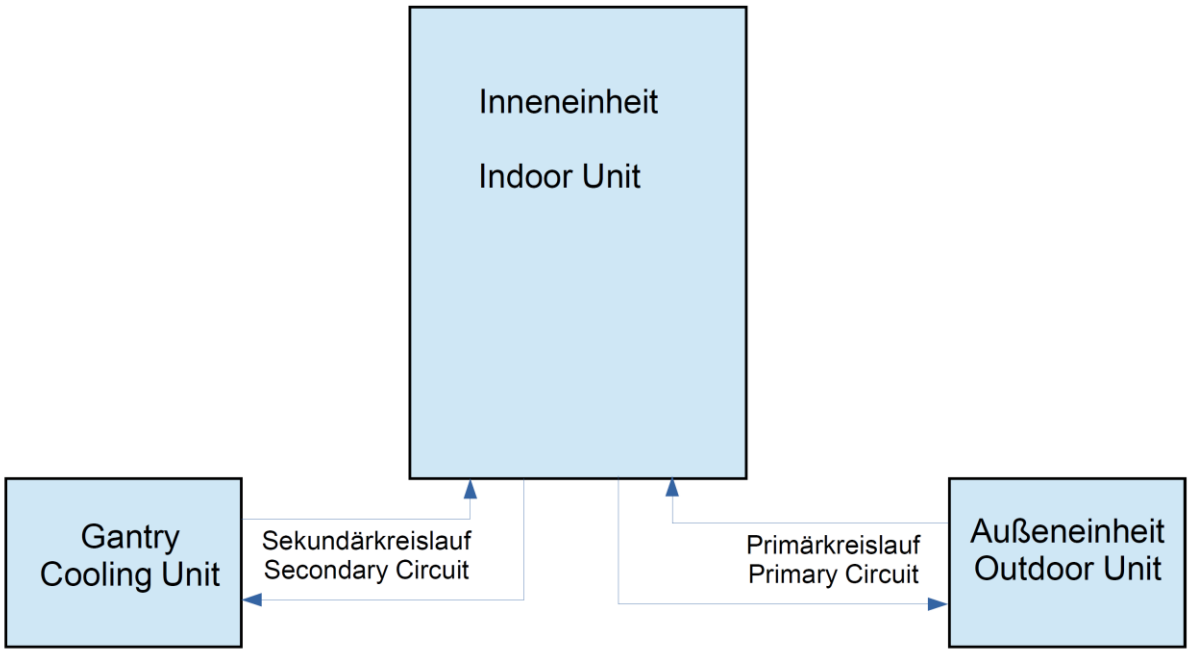
Code	Description	Item
8.88	Temperature secondary outlet	B1
F01	alarm motor protection compressor 1	Q2
F02	alarm motor protection compressor 2	Q3
F03	HP-alarm	B11
F04	LP-alarm	B10
F05	alarm motor protection secondary pump	Q4
F06	alarm motor protection primary pump	Q5
F07	alarm motor protection glycol fans	Q1
F08	alarm thermostat glycol fans	M4/M5
F11	Sec. temperature low warning	B1
F12	Sec. temperature high warning	B1
F14	Sec. temperature low alarm - shutdown system	B1
F15	Sec. temperature high alarm 1 - shutdown system	B1
F16	Sec. temperature high alarm 2 - shutdown system	B1
F17	Temperature sec. water out sensor error	B1
F27	Temperature sec. water in sensor error	B2
F31	Prim. temperature low warning	B3
F32	Prim. temperature high warning	B3
F34	Prim. temperature low alarm - shutdown system	B3
F35	Prim. temperature high alarm 1 - shutdown system	B3
F36	Prim. temperature high alarm 2 - shutdown system	B3
F37	Prim. temperature sensor error	B3
F47	device type 2NK6751W detected	B4
F51	Pressure sec. low warning	B5
F52	Pressure sec. high warning	B5
F54	Pressure sec. low alarm - shutdown system	B5
F55	Pressure sec. high alarm - shutdown system	B5
F57	Pressure sec. sensor error	B5
F71	Pressure prim. low warning	B7
F72	Pressure prim. high warning	B7
F74	Pressure prim. low alarm - shutdown system	B7
F75	Pressure prim. high alarm - shutdown system	B7
F77	Pressure prim. sensor error	B7

RI-Fließbild / PI Diagram



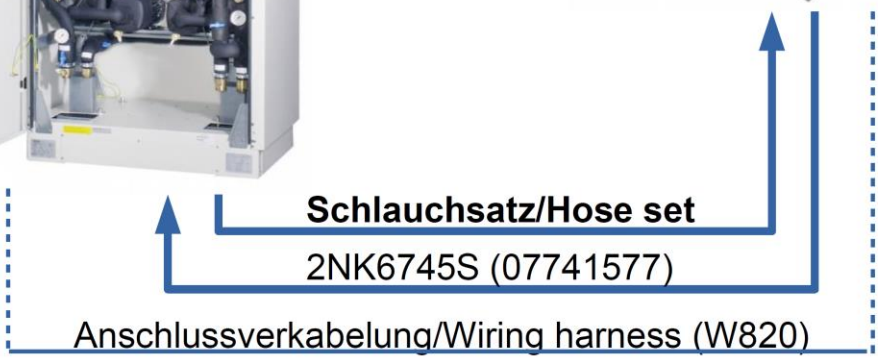
Caption	Legende
01 Compressor	01 Verdichter
02 Highside pressure sensor	02 HD Pressostat
03 Condensor	03 Verflüssiger
04 Hotgas-bypass-valve	04 Heißgas-Bypass-Ventil
05 Collector refrigerant circuit	05 Kältemittelsammler
06 Filter dryer	06 Filtertrockner
07 Expansion valve	07 Expansionsventil
08 Evaporator	08 Verdampfer
09 Lowside pressure sensor	09 ND Pressostat
10 Temperature sensor	10 Temperatursensor
11 Pressure indicator	11 Manometer
12 Ball valve	12 Kugelhahn
13 Filling and draining valve	13 F+E-Hahn
14 Connection M36x2	14 Anschlüss M36x2
15 Plate heat exchanger	15 Plattenwärmetauscher
16 Air bleeder	16 Entlüfter
17 Expansion vessel	17 Ausdehnungsgefäß
18 Safety valve	18 Sicherheitsventil
19 Pressure sensor	19 Drucksensor
20 Pump secondary circuit	20 Pumpe Sekundärkreislauf
21 Controller cooling water	21 Kühlwasserregler
22 3/2 way valve	22 3/2-Wege-Ventil
23 Connection M45x2	23 Anschluss M45x2
24 Pump primary circuit	24 Pumpe Primärkreislauf
Insulation	Isolation

Prinzipskizzen / Schematic Diagrams

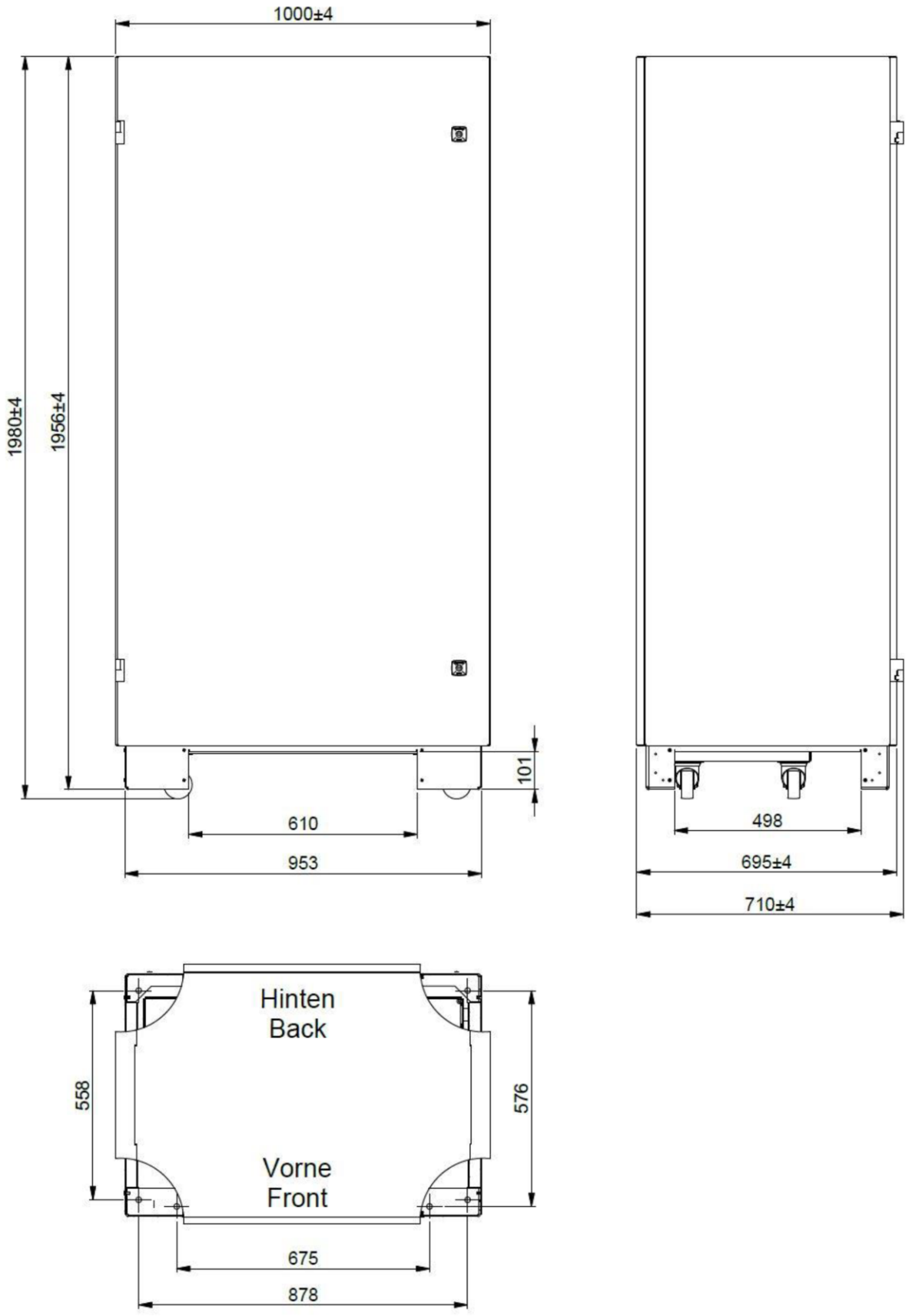


Inneneinheit/Indoor Unit
2NK6746W (10589726)
2NK67451W (10430821)
2NK6751W (11331491)

Außeneinheit/Outdoor Unit
2NK67451A (10743384)



Abmessungen / Dimensions



Muster Kurzanweisung

Bitte diese Kurzanweisung sorgfältig ergänzen, ausschneiden, mit einer Folie schützen und gut lesbar am Gerät anbringen !

Sample Quick Reference Guide

Please carefully complete this quick reference guide, cut it out, cover it with protective film and affix it to the unit in an easily accessible place !

Diese Kurzanweisung enthält wichtige Informationen für Notfälle und Störungen !
This short guide contains important information for use in cases of emergency and malfunctions !

NOTFALL
EMERGENCY

Im Notfall ist das Kühlaggregat vom Netz zu trennen !

The process cooler must be turned off in emergencies !

Vom Anwender einzutragen / To be entered by the user :

ERSTE HILFE
FIRST AID

_____

TECHNISCHE ANGABEN

siehe auch Typschild

TECHNICAL DATA

see also data plate

Gerätetyp / Device type: _____
Kältemittel / Refrigerant: _____
Kältemittelformel / Refrigerant formula: _____
Kältemittelfüllmenge / Refrigerant charge: _____
Zul. Betriebsüberdruck / Max. allow. working pressure _____

Baujahr / Year of manufacture: _____
Seriennummer / Serial number: _____
Stromart / Power requirements: ___V / _ Ph /____A
Nennstrom / Rated current: _____

Gerätehersteller
Kundendienst
Equipment manufacturer
Customer service

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