Operator Manual

Refrigerated dryer

TD

902481-US 01 USE

Read this manual before using the product.
Failure to follow the instructions and safety information provided in this manual can result in serious injury or death.

Manufacturer:

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1 About this document

Read the operating manual carefully and ensure you are familiar with the contents before using machine.

The operating manual is an integral part of the product and describes the machine at the point of initial delivery following completion. Keep the operating manual throughout the entire lifetime of the machine and pass it on to any subsequent owner or user.

For reasons of improved readability, the simultaneous use of the male, female and plural language forms has been dispensed with. All personal designations apply equally to all genders.

Supplement the manual with any amendments that may be provided by KAESER. Provide the data from the nameplate wherever you are asked to do so. This simplifies orientation for every user.

The illustrations in this manual are basic representations, which may differ from the actual in minor details.

1.1 Warning notices

Warning notices warn of hazards that can lead to personal injury and provide instructions on how to avoid damage. Warning notices precede actions associated with hazards and also apply to sub-chapters if they precede the chapter.

Warning notices indicate three levels of hazard identified by the corresponding signal word:

Signal word	Consequence if the hazard is not avoided
DANGER	Hazard with a high level of risk that will result in death or serious injury if not avoided
WARNING	Hazard with a medium level of risk that may lead to death or serious injury if not avoided
CAUTION	Hazard with a low level of risk that may lead to minor or moderate injury if not avoided

Tab. 1 Signal words and their consequences

Example:

⚠ WARNING

Description of the hazard, cause and consequences

► Instructions on how to avoid the hazard

1.2 Material damage warnings

Material damage warnings warn of situations that can lead to material/property damage and provide instructions on how to avoid damage. Material damage warnings precede actions associated with risks and also apply to sub-chapters if they precede the chapter.

Material damage warnings are identified by their signal word NOTICE.

Example:

NOTICE

Description of the hazard, cause and consequences

► Instructions on how to avoid the damage

1.3 Symbols and labels

Symbols and pictograms in this document draw your attention to information that requires special attention. Follow all instructions provided to prevent damage.

Representation	Meaning	Representation	Meaning
A1	Section or information relating to an optional equipment feature	Softkey	Software-dependent button on display for triggering an operating function
►	This symbol indicates an individual action requirement	1. ... 2. ... 3. ...	A series of action requirements are numbered consecutively. Follow the sequence accordingly.
«Operating element»	Visualization of an operating element, e.g. a key	*Display element*	Visualization of a display element, e.g. a control indicator
	Safety-related condition that must be fulfilled in order to be able to perform the subsequent activity		Prerequisite that must be met in order to be able to perform the subsequent activity
	Useful information or information that needs to be observed		Reference to another source of information
	Materials and tools		Spare parts
	Tool		Information or action relating to environmental protection
	Assistance relating to an activity		Assistance relating to an individual action step
	Result of an implemented activity		Result of an individual action step

Tab. 2 Symbols and labels

1.4 Related documents and documentation

Where applicable, a Declaration of Conformity in accordance with the relevant guideline or regulation is supplied with this operating manual.

Check that all documentation is complete and ensure that the Declaration of Conformity is retained together with the operating manual. Missing documents can be requested from an authorized KAESER service partner. To do so, you must provide the material number and serial number for the machine as found on the nameplate.

1.5 Copyright

This manual is copyright protected. Should you have any queries relating to usage and duplication of this documentation, please contact KAESER. KAESER will be glad to provide advice regarding the appropriate use of the information.

1.6 Warranty

This manual does not contain any independent warranty commitment. Our general terms and conditions apply with regard to the warranty.

The provision of warranty by KAESER is conditional upon the machine being used only for the purposes for which it is intended. As the operator, you are responsible for ensuring that the machine is used only for the purposes for which it is intended in the context of your specific application.

2 Technical data

The technical specifications reflect the nominal values of a new machine. The installed equipment and maintenance condition of the machine, as well as the ambient and operating conditions, can influence these values.

2.1 Nameplate

Important technical data can be found on the machine nameplate. The nameplate is clearly visible on the outside of the machine.

Complete the nameplate data in the table for reference.

Characteristic	Value
Refrigerated dryer	
Material no.	
Serial no.	
Year of manufacture	
Maximum working pressure	
Compressed air inlet temperature	
Ambient temperature	
Rated current	
Phases	
Full load current - Drive motor	
Short-circuit current	
Power supply fuse (user-end)	
Power supply	
Wiring diagram	
Option	
Refrigerant system[1)]	
Refrigerant	
Refrigerant charge	
Global warming potential (GWP)	
CO_2 equivalent	
Max. working pressure HP[2)]	
Max. working pressure LP[3)]	
Checked for pressure leaks	

1) Contains fluorinated greenhouse gases
2) High pressure
3) Low pressure

Tab. 3 Nameplate

2.1.1 Heat exchanger nameplate

Important technical data can be found on the machine nameplate.

The nameplate is located directly on the heat exchanger, behind the insulation.

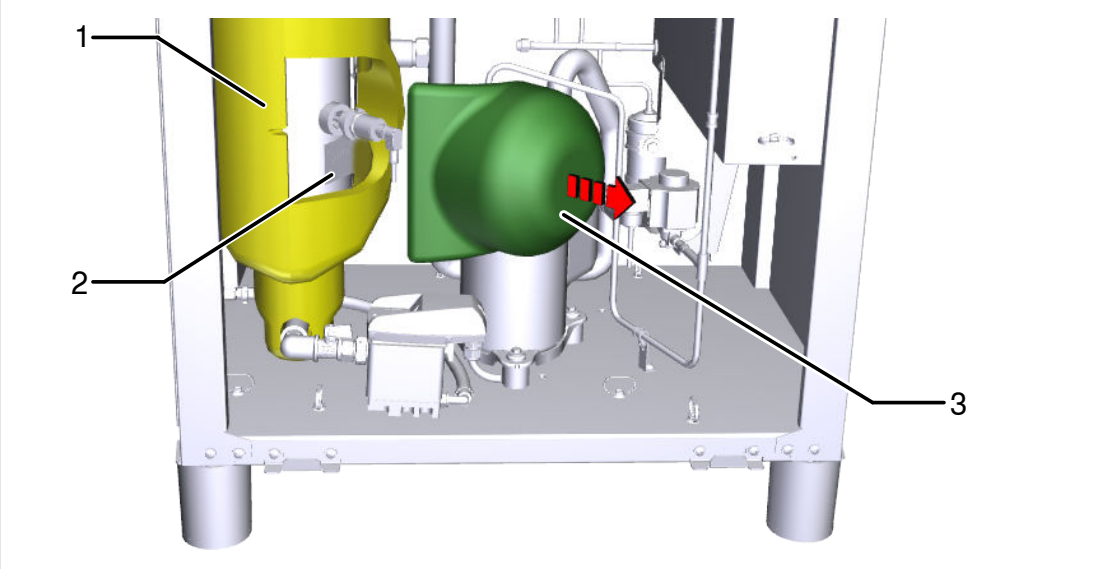


Fig. 1 Heat exchanger nameplate

1 Heat exchanger
2 Nameplate
3 Insulation

Proceed as follows:

1. Carefully pull out and remove the insulation 3.
2. Read the data on the nameplate 2.
3. Refit the insulation 3.

2.2 Options

The options for this machine are displayed on the nameplate.

Complete the options in the table for reference:

Option	Symbol	Installed?[1)]
Floating contact: “Pressure dew point warning”	C36	✓
Floating contact: “Refrigerant compressor running”	C37	✓
Communications module: Modbus TCP	C44	
Bolt-down machine feet	H1	

1) Installed: ✓, Not available: —

Tab. 4 Options

2.3 Weight

The values indicated are maximum values. The actual weight of a machine depends on the equipment individually specified.

	TD 52	TD 67	TD 73	TD 94
Weight [lb]	291	304	304	333

Tab. 5 Weight

2.4 Ambient conditions

Type	TD 52	TD 67	TD 73	TD 94
Maximum installation above sea level[1)] [ft]	3000	3000	3000	3000
Permissible ambient temperature [°F]	38 – 120	38 – 120	38 – 120	38 – 120

1) Higher installation location only possible following consultation with an authorized KAESER service representative

Tab. 6 Ambient conditions

2.5 Compressed air system

Type	TD 52	TD 67	TD 73	TD 94
Pressure loss[1)] [psig]	1.45	1.16	1.89	1.16
Flow rate[1)] [cfm]	162	212	244	279
Heat exchanger volume [gal]	2.51	3.57	3.57	5.24
Pressure dew point[1)] [°F]	42	38	42	41
Minimum working pressure [psig]	45	45	45	45
Maximum working pressure [psig]	230	230	230	230
Minimum compressed air inlet temperature [°F]	38	38	38	38
Maximum compressed air inlet temperature [°F]	140	140	140	140

1) in accordance with ISO 7183 (Option A2):

- Reference point: 14.5 psia, 70 °F, relative humidity 0%
- Operating point: working pressure 100 psig, compressed air inlet temperature 100 °F, relative humidity 100%, cooling air inlet temperature 100 °F

Tab. 7 Compressed air system

2.6 Refrigerant system

Type	TD 52	TD 67	TD 73	TD 94
Refrigerant	R-513A	R-513A	R-513A	R-513A
Global warming potential (GWP)	631	631	631	631
Charge[1)] [lb]	1.59	1.81	1.81	2.05
Charge as CO_2 equivalent [t]	0.45	0.52	0.52	0.59
Maximum working pressure [psig] (high-pressure side)	392	392	392	392
Maximum working pressure [psig] (low-pressure side)	305	305	305	305
Pressure limiter: Cut-out pressure [psig]	305	305	305	305

1) Volume of fluorinated greenhouse gas for which the refrigerant system is designed

Tab. 8 Refrigerant system

2.7 C44 Modbus TCP communications module

Characteristic	Value
Communications bus	SIGMA NETWORK / Modbus TCP server (slave)
Transfer rate [Mbit/s]	10/100
Properties 1	Auto crossing (Auto-MDI (X))
Properties 2	Auto negotiation
Connections	1 x RJ45 CAT5 screened socket, 10/100 Base-TX
Max. cable length between 2 components [ft]	325
Input data [bytes]	1
Output data [bytes]	89
Data content	“Technical description - SIGMA CONTROL SMART process map”, Document number: 7_9200_PCM_PA
Power supply [V DC]	24

Tab. 9 Communications interface

2.8 Sound emissions

	TD 52	TD 67	TD 73	TD 94
Sound emissions[1)] [dB(A)]	57	57	57	57

1) Sound pressure level as per EN ISO 11203:2009 and basic standard ISO 9614-2 where d = 3.3 ft and Q2 = 15.2 dB(A), operation at maximum working pressure; tolerance: ±3 dB(A)

Tab. 10 Sound emissions

2.9 Power supply specifications

The specified cable cross-sections refer to multi-core copper conductors of temperature class 75 °C and are adapted for an ambient temperature of 40 °C in accordance with 2020 NEC 310.14, 310.15, 310.16 and Table 310.16.

Check and measure the cable cross-section in accordance with 2020 NEC 110.14(C), 220.3, 310.14, 310.15, 310.16, Table 310.15(B)(1), Table 310.15(C)(1), 430.6, 430.22, 430.24, 670.4(A), as well as any further local regulations.

Select time-delay fuses with dual elements in accordance with 2020 NEC 240.6, 430.52 and Tables 430.52, 430.248 and 430.250.

Where local regulations permit, use an earthing conductor of the same size as the current-carrying conductors. Minimum sizing of the grounding conductor as per Table NEC 250.122 from 2020 is not permitted, nor is the use of piping as the sole grounding connection.

2.9.1 Rated voltage 230 V / 1 / 60 Hz

	TD 52	TD 67	TD 73	TD 94
Power consumption[1)] [hp]	1.2	1.6	1.5	1.7
Backup fuse [A]	15	15	15	15
Cable cross-section per phase and earth [AWG/MCM]	14	14	14	14
Full load current [A]	5.6	7.3	7.3	8.5

1) in accordance with ISO 7183 (Option A2):

- Reference point: 14.5 psia, 70 °F, relative humidity 0%
- Operating point: working pressure 100 psig, compressed air inlet temperature 100 °F, relative humidity 100%, cooling air inlet temperature 100 °F

Tab. 11 Electrical connection data 230 V / 1 / 60 Hz

3 Safety and responsibility

The machine is manufactured to the latest engineering standards and recognized safety regulations. Nevertheless, dangers can arise through its use:

- Danger to life and limb for the operator or third parties.
- Damage to the machine and other material assets

To prevent injury, follow all safety instructions.

Only use the machine as intended.

Only use the machine if it is in perfect technical condition. Faults that could impair safety must be rectified immediately.

3.1 Intended use

The machine is intended solely for drying compressed air in an industrial area. Any other use shall be considered improper. The manufacturer shall not be liable for any damage that may result from improper use. The operator shall be solely liable for any risks incurred.

Refrigerant must only be handled by appropriately qualified personnel.

Follow the instructions in this operating manual; only operate the machine within the specified performance limits and in accordance with the permissible ambient conditions.

The use of compressed air as breathing air or in contact with food products is permitted only in combination with the appropriate treatment.

Only use genuine KAESER spare parts for pressure-bearing components.

3.2 Improper use

The air drawn into the machine for treatment must not contain any toxic, acidic, inflammable or explosive gases or vapors.

Modifications to the machine or controller can result in unforeseen dangers. The operator shall be solely liable for any risks incurred. Do not make unauthorized modifications or conversions to the machine.

Note the following when using:

- Do not direct compressed air at living things.
- Operation in potentially explosive areas is prohibited.

3.3 Hazards

This section provides information regarding the various types of hazard that can arise in connection with operating the machine.

Observe the following whenever any work is performed on the machine:

- Have work performed by authorized personnel only.
- Before commencing any work, switch off the power supply (all poles), secure the power supply disconnecting device (main switch) against reactivation and verify that no voltage is present.
- Fully vent all pressurized components and enclosures and verify the absence of all pressure.
- Do not use any part of the machine as a climbing aid.
- Pay strict attention to cleanliness during all work.
- To prevent ingress of dirt and dust, cover components and exposed openings with clean cloths, paper, or masking tape.
- Do not leave any loose components, tools or cleaning cloths on or in the machine.

- Do not open or destroy any dismantled components.
- Regularly check the following on the machine:
  - For visible damage
  - Safety devices
  - Components that require monitoring

Wear suitable protective clothing for all work, e.g.:

- Approved work clothing, close-fitting and flame-retardant
- Protective gloves
- Safety shoes
- Eye protection
- Ear protection

3.3.1 Electricity

Touching live components can result in electric shock, burns or death:

- Allow only qualified and authorized certified electricians or trained personnel under the supervision of a qualified and authorized certified electrician to carry out work on electrical equipment in accordance with electrical engineering regulations.
- In order to prevent electrical accidents, follow the below rules in the sequence provided:
  - Switch off the power supply at all poles
  - Lock out / tag out the power supply disconnecting device to secure it against being switched on again
  - Verify the absence of voltage at all poles
- As the operator, before each commissioning of the machine you must establish and check protection against direct or indirect touch voltages.
- Verify the absence of all voltage from the power supply and any external voltage sources. External voltage sources may include, for example, connections to the floating contacts.
- Use electrical fuses that correspond to the power of the machine.
- Regularly check that all electrical connections are tightened and in proper condition.

3.3.2 Pressure

Compressed air is stored energy. Uncontrolled release of compressed air may result in serious injury or death:

- Close shut-off valves or otherwise isolate the machine from the compressed air network so as to ensure that no compressed air can flow back into the machine.
- Verify that all enclosures are completely free from pressure.
- Install pressure lines only when they are in a pressure-free state.
- Do not carry out welding, heat treatment or mechanical modifications on pressure-bearing components (e.g. piping, pressure vessels).

3.3.3 Compressed air quality

To prevent danger to life and limb, the composition of the compressed air must be suitable for the specific application.

Use suitable compressed air treatment systems when using compressed air as breathing air and/or for the processing of food products.

3.3.4 Temperature

Touching hot components may lead to injury:

- Avoid touching hot components such as the refrigerant condenser.
- Wear suitable protective clothing.

- Allow the machine to cool down sufficiently.
- Take suitable measures to prevent sparks or high temperatures from igniting certain parts of the machine. This may be necessary, for example, when welding work is being performed on, or in the vicinity of, the machine.

Contact with refrigerant may lead to frostbite: Wear suitable protective clothing.

3.3.5 Noise

The machine enclosure suppresses machine noise to a low level. This sound insulation is only effective when the machine enclosure is closed:

- Only operate the machine when the enclosure is closed.
- Wear ear protection.

3.3.6 During transportation

In order to prevent accidents, the weight and size of the machine require that safety measures be taken during transportation:

- Ensure the danger zone is clear of personnel.
- Use suitable hoists that comply with local safety regulations.
- Ensure that the machine is transported only by persons who, due to their training, possess the appropriate authorization for safe handling of transported goods.
- Only attach hoists to suitable load-bearing points.
- To prevent the machine from tipping, pay attention to the center of gravity.

3.3.7 During installation

A suitable installation location helps to ensure reliable operation of the machine:

- Adhere to the ambient conditions.
- Install the machine in a suitable, frost-free machine room.
- Ensure sufficient ventilation of the machine room.
- Install the machine away from the hot exhaust air flow from other machines.
- Position the machine in such a manner that the working conditions in the immediate vicinity are not impaired.
- In order to be able to read displays without glare and to be able to perform work safely, ensure sufficient and suitable lighting.
- Ensure suitable accessibility so that all work on the machine can be carried out without danger or hindrance.
- For outdoor installation, the machine must be protected from frost, direct sunlight, dust, rain and splash water.
- Do not install the machine in areas where specific requirements apply in relation to explosion protection. For example, the requirements for “intended use in potentially explosive atmospheres” as per 2014/34/EU[1)]
- Ensure clean ambient air with no damaging contaminants. Damaging contaminants include, for example:
  - Explosive or chemically unstable gases and vapors
  - Acids or base-forming chemicals such as ammonia, chlorine or hydrogen sulfide

3.3.8 During installation

Note the following when performing installation work:

- Only use electrical cables that are suitable and approved for the relevant surroundings and electrical loads.

[1)] ATEX Directive

- Only use pressure lines that are suitable and approved for the maximum working pressure and the intended medium.
- In order to prevent them from being transferred to the connection points, compensate for the forces exerted by pipelines on the machine.

3.3.9 Operating fluids/materials

The operating fluids and materials used can cause adverse health effects. To avoid injury, take the appropriate precautionary measures:

- Ensure that work is performed on the refrigerant circuit by qualified specialists only.
- Follow all safety regulations relating to refrigerants, lubricants or chemical substances.
- Avoid contact with the skin and eyes.
- Do not inhale refrigerant vapors.
- Do not eat or drink if you have been handling refrigerants, lubricants or chemical substances.
- Fire, open flame and smoking must all be prohibited.
- Keep a suitable fire-extinguishing agent close to hand.
- Only use KAESER-approved operating fluids/materials.
- Dispose of used operating fluids/materials via a certified disposal specialist, in accordance with the applicable local regulations.

3.3.10 Spare parts

Unsuitable spare parts compromise the safety of the machine:

- Only use spare parts approved by KAESER for use in this machine.
- Only use genuine KAESER spare parts on pressure-bearing components.
- Dispose of any spare parts contaminated with environmentally harmful operating fluids/materials in accordance with the applicable local regulations.

3.3.11 Machine modifications

Modifications to the machine or controller can result in unforeseen dangers:

- Do not make modifications to the machine.
- Obtain written approval from KAESER prior to making any technical modifications or enhancements to the machine, the controller, or the control programs.

3.4 Danger areas

The following table provides information regarding the areas which are potentially dangerous to personnel.

Only authorized personnel may access these areas:

Task	Danger area	Authorized personnel
Transportation	10 ft radius around the machine	Installation personnel to prepare the machine for transportation No personnel during transportation
	Beneath the raised machine	No personnel
Installation	Inside the machine 4 ft radius around the machine and its power supply cables	Installation personnel
Operation	4 ft radius around the machine	Operating personnel

Task	Danger area	Authorized personnel
Maintenance	Inside the machine 4 ft radius around the machine	Maintenance personnel

Tab. 12 Danger areas

3.5 Safety devices

Safety devices ensure safe operation of the machine. Safety devices must not be modified or bypassed. Check safety devices regularly to ensure reliable function.

The following safety devices are fitted:

- Power supply disconnecting device:
  The power supply disconnecting device (main switch) switches the machine off in an emergency situation.
- Pressure monitor:
  The pressure limiter shuts down the machine in the event that the refrigerant pressure exceeds the maximum permitted value. It is set at the factory.
- Machine enclosure and panels:
  Cover panels provide protection from rotating, hot and electrical components.

3.6 Safety signs

The safety signs on the machine are easily visible and serve to indicate hazards.

- Do not remove or render unrecognizable any labels or signs.
- Ensure that labels and signs are always clearly visible.

The following illustration shows the location of the safety signs on the machine. The following table provides information regarding the safety signs used.

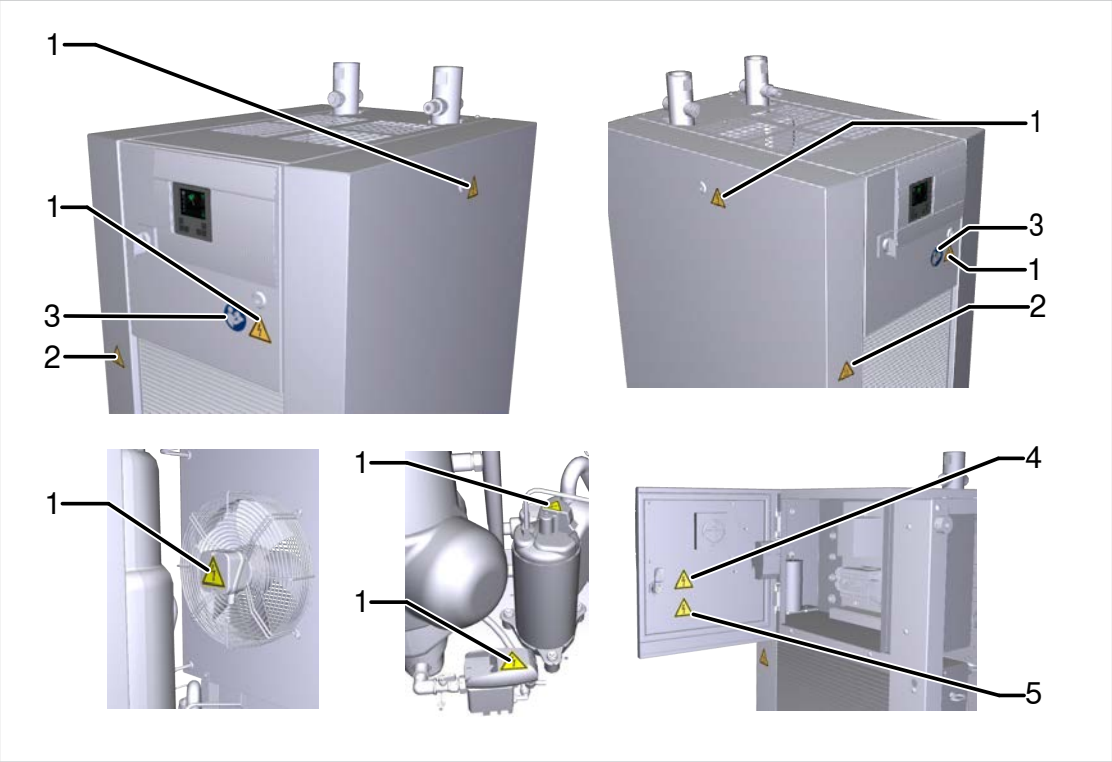


Fig. 2 Location of safety signs

Item	Pictogram	Meaning
1		**Danger of fatal injury from electric shock** ► Disconnect the machine from the power supply (all poles) ► Switch off and lock out / tag out the power supply disconnecting device ► Verify the absence of voltage (all poles)
2		**Danger of burning from hot surface** ► Do not touch the hot surface ► Wear protective clothing
3		**Risk of injury to personnel or damage to the machine from incorrect operation** ► Ensure that you have read and understood the operating manual and all related safety information before switching on this machine
4		**Danger of fire or electric shock** ► Should the breaker be triggered, examine the current-carrying components and replace them in the event of damage to reduce the risk of fire or electric shock
5		**Danger of fire or electric shock** ► To reduce the risk of fire or electric shock, the manufacturer's instructions for setting the breaker must be complied with in order to ensure that overcurrent, short-circuit and ground-fault protection are maintained

Tab. 13 Safety signs

3.7 Operator responsibilities

Observe the relevant legal and generally recognized technical regulations when installing, operating and performing maintenance on the machine.

3.7.1 Determining suitable personnel

The machine may only be operated by specialists who are of legal age and who have read and understood these instructions. Personnel must have specialist training, experience and knowledge of the relevant regulations and therefore be able to perform work accordingly, as well as to recognize dangers.

Personnel tasked with commissioning, operation and maintenance must be familiar with the safety concepts and regulations relating to the following technical fields:

- Compressed air technology
- Electrical engineering
- Refrigeration technology

Ensure that the personnel entrusted with installation, operation and maintenance have the relevant qualifications and authorization required for the respective activity.

3.7.2 Organizational measures

As the operator, you must take the following organisational measures:

- Determine personnel and regulate responsibilities.
- Regulate the obligation to report any faults with or damage to the machine.
- Provide instructions for how personnel should prevent, report or combat fires.

3.8 Emergencies

3.8.1 First aid measures following contact with refrigerants

In the event of accident or illness, call a doctor immediately. In case of doubt or should symptoms appear, always consult a doctor.

Contact with the eyes

Refrigerant can cause chemical burns and frostbite, as well as eye irritation, tears, redness, and swelling of the eyelids.

- If contact lenses are worn, remove them if possible and gently rinse the eyes with clean water for a few minutes.
- Consult a doctor immediately.

Skin contact

In the event of contact with the skin, refrigerant can cause irritation and frostbite:

- Remove dirty clothing or clothes soaked with refrigerant.
- Wash the skin gently with warm water.
- Consult a doctor immediately.

Inhalation

Refrigerant mist can impair the breathing and cause breathing difficulties, respiratory arrest and cardiac arrhythmia:

- Move outside to fresh air and allow injured persons to breathe without hindrance.
- In the event of breathing difficulties or respiratory arrest, begin artificial respiration.
- In the event of breathing difficulties or neurological symptoms, consult a doctor.

3.9 Environmental protection

Refrigerant must not be released into the environment. Store and dispose of refrigerant and all replacement parts in accordance with the applicable national environmental protection regulations.

4 Design and function

4.1 Machine enclosure

The following illustration provides an overview of the machine enclosure.

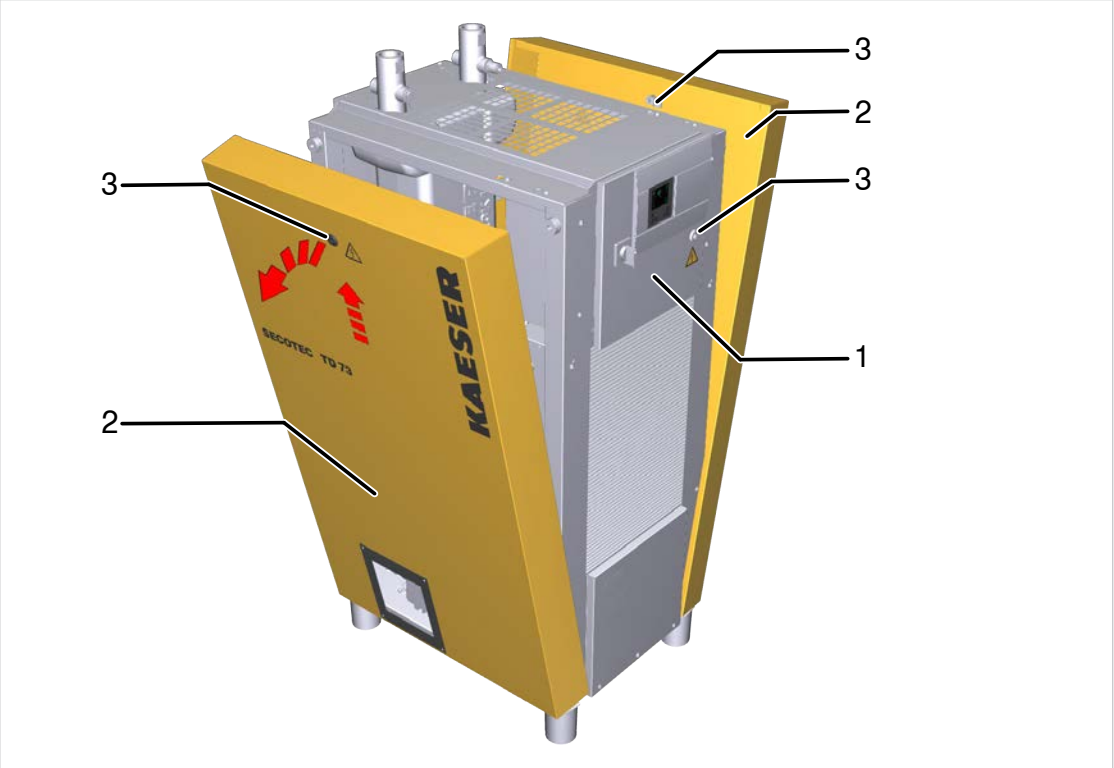


Fig. 3 Machine enclosure overview

1 Control cabinet door
2 Cover panel
3 Latch

When closed, the machine enclosure serves various functions:

- Sound insulation
- Protection against contact with components
- Cooling air flow

The machine enclosure is not suitable for the following:

- Walking on, standing on or sitting on
- Placing or storing any kind of load

Safe and reliable operation is assured only when the machine enclosure is closed.

Cover panels are fastened in place with latches and can be lifted off. The control cabinet door can be swung open. The latches can be opened or closed using the key supplied with the machine.

4.2 Machine function

The refrigerated dryer cools the compressed air. Since cold air is less able to retain moisture, the condensable component of the humidity precipitates out as condensate. This condensate is separated and automatically drained off.

The following illustration shows the main components on the machine.

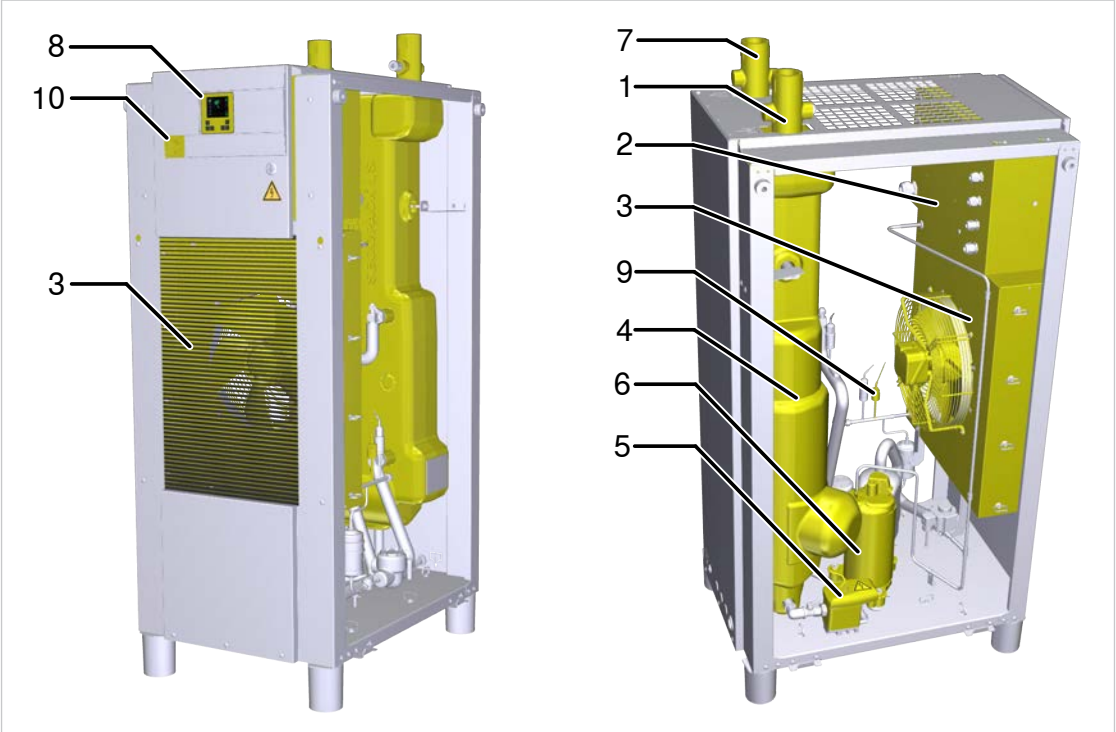


Fig. 4 Main components

1 Compressed air inlet
2 Control cabinet
3 Refrigerant condenser
4 Heat exchanger with condensate separator
5 Condensate drain
6 Refrigerant compressor
7 Compressed air outlet
8 Control panel (controller)
9 Pressure monitor
10 Power supply disconnecting device (main switch)

- Stage 1: The incoming warm compressed air is pre-cooled in the first part of the heat exchanger by the outgoing cool compressed air.
- Stage 2: Further cooling then takes place via a refrigerant circuit in the second part of the heat exchanger. The exhaust heat is released into the ambient air via the refrigerant condenser.
- Stage 3: The condensate produced during the cooling process is separated from the compressed air via a separation system integrated into the heat exchanger. The condensate is then drained off via a condensate drain.
- Stage 4: The dry, cool compressed air is reheated in the first part of the heat exchanger. The relative humidity of the compressed air is reduced.

4.2.1 SECOTEC thermal mass control

The principal requirement for this type of control is a high-capacity thermal mass: SECOPACK LS.

The thermal mass is cooled via the refrigeration circuit. As soon as the thermal mass has reached a sufficiently low temperature, the refrigerant compressor shuts down.
Due to the high thermal storage capacity, the pressure dew point remains stable for a long time before further cooling power is required,

which results in reduced energy consumption.

As soon as the thermal mass reaches the cut-in temperature, the refrigerant compressor starts up automatically to provide further cooling.

4.2.2 Floating contacts

Floating contacts are provided for the transfer of messages. They require an external voltage source. If the machine is separated from its power supply, the floating contacts may remain under voltage.

Further information on the locations, capacities and types of message is provided in Chapter 13.3 Wiring diagram.

4.3 SIGMA CONTROL SMART

4.3.1 Control panel

4.3.1.1 Keys

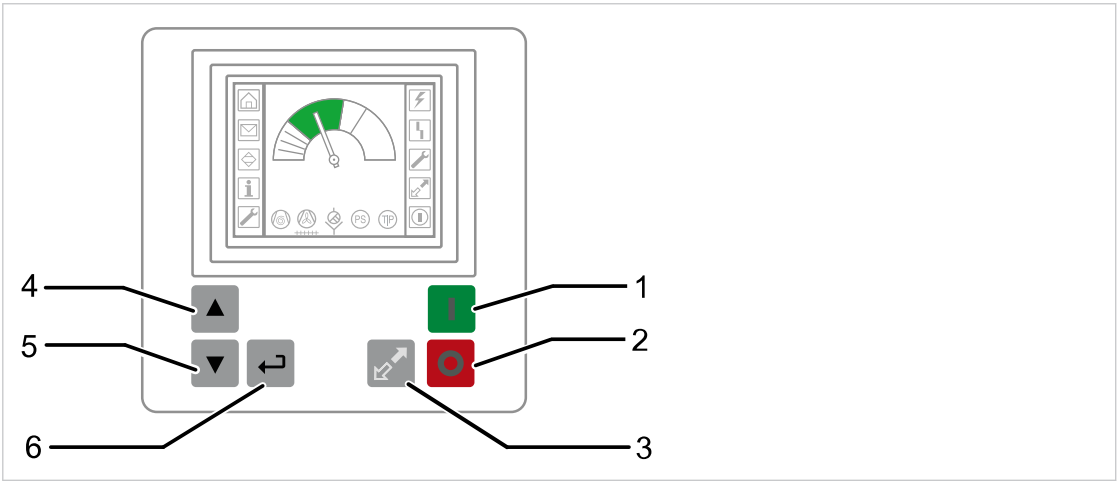


Fig. 5 Keys – overview

Item	Keys	Designation	Meaning
1		«ON»	Switches the machine on
2		«OFF»	Switches the machine off
3		«Remote control»	Switches remote control on or off
4		«Up»	Switches to previous menu page Increases a parameter value
5		«Down»	Switches to next menu page Reduces a parameter value

Item	Keys	Designation	Meaning
6		«Enter»	Switches between menus Switches to Edit mode Exits Edit mode and saves Acknowledges messages

Tab. 14 Keys

4.3.1.2 Navigation buttons

The display features buttons which can be selected using the arrow keys.

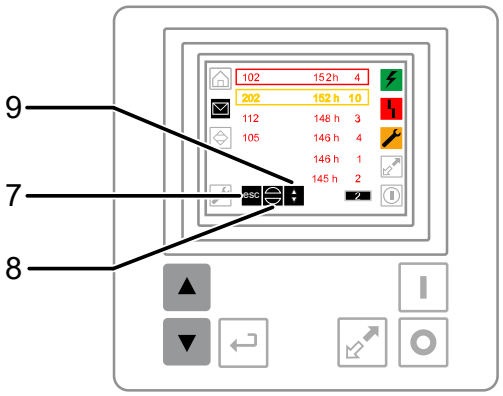


Fig. 6 Buttons

Item	Pictogram	Designation	Meaning
7	esc	Escape	Switches to next highest menu level
8		Acknowledge	Acknowledges fault messages and warning messages
9		Up / Down	Black / white: The «Up» and «Down» keys can be used for navigation: ▪ Can be used to switch to the esc pictogram or the pictogram. ▪ Switches to next / previous menu page
			Grey: The «Up» and «Down» keys are inactive.

Tab. 15 Buttons

4.3.1.3 Display elements

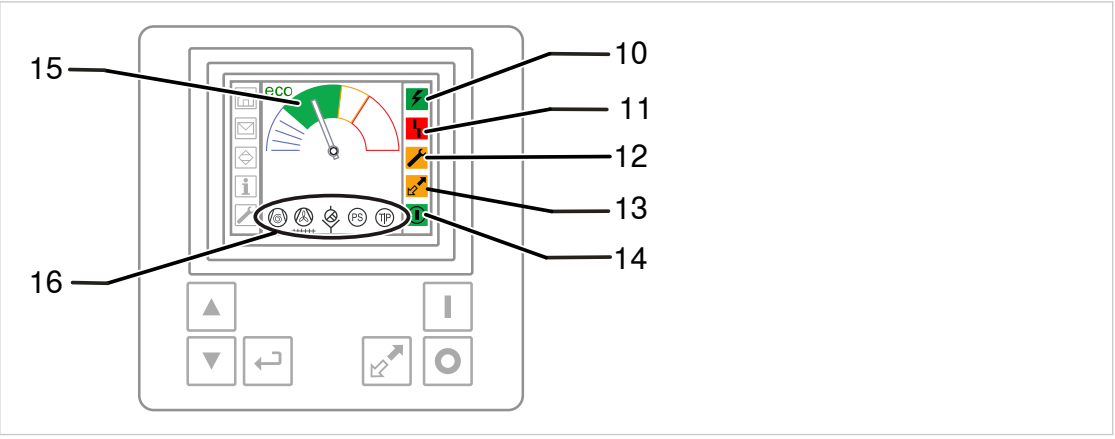


Fig. 7 Display elements

Item	Pictogram	Designation	Display characteristics	Meaning
10		Voltage applied to controller	Illuminates green	Power supply switched on
11		Fault	Illuminates red	Fault (machine switches off)
12		Warning / maintenance	Illuminates yellow	Warning message or maintenance message pending
13		Remote control	Illuminates yellow	Remote control activated
14		ON	Illuminates green	Machine switched on
15		Dew point trend indicator	Blue zone	Pressure dew point too low
			Green zone	Pressure dew point optimal Machine in energy-saving mode (eco)
			Yellow zone	Pressure dew point elevated
			Red zone	Pressure dew point high (message contact switches)

Item	Pictogram	Designation	Display characteristics	Meaning
16		Indicates messages concerning individual components	—	Refrigerant compressor
			—	Refrigerant condenser
			—	Condensate drain
			—	Pressure limiter
			—	▪ Analog sensors: ▪ Temperature transducer ▪ Pressure transducer

Tab. 16 Display elements

4.3.2 SIGMA CONTROL SMART operating concept

Action	Key	Procedure
Navigating the menu		A cursor is provided for navigating the menu, which you can move using the «Up» and «Down» keys. The current cursor position is indicated as an inverted display.
		Use the «Enter» key to switch e.g. from the main menu to a submenu. Should a menu be too large, the information is provided across multiple numbered pages. In this case, the corresponding pictogram in the main menu is displayed in a darker shade.
Changing parameters		To change a parameter, navigate to an entry and confirm with the «Enter» key. You can then use the «Up» and «Down» keys to change values or activate/deactivate check boxes: ▪ Check box activated: ✓ ▪ Check box deactivated: □ Confirm your selection with the «Enter» key. Your changes are now active.

Tab. 17 Operating concept

4.3.2.1 Main menu

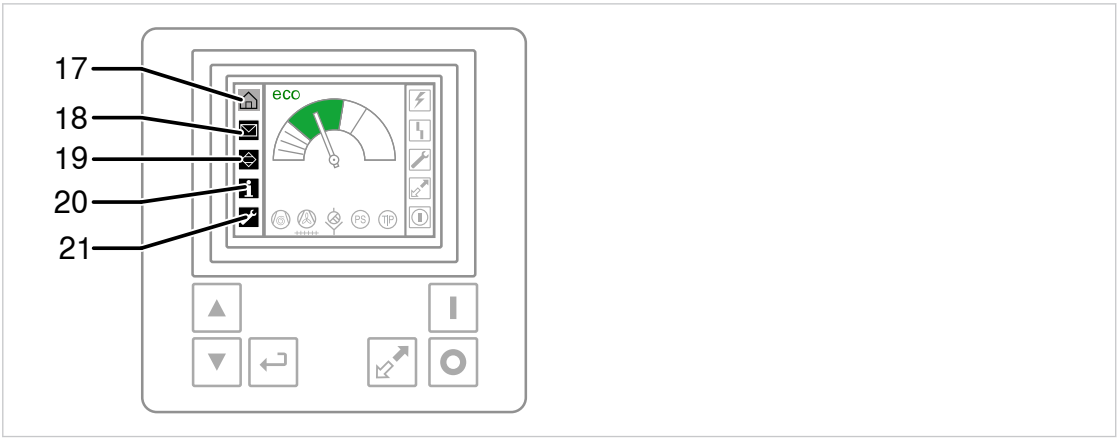


Fig. 8 Main menu

Item	Pictogram	Designation	Meaning
17		Home	Indicator: Pressure dew point
18		Messages	The following messages are saved: ▪ Faults ▪ Warnings Machine shuts down when a fault message is triggered
19		Flow diagram	Indicates all control-relevant sensors and actuators
20		Information	Indicator: Operating hours Setting option for temperature limits and units
21		Service	Indicates required maintenance tasks with an interval counter

Tab. 18 Main menu

4.3.2.2 Color code

Different colors are used indicate the various operating states.

Color		Meaning
	White	Component switched off For sensors: Activation criterion not met
	Green	Component switched on For sensors: Activation criterion met Measured value in non-critical range
	Yellow	Warning message / maintenance message pending for a component Measured value in critical range

Color		Meaning
	Blue	Pressure dew point too low
	Red	Component fault pending Measured value in impermissible range Machine will shut down

Tab. 19 Color code

4.3.3 “Home” menu

During operation of the machine, the controller displays the “Home” menu so long as you do not open any other menu. The controller switches to this display automatically if no key is activated for a period of 3 minutes.

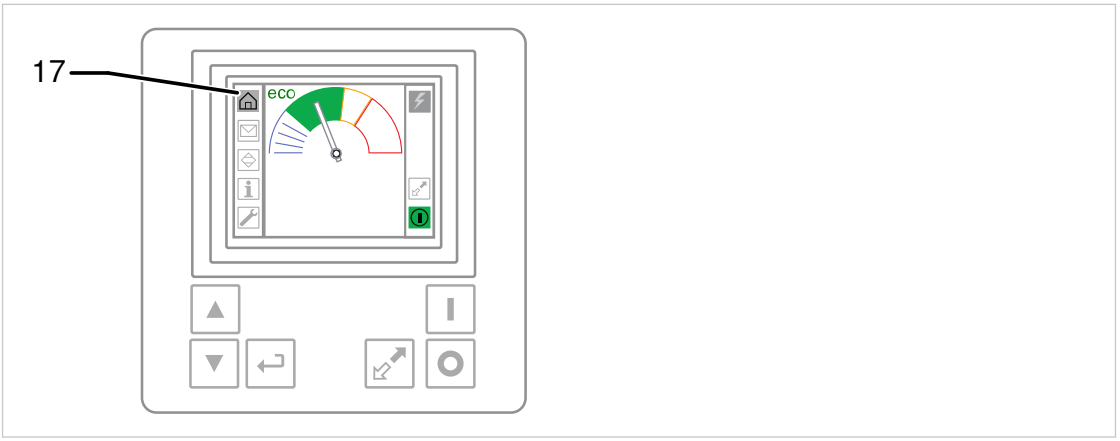


Fig. 9 “Home” menu

17 “Home” menu

4.3.4 “Messages” menu

All previously occurring messages are listed and displayed in color according to their category:

- Yellow: Warning / maintenance message
- Red: Fault message

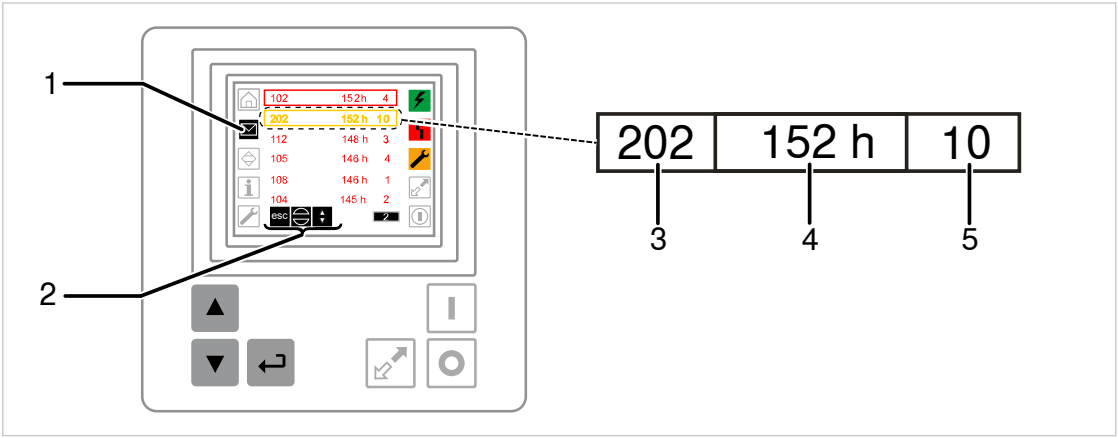


Fig. 10 Message history

1 Pictogram for the “Messages” menu
2 Additional navigation options:
“Escape” button esc
“Acknowledge” button
3 Message number (here: 202)
4 Operating hour during which the message was last triggered (here: 152 h)
5 Frequency of occurrence (here: 10)

Use the «Up» ▲ or «Down» ▼ keys to select the “Messages” pictogram.

Press the «Enter» key ↵ to open the corresponding menu page.

Active faults or warnings which have not yet been acknowledged are indicated by a flashing colored frame.

Acknowledged messages are displayed with a colored frame for as long as the cause of the message remains unresolved.

As soon as the cause of the message has been resolved, the frame disappears. This is also the case for messages that do not require acknowledging.

- Further information regarding the acknowledgement of messages can be found in Chapter 9.3 Acknowledging messages.
- Further information regarding message numbers can be found in Chapter 10.1 Messages on the controller.

4.3.5 “Flow diagram” menu

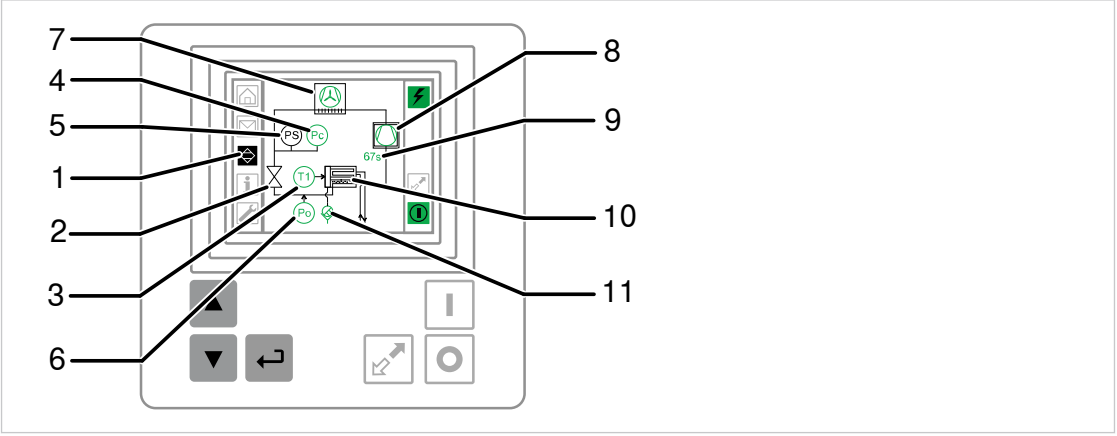


Fig. 11 Flow diagram

1. Pictogram for the “Flow diagram” menu
2. Expansion valve: thermostatic
3. Temperature transducer (pressure dew point)
4. Pressure transducer (condensation pressure)
5. Pressure limiter
6. Pressure transducer (evaporation pressure)
7. Refrigerant condenser
8. Refrigerant compressor
9. Run time of refrigerant compressor in current cycle (here: 67 s)
10. Heat exchanger
11. Condensate drain

Use the «Up» [▲] or «Down» [▼] keys to select the “Flow diagram” pictogram .

In the “Flow diagram” menu, you will find a simplified overview of the components with additional information.

The operating states of the components are indicated by the different colors in which they are displayed.

A complete Flow diagram can be found in Chapter 13.2 Flow diagram

4.3.6 “Information” menu

Use the «Up» [▲] or «Down» [▼] keys to select the “Information” pictogram .

Press the «Enter» key [↵] to open the first menu page.

Use the «Down» [▼] or «Up» [▲] keys to switch between the menu pages.

4.3.6.1 Information – Menu page 1

The system displays the operating hours for the individual machine components.

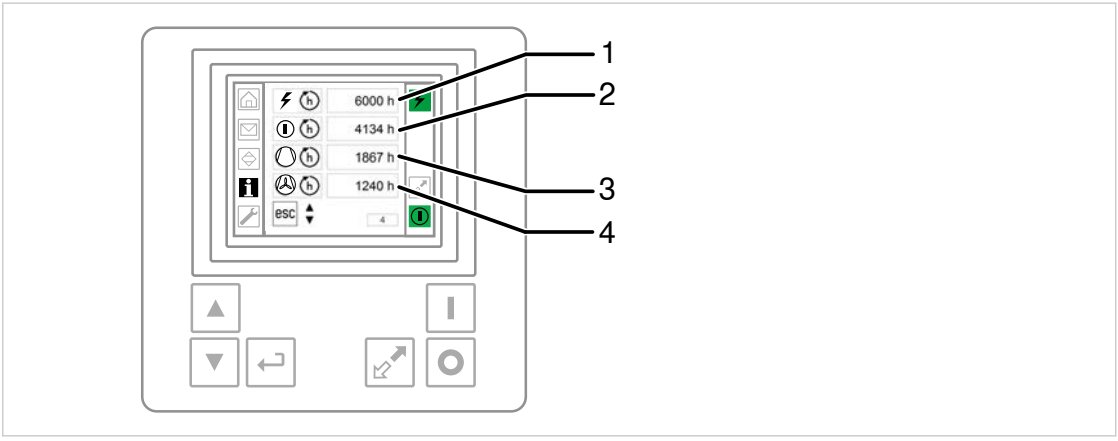


Fig. 12 Information: Menu page 1

1 Number of operating hours for which the controller has been supplied with power (here: 6000 h)
2 Number of operating hours for which the machine has been switched on (here: 4134 h)
3 Number of operating hours for the refrigerant compressor (here: 1867 h)
4 Number of operating hours for the fan motor (here: 1240 h)

4.3.6.2 Information – Menu page 2

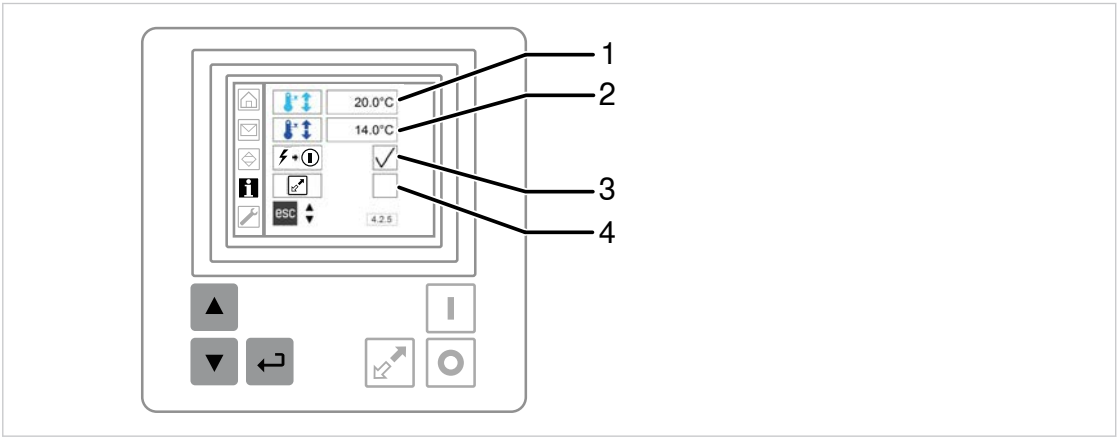


Fig. 13 Information: Menu page 2

1 Red warning range (here: 68 °F)
2 Yellow warning range (here: 57 °F)
3 Automatic restart (here: active)
4 *Remote control* (here: deactivated)

You can set the following parameters:

- Pressure dew point: Specify the lower temperature limit for the red warning range
- Pressure dew point: Specify the lower temperature limit for the yellow warning range
- Automatic restart following a power failure: Activate or deactivate
- «Remote control» key: Activate or deactivate

4.3.6.3 Information – Menu page 3

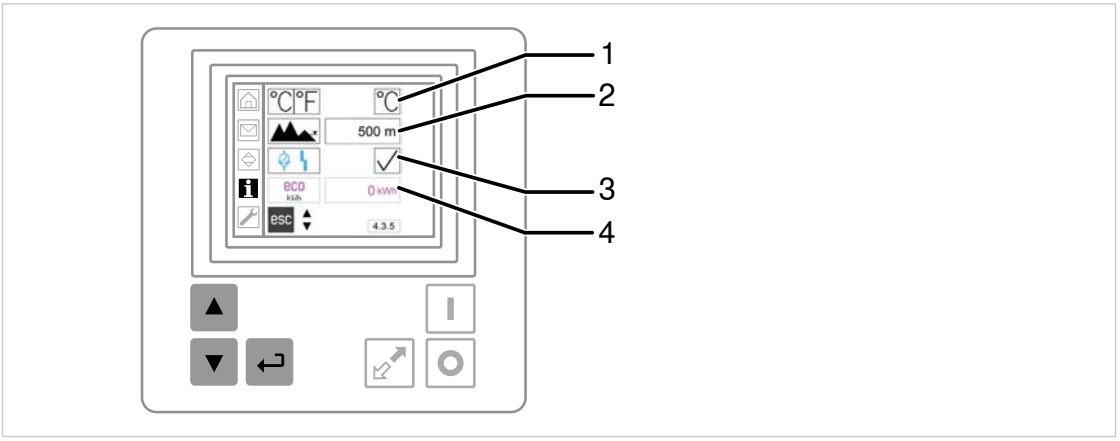


Fig. 14 Information: Menu page 3

1 Measurement unit system (here: °C)
2 Installation elevation (here: 500 m)
3 Condensate drain: Activate fault message (here: Fault message activated)
4 Electrical energy saved with “Eco mode”

You can configure the following settings on this page:

- Set the measurement unit system:
  - Measurement unit °C: Temperature in *°C*, pressure in *bar* and length in *m*
  - Measurement unit °F: Temperature in *°F*, pressure in *psi* and length in *feet*
- Adjust the installation elevation:
  - Adjustment range: 0 – 13123 ft (1640 ft preset)
  - Adjust the value for the installation elevation if the machine is installed at a location above 3280ft.
- Activate or deactivate the fault message:
  - The default setting is for a warning message to be triggered in the event of a fault with the condensate drain. The refrigerated dryer continues to run.
  - Should you activate the fault message, the controller will also report a fault. This will be triggered as soon as the condensate drain has been malfunctioning continuously for a period of 10 min. The refrigerated dryer shuts down.

4.3.7 “Service” menu

Use the «Up» [▲] or «Down» [▼] keys to select the “Service” pictogram .

Press the «Enter» key [↵] to open the first menu page.

Use the «Down» [▼] or «Up» [▲] keys to switch between the menu pages.

4.3.7.1 Service – Menu page 1: Condensate drain

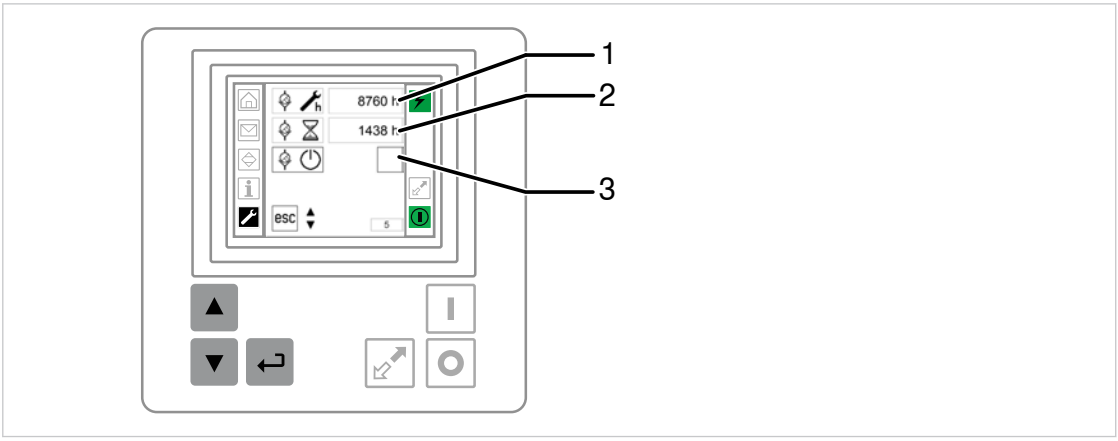


Fig. 15 Menu page 1: Condensate drain

1 Start value on interval counter (here: 8760 h)
2 Operating hours remaining until next maintenance due (here: 1438 h)
3 To reset the interval counter: Activate or deactivate the check box

The start value on the interval counter cannot be modified. To reset the interval counter to its start value, activate the check box 3 and confirm your selection with the «Enter» ↵ key.

4.3.7.2 Service – Menu page 2: Refrigerant condenser

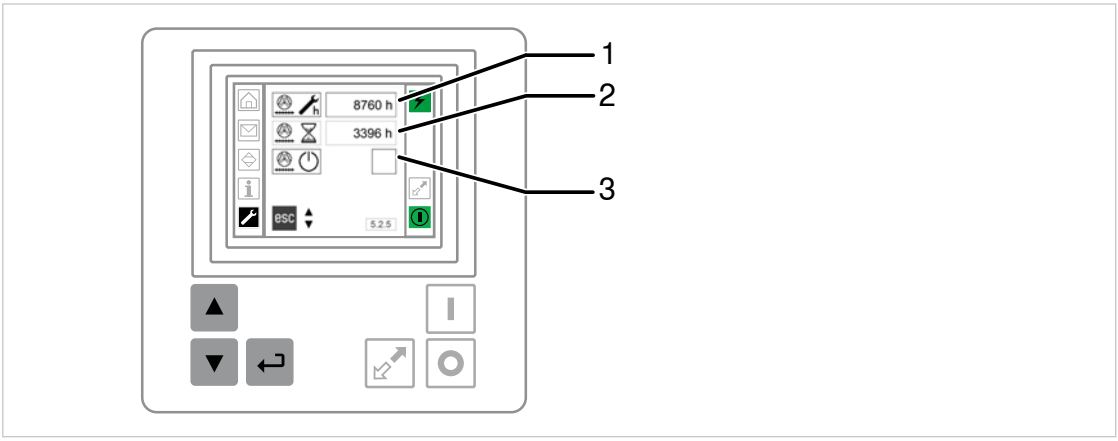


Fig. 16 Menu page 2: Refrigerant condenser

1 Start value on interval counter (here: 8760 h)
2 Operating hours remaining until next maintenance due (here: 3396 h)
3 Reset interval counter: Activate or deactivate

The start value on the interval counter can be modified. By adjusting the interval accordingly, you can adapt the maintenance period to the operating conditions of the machine. To reset the interval counter to its start value, activate the check box 3 and confirm your selection with the «Enter» ↵ key.

4.4 Machine operating points

STOP

The machine is in STOP mode:

- The machine is connected to the power supply.
- The "*Voltage applied to controller*" display element is illuminated green.
- The machine is switched off.
- The "*ON*" display element is not illuminated.

READY

The machine is switched on using the «ON» key:

- The "*ON*" display element is illuminated green.
- The refrigerant compressor is switched off.
- The refrigerant compressor starts as soon as the start conditions are met. Timer control or remote control can also influence when the refrigerant compressor starts.

LOAD

The start conditions are met:

- The refrigerant compressor runs.
- The thermal mass is cooled.

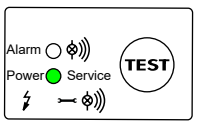
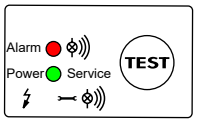
4.5 Electronic condensate drain

Accumulating condensate flows into the collection tank. A level sensor monitors the fill level and transmits a signal to the electronic controller. When the collection tank is full, a valve opens automatically and the condensate is drained. The valve closes again once the condensate drain is empty, thereby preventing unnecessary pressure losses.

4.5.1 Operating indicators and test mode

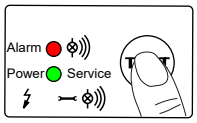
The condensate drain indicates various operating states. Press and hold down the «TEST» key to activate the different test modes.

Control lamps indicate the operating states:

Display characteristics	Meaning
	The condensate drain is ready for operation.
	A fault is pending. The valve opens and closes repeatedly in an attempt to resolve the fault.

Tab. 20 Condensate drain operating states

The «TEST» key activates the test modes:

Pictogram	Meaning
	To test the function of the valve, hold down the «TEST» key for approx. 2 seconds.
	To test the alarm function, hold down the «TEST» key for at least 1 minute.

Tab. 21 Condensate drain test modes

4.6 Options

This section contains a list of available options for your machine and a description of them.

4.6.1 H1 Adjustable machine feet

These mountings enable the machine to be anchored firmly to the floor.

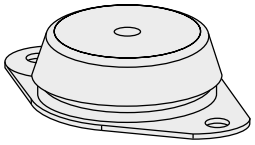


Fig. 17 Adjustable machine foot

4.6.2 C36 Floating contact “Pressure dew point warning”

Should the pressure dew point exceed the permissible range, the floating contact “Pressure dew point warning” switches. The floating contact is reset automatically as soon as the pressure dew point reduces again.

4.6.3 C37 Floating contact “Refrigerant compressor running”

This floating contact switches as soon as the refrigerant compressor is running.

4.6.4 C44 Modbus TCP communications module

The Modbus TCP communications module enables communication between the SIGMA CONTROL SMART controller and the SIGMA AIR MANAGER 4.0 master controller.
As an alternative to the SIGMA AIR MANAGER 4.0, controllers from other manufacturers can also be connected via Modbus TCP.
In such cases, please contact an authorized KAESER service representative.

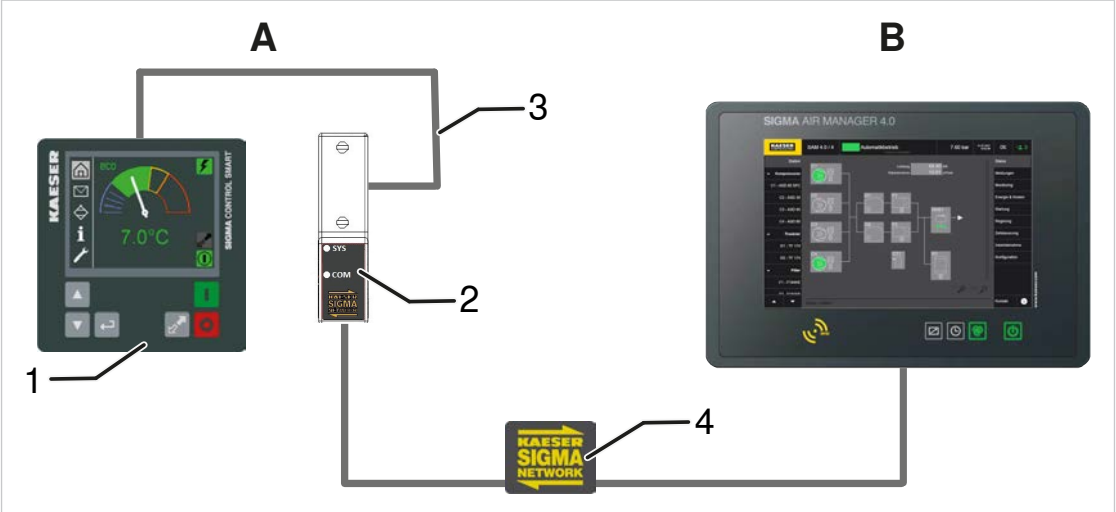


Fig. 18 Installation variants with SIGMA AIR MANAGER 4.0

A	Refrigerated dryer	B	SIGMA AIR MANAGER 4.0
1	SIGMA CONTROL SMART	3	CAN bus cable
2	Modbus TCP communications module	4	SIGMA NETWORK cable

4.6.4.1 Display and operating elements on the communications module

The communications module communicates with the SIGMA CONTROL SMART controller via CAN bus (X2).

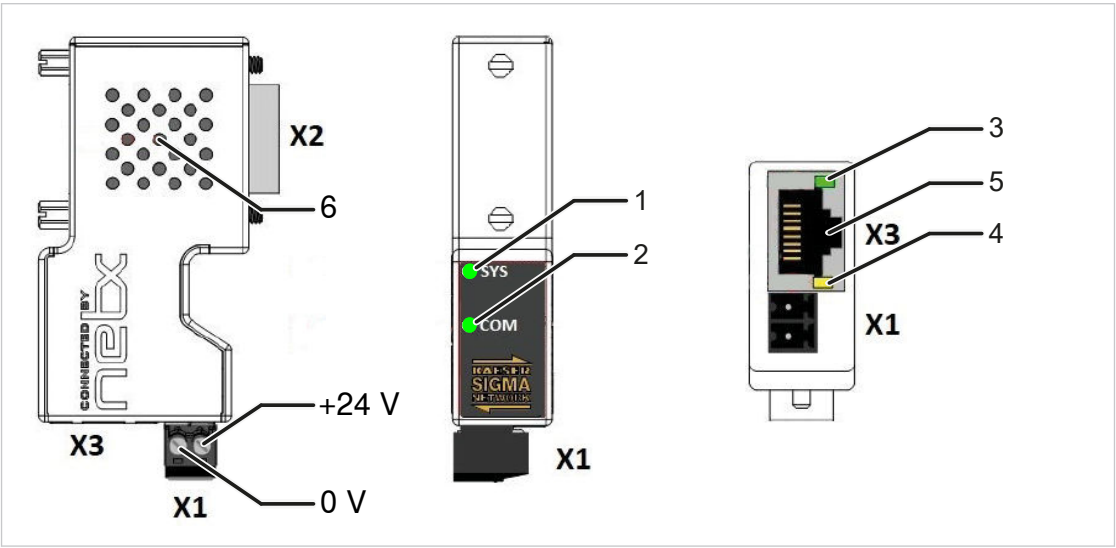


Fig. 19 Communications module

The communications module is equipped with the following display elements, operating elements and connections:

Item	Designation	Display characteristics		Meaning
	X1	—	—	Supply voltage 24 VDC
	X2	—	—	CAN, 9-pole D-sub connector
	X3	—	—	Ethernet, RJ45 socket
1	SYS	Green	On	System status: Standard operation, firmware started
		Yellow	On	Transition state
		Yellow/ green	Flashing	Activation of communications module in progress
		—	Off	No supply voltage
2	COM	Green	On	Standard operation, CAN and Ethernet communication in progress
		—	Off	RESET button pressed
		Red	Flashing 1x/s	CAN communication interrupted / Ethernet communication in progress
		Red	Flashing 2x/s	Ethernet communication interrupted or CAN communication in progress
3	Ethernet LINK	Green	Off	No network connection
			On	Network connection established
4	Ethernet ACT	Yellow	Off	No Ethernet communication
			Flashing	Ethernet communication in progress
5	—	—	—	Pin 1
6	RESET button in enclosure beneath opening	—	—	Holding down the button for longer than 3 s with a suitable object will restore the IP settings (IP address, subnet mask, gateway) to the factory setting

Tab. 22 Display elements, operating elements and connections on the communications module

The following control indicators illuminate during operation:

- The SYS control indicator illuminates green during standard operation of the communications module.
- The COM control indicator illuminates green when communication is in progress between the SIGMA CONTROL SMART controller and the bus master (SIGMA AIR MANAGER 4.0 or Modbus TCP control system).
- The Ethernet LINK control indicator illuminates green when connection to the Ethernet network has been established.
- The Ethernet ACT control indicator flashes yellow when Ethernet communication is in progress.

5 Transport and storage

5.1 Transport damage

The machine is shipped in perfect condition. Nevertheless, damage may have occurred during transportation.

Check the machine for visible transport damage. If damage has occurred, report it immediately to the carrier or supplier.

5.2 Transportation

Weight and center of gravity determine the most suitable method of transportation. The center of gravity is shown in the dimensional drawing in chapter 13.1 Dimensions and connection sizes.

Consult KAESER or an authorized KAESER service representative if you intend to transport the machine in freezing temperatures.

Allow the machine to be transported only by persons who, due to their training, possess the appropriate authorization for safe handling of transported goods.

Only transport the machine by forklift, or use suitable load-carrying equipment.

If the machine is already connected to a compressed air network, decommission the machine as described in chapter 12 Decommissioning, dismantling and disposal before transporting it.

⚠ WARNING

Risk of accident during transportation

- ► Adhere to the permissible load limits for transportation aids
- ► Ensure that connections at the load lifting points are established correctly

5.2.1 Transporting the machine by forklift

Fig. 20 Transporting by forklift

Proceed as follows:

1. Note position of the center of gravity.
2. Position the forks completely underneath the machine or pallet.
3. Lift slowly.

5.2.2 Transporting the machine with a hoist

Only suitable and approved load-carrying and lifting equipment can ensure proper transportation of the machine using a hoist, e.g. a crane. Consult KAESER or an authorized service partner should you require suitable load-carrying or lifting equipment, or have any queries regarding their correct use.

The machine is not equipped with any load-fastening points. In order to prevent damage, use suitable spreader beams or load traverses to ensure sufficient distance between the lifting equipment and the machine enclosure.

Unsuitable load-fastening points include the following components:

- Pipe sockets
- Flanges
- Condensate drain

1. Load-carrying and lifting equipment correspond to local safety regulations
2. No personnel are to be endangered by the hoist, load-carrying equipment, lifting equipment or the lifted machine

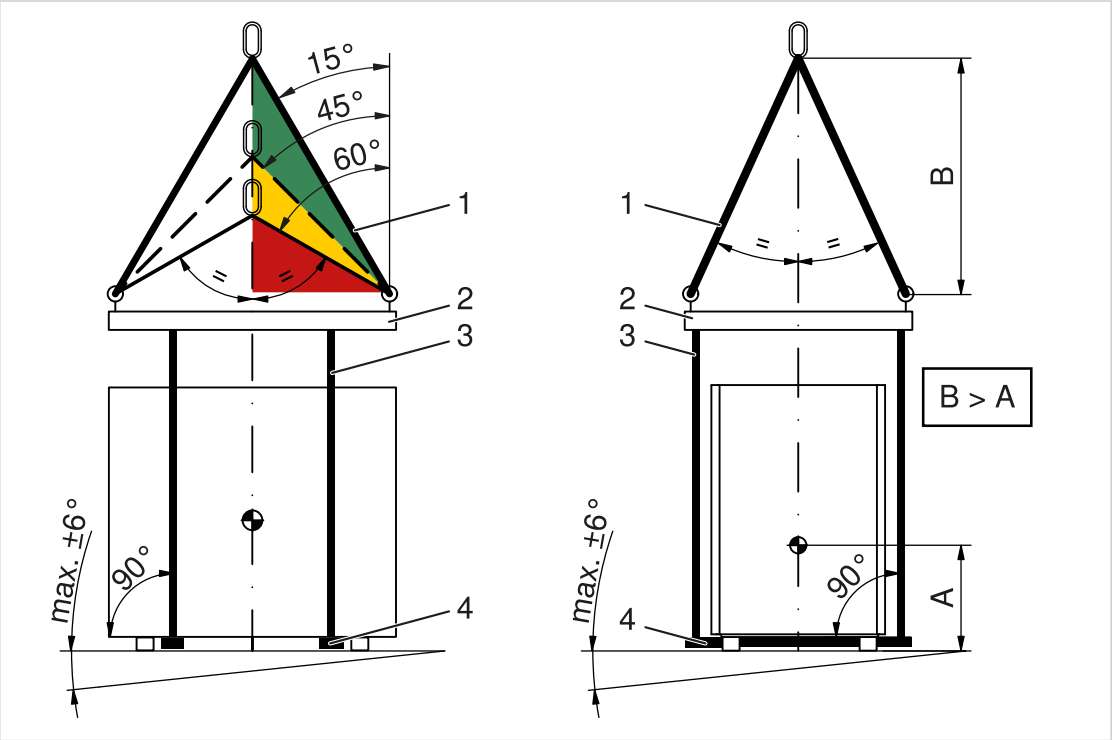


Fig. 21 Transporting using a crane

1 Lifting equipment
2 Load-carrying equipment
3 Suspension to the load-carrying equipment
4 Spreader beam or load traverse

Proceed as follows:

1. Use the load-carrying and lifting equipment correctly:
   - Ensure proper distribution of load-fastening points relative to the center of gravity (symmetrical load distribution)
   - For lifting equipment with multiple cables, maintain an even tilt angle of 15 ° to 45 °
   - Avoid tilt angles between 45 ° and 60 °; tilt angles greater than this are prohibited
   - Ensure a maximum horizontal tilt of 6 ° for the machine
   - Ensure sufficient distance between the lifting equipment and the machine
   - Ensure a positive stability height: Dimension B > Dimension A
   - Do not attach the lifting equipment to any of the machine's components
2. Conduct a lifting test:
   To check the horizontal positioning of the machine and avoid a swinging motion, raise the machine slightly.
3. Only transport the machine after conducting a successful lifting test.

5.3 Packaging

Protect the machine from mechanical damage during transportation. The original packaging or a wooden crate is suitable for overland transport.

Additional measures must be taken for the transportation of a machine by sea or air. Detailed information can be obtained from KAESER or an authorized service partner.

- Desiccant: Silica gel or activated clay
- Protective sheet
- Wooden transport crate

- The machine has been decommissioned
- The machine has cooled down and dried

Proceed as follows:

1. Place sufficient desiccant in the machine.
2. Use a sheet to protect the machine against precipitation and dirt.
3. Protect the machine against mechanical damage by placing it in a suitable wooden crate.

5.4 Storage

Ensure that the machine is stored in a dry and frost-free location. This also applies to machines that have not yet been commissioned.

Prevent humidity and condensation from forming inside the machine. Humidity leads to corrosion. Frozen moisture can damage components, valve diaphragms and seals.

Contact an authorized KAESER service representative should you wish to store the machine in conditions that deviate from those specified.

6 Installation and operating conditions

This chapter provides you with information on how to design a suitable installation location.

6.1 Installation conditions

The machine is intended for installation in a suitable machine room. The minimum clearances specified guarantee unhindered access to all machine parts.

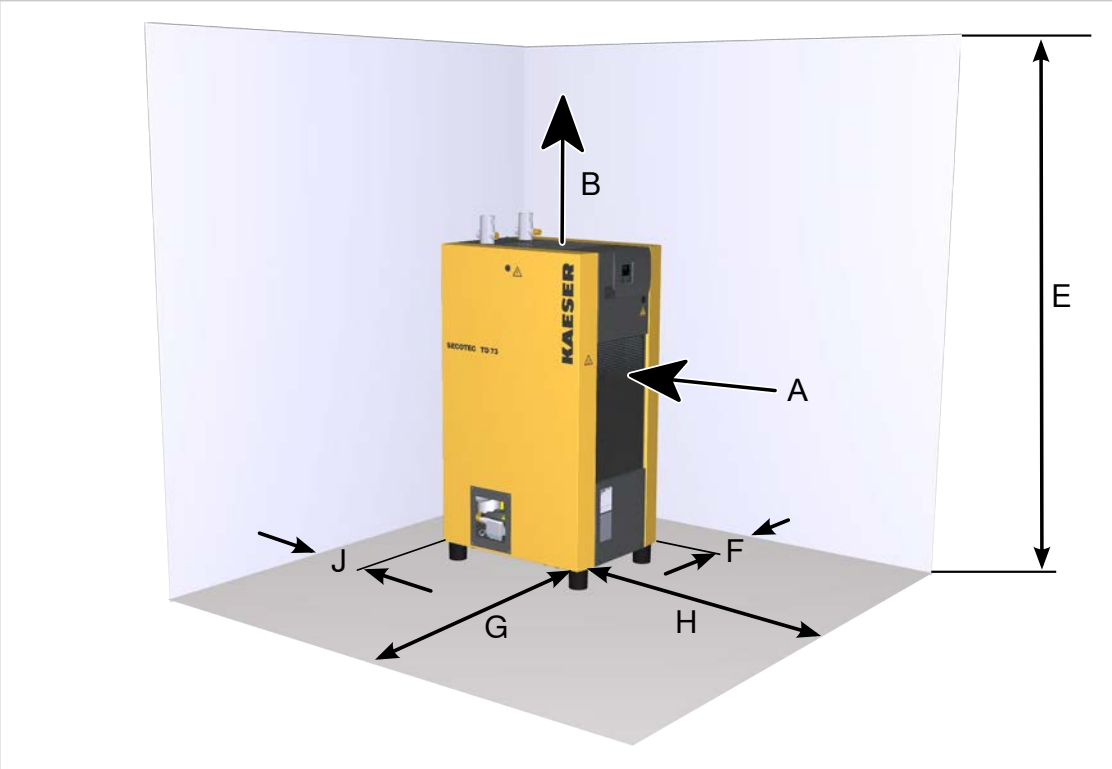


Fig. 22 Installation conditions

- A Inlet: Cooling air
- B Outlet: Cooling air
- E 83 in
- F 8 in
- G 60 in
- H 60 in
- J 8 in

To install the machine correctly, the following points must be observed:

- Ensure that the ground beneath is level, firm and capable of bearing the weight of the machine.
- Take any additional clearances specified by local health and safety regulations and construction regulations into account. Escape and rescue routes must remain safely accessible when the machine enclosure is open.
- Ensure optimal accessibility and sufficient lighting. It must be ensured that all work on the machine can be carried out without hindrance.
- Ensure that displays are free from glare.
- Ensure that UV rays from direct sunlight cannot damage the controller display.
- Ensure that all air inlet and exhaust air openings in the machine enclosure remain open.
- Ensure that the machine room is maintained in a clean condition and free from extraneous equipment and other objects.

6.2 Machine room ventilation

Sufficient ventilation of the machine room serves to convey exhaust heat away from the machine, thereby ensuring the necessary operating conditions.

The table contains details of the cooling air flow rate generated by the internal fan:

	TD 52	TD 67	TD 73	TD 94
Cooling air flow rate [cfm]	1392	1392	1392	1392

Tab. 23 Cooling air flow rate

Please note the following with regard to ventilation of the machine room:

- Ensure that the specified cooling air flow rate can be conveyed away from the machine room.
- Keep the air inlet and exhaust air openings free from obstruction so that the air can flow freely through the machine room.
- Ensure proper functioning of the machine by maintaining clean air in the machine room.

6.3 Power supply

The machine is designed for an electrical power supply in accordance with the National Electric Code (NEC), Edition 2020, specifically Article 670, and NFPA 79, Edition 2021, specifically Section 4.4. In the absence of user-specific alternatives, comply with the limits specified in these standards.

Should you require a different specific power supply, contact an authorized KAESER service representative.

6.4 Connection to a compressed air network

If the machine is to be connected to a compressed air network, the working pressure of the compressed air network must not exceed 232 psig.

When filling an empty compressed air network, very high flow velocities usually occur within the compressed air treatment equipment. Compressed air treatment equipment cannot function perfectly under such conditions. The compressed air quality is reduced. In order to charge the compressed air network in a controlled manner and simultaneously guarantee the desired compressed air quality, KAESER recommends installing an air-main charging system.

7 Assembly and installation

⚠ DANGER

Danger of electric shock from live components

- ► Switch off the power supply disconnecting device
- ► Lock out / tag out the power supply disconnecting device
- ► Verify the absence of voltage

⚠ WARNING

Danger of force being exerted on the body due to sudden release of pressure

- ► Fully vent all pressurized components and enclosures
- ► Verify the absence of pressure

- Further information regarding the size and location of the connection points is provided in Chapter 13.1 Dimensions and connection sizes.
- Further information regarding clamp assignment and adjustment values can be found in Chapter 13.3 Wiring diagram.

7.1 Attaching a nameplate in the applicable language

The machine is supplied with nameplates in the applicable language. In the event that the nameplate attached to your machine is in the incorrect language, cover it over with the correct one.

Proceed as follows:

- ► Pull the nameplate off the backing film and attach it over the existing nameplate.

7.2 Connecting the machine to a compressed air network

Condensate in the compressed air network can damage the piping. Only use corrosion-resistant piping, taking the electrochemical series into account. Only use fluoroelastomer sealing rings.

Install user-end shut-off valves at the compressed air inlet and outlet so that the refrigerated dryer can be separated from the compressed air network.

The machine's compressed air system is not protected internally against impermissible excess pressure. Install a suitable safety valve at the user-end, in order to protect the compressed air system in the event that the maximum working pressure is exceeded when the shut-off valves are closed.

- Flexible compressed air lines or compensators
- Fluorelastomer sealing rings
- Shut-off valves
- Safety relief valve

- The compressed air network is vented

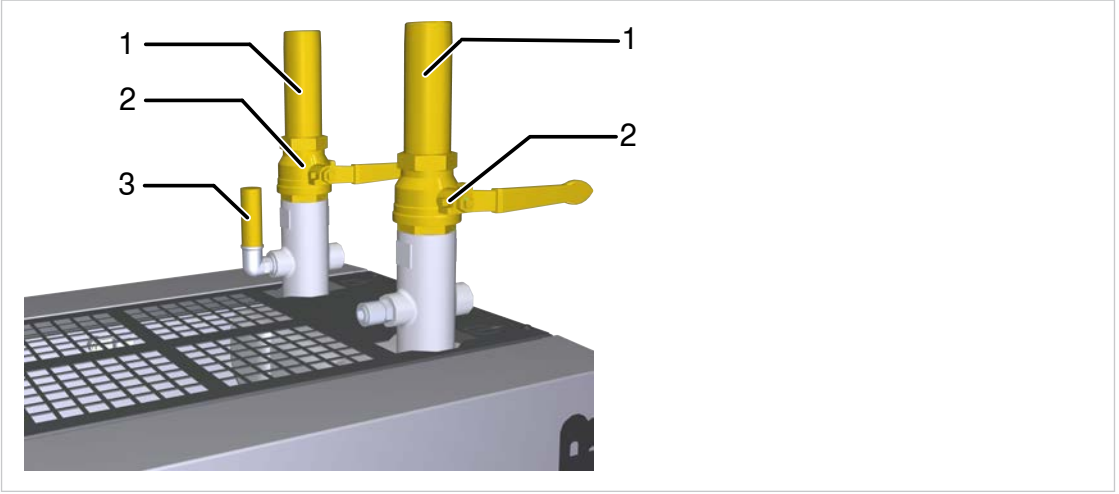


Fig. 23 Establishing a compressed air connection

1 Flexible compressed air line or compensator
2 Shut-off valve
3 Safety relief valve

Proceed as follows:

1. Install shut-off valves at the user-end in the connecting lines.
2. Connect the machine to the compressed air network with flexible compressed air lines or compensators.
3. Install a suitable safety valve as shown.

7.3 Connecting a condensate line

The machine is fitted with a threaded connection for connecting a condensate line. Ensure that the condensate can drain away without hindrance.

Only connect machines to the condensate collection pipe which do not exceed the maximum working pressure of 232 psig.

Condensate line

Characteristic	Value
Max. delivery head [ft]	16
Material (pressure-resistant, corrosion-proof)	Copper Stainless steel Plastic
Max. length[1)] [ft]	50

1) Longer lengths only possible following consultation with an authorized KAESER service representative

Tab. 24 Condensate line

Condensate collection pipe

Characteristic	Value
Max. length[1] [ft]	65
Material (pressure-resistant, corrosion-proof)	Copper Stainless steel Plastic
Gradient [%]	≥3

1) Longer lengths only possible following consultation with an authorized KAESER service representative

Tab. 25 Condensate collection pipe

Required cross-section for condensate collection pipe

Compressed air flow rate[1] [cfm]	Cable cross-section
<350	¾"
350 – 705	1"
706 – 1410	1 ½"
>1410	2"

1) Compressed air flow rate as an indicator for the amount of condensate to be expected

Tab. 26 Required pipe cross-section

The following illustration shows an installation recommendation. Condensate flows downwards into the condensate collection pipe. This type of connection prevents condensate flowing back into the machine from the condensate collection pipe. Connect the condensate line directly to the condensate collection pipe. To enable the condensate line to be shut off, install a shut-off valve in the line.

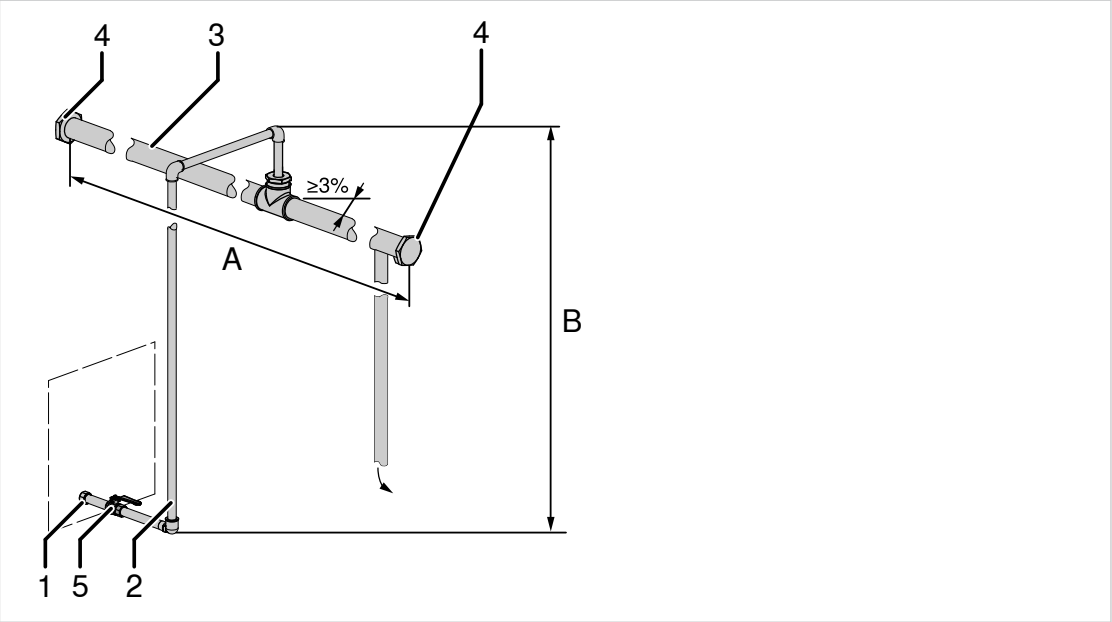


Fig. 24 Connecting the condensate line

1. Threaded connection
2. Condensate line
3. Condensate collection pipe
4. Screw plug
5. Shut-off valve
A. Length of condensate collection pipe
B. Delivery head

Proceed as follows:

1. Install a shut-off valve in the condensate line.
2. Connect the condensate line directly to the condensate collection pipe.

Conduct the condensate into a suitable collection tank and dispose of it in accordance with the applicable environmental protection regulations.

7.4 Connecting the machine to a power supply

Carry out the necessary protective measures in accordance with the relevant regulations and the national accident prevention regulations. Also observe the regulations of the local power supply company.

Calculate the cable cross-sections and backup fuses in accordance with local regulations.

Use screened cables when connecting external sensors or communications cables. Feed cables into the control cabinet via EMC screw connections.

Ensure a distance of at least 100 ft from any sensitive third-party radio communications equipment.

Proceed as follows:

1. Check whether the tolerance limits of the power supply network are within the permissible tolerance limits of the rated voltage for the machine.
2. Check the permissible shutdown times for the overcurrent protection device in the event of a fault.
3. Ensure that the supply cable inside the control cabinet is laid as short as possible and connect the machine to the power supply network.
4. Ensure that the control cabinet complies with protection class NEMA 12.

7.5 Options

7.5.1 H1 Anchoring the machine

Proceed as follows:

1. Determine suitable fixing elements for the ground beneath the machine.
2. Bolt the machine to the floor.

7.5.2 C44 Connecting a Modbus TCP communications module with the SIGMA AIR MANAGER 4.0

To connect Modbus TCP with SIGMA AIR MANAGER 4.0, the following accessories are required:

Designation	Part number	Remarks
SIGMA NETWORK cable	7.9679.0	CAT5 screened, 2 x 2 x 0.64 / 1.5 for indoor installation, PVC coating, grey, ∅ 6.5 mm, by the meter
Industrial Ethernet cable	7.7629.0	CAT5 screened, 2 x 2 x 0.64 / 1.5 for indoor installation, PVC coating, grey, ∅ 6.5 mm, by the meter
RJ45 Ethernet bus connector	7.7628.1	RJ45 connector, 4 x insulation displacement / clamping contacts, tool-free installation (Fast-Connect)
Stripping tool for Ethernet cable	8.8294.0	FastConnect stripping tool for industrial Ethernet FC cables
SIGMA CONTROL SMART RJ45 LAN retrofit kit	7.5250.02180	Angled RJ45 connector, screw connections, small parts
SNW & Modbus TCP for SIGMA CONTROL SMART retrofit kit	7.5250.12030	SNW / CAN Master protocol converter, installation material

Proceed as follows:

► Using the required accessories, connect Modbus TCP to the SIGMA AIR MANAGER 4.0.

7.5.2.1 Establishing communication with SIGMA AIR MANAGER 4.0

Proceed as follows:

► Connect the communications module to the SIGMA AIR MANAGER 4.0 via the KAESERSIGMA NETWORK.

Further information regarding your connection options can be found in the SIGMA AIR MANAGER 4.0 operating manual.

7.5.2.2 Establishing communication with a user-end controller or control technology

Proceed as follows:

► Connect the communications module to a user-end controller / control technology via Modbus TCP.

Contact an authorized KAESER service representative for more information regarding your connection options.

8 Commissioning

8.1 To be observed before each commissioning

In addition to when using the machine for the first time, commissioning is required after any longer periods of downtime.

Follow the measures below for safe and reliable operation of the machine:

Downtime periods of longer than	Preparatory measure
3 months	Check the condensate drainage
12 months	▪ Check the electrical equipment ▪ Check cables. hoses and screw connections for leaks and any visible damage
36 months	Arrange for the technical condition of the machine to be checked by an authorized KAESER service representative

Tab. 27 Commissioning following extended downtime

8.2 Checking installation and operating conditions

To be checked:	See chapter	Fulfilled?
Are operating personnel familiar with all applicable safety regulations?	3.7.1 Determining suitable personnel	
Have all of the installation conditions been fulfilled?	6 Installation and operating conditions	
Have all of the ambient conditions been fulfilled?	2.4 Ambient conditions	
Has a safety relief valve been installed at the user-end?	7.2 Connecting the machine to a compressed air network	
Are the tolerance limits of the power supply within the permissible tolerance limits of the rated voltage for the machine? (See nameplate in the control cabinet)	13.3 Wiring diagram	
Are the cable cross-sections and fuse protection sufficient?	2.9 Power supply specifications	
Have all electrical connections been checked for tightness?	—	
Has the connection to the compressed air network been made with a shut-off valve and a flexible compressed air line or compensator?	7.2 Connecting the machine to a compressed air network	
Has the condensate line been connected?	7.3 Connecting a condensate line	
H1 Is the machine firmly anchored to the floor without stress?	7.5.1 H1 Anchoring the machine	
Is the machine enclosure closed completely?	—	

Tab. 28 Checklist for installation conditions

8.3 Switching the machine on for the first time

Proceed as follows:

1. Check that no personnel are working on the machine.
2. Close the machine enclosure completely.
3. Switch on the power supply disconnecting device (main switch).
4. Check that the "*Voltage applied to controller*" display element is illuminated green.
5. Press the «ON» key.
   ✓ The "*ON*" display element is illuminated green.
6. Open the shut-off valve to the compressed air network.
7. Watch for any malfunctions occurring in the first few hours of machine operation.
8. After 50 operating hours, check all electrical connections for tightness.

8.4 Registering the machine as a network participant

- The bus cabling has been completed and the RJ45 connectors are inserted at both ends of the network cable (see Chapter 4.6.4 C44Modbus TCP communications module).
- The other network participant (SIGMA AIR MANAGER 4.0, SBU, user-end components) is in operation.
- For connection to a user-end Modbus TCP network: “Technical description - SIGMA CONTROL SMART process map”, document number: 7_9200_PCM_PA is provided.

The bus address for the communications module depends on its IP address.

During the registration procedure, only one machine with SIGMA CONTROL SMART (SCS) controller can be registered at a time with the SIGMA AIR MANAGER 4.0 or Modbus TCP Bus Master. Should you wish to register multiple machines with SCS controller, this must be done sequentially. Any machines not yet registered must remain switched off.

Stick the adhesive label with the bus address for the communications module (e.g. 11) onto the front of the module. Adhesive labels for the last digit of the IP address are supplied with the SIGMA AIR MANAGER 4.0.

Connecting to the SIGMA NETWORK

► Register the machine with the SIGMA AIR MANAGER 4.0. The IP address is transferred to the SCS controller. For details, see the “Commissioning” chapter in the SIGMA AIR MANAGER 4.0 operating manual.
   ✓ The SCS communicates with the Bus Master via the network.
   ? If no connection to the communications module can be established, the IP address may have been set to an unknown address. Restore the IP address to the factory setting (169.254.100.95) by holding down the RESET button on the communications module for longer than 3 s.

Connecting to a user-end network with Modbus TCP

► Register the machine as a Modbus TCP participant with the user-end Modbus TCP Bus Master and parametrize. The factory-set IP address is 169.254.100.95. IP settings are adjusted via Modbus TCP. For details, see ID x10...x22 in “Technical description - SIGMA CONTROL SMART process map”, document number: 7_9200_PCM_PA.

- The SCS communicates with the Bus Master via the network.
- If no connection to the communication module can be established, the IP address may have been set to an unknown address. Restore the IP address to the factory setting (169.254.100.95) by holding down the RESET button on the communications module for longer than 3 s.

9 Operation

9.1 Switching on and off

Always use the «ON» and «OFF» keys to switch the machine on or off.

The machine is connected to or disconnected from the power supply network via the power supply disconnecting device (main switch).

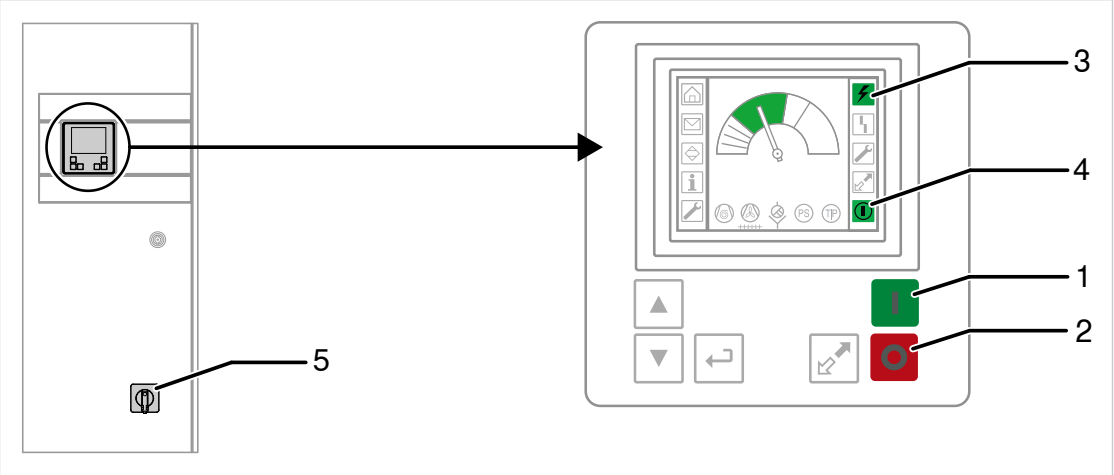


Fig. 25 Switching on and off

1 «ON» key
2 «OFF» key
3 "*Voltage applied to controller*" display element
4 "*ON*" display element
5 Power supply disconnecting device (main switch)

9.1.1 Switching on

The refrigerated dryer must be switched on approx. 10 – 15 minutes in advance, to ensure that the temperature in the compressed air system has dropped sufficiently for compressed air to be dried.

- No personnel are working on the machine
- All control cabinet doors and cover panels are closed and secured

Proceed as follows:

In the event of a power failure, the machine is **not** locked off against automatic restart when power returns.
The machine can automatically restart when the power supply is resumed and when the cut-in temperature is reached in the thermal mass.

1. Switch on the power supply disconnecting device (main switch) 5.
   ✓ The 3 display element "*Voltage applied to controller*" illuminates green.
2. Press the «ON» key.
   ✓ The "*ON*" display element illuminates green.
3. Open the shut-off valves at the compressed air outlet and inlet as soon as the temperature in the compressed air system has dropped sufficiently.

9.1.2 Switching off

Proceed as follows:

1. Press the «OFF» key.
   - The machine gently shuts down. The "*ON*" display element flashes green.
   - If you wish to switch the machine off immediately, press the «OFF» key again.
2. Switch off and lock out the power supply disconnecting device 5 .
3. Close the shut-off valves to the compressed air system.

The "*Voltage applied to controller*" display element is extinguished.

9.2 Switching on and off via remote control

The machine can be controlled remotely via the SIGMA AIR MANAGER 4.0 or a remote control center.

When connecting to SIGMA AIR MANAGER 4.0, data are read from the machine. Remote control is not possible via bus.

Different options exist for establishing a connection:

- Connection via digital input
  - Contact closed: READY
  - Contact open: STOP
- C44 Connection via Modbus TCP communications module
  The connection to the communications module has a higher priority than the digital input.

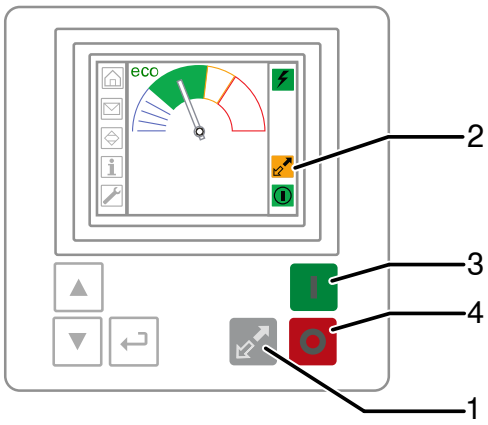


Fig. 26 Switching on and off via remote control

1	«Remote control» key	3	«ON» key
2	“Remote control” display element	4	«OFF» key

- The «Remote control» key is activated (see Chapter 4.3.6.2 Information – Menu page 2).
- A connection to a remote control center is available.

Proceed as follows:

1. Switch the machine on using the «ON» key .
2. Press the «Remote control» key.
   Remote control is switched on, the “Remote control” display element illuminates yellow. From the remote control center, you can switch the machine between the operating points READY and STOP.
3. Press the «Remote control» key again to switch the remote control off.
4. To prevent unintentional adjustment of the remote control, deactivate the «Remote control» key (see Chapter 4.3.6.2 Information – Menu page 2).

9.3 Acknowledging messages

The “Acknowledge” button affects the uppermost message shown on the display. This message is displayed inside a frame.

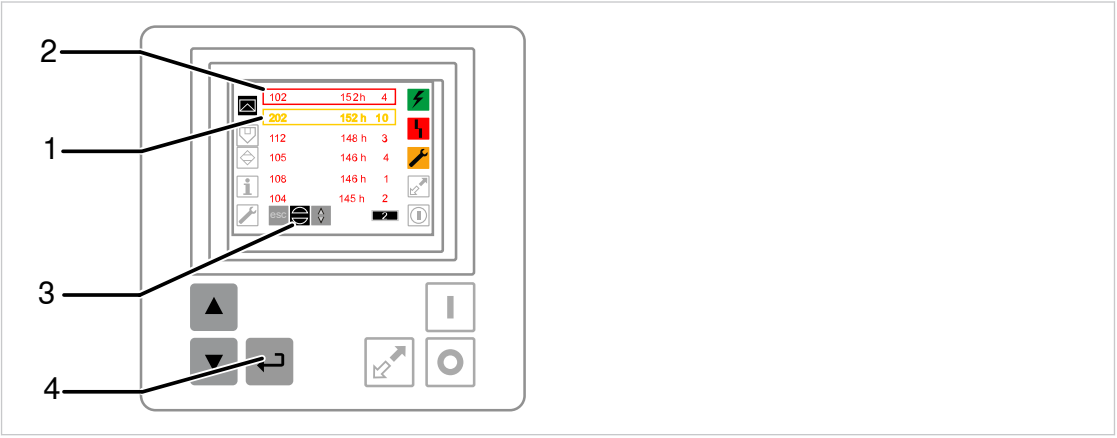


Fig. 27 Acknowledging messages

1. Yellow: Warning
2. Red: Fault
3. “Acknowledge” button
4. «Enter» key

Proceed as follows:

1. Use the «Up» or «Down» keys to select the “Acknowledge” button .
   The “Acknowledge” button is indicated as an inverted display.
2. Press the «Enter» key .
   The message in the uppermost line is acknowledged and the next, unacknowledged message is displayed in its place.
3. Once all messages have been acknowledged, switch to the “Home” menu by pressing the “Escape” button esc.

10 Fault recognition and rectification

In this chapter, you will find out how to respond to controller messages or unforeseen situations. The messages applicable to your machine are dependent on how the individual machine is equipped.

Only carry out measures described in this operating manual. For all other cases, arrange for the fault to be resolved by an authorized KAESER service representative.

10.1 Messages on the controller

Different message types are indicated by their color:

- Red: Fault. A fault message shuts the machine down automatically.
- Yellow: Warning
- Yellow: Maintenance message

Following rectification of the fault, the fault message must be acknowledged before the machine can be restarted.

Fault messages

Message	Meaning
101	Pressure limiter triggered.
102	Motor protection switch for refrigerant compressor triggered.
103	Refrigerant compressor switching frequency very high.
104	Motor protection switch for fan motor triggered.
105	Fan motor temperature switch triggered.
106	Open circuit in pressure transducer (evaporation pressure).
107	Short circuit in pressure transducer (evaporation pressure).
108	Open circuit in pressure transducer (condensation pressure).
109	Short circuit in pressure transducer (condensation pressure).
110	Open circuit in temperature transducer (pressure dew point).
111	Short circuit in temperature transducer (pressure dew point).
112	Main voltage phase sequence incorrect.
113	CAN bus communication error in display unit.
114	CAN bus communication error in controller module.
115	Display unit internal temperature too high.
116	Controller module internal temperature too high.
117	Refrigerant pressure on low-pressure side too low.
119	Condensate drain fault.

Tab. 29 Fault messages

Warning messages

Message	Meaning
201	Refrigerant compressor switching frequency high.
202	Condensate drain fault.
203	Pressure dew point high. ▪ Message is triggered when yellow warning range reached. ▪ No acknowledgement necessary.
204	Pressure dew point very high. ▪ Message is triggered when red warning range reached. ▪ No acknowledgement necessary. ▪ “Pressure dew point high” message relay contact switches.
207 208	Dryer controlled by means of refrigerant pressure. ▪ Contact an authorized KAESER service representative.

Tab. 30 Warning messages

Maintenance messages

Message	Meaning
301	Service refrigerant condenser.
302	Service condensate drain.

Tab. 31 Maintenance messages

10.2 Communications module – Troubleshooting

Communications module errors or errors in communication via the interfaces are displayed by means of control indicators on the communications module.

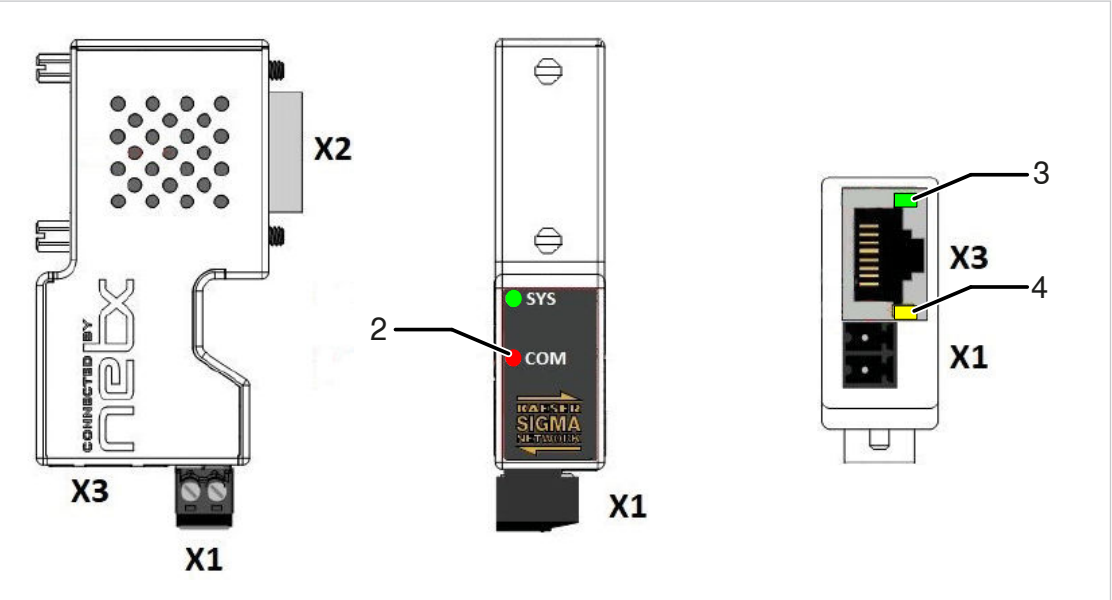


Fig. 28 Displays and connections on the communications module

Item	Designation	Display characteristics		Error	Possible cause	Action
2	COM	Red	Flashing 1/s	CAN communication fault	SCS without voltage	Check power supply
					Communications module loose	Plug communications module in and tighten fastening screws
		Red	Flashing 2/s	Ethernet communication fault	See following errors	
3	ETH LINK	Green	Off	No Ethernet connection	Network connection interrupted	Check network cables and connector
4	ETH ACT	Yellow	Off		Communications module not/incorrectly parametrized in Bus Master	Parametrize module in Master, see Chapter 8.4 Registering the machine as a network participant
			Flashing		Incorrect IP address or communication settings	Restore factory setting and re-register with bus, see Chapter 8.4 Registering the machine as a network participant
3	ETH LINK	Green	On	No Ethernet communication	SIGMA AIR MANAGER 4.0 not operational	Switch SIGMA AIR MANAGER 4.0 on
4	ETH ACT	Yellow	Off		Ethernet network not operational	Contact IT

Tab. 32 Error indicators on the communications module

10.3 Other faults and rectifying measures

Fault	Possible cause	Action
Water in the compressed pressure system	Compressed air inlet and outlet reversed	Check compressed air connection
	Condensate not draining	Check and clean condensate drain and condensate line Replace service unit on condensate drain
	Pressure limiter has shut machine down	Check operating conditions Check the machine
High pressure drop	Compressed air system frozen	Switch off machine and increase ambient temperature
	Continuous pressure loss via condensate drain	Service condensate drain

Fault	Possible cause	Action
Pressure dew point too high	Ambient or compressed air inlet temperature too high	Check and comply with installation conditions
	Low refrigerant level	Contact an authorized KAESER service representative
	Fan motor defective	Contact an authorized KAESER service representative
	Dirt build-up in compressed air system	Contact an authorized KAESER service representative
Pressure limiter shuts machine down	Ambient or compressed air inlet temperature too high	Check and comply with installation conditions
	Refrigerant condenser contaminated	Clean refrigerant condenser.
Motor protection switch is triggered	Phase failure	Reset motor protection switch
Machine cannot be switched on remotely via data connection	Jumper between X2:VBB and X2:IN11 missing	Install jumper
	«Remote control» key not activated	Activate «Remote control» key, see Chapter 4.3.6.2 Information – Menu page 2

Tab. 33 Faults and rectifying measures

11 Maintenance

Proper maintenance is essential in order to ensure a reliable compressed air supply, efficient operation and a long service life for the machine. Perform maintenance work only when the machine is switched off and has cooled down. Work on live parts must be performed only by a qualified electrician.

⚠ CAUTION

Danger of burns from hot components and surfaces

- ► Wear protective clothing
- ► Allow the machine to cool down

Warn other people by blocking off access to the work area and displaying appropriate labellng while work is being performed on the machine:

Pictogram	Meaning
	Do not switch on the machine or its power supply
	Work taking place on the machine Machine not ready for use

Tab. 34 Labeling the machine

Once work has been completed and before switching the machine back on, ensure the following:

- Nobody is working on the machine.
- No tools have been left on or in the machine.
- All protective devices and cover panels are fitted.
- The enclosure is closed completely.

11.1 Regular maintenance tasks

Interval	Maintenance activity	See chapter
Weekly	Check the condensate drain.	11.3.1 Checking the condensate drain
Quarterly	Check lines, hoses and screw connections for leaks.	–
Annually	Arrange for the refrigerant circuit to be checked for leaks and documented by an authorized KAESER service representative.	–
	Check electrical connections for tightness.	–
	Arrange for the pressure limiter to be checked by an authorized KAESER service representative.	–
Service interval indicator:	Condensate drain: Replace the Service Unit.	11.3.2 Replacing the service unit
	Clean refrigerant condenser.	11.2 Cleaning the refrigerant condenser

Tab. 35 Regular maintenance tasks

11.2 Cleaning the refrigerant condenser

Regularly cleaning the refrigerant condenser ensures reliable cooling of the machine and compressed air. The required frequency depends mainly on local ambient conditions.

1. The machine is switched off
2. The machine is disconnected from its power supply (all poles), the power supply disconnecting device has been locked off and the absence of all voltage has been verified

- Brush
- Vacuum cleaner

Fig. 29 Cleaning the refrigerant condenser

[1] Refrigerant condenser

Proceed as follows:

1. Dry-brush the refrigerant condenser and vacuum up any dirt.
2. Arrange for heavy contamination to be cleaned by an authorized KAESER service representative.

11.3 Condensate drain

11.3.1 Checking the condensate drain

- The power supply is available
- The machine is pressurized
- The Power control indicator on the condensate drain is illuminated green

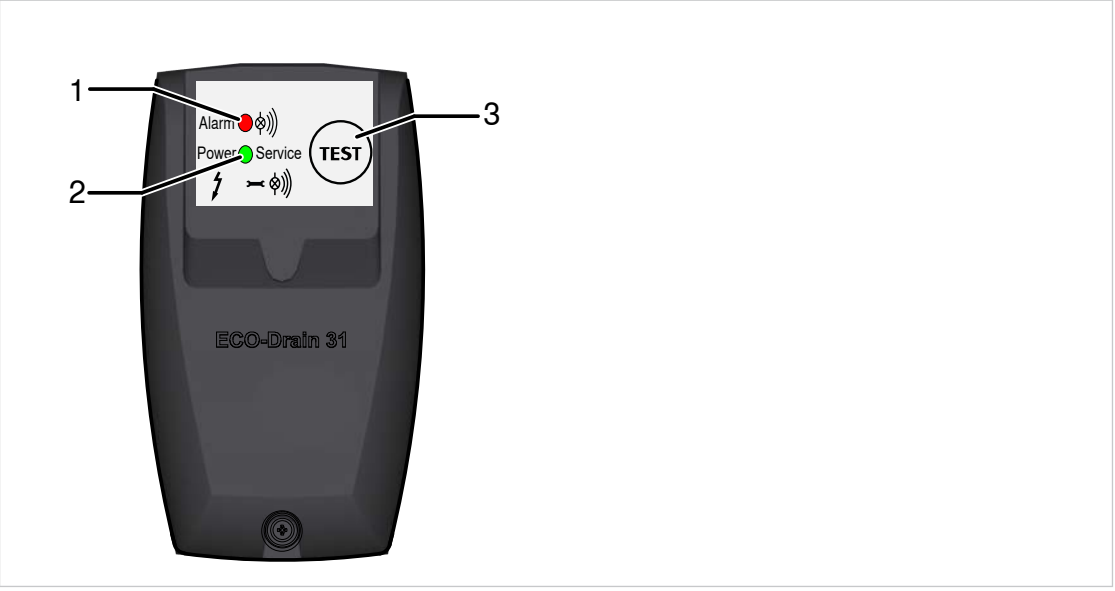


Fig. 30 Checking the condensate drain

1 Alarm control indicator, red
2 Power control indicator, green
3 TEST key

Proceed as follows:

1. With one hand, lightly touch the condensate line on the condensate drain.
2. With your other hand, push and hold the TEST key on the condensate drain for at least 2 s.
   As soon as the condensate drain opens, you will feel a brief pressure surge in the condensate line.
3. In the event that you do **not** feel a pressure surge, replace the service unit.

11.3.2 Replacing the service unit

The condensate drain cannot be cleaned. The service unit must be replaced if condensate no longer drains.

- Sealing tape
- If required: O-ring 16 x 2 (5.1519.0)

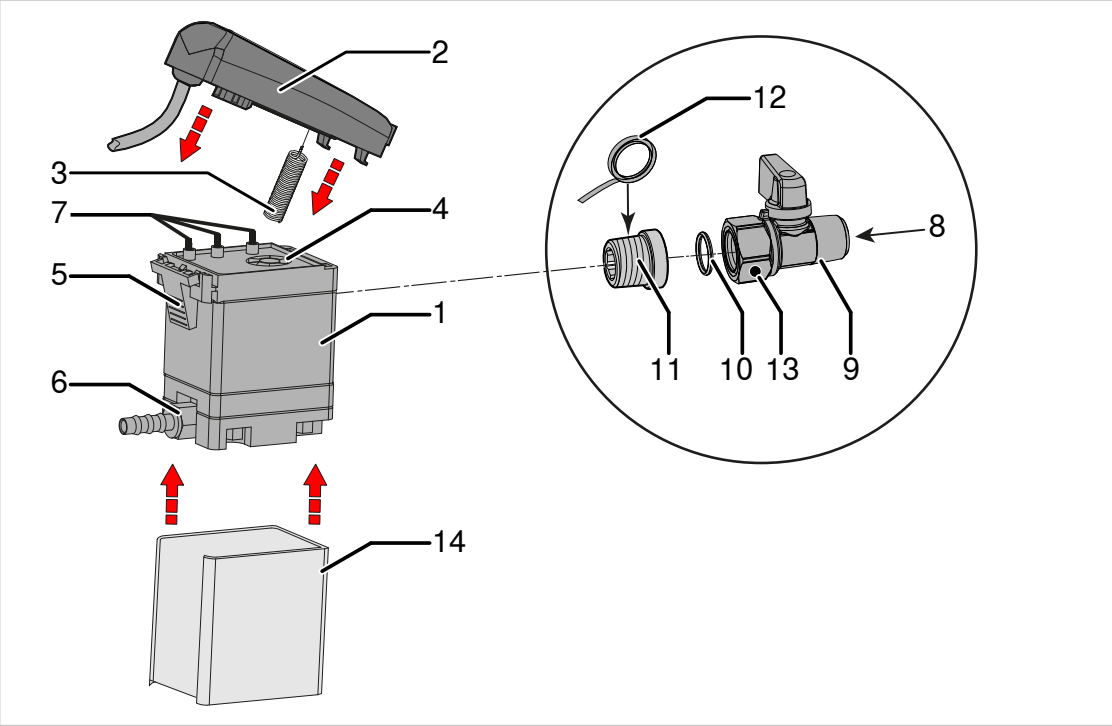


Fig. 31 Replacing the service unit

1 Service unit
2 Control unit
3 Sensor
4 Opening for sensor
5 Snap fastener
6 Screw connection (for condensate line)
7 Contact springs
8 Condensate inlet
9 Shut-off valve
10 O-ring
11 Screw-in part
12 Sealing tape
13 Clamping nut with vent holes
14 Insulation

11.3.2.1 Removing the service unit

Proceed as follows:

⚠ CAUTION

Danger of force being exerted on the body due to sudden release of pressure

► Close the upstream shut-off valve on the condensate drain

1. Check that the shut-off valve 9 is closed.
2. Hold down the TEST key (3 Fig. 30 Checking the condensate drain) for at least 2 s to vent the condensate drain.

   ? In the event that the condensate drain cannot be vented by pressing the TEST key, loosen the clamping nut 13 on the shut-off valve 9 until compressed air escapes from the ventilation hole. When this happens, you will hear a brief whistling sound.
   Should this not be the case, retighten the clamping nut and contact an authorized KAESER service representative.
3. Completely unscrew the screw connection 6 on the condensate line.
4. Press the snap fastener 5 and carefully remove the control module 2 from the service unit 1.
5. Unscrew the screw-in part 11 from the service unit 1 and place aside.

6. Remove the insulation [14] from the service unit.

11.3.2.2 Installing the service unit

To ensure correct function of the condensate drain, only use KAESER service units.

- Make sure that the top of the service unit and the contact springs are clean and dry.

Proceed as follows:

1. Fit the insulation [14] to the service unit [1].
2. Carefully insert the sensor [3] for the control module [2] into the opening [4] on the service unit [1].
3. Hook the snap fastener [5] on the control unit [2] into the eyelets on the service unit [1].
4. Press the control unit [2] against the service unit [1] until the snap fastener [5] audibly clicks into place.
5. Replace the old sealing material on the screw-in part [11] with new sealing tape [12].
6. Fit the screw-in part [11] to the service unit [1].
7. If necessary, insert a new O-ring [10].
8. Tighten the clamping nut [13] on the shut-off valve [9].
9. Fit the condensate line to the screw connection [6].
10. Open the shut-off valve [9] upstream from the condensate drain.

11.4 Ordering spare parts and operating fluids/materials

Spare parts and operating fluids/materials must meet the technical requirements specified by KAESER and be approved for use in this machine. Otherwise, the machine may become damaged or its function may be significantly impaired. By using genuine KAESER parts, you ensure that these key requirements are met.

KAESER accepts no liability for damage caused by the use of non-original spare parts.

Please provide all of the information from the nameplate when making any enquiries and when ordering spare parts.

Designation	Number
Condensate drain: Service unit	9602

Tab. 36 Spare parts

12 Decommissioning, dismantling and disposal

Decommissioning the machine involves the removal of some components, in order to enable disposal in accordance with the applicable regulations.

In order to dismantle the machine properly, it must be fully vented as described in detail in Chapter 11 Maintenance.

12.1 Decommissioning and dismantling the machine

Decommissioning is necessary in circumstances such as the following:

- The machine is temporarily not required.
- The machine is to be transported to another location.
- The machine must be disposed of.

1. The machine is switched off
2. The machine is disconnected from its power supply (all poles), has been locked off and the absence of all voltage has been verified
3. The user-end shut-off valve between the machine and compressed air network is closed
4. The machine is fully vented, the absence of all pressure has been verified
5. The machine has cooled down

Proceed as follows:

1. Drain and collect the condensate from all condensate drains.
2. Remove user-end condensate lines.
3. Remove the connection to the compressed air network.
4. Remove the connecting lines for the power supply.
5. Close all open connection ports properly.
6. If the machine is to be scrapped, the refrigerant should be drained only by a certified refrigeration technology specialist.

12.2 Disposal

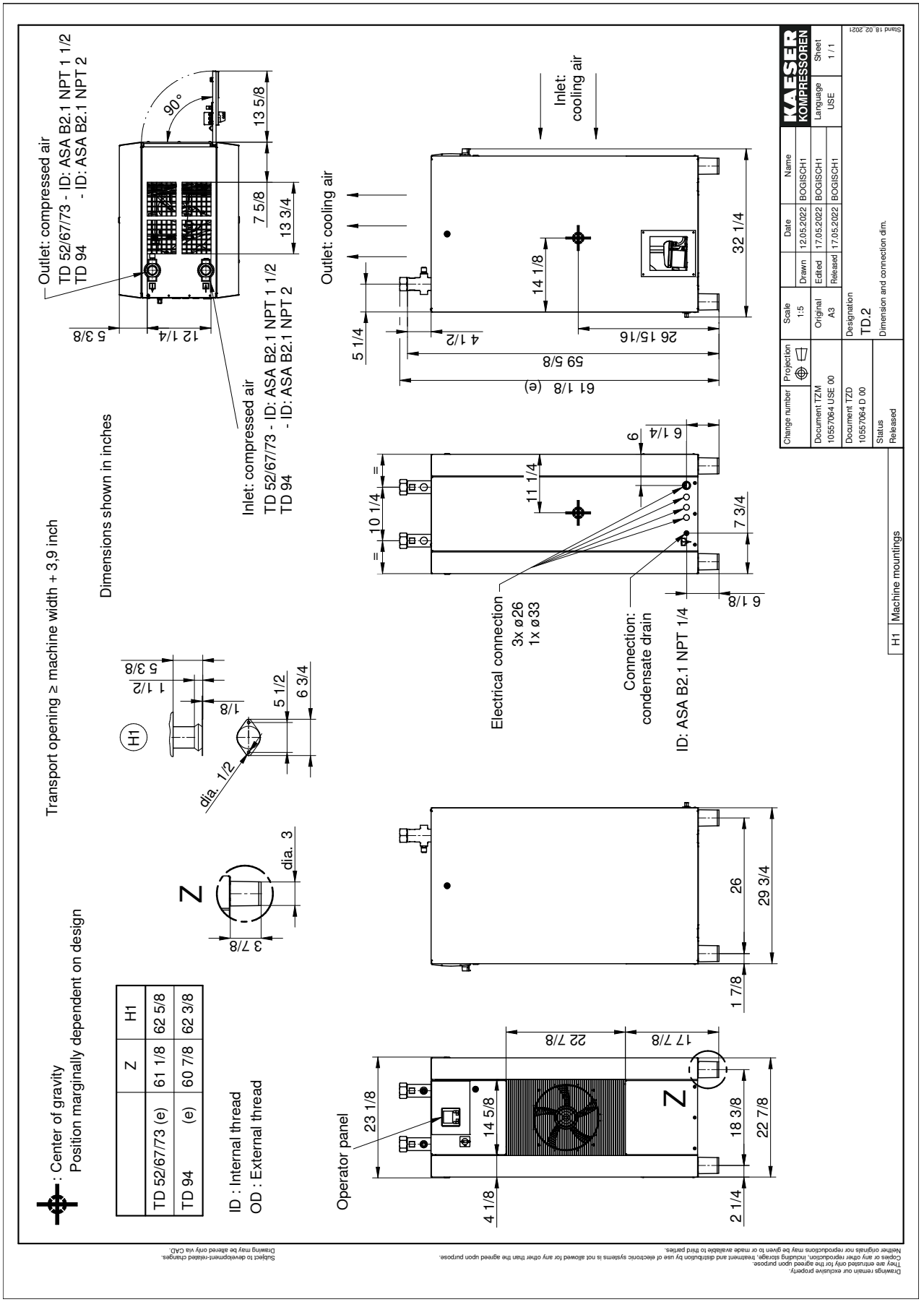
Proper disposal is required by law. If separated appropriately from regular waste, substances which are harmful to the health of living things and the environment can be recycled or disposed of in a controlled manner. Deliver all removed components and used operating fluids/materials to the designated disposal system in accordance with environmental regulations. Finally, hand the machine over to a certified disposal agent.

Proceed as follows:

1. All operating fluids/materials (refrigerant, refrigeration machine oil, thermal mass storage material) and condensate liquid must be delivered to the designated disposal system.
2. Dispose of contaminated components and cleaning cloths in accordance with environmental regulations.
3. Deliver the machine to a certified disposal agent.

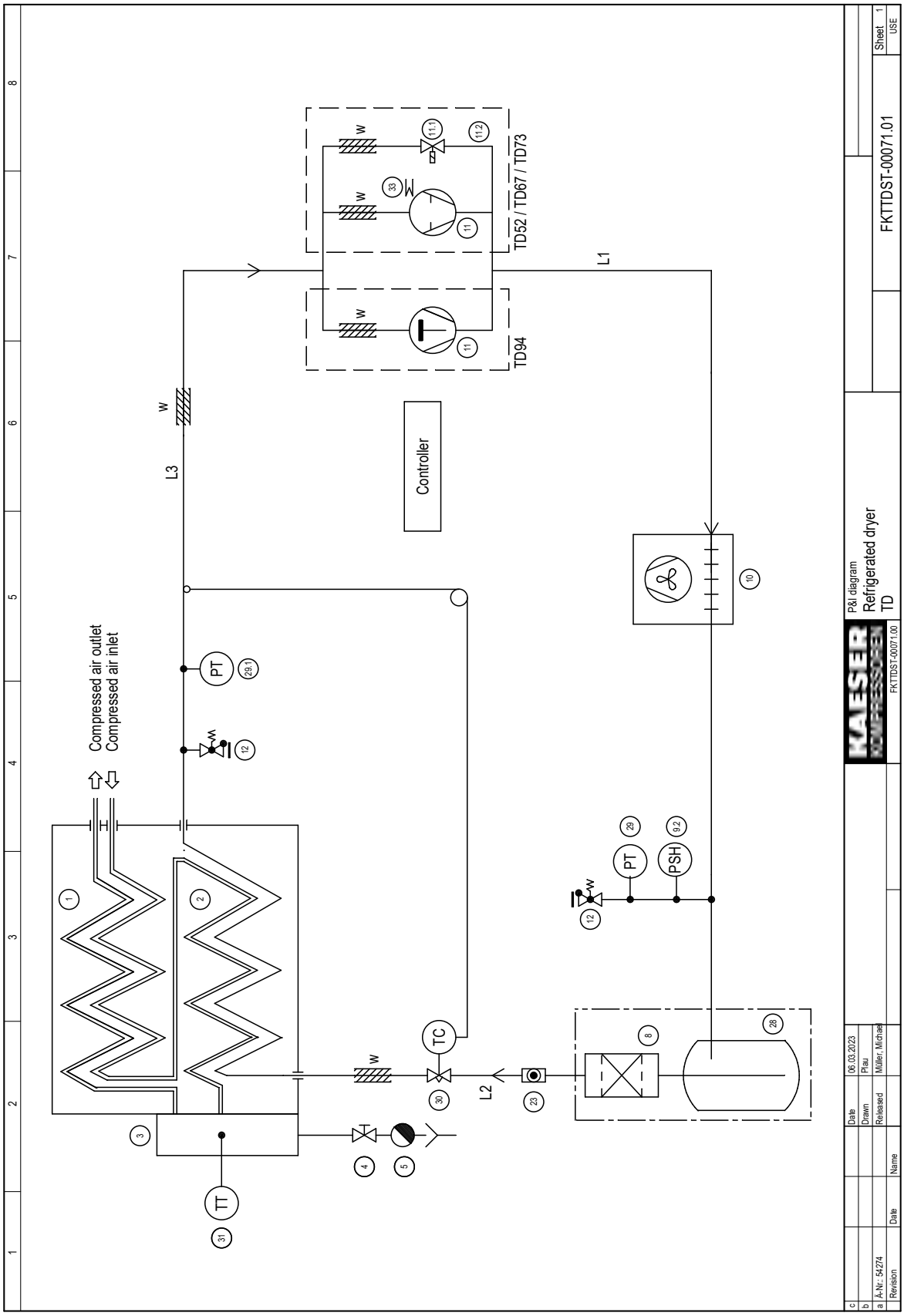
13 Documents and drawings

13.1 Dimensions and connection sizes



	Z	H1
TD 52/67/73 (e)	61 1/8	62 5/8
TD 94 (e)	60 7/8	62 3/8

13.2 Flow diagram


TD52 / TD67 / TD73
TD94
L1
L2
L3
Controller
Compressed air outlet
Compressed air inlet
PT
PSH
TC
TT
P&I diagram
Refrigerated dryer
TD
FKTTDST-00071.01
Sheet 1
USE

1	Air to air heat exchanger (heat insulated)	12	Service connection (Schrader valve)
2	Air to refrigerant heat exchanger (Evaporator) (heat insulated)	23	Inspection glass with humidity indicator
3	Condensate separator (heat insulated)	28	Refrigerant collector
4	Shut-off valve	29	Pressure transducer - Condensation pressure
5	Condensate drain	29.1	Pressure transducer - Evaporation pressure
8	Filter dryer	30	Thermostatic expansion valve
9.2	Pressure limiter	31	Temperature transducer - Pressure dew point
10	Refrigerant condenser	33	Heating - Crankcase
11	Refrigerant compressor		
11.1	Solenoid valve	Piping:	
11.2	Bypass line	L1, L2, L3	CU-Pipe
		w	heat insulated

c			Date	06.03.2023	
b			Drawn	Plau	
a			Released	Müller, Michael	
	Revision	Date	Name		

KAESER KOMPRESSOREN
FKTTDST-00071.00

P&I Diagram legend
Refrigerated dryer
TD

FKTTDST-00071.01

Sheet 2
USE

13.3 Wiring diagram

1	2	3	4	5	6	7	8

Wiring Diagram

refrigeration dryer series TD

230V ±10% 1ph 60Hz

power supply:

single phase system with solidly grounded midpoint of phase
single phase system with solidly grounded end of phase

ATTENTION !!!
The document gives collective information on
power supply voltages and frequencies for all machines.
The voltage and frequency and local conditions under
which any particular machine may be used
are given on the nameplate of the machine
and in the accompanying service manual.

manufacturer: KAESER COMPRESSORS
96450 COBURG
GERMANY

c				Date	22.03.2023 USE	KAESER KOMPRESSOREN	cover page	=	
c				Drawn	Taubmann		refrigeration dryer series TD	+	
b				Released	Ehrsam				
A	Change	Date	Name			a		DTD-U3010.01	page 1 / 1 Sht.

Lfd. Nr. No.	Benennung Name	Zeichnungsnummer (Kunde) Drawing No. (customer)	Zeichnungsnummer (Hersteller) Drawing No. (manufacturer)	Blatt Page	Anlagenkennzeichen Unit designation
1	cover page		DTD-U3010.01	1	
2	list of contents		ZTD-U3010.01	1	
3	general instructions		UTD-U3010.01	1	
4	electrical component parts list		UTD-U3010.01	2	
5	wiring diagram power supply/power unit		STD-U3010.01	1	
6	wiring diagram		STD-U3010.01	2	
7	wiring diagram		STD-U3010.01	3	
8	wiring diagram		STD-U3010.01	4	
9	wiring diagram		STD-U3010.01	5	
10	wiring diagram		STD-U3010.01	6	
11	wiring diagram		STD-U3010.01	7	
12	wiring diagram Handling: Terminals / Feed line connection		STD-U3010.01	8	
13	terminal connection terminal strip -X1		KTD-U3010.01	1	
14	terminal connection terminal strip -X2		KTD-U3010.01	2	
15	terminal connection terminal strip -X21		KTD-U3010.01	3	
16	lay-out control cabinet / control panel		ATD-U3010.01	1	
17	lay-out control cabinet door		ATD-U3010.01	2	

c						KAESER KOMPRESSOREN	list of contents refrigeration dryer series TD	=	
b			Date	22.03.2023				+	
a			Drawn	Taubmann					
B	Change	Date	Released	Ehrsam			ZTD-U3010.01	page 1	
		Name						1 Sht.	

1	2	3	4	5	6	7	8

general instructions

ATTENTION !!!
Install supplies, grounding and shock protection
to local safety regulations.
Do not make or break
live plug-in connectors.

control cabinet wiring for non-designated conductors
with multi-standard stranded conductors

primary circuits:	black 2,5mm² H07V-K, 14AWG UL-Style 1015, CSA-TEW
control voltage DC ungrounded:	blue 1mm² H05V-K, 18AWG UL-Style 1015, CSA-TEW
control voltage DC grounded:	white/blue 1mm² H05V-K, 18AWG UL-Style 1015, CSA-TEW
CAN-Bus:	brown 1mm² H05V-K, 18AWG UL-Style 1015, CSA-TEW
ground conductor:	green/yellow H07V-K, UL-Style 1015, CSA-TEW

option C36 = warning pressure dew point

option C37 = Refrigerant compressor running

option C44 = Communication module: MODBUS TCP

electrical equipment identification

-B30	safety air pressure switch (Pressure limiter)
-B32	pressure transducer (Liquefaction pressure)
-B33	pressure transducer (Gassing pressure)
-B34	Temperature measuring transducer (pressure dew point)
-C1,-C2	operating capacitor
-C3	starting capacitor
-F0	fusing
-F30	circuit breaker
-K1	communication module
-K10	solenoid valve
-K20	Display
-K21	control
-K33	condensate drain
-K50...-K54	coupling relay
-K70	Starting relay
-M30	Refrigerant compressor with overload protection
-M31	vent motor
-Q0	main disconnect
-Q30	motor starter Refrigerant compressor
-Q31	motor starter vent motor
-T21	power supply
-X1	terminal strip
-X2,-X21,-X22	transfer module
-E39	crankcase heater

c				Date	22.03.2023	KAESER KOMPRESSOREN	general instructions	=
b				Drawn	Taubmann		refrigeration dryer series TD	+
a				Released	Ehrsam			
C	Change	Date	Name				UTD-U3010.01	page 1 / 2 Sht.

model		electrical component parts list TD 52	TD 67	TD 73	TD 94
machine power supply		**230 V ±10 %, 60 Hz**	**230 V ±10 %, 60 Hz**	**230 V ±10 %, 60 Hz**	**230 V ±10 %, 60 Hz**
supply terminals	**-X1:U1/V1(N)**	7.3149.01810	7.3149.01810	7.3149.01810	7.3149.01810
	Wieland	WKFN4/35	WKFN4/35	WKFN4/35	WKFN4/35
	Stripped length	11 mm	11 mm	11 mm	11 mm
	Handling	fig. 2, Sht. 8	fig. 2, Sht. 8	fig. 2, Sht. 8	fig. 2, Sht. 8
	-X1:PE	7.3149.01830	7.3149.01830	7.3149.01830	7.3149.01830
	Wieland	WKFN4/SL/35	WKFN4/SL/35	WKFN4/SL/35	WKFN4/SL/35
	Stripped length	11 mm	11 mm	11 mm	11 mm
	Handling	fig. 2, Sht. 8	fig. 2, Sht. 8	fig. 2, Sht. 8	fig. 2, Sht. 8
supply	**connection**	fig. 10, Sht. 8	fig. 10, Sht. 8	fig. 10, Sht. 8	fig. 10, Sht. 8
terminal strip	**-X1**	7.8237.00660 (Wieland)	7.8237.00660 (Wieland)	7.8237.00660 (Wieland)	7.8237.00660 (Wieland)
circuit breaker	**-F30**	---	---	---	7.8237.00160
					3RV2711-1JD10
	Siemens				10 A
contactor	**-Q30**	7.8237.00310	7.8237.00310	7.8237.00310	7.8237.00330
		3RT2016-2BB41	3RT2016-2BB41	3RT2016-2BB41	3RT2018-2BB41
	Siemens	24 VDC	24 VDC	24 VDC	24 VDC
contactor	**-Q31**	7.8237.00310	7.8237.00310	7.8237.00310	7.8237.00310
		3RT2016-2BB41	3RT2016-2BB41	3RT2016-2BB41	3RT2016-2BB41
	Siemens	24 VDC	24 VDC	24 VDC	24 VDC
operating capacitor	**-C1**	7.9607.0	7.9608.0	7.9608.0	7.5297.00010
		25µF	30µF	30µF	Danfoss MTZ18-1
operating capacitor	**-C2**	---	---	---	7.5297.00010
					Danfoss MTZ18-1
starting capacitor	**-C3**	---	---	---	7.5297.00010
					Danfoss MTZ18-1
Starting relay	**-K70**	---	---	---	7.5297.00010
					Danfoss MTZ18-1
power supply	**-T21**	7.8726.0	7.8726.0	7.8726.0	7.8726.0
		PM-0224-038-0	PM-0224-038-0	PM-0224-038-0	PM-0224-038-0
	Block	200-500 VAC//24 VDC 3.8 A	200-500 VAC//24 VDC 3.8 A	200-500 VAC//24 VDC 3.8 A	200-500 VAC//24 VDC 3.8 A
coupling relay	**-K50/-K51/-K52/-K53**	7.3172.00310	7.3172.00310	7.3172.00310	7.3172.00310
	Phönix	RIF-0-RPT-24DC/21	RIF-0-RPT-24DC/21	RIF-0-RPT-24DC/21	RIF-0-RPT-24DC/21
	Handling	fig. 3, Sht. 8	fig. 3, Sht. 8	fig. 3, Sht. 8	fig. 3, Sht. 8
coupling relay	**-K54**	7.3172.00310	7.3172.00310	7.3172.00310	---
	Phönix	RIF-0-RPT-24DC/21	RIF-0-RPT-24DC/21	RIF-0-RPT-24DC/21	
	Handling	fig. 3, Sht. 8	fig. 3, Sht. 8	fig. 3, Sht. 8	
transfer module	**-X2/-X21/-X22**	7.8283.0	7.8283.0	7.8283.0	7.8283.0
	Wieland	99.808.5333.8	99.808.5333.8	99.808.5333.8	99.808.5333.8
	Handling	fig. 1, Sht. 8	fig. 1, Sht. 8	fig. 1, Sht. 8	fig. 1, Sht. 8
main disconnect	**-Q0**	896595.00020	896595.00020	896595.00020	896595.00030
	Sontheimer	HLT40 / 3ZM / Z20	HLT40 / 3ZM / Z20	HLT40 / 3ZM / Z20	HLX80/3E/Z20/1/62
control	**-K21**	7.9200.11000	7.9200.11000	7.9200.11000	7.9200.11000
	ifm	CR 9052	CR 9052	CR 9052	CR 9052
Operating panel and display	**-K20**	7.9200.11010	7.9200.11010	7.9200.11010	7.9200.11010
	ifm	CR 9047	CR 9047	CR 9047	CR 9047
communication module	**-K1**	7.9602.0	7.9602.0	7.9602.0	7.9602.0
Modbus TCP	**Hilscher**	SNW/CAN-Master	SNW/CAN-Master	SNW/CAN-Master	SNW/CAN-Master

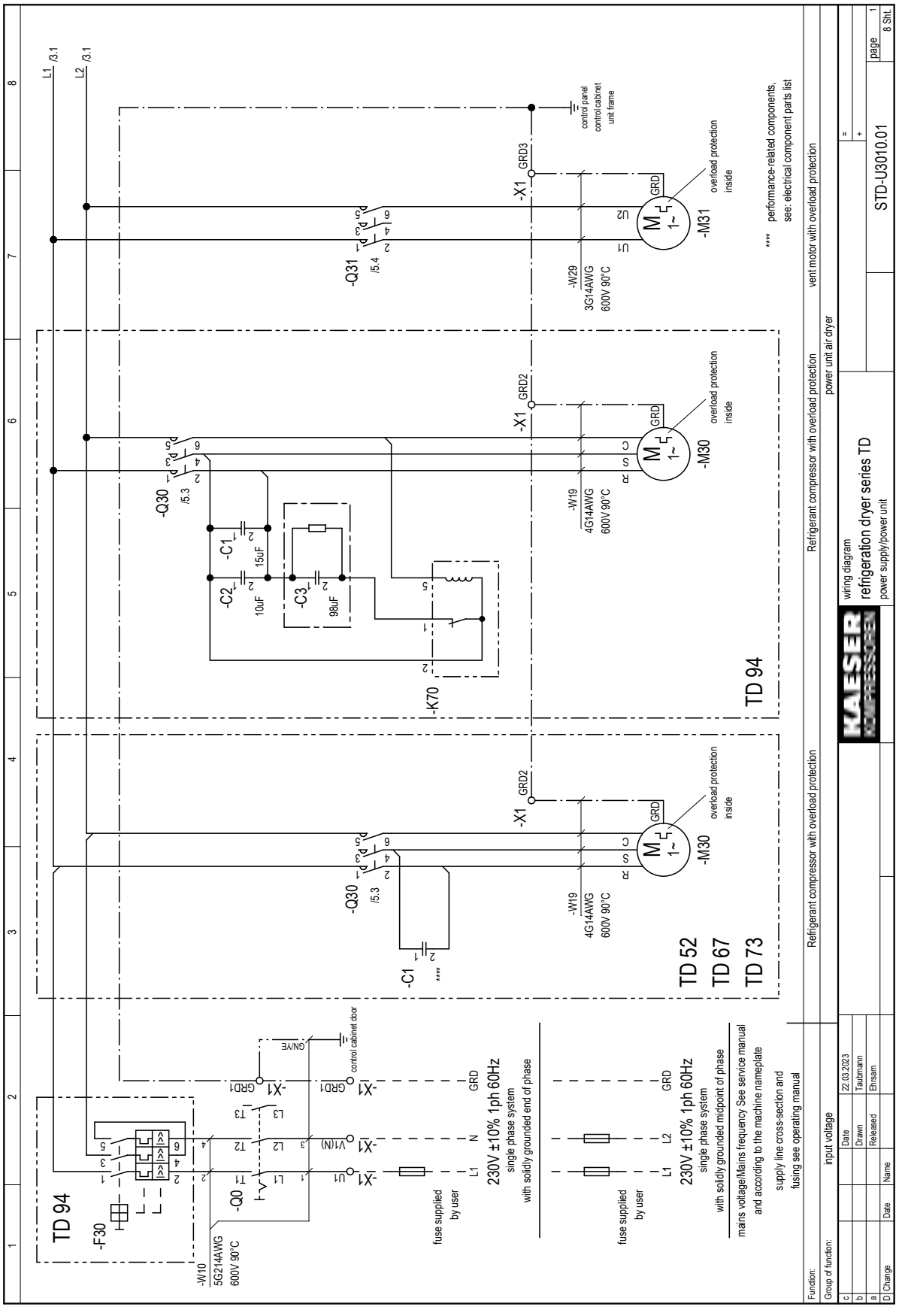
page 2 2 Sht.

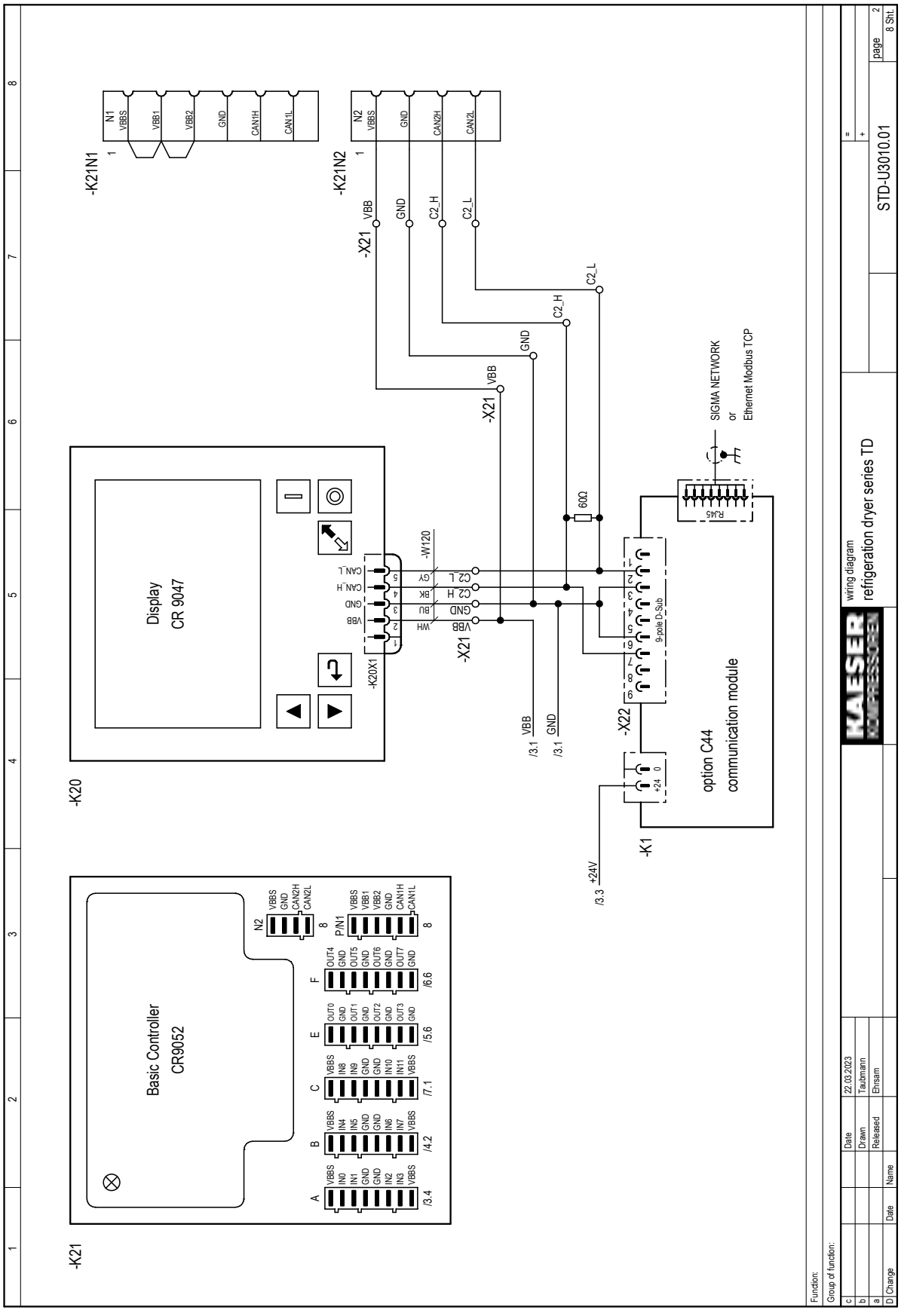
UTD-U3010.01

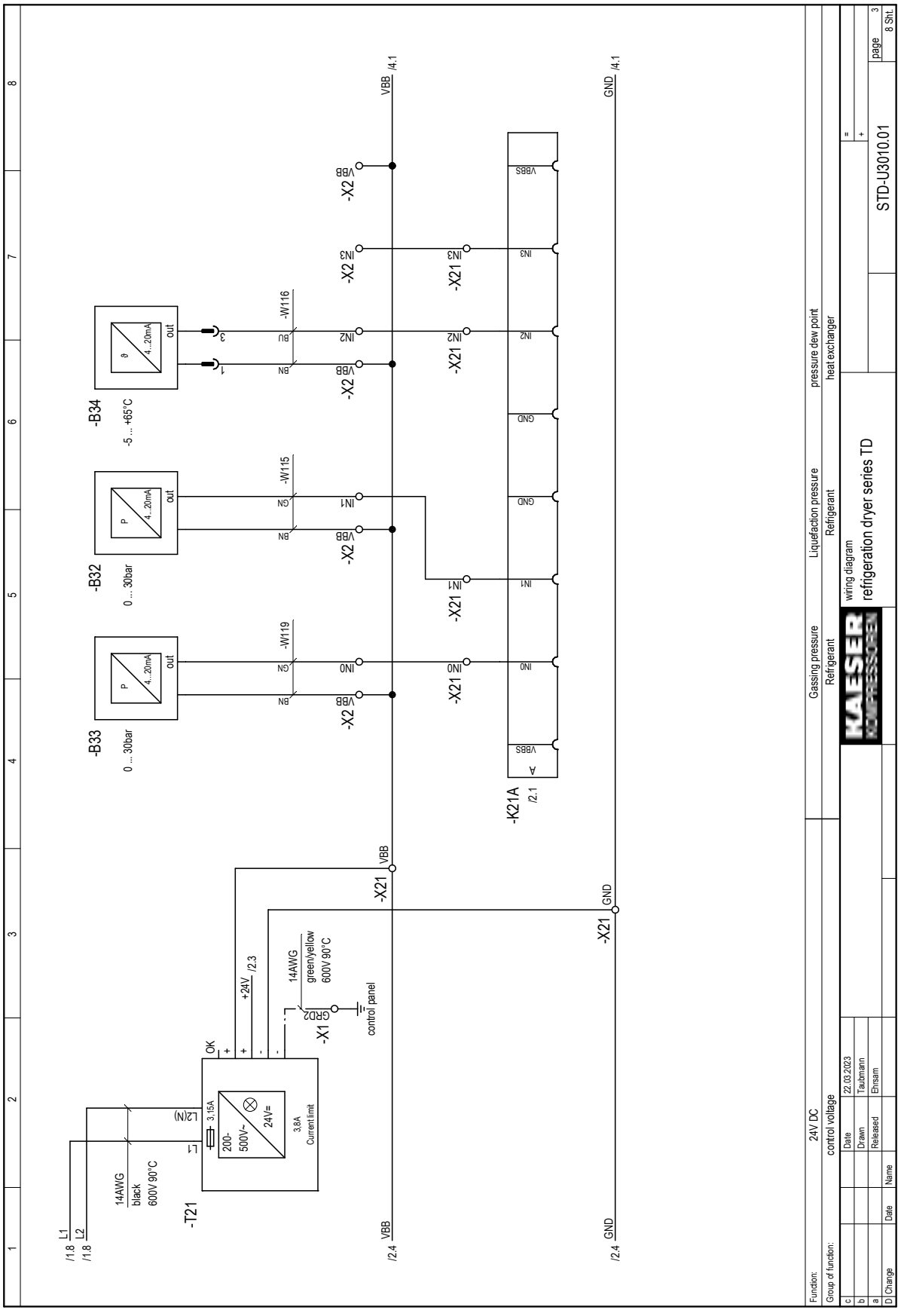
electrical component parts list
refrigeration dryer series TD

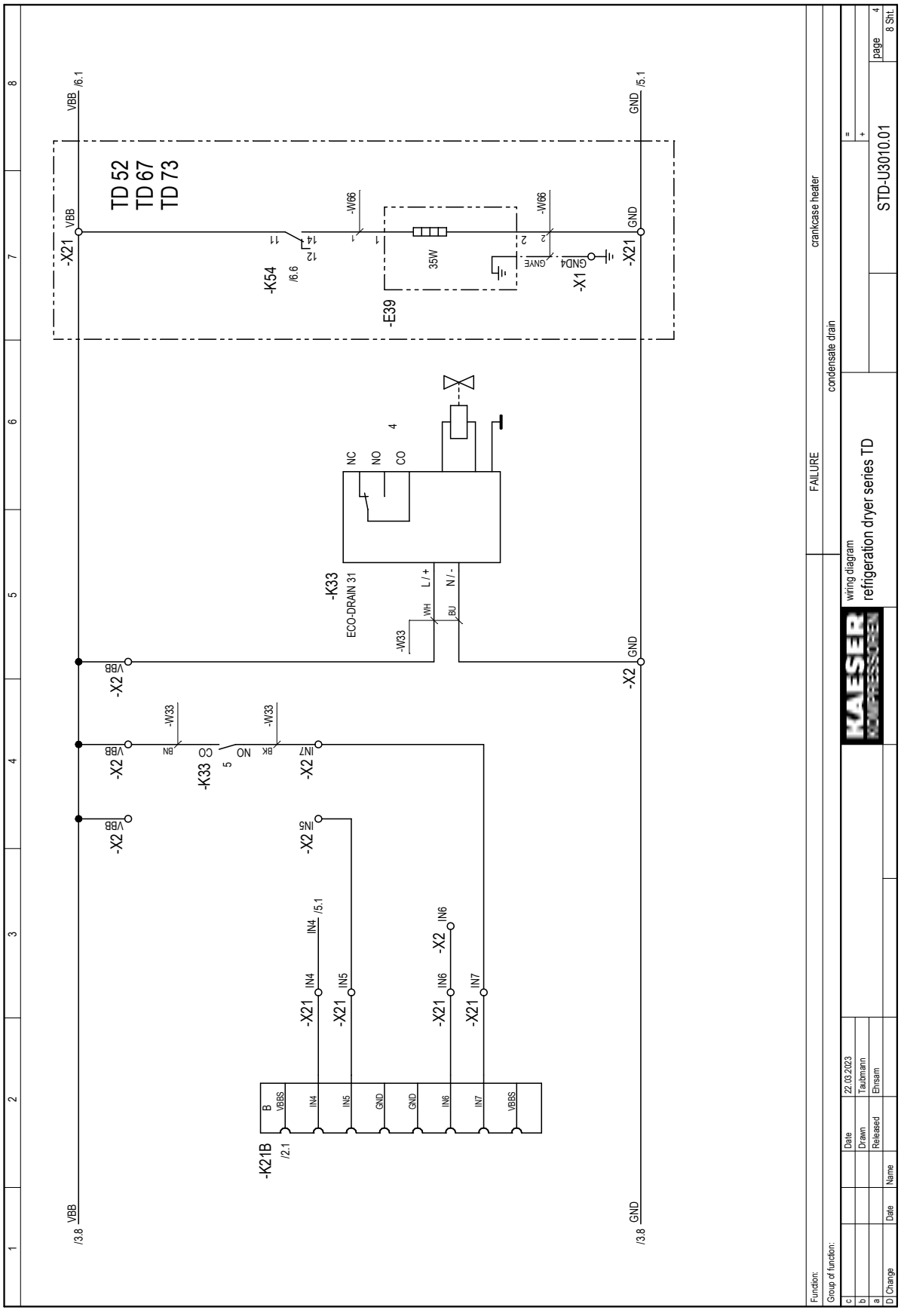
KAESER KOMPRESSOREN

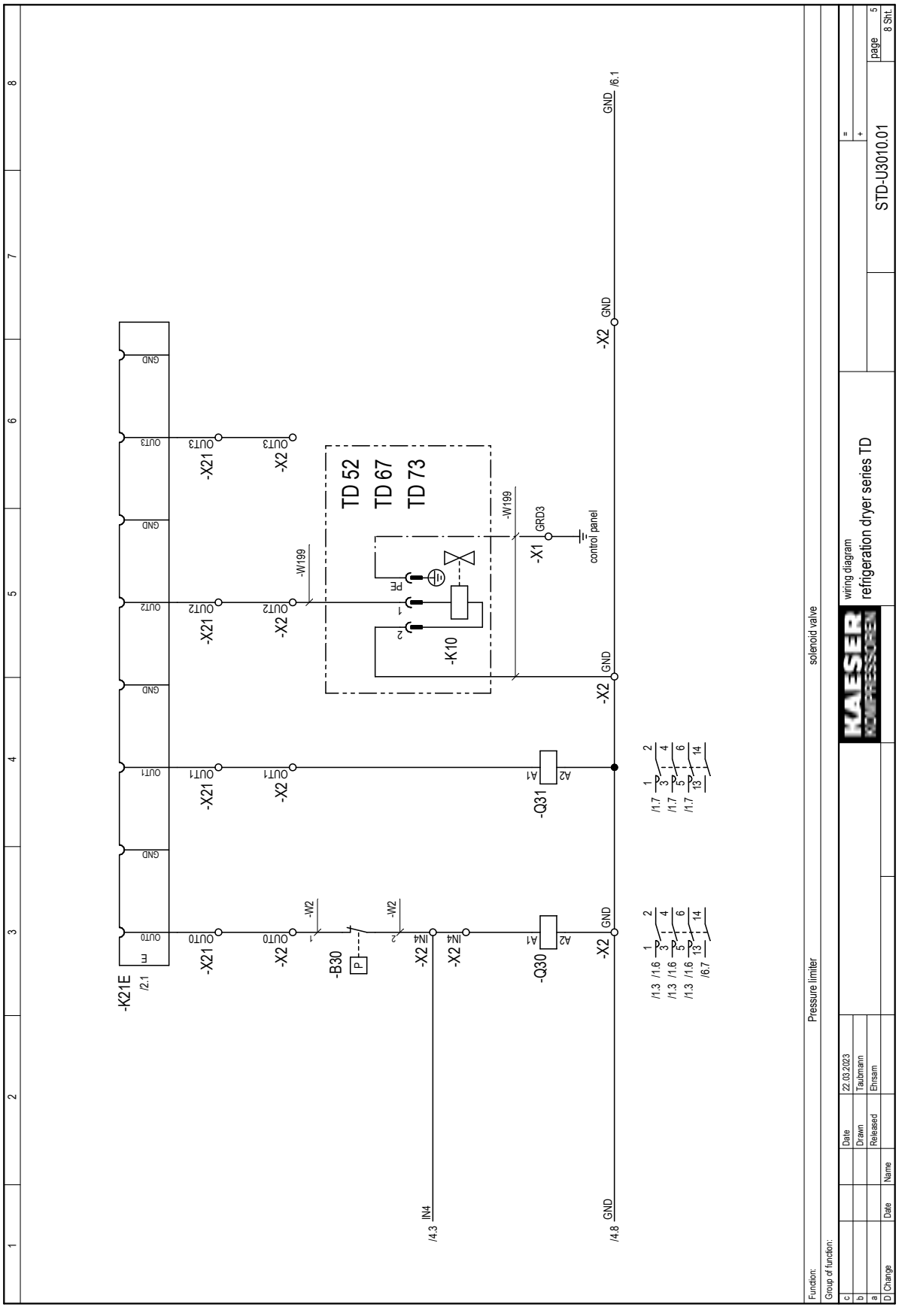
		Date	Name
c			
b		Drawn	Taubmann
a	C Change	Released	Ehrsam
		22.03.2023	

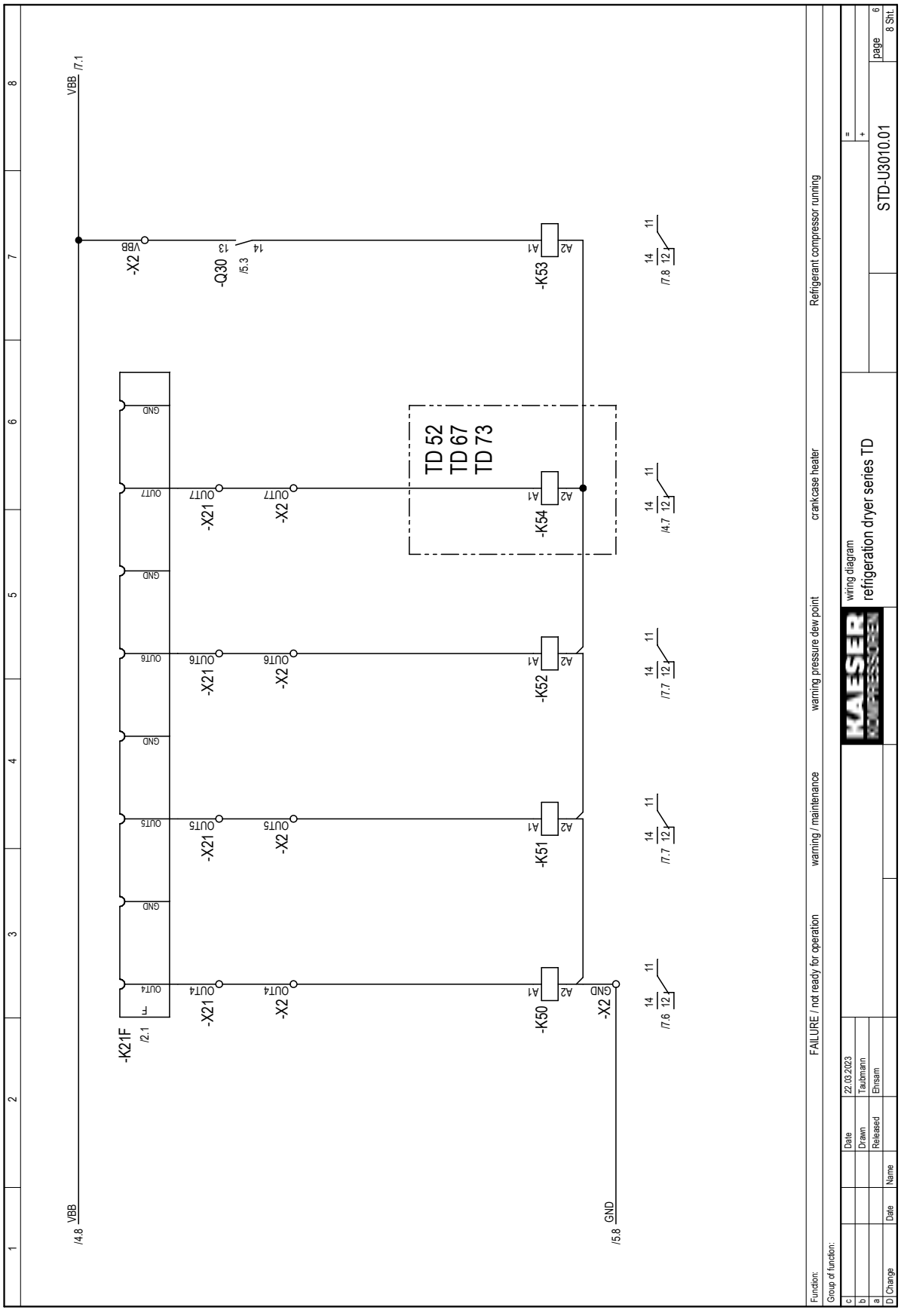

TD 94
TD 52
TD 67
TD 73
-K70
-C1
-C2
-C3
-Q30
-Q31
-M30
-M31
-X1
-W10
-W19
-W29
-F30
-Q0
control panel
control cabinet
unit frame
overload protection
inside
vent.motor with overload protection
Refrigerant compressor with overload protection
power unit air dryer
wiring diagram
refrigeration dryer series TD
power supply/power unit
STD-U3010.01
page 1
8 Sht.
230V ±10% 1ph 60Hz
single phase system
with solidly grounded end of phase
fuse supplied
by user
control cabinet door
performance-related components,
see: electrical component parts list

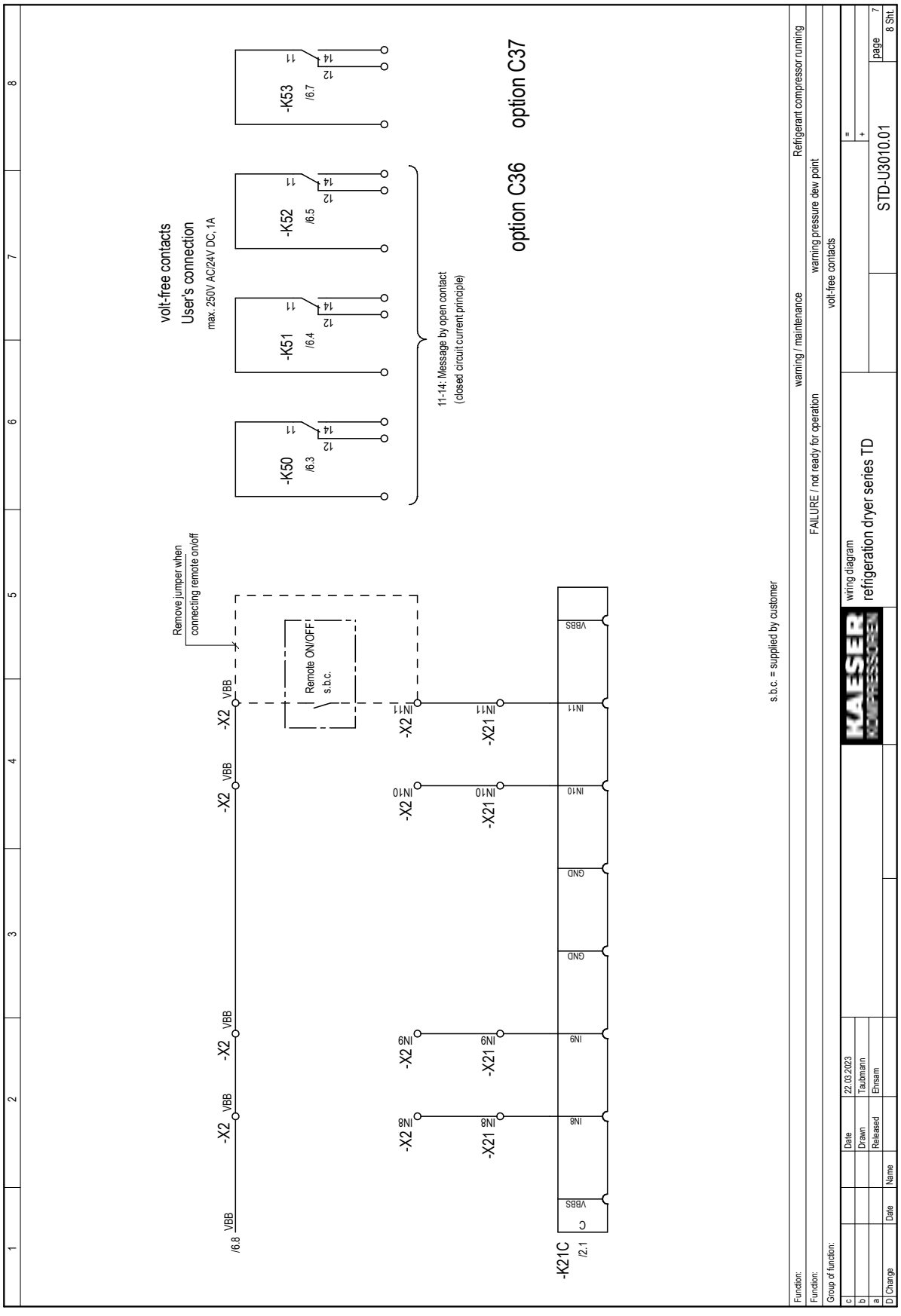

-K21N1
N1
VBBS
VBB1
VBB2
GND
CAN1H
CAN1L
-K21N2
N2
VBBS
GND
CAN2H
CAN2L
-X21
VBB
GND
C2_H
C2_L
-K20
Display
CR 9047
-K20X1
-W120
CAN_L
CAN_H
GND
VBB
GY
BK
BU
WH
C2_L
C2_H
GND
VBB
60Ω
-X21
-X22
9-pole D-Sub
option C44
communication module
-K1
+24 0
+24V
/3.3
VBB
/3.1
GND
/3.1
SIGMA NETWORK
or
Ethernet Modbus TCP
RJ45
-K21
Basic Controller
CR9052
N2
P/N1
A
B
C
E
F
VBBS
IN0
IN1
GND
IN2
IN3
IN4
IN5
IN6
IN7
IN8
IN9
IN10
IN11
OUT0
OUT1
OUT2
OUT3
OUT4
OUT5
OUT6
OUT7
/3.4
/4.2
/7.1
/5.6
/6.6
wiring diagram
refrigeration dryer series TD
STD-U3010.01
page 2
8 Sht.
Function:
Group of function:
Date
Name
Drawn
Released
22.03.2023
Taubmann
Ehrsam
D Change


-B34
-5 ... +65°C
-B32
0 ... 30bar
-B33
0 ... 30bar
-T21
-K21A
/2.1
-X1
-X2
-X21
-W116
-W115
-W119
14AWG
black
600V 90°C
14AWG
green/yellow
600V 90°C
control panel
+24V /2.3
OK
3.8A
Current limit
3.15A
200-500V~
24V=
L1
L2(N)
/1.8
/2.4
VBB
GND
/4.1
Function: 24V DC
Group of function: control voltage
Gassing pressure
Refrigerant
Liquefaction pressure
Refrigerant
pressure dew point
heat exchanger
wiring diagram
refrigeration dryer series TD
STD-U3010.01
page 3
8 Sht.
Date 22.03.2023
Drawn Taubmann
Released Ehrsam
Name
Change


TD 52
TD 67
TD 73
-X21
VBB
GND
-K54
-E39
35W
-X1
-K33
ECO-DRAIN 31
NC
NO
CO
L / +
N / -
-K21B
IN4
IN5
IN6
IN7
-X2
-X21
-W33
-W66
crankcase heater
condensate drain
FAILURE
wiring diagram
refrigeration dryer series TD
STD-U3010.01
22.03.2023
Taubmann
Ehrsam


-K21E
-B30
-Q30
-Q31
-K10
TD 52
TD 67
TD 73
-W199
-W2
-X1
-X2
-X21
GRD3
control panel
solenoid valve
Pressure limiter
wiring diagram
refrigeration dryer series TD
STD-U3010.01
KAESER KOMPRESSOREN


VBB /7.1
-X2
VBB
-Q30
13
14
/5.3
-K53
A2
A1
14
11
12
/7.8
TD 52
TD 67
TD 73
GND
OUT7
-X21
-X2
-K54
/4.7
GND
OUT6
-K52
/7.7
GND
OUT5
-K51
/7.7
GND
OUT4
-K50
GND
-K21F
/2.1
/7.6
VBB
/4.8
GND
/5.8
Function:
FAILURE / not ready for operation
warning / maintenance
warning pressure dew point
crankcase heater
Refrigerant compressor running
Group of function:
Date
Drawn
Released
Name
22.03.2023
Taubmann
Ehrsam
Change
wiring diagram
refrigeration dryer series TD
STD-U3010.01
page 6
8 Sht.


volt-free contacts
User's connection
max. 250V AC/24V DC, 1A
-K50 /6.3
-K51 /6.4
-K52 /6.5
-K53 /6.7
11-14: Message by open contact
(closed circuit current principle)
option C36
option C37
Remove jumper when
connecting remote on/off
Remote ON/OFF
s.b.c.
-X2 VBB
-X2 IN11
-X2 IN10
-X2 IN9
-X2 IN8
-X21 IN11
-X21 IN10
-X21 IN9
-X21 IN8
VBBS
GND
-K21C /2.1
/6.8
s.b.c. = supplied by customer
Function: warning / maintenance Refrigerant compressor running
Function: FAILURE / not ready for operation warning pressure dew point
Group of function: volt-free contacts
wiring diagram
refrigeration dryer series TD
STD-U3010.01
page 7
8 Sht.
Date 22.03.2023
Drawn Taubmann
Released Ehrsam
Name
Date
D Change

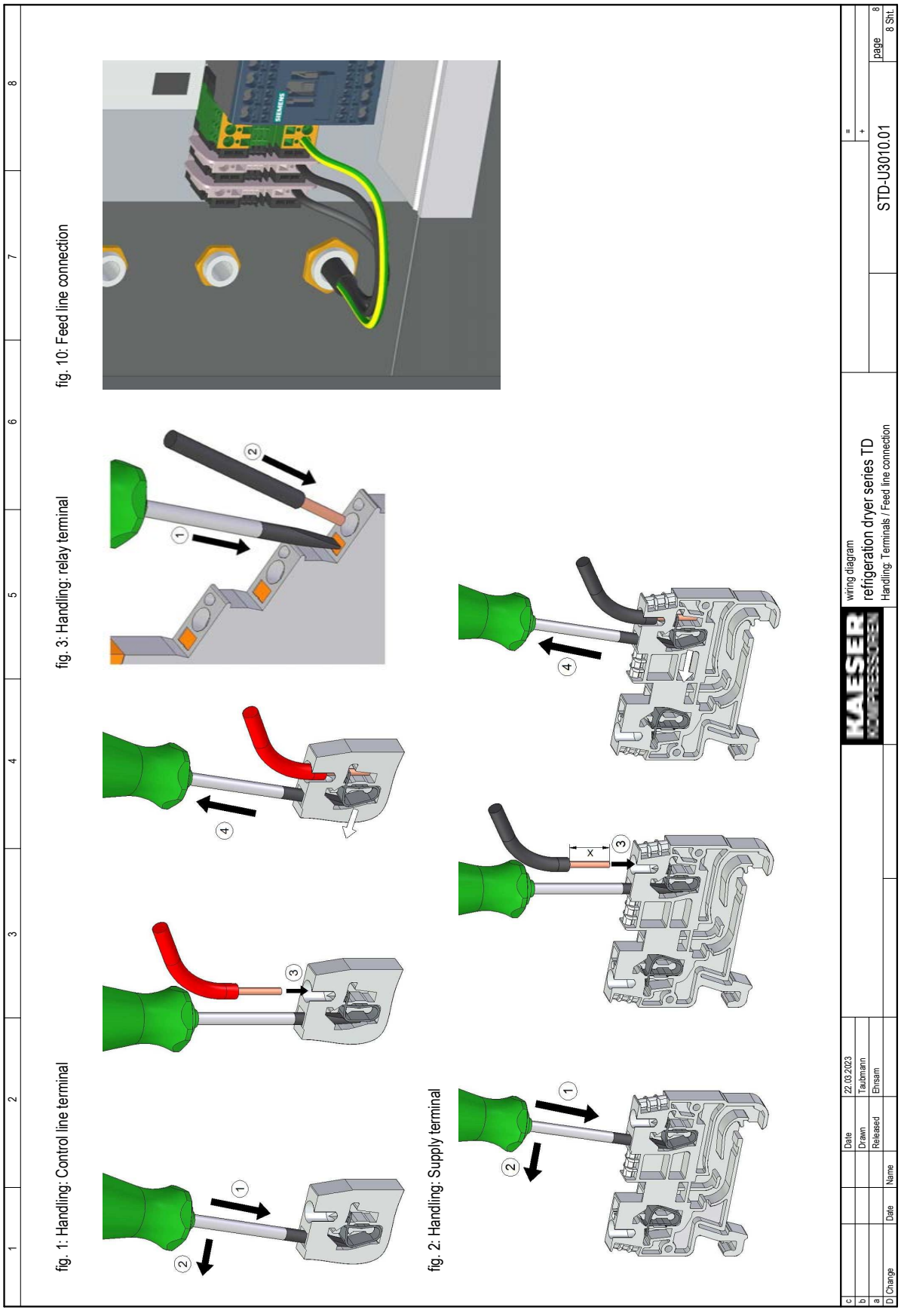
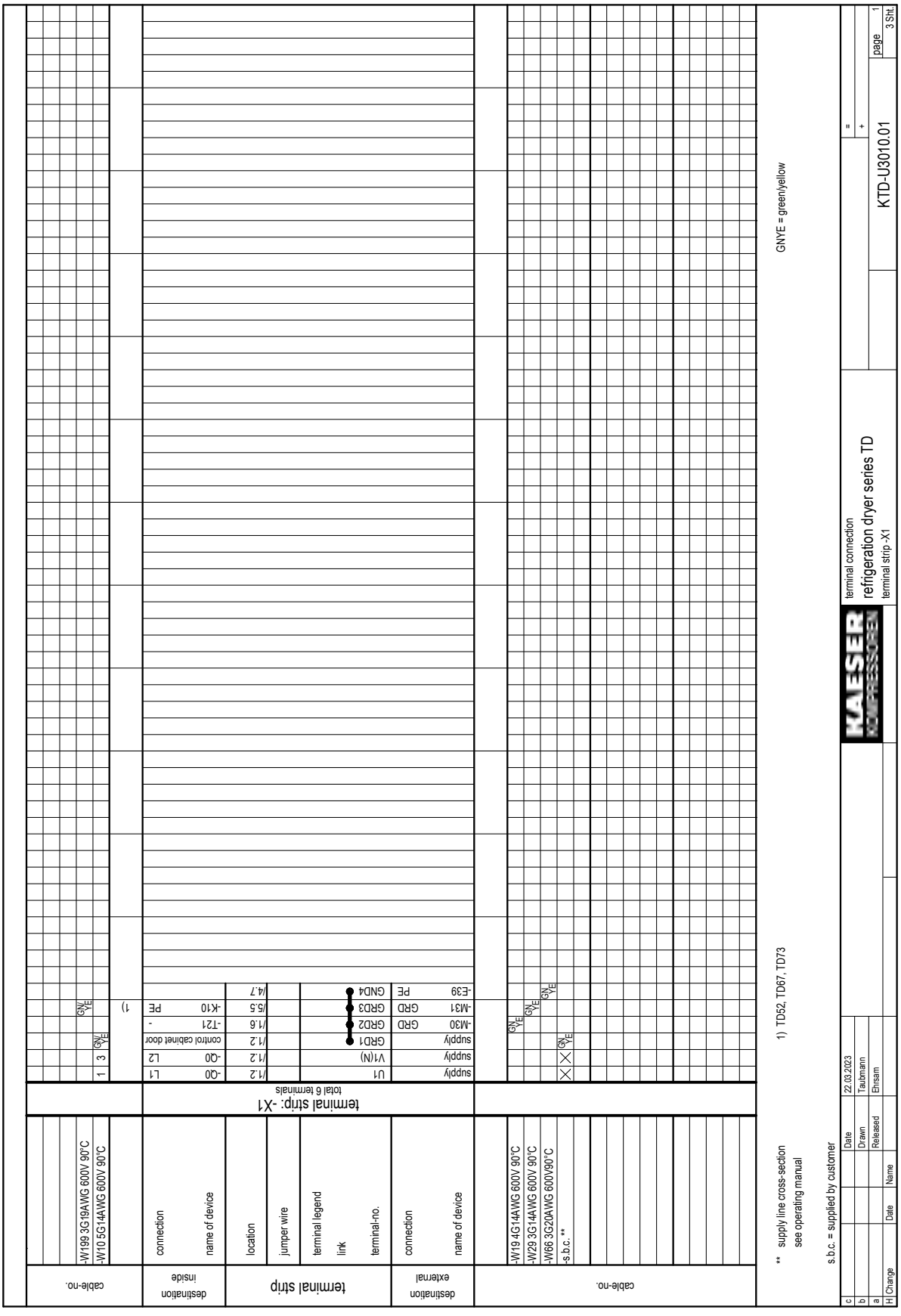
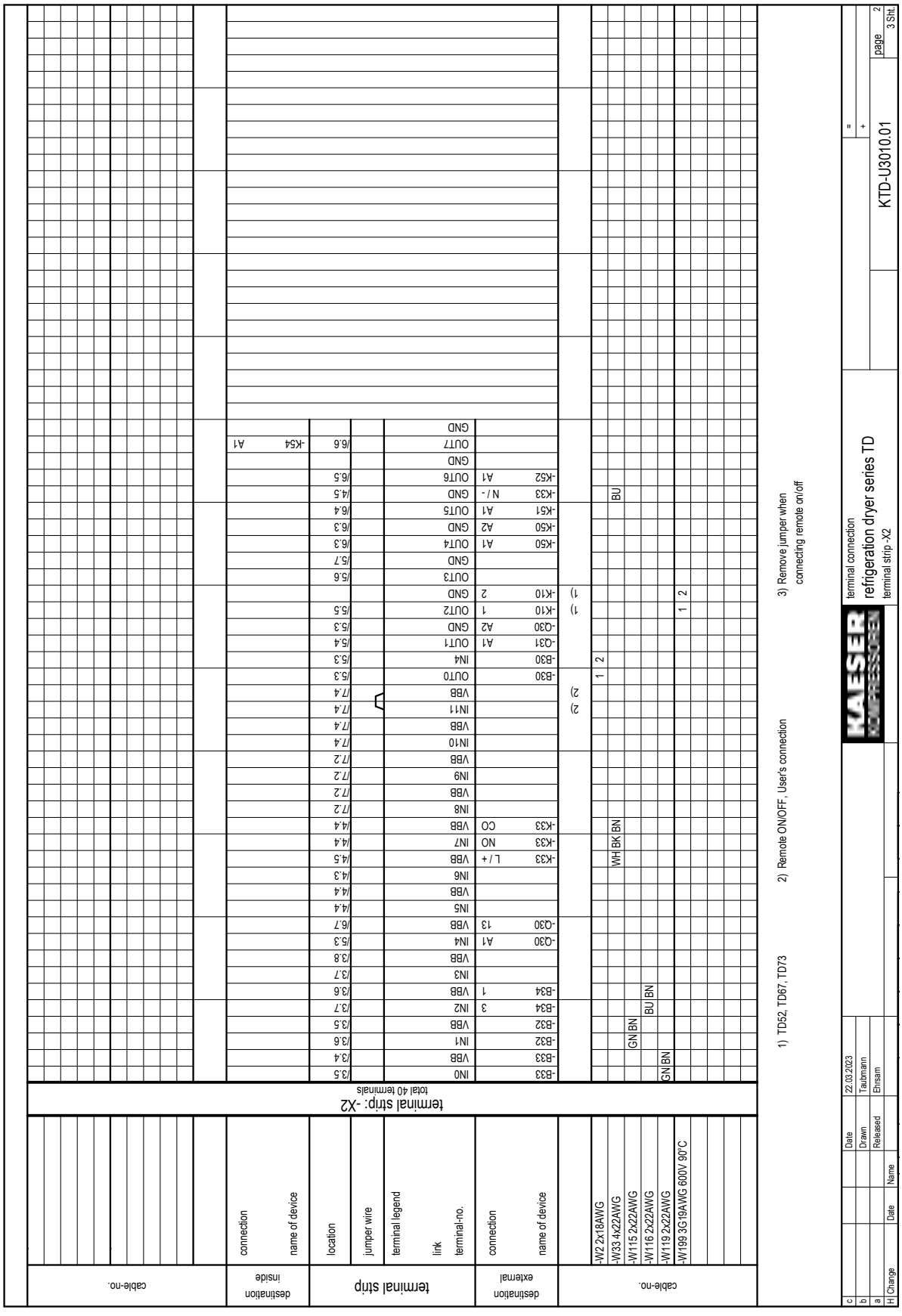
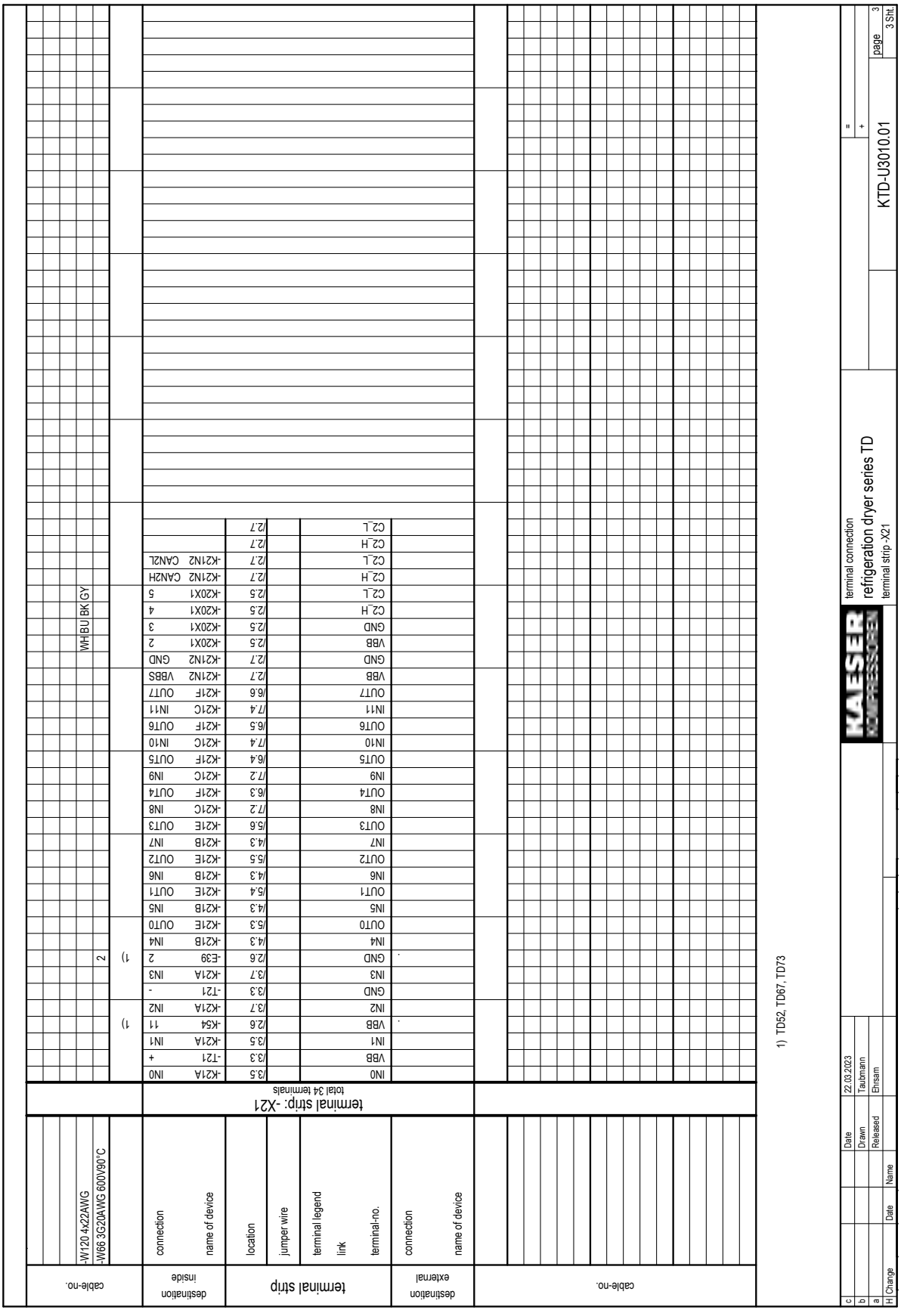
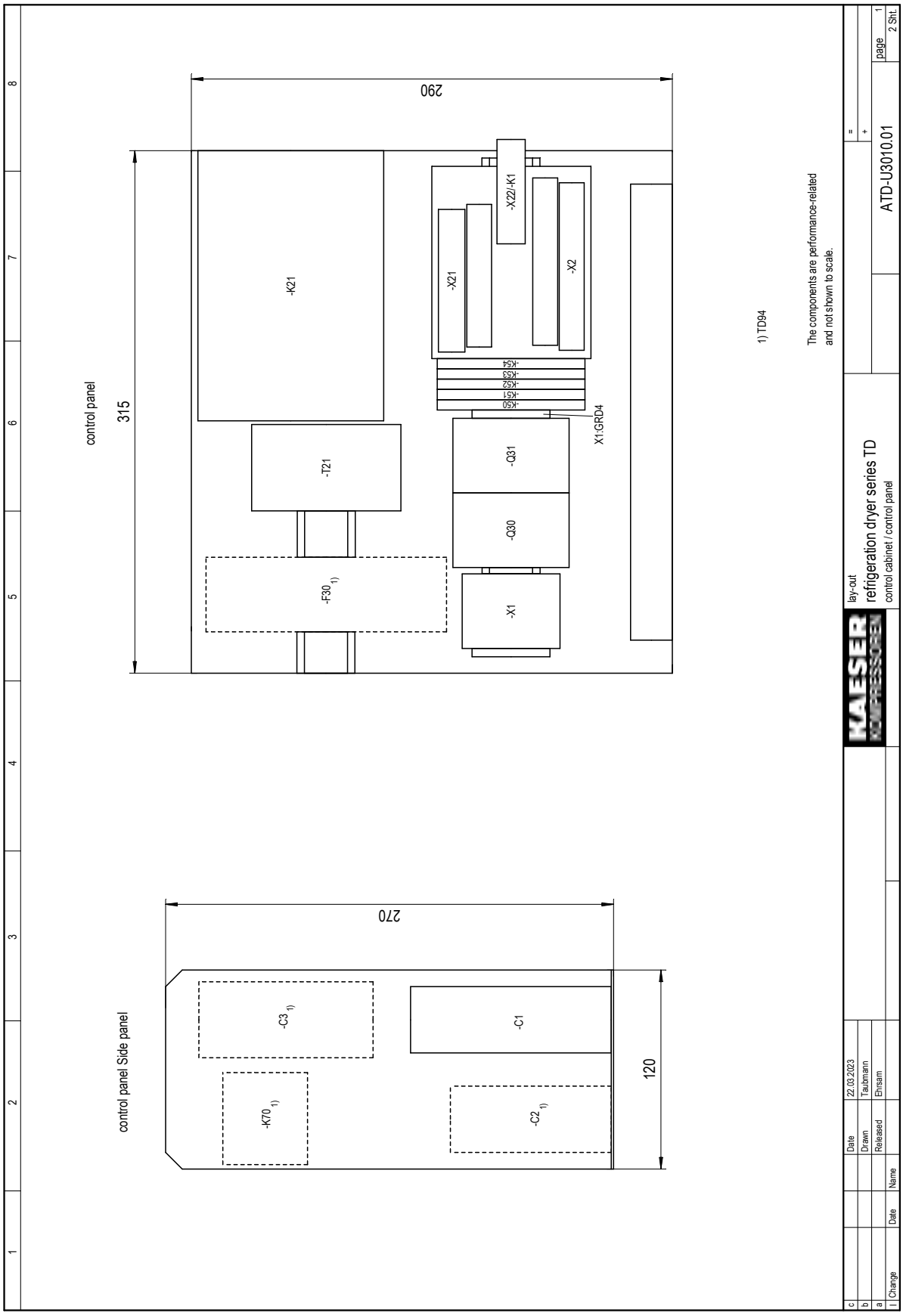


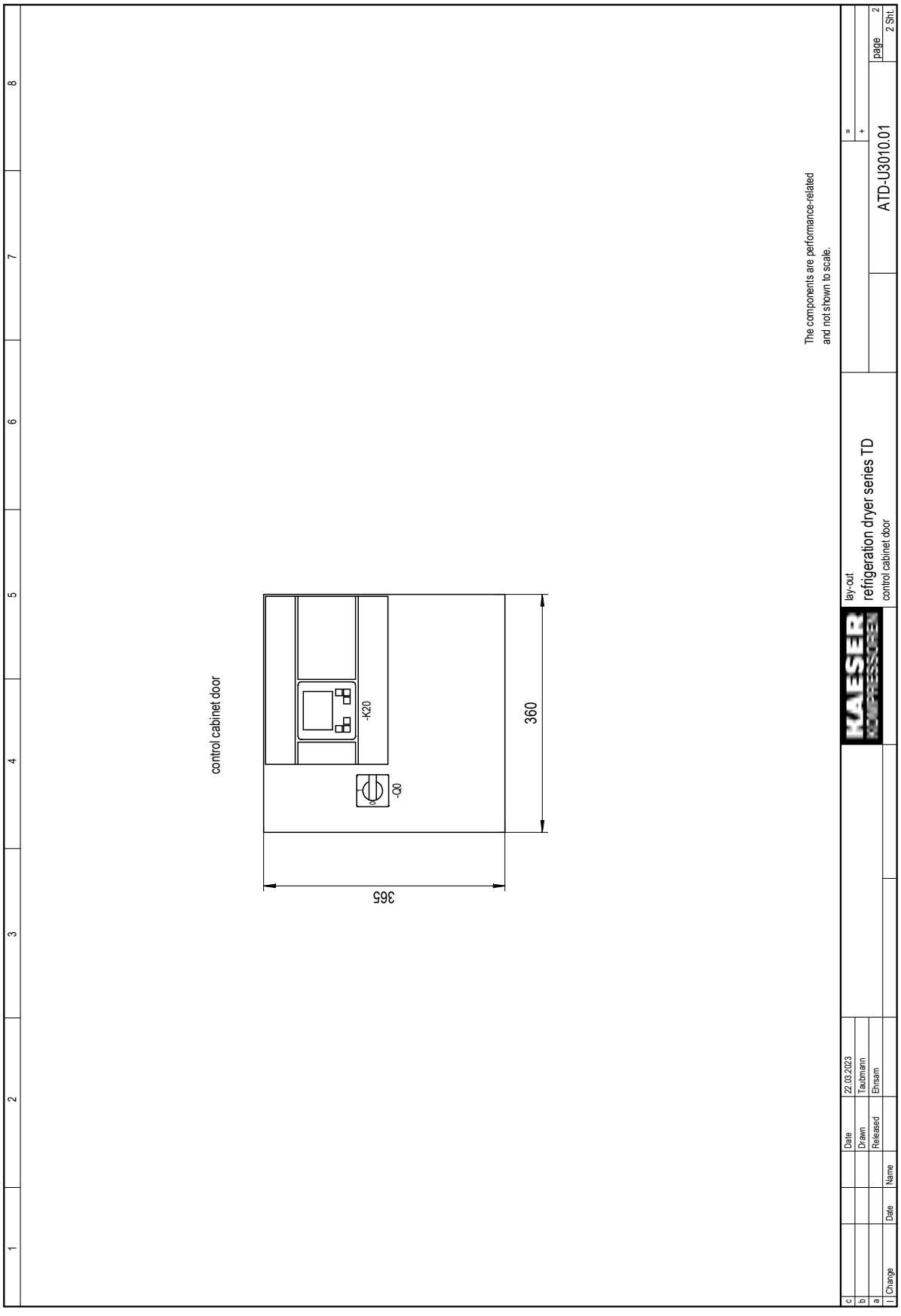
fig. 10: Feed line connection
fig. 3: Handling: relay terminal
fig. 1: Handling: Control line terminal
fig. 2: Handling: Supply terminal
wiring diagram
refrigeration dryer series TD
Handling: Terminals / Feed line connection
STD-U3010.01
page 8
8 Sht.
Date
Drawn
Released
Name
22.03.2023
Taubmann
Ehrsam
D Change


cable-no.
destination inside
terminal strip
destination external
cable-no.
-W199 3G19AWG 600V 90°C
-W110 5G14AWG 600V 90°C
connection
name of device
location
jumper wire
terminal legend
link
terminal-no.
connection
name of device
-W19 4G14AWG 600V 90°C
-W29 3G14AWG 600V 90°C
-W66 3G20AWG 600V90°C
-s.b.c.**
terminal strip: -X1
total 6 terminals
supply
-Q0 L1
-Q0 L2
control cabinet door
-T21 -
-K10 PE
-M30 GRD
-M31 GRD
-E39 PE
U1
V1(N)
GRD1
GRD2
GRD3
GND4
1.2
1.2
1.2
1.6
5.5
4.7
1
3
1)
** supply line cross-section see operating manual
s.b.c. = supplied by customer
1) TD52, TD67, TD73
GNYE = green/yellow
KAESER KOMPRESSOREN
terminal connection
refrigeration dryer series TD
terminal strip -X1
KTD-U3010.01
page 1
3 Sht.
Change
Date
Name
Date
Drawn
Released
22.03.2023
Taubmann
Ehrsam

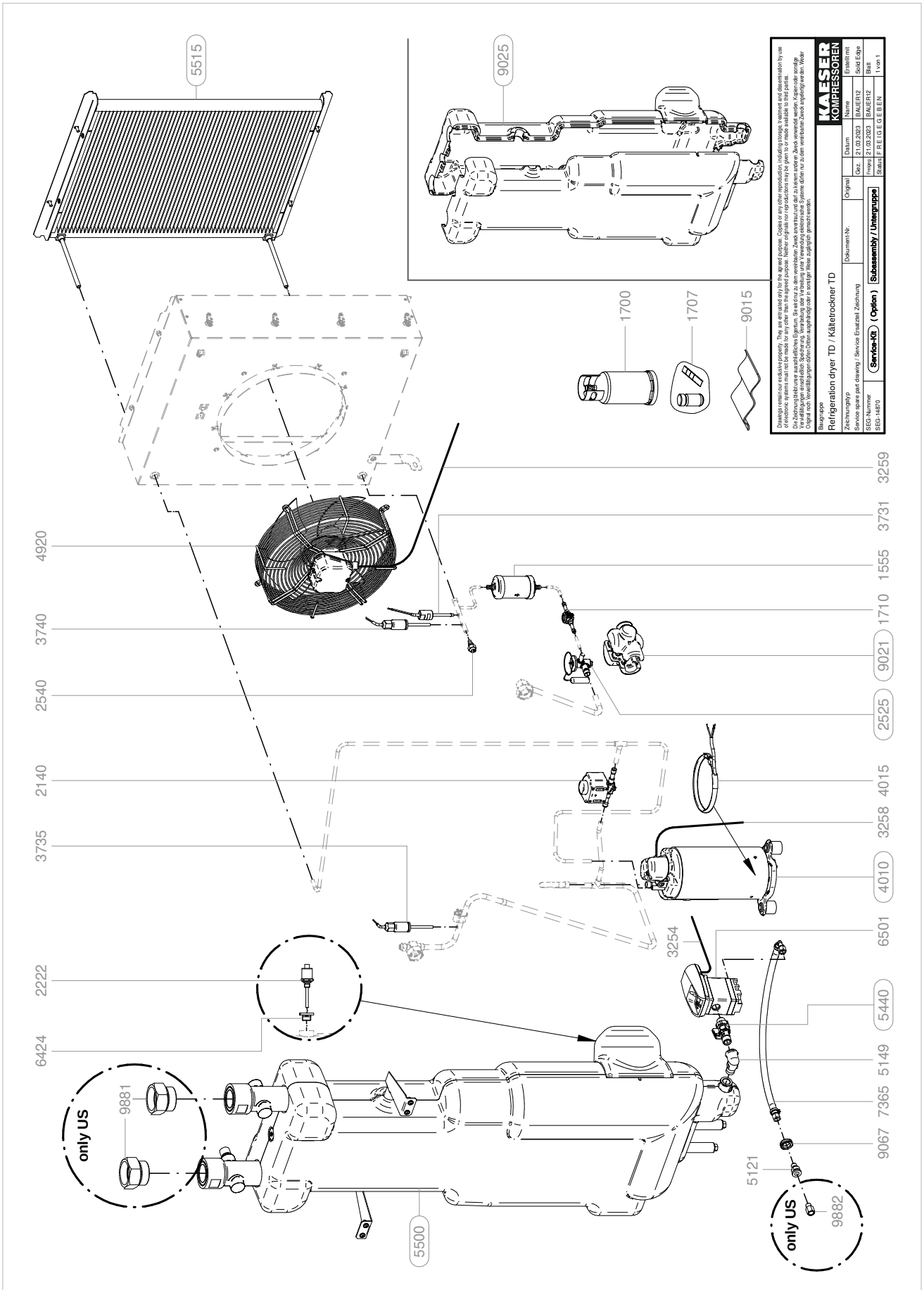

terminal strip: -X2
total 40 terminals
cable-no.
destination external
terminal strip
destination inside
cable-no.
connection name of device
location
jumper wire
terminal legend
link terminal-no.
connection name of device
-W2 2x18AWG
-W33 4x22AWG
-W115 2x22AWG
-W116 2x22AWG
-W119 2x22AWG
-W199 3G19AWG 600V 90°C
-B33 IN0 /3.5
-B33 VBB /3.4
-B32 IN1 /3.6
-B32 VBB /3.5
-B34 3 IN2 /3.7
-B34 1 VBB /3.6
IN3 /3.7
VBB /3.8
-Q30 A1 IN4 /5.3
-Q30 13 VBB /6.7
IN5 /4.4
VBB /4.4
IN6 /4.3
-K33 L / + VBB /4.5
-K33 NO IN7 /4.4
-K33 CO VBB /4.4
IN8 /7.2
VBB /7.2
IN9 /7.2
VBB /7.2
IN10 /7.4
VBB /7.4
IN11 /7.4
VBB /7.4
-B30 OUT0 /5.3
-B30 IN4 /5.3
-Q31 A1 OUT1 /5.4
-Q30 A2 GND /5.3
-K10 1 OUT2 /5.5
-K10 2 GND
OUT3 /5.6
GND /5.7
-K50 A1 OUT4 /6.3
-K50 A2 GND /6.3
-K51 A1 OUT5 /6.4
-K33 N / - GND /4.5
-K52 A1 OUT6 /6.5
GND
OUT7 /6.6 -K54 A1
GND
1) TD52, TD67, TD73
2) Remote ON/OFF, User's connection
3) Remove jumper when connecting remote on/off
KAESER KOMPRESSOREN
terminal connection
refrigeration dryer series TD
terminal strip -X2
KTD-U3010.01
page 2
3 Sht.
Date 22.03.2023
Drawn Taubmann
Released Ehrsam
Name
Date
H Change


terminal strip: -X21
total 34 terminals
terminal connection
refrigeration dryer series TD
terminal strip -X21
KTD-U3010.01
page 3
3 Sht.
1) TD52, TD67, TD73


290
315
control panel
-K21
-X22/-K1
-X21
-X2
-K54
-K53
-K52
-K51
-K50
X1:GRD4
-T21
-Q31
-Q30
-F30 1)
-X1
1) TD94
The components are performance-related and not shown to scale.
lay-out
refrigeration dryer series TD
control cabinet / control panel
ATD-U3010.01
page 1
2 Sht.
Date
Drawn
Released
Name
22.03.2023
Taubmann
Ehrsam
Change
270
120
control panel Side panel
-C3 1)
-C1
-K70 1)
-C2 1)


control cabinet door
-K20
-Q0
360
365
The components are performance-related
and not shown to scale.
lay-out
refrigeration dryer series TD
control cabinet door
ATD-U3010.01
page 2
2 Sht.
Change
Date
Name
Drawn
Taubmann
Released
Ehrsam
22.03.2023

13.4 Spare part information


5515
9025
1700
1707
9015
4920
3740
2540
2140
3735
2222
6424
3259
3731
1555
1710
9021
2525
4015
3258
4010
6501
3254
5440
5149
7365
9067
5121
9882
9881
only US
only US
5500
Refrigeration dryer TD / Kältetrockner TD
Service spare part drawing / Service Ersatzteil Zeichnung
Service-Kit
Option
Subassembly / Untergruppe

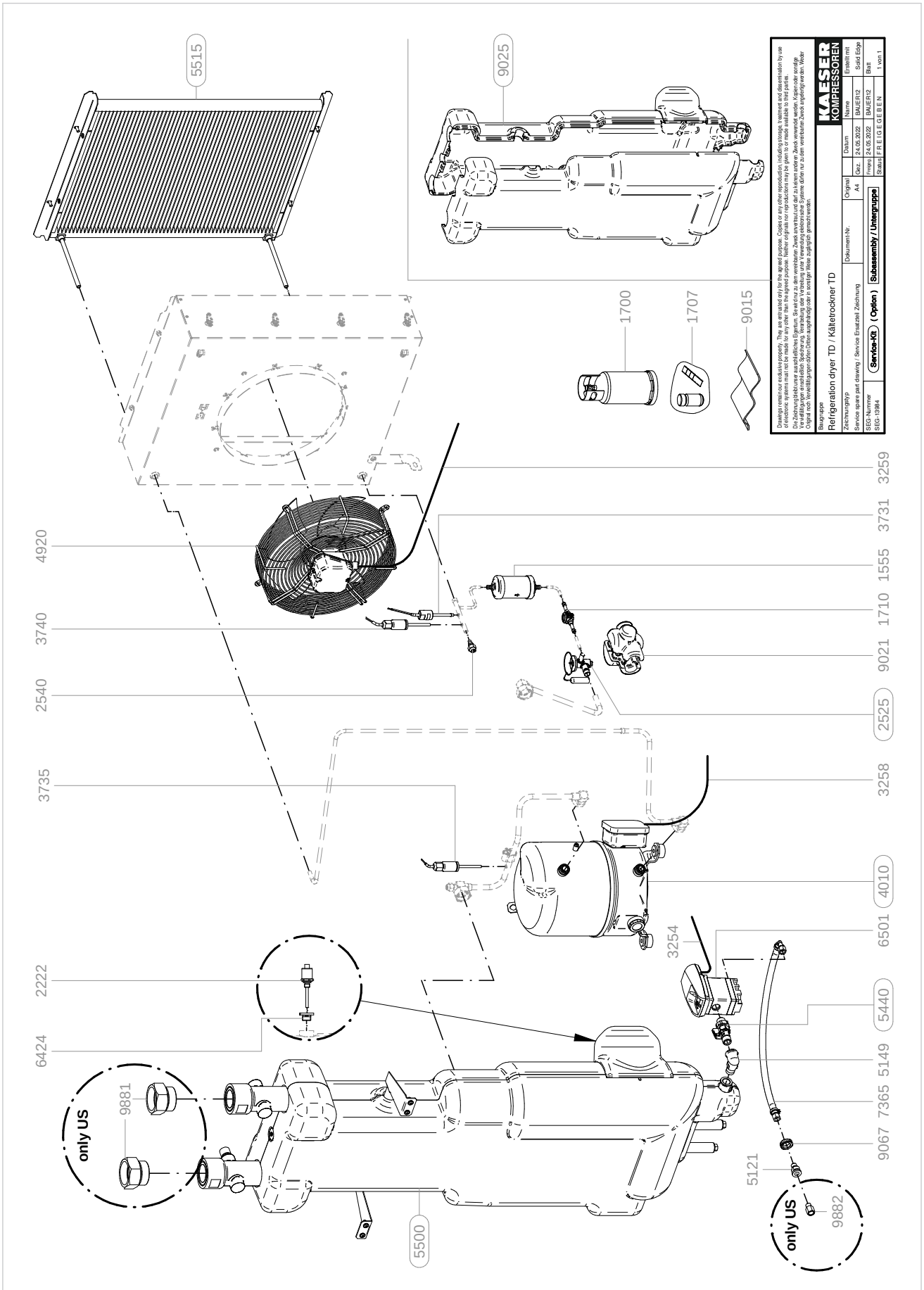
Legend		KAESER KOMPRESSOREN
	Refrigeration dryer	SEL-4575_01 E

Item		Description	Option
1555	*)	Filter dryer	
1700	*)	Refrigerant	
1707	*)	Acid test, refrigerant	
1710	*)	Refrigerant indicator	
2140	*)	Control valve	
2222		Temperature sensor	
2525	*)	Injection valve	
2540	*)	Refrigerant filling port	
3254		Condens. drain, connect. cable	
3258		Refr.compress.connecting cable	
3259		Fan motor connecting cable	
3731	*)	Safety pressure switch	
3735	*)	Leakage protection switch	
3740	*)	Fan pressure switch	
4010	*)	Refrigerant compressor	
4015		Crankcase heating	
4920		Exhauster, dryer	
5121		Double nipple	
5149		Elbow fitting	
5440		Ball valve	
5500	*)	Heat exchanger	
5515	*)	Refrigerant condenser	
6424		Reduction piece	
6501		Condensate drain, dryer	
9602		Condensate drain service-unit	
7365		Condensate drain line	
9015		Insulating tape	
9021		Insulating jacket	
9025		Heat exchanger insulation	
9067		Counternut	
9881		Adapter	
9882		Adapter	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual!

*) The replacement of the spare parts described requires an authorized and certified refrigerant technican


5515
9025
1700
1707
9015
4920
3740
2540
3735
2222
6424
3259
3731
1555
1710
9021
2525
3258
4010
6501
3254
5440
5149
7365
9067
5121
9882
9881
only US
only US
5500
Refrigeration dryer TD / Kältetrockner TD
KAESER KOMPRESSOREN

Legend	KAESER KOMPRESSOREN
Refrigeration dryer	SEL-4566_01 E

Item		Description	Option
1555	*)	Filter dryer	
1700	*)	Refrigerant	
1707	*)	Acid test, refrigerant	
1710	*)	Refrigerant indicator	
2222		Temperature sensor	
2525	*)	Injection valve	
2540	*)	Refrigerant filling port	
3254		Condens. drain, connect. cable	
3258		Refr.compress.connecting cable	
3259		Fan motor connecting cable	
3731	*)	Safety pressure switch	
3735	*)	Leakage protection switch	
3740	*)	Fan pressure switch	
4010	*)	Refrigerant compressor	
4920		Exhauster, dryer	
5121		Double nipple	
5149		Elbow fitting	
5440		Ball valve	
5500	*)	Heat exchanger	
5515	*)	Refrigerant condenser	
6424		Reduction piece	
6501		Condensate drain, dryer	
9602		Condensate drain service-unit	
7365		Condensate drain line	
9015		Insulating tape	
9021		Insulating jacket	
9025		Heat exchanger insulation	
9067		Counternut	
9881		Adapter	
9882		Adapter	

Please quote the part number and serial number of the machine together with the item number and the description of the part when ordering.

Before and during all work, be sure to read and follow the safety and service instructions in the machine's service manual!

*) The replacement of the spare parts described requires an authorized and certified refrigerant technican

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