Operator manual

Portable compressor

MOBILAIR M500-2.2 SIGMA CONTROL MOBIL SCREW DRY pV

No.: 901860 04 E

Manufacturer:

KAESER KOMPRESSOREN SE

96410 Coburg • PO Box 2143 • GERMANY • Tel. +49-(0)9561-6400 • Fax +49-(0)9561-640130

www.kaeser.com

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1 Regarding this document

1.1 Using this document

The operating manual is a component of the product. It describes the machine as it was at the time of first delivery after manufacture.

- ➢ Keep the operating manual in a safe place throughout the life of the machine.
- ➢ Supply any successive owner or user with this operating manual.
- ➢ Please insert any amendment or revision of the operating manual sent to you.
- ➢ Enter details from the machine nameplate and individual items of equipment in the table in chapter 2.

1.2 Further documents

Further documents included with this operating manual are:

- Certificate of acceptance / operating instructions for the pressure vessel
- Declaration of Conformity in accordance with the applicable directive
- SIGMA CONTROL MOBIL service manual

Missing documents can be requested from KAESER.

- ➢ Make sure all documents are complete and observe the instructions contained in them.
- ➢ Make sure you provide the data from the nameplate when ordering documents.

1.3 Copyright

This operating manual is protected by copyright. Any queries regarding the use or duplication of this documentation should be referred to KAESER. Correct use of information will be fully supported.

1.4 Symbols and labels

- ➢ Please note the symbols and labels used in this document.

1.4.1 Warnings

Warnings indicate danger potentially resulting in personal injury, if the measures specified are not taken.

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

Signal word	Meaning	Consequences of non-compliance
DANGER	Warns of imminent danger	Will very likely result in death or severe injury
WARNING	Warns of potentially imminent danger	May result in death or severe injury
CAUTION	Warns of a potentially dangerous situation	May result in moderate physical injury

Tab. 1 Danger levels and their definition (personal injury)

Some warning notes may precede a chapter. They apply to the entire chapter including all sub-sections.

Example:



DANGER
The type and source of the imminent danger is shown here!
The possible consequences of ignoring a warning are shown here.
The word "DANGER" indicates that death or severe injury can very likely result from ignoring the warning.

➢ The measures required to protect yourself from danger are shown here.

Warning notes referring to a sub-section or the subsequent step are integrated into the procedure and numbered as a step.

Example:



1. **WARNING!**
   The type and source of the imminent danger is shown here!
   The possible consequences of ignoring a warning are shown here.
   The word "WARNING" indicates that death or severe injury may result from ignoring the warning.
   ➢ The measures required to protect yourself from danger are shown here.
2. Always read and comply with warning instructions.

1.4.2 Potential damage warnings

Contrary to the warnings shown above, damage warnings do not indicate potential personal injury.

Damage warnings have only one danger level, identified by this signal word:

Signal word	Meaning	Consequences of non-compliance
NOTE	Warns of a potentially dangerous situation	Damage to property is possible

Tab. 2 Danger levels and their definition (damage to property)

Example:



NOTICE
The type and source of the imminent danger is shown here!
Potential effects when ignoring the warning are indicated here.

➢ The protective measures against the damages are shown here.

➢ Carefully read and fully comply with warnings against damages.

1.4.3 Other alert notes and their symbols



This symbol indicates particular important information.

Material Here you will find details on special tools, operating materials or spare parts.

Precondition Here you will find conditional requirements necessary to carry out the task.

The conditional requirements relevant to safety shown here will help you to avoid dangerous situations.

➢ This symbol is placed by lists of actions comprising one step of a task.

1. This symbol is is placed by lists of actions comprising several stages of tasks.
2. Operating instructions with several steps are numbered in the sequence of the operating steps.

Option rf

➢ Information relating to one option only is marked with an option code (e.g., “Option rf” means that this section applies only to machines with "chassis with steerable axle"). Option codes used in this user manual are explained in the machine's user manual.



Information referring to potential problems is identified by a question mark.

The cause is specified in the help text ...

➢ ... as is a solution.



This symbol identifies important information or measures regarding the protection of the environment.

Further information

Further subjects are introduced here.

2 Technical Specifications

2.1 Nameplate

The machine's nameplate provides the model designation and important technical information.
The nameplate is located on the outside of the machine (see illustration in chapter 13.1).

➢ Enter here the nameplate data as a reference:

Characteristic	Value
Vehicle identity no.	
Options	
Portable compressor	
Material No.	
Serial No.	
Year of manufacture	
Actual total mass	
Lifting point load capacity	
Nominal engine power	
Engine speed	
Maximum working pressure	

Tab. 3 Nameplate

2.2 Options

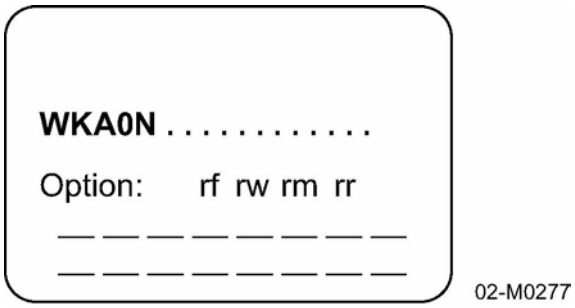
A list of the options fitted to your machine helps to correlate the information in this operating manual.
Options fitted to the machine are listed on the nameplate (centre of the plate, option: code letters).

The nameplate is to be found:

- on the outside of the machine,
- on the front-right (see chapter 13.1)

The following tables list all possible options.
Only the codes for those options fitted appear on the nameplate.

Options fitted



M500–2.2

Tab. 4 Nameplate with options

➢ Take a list of fitted options from the nameplate and enter the fitted options as reference.

2.2.1 Option rf/rm/rr; rw Chassis

Chassis are defined by the combination of several option designations as follows:
design/height adjustment/service brake

Example: *rf/rm/rr* means
Steerable axle chassis with hight adjustment and without service brake

Chassis:

Chassis	Code	Available?
Design:		
Steerable axle	rf	
Height adjustment:		
With height adjustment	rm	
Service brake:		
Without service brake	rr	

Tab. 5 Chassis options

Option rw Stationary frame

Chassis	Option code	Available?
Stationary (rw):		
on skids	rw	

Tab. 6 Stationary frame option

2.3 Machine

2.3.1 Sound emission

Emission sound pressure level

Type	M500–2
Emission sound pressure level [dB(A)] (according to EN ISO 11203: 1995 number 6.2.3.d)	92
Measurement distance: d = 1 m Logarithmic surface ratio: Q2 = 18 dB(A)	

Tab. 7 Emission sound pressure level

2.3.2 Tightening torques for screws

Standard values for screws:

Thread	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20
Torque [Nm]	3.0	5.9	10.0	24.5	48.0	84.0	133.0	206.0	295.0	415.0
Information provided according to VDI 2230.										

Tab. 8 Tightening torques for screws

2.3.3 Torques for lifting eye

Recommended values for screws corresponding to the strength category:

Screws	Strength category	Thread	Torque [Nm]
Hex-head bolt	8.8	M20	415
Hex-head bolt	8.8	M24	630

Tab. 9 Torques for lifting eye screws

2.3.4 Ambient conditions

Positioning	Limit value
Maximum altitude amsl* [m]	1000
Minimum ambient temperature [°C]	−10
Maximum ambient temperature [°C]	+45
* Higher altitudes are permissible only after consultation with the manufacturer.	

Tab. 10 Ambient conditions

2.3.5 Mass

The values given are the maximum in each case. Actual mass of individual machines are dependent on equipment fitted (see machine nameplate).

Feature	Chassis
Actual total weight [kg]*	
Permissible axle load [kg]	each axle 7000
* Enter here for reference, the actual total weight taken from the nameplate.	

Tab. 11 Mass of the machine

2.3.6 Additional information according to the machine's operating licence

For specifications according to the machine's operating licence, such as:

- Dimensions,
- Wheel base
- Footprint

are provided in the dimensional drawings, chapter 13.3.

The dimensional drawing also shows the position of the following inlets and outlets:

- Cooling air inlet
- Cooling air outlet
- Compressed air outlet
- Exhaust
- Lifting points (lifting eye)
- Anchoring points (protective equipment)
- Strapping points (transport)
- Permissible coupling height, chassis

2.4 Compressor

2.4.1 Variable pressure flow rate control (pV control)

Definition of flow rate: Constant delivery volume relative to intake conditions.

Airend	CD26Dw
Maximum working pressure [bar]	10.3
Flow rate [m^3/min]	45.8
Setting range, nominal system pressure [bar(g)]	4 - 10.3
* at 6.9 bar	

Tab. 12 Working gauge pressure and flow rate

Flow rate and nominal system pressure:

The illustration shows the engine speed/flow rate, in dependence to the set nominal system pressure.

Examples, by way of illustration:
(identified as Ⓑ in the graphic)

- Nominal system pressure: 8 bar

- Engine speed: 1850 min^{-1}
- Flow rate: ~44.7 m^3/min

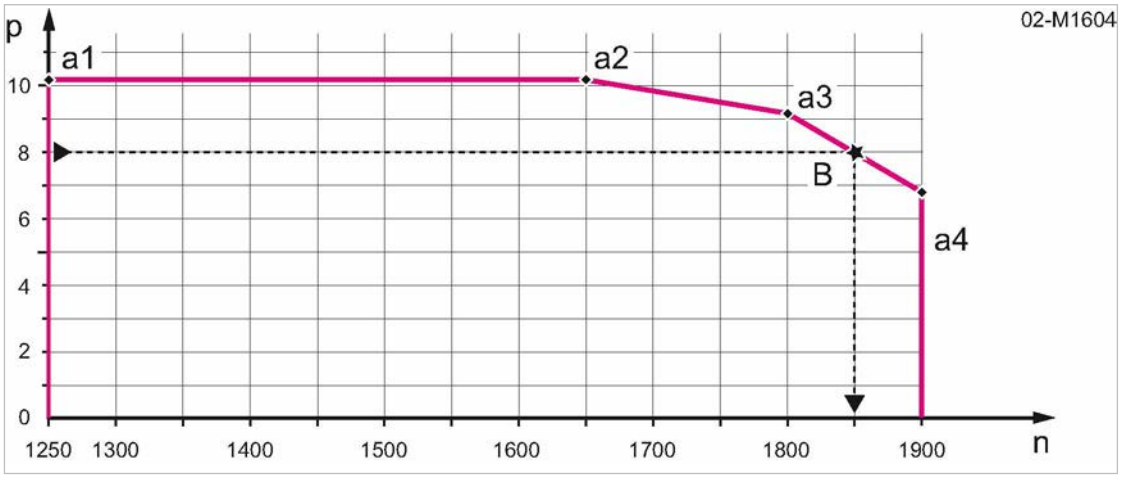


Fig. 1 Engine speed/flow rate in dependence to the nominal system pressure

(p) Nominal pressure [bar(g)]
(n) Engine speed [min^{-1}]
(B) Example

Measuring point	Engine speed [min^{-1}]	Nominal system pressure [bar(g)]	Flow rate [m^3/min]
a1	1250	10.3	28.8
a2	1650	10.3	38.0
a3	1800	9.3	43.3
a4	1900	6.9	45.8

Tab. 13 Flow rate, nominal system pressure and engine speed

Flow rate in accordance with ISO 1217:2009. Annex D

2.4.2 Compressed air outlet

Butterfly valve		
Actuation	Hand wheel with gearing	
Nominal width	DN80	Quantity
with connection flange	DN80/PN16	1

Tab. 14 Butterfly valve

Discharge valve		
Connection size	G1	Quantity
		1

Tab. 15 Discharge valve

2.4.3 Air quality at the compressed air outlets

Interrelation between compressed air treatment and compressed air quality:

Components Air Treatment	Characteristics Compressed air quality	Compressed air quality, abbreviation
■ After-cooler ■ Cyclone separator	cool and condensate-free	A

Tab. 16 Interrelation between compressed air treatment and compressed air quality

The compressed air outlets at the air distributor are labelled with the identifiers of compressed air quality.

2.4.4 Net pressure connection

Quick-release coupling	Connection
Net pressure line connection	DN 6

Tab. 17 Connection to external net pressure line

2.4.5 Hot air connection

Sheet metal flange:		
Nominal width	DN80	Quantity
with connection flange	DN80/PN16	1

Tab. 18 Hot air connection

2.4.6 Safety valves

Maximum working pressure: see machine nameplate

1st compression stage safety valve activating pressure

Safety valve 1st compression stage:	
Activating pressure [bar]	3.6

Tab. 19 1st compression stage safety valve activating pressure

2nd compression stage safety valve activating pressure

Safety valve 2nd compression stage:	
Maximum working pressure [bar]	10.3
Activating pressure [bar]	11.3

Tab. 20 2nd compression stage safety valve activating pressure

2.4.7 Temperature

Temperatures, first compression stage:

Airend discharge temperature	Values
Typical airend discharge temperature during operation [°C]	150 200
Maximum airend discharge temperature (automatic safety shut-down) [°C]	250

Tab. 21 Airend discharge temperatures, first compression stage

Temperatures, second compression stage:

Airend discharge temperature	Values
Typical airend discharge temperature during operation [°C]	140 240
Maximum airend discharge temperature (automatic safety shut-down) [°C]	270

Tab. 22 Airend discharge temperatures, second compression stage

2.4.8 Cooling oil recommendation (gear)

The type of cooling oil with which the gear is filled is given on a label next to the filling port.

For information on ordering cooling oil, please see chapter 11.

	SIGMA FLUID	
	G-460	G-680
Description	Synthetic oil	Synthetic oil
Application	Standard oil for every application.	Special oil for ambient conditions with high temperatures and humidity.
Recommended temperature range (surroundings)	-10 °C to 40 °C	-5 °C to 45 °C
Viscosity at 40 °C	46.4 mm^2/s (ASTM D445)	64.7 mm^2/s (ASTM D445)
Viscosity at 100 °C	8.2 mm^2/s (ASTM D445)	10.3 mm^2/s (ASTM D445)
Flash point	266 °C (ASTM D92)	280 °C (ASTM D92)
Density at 15 °C	0.98 g/cm^3 (ASTM D1298)	0.983 g/cm^3 (ASTM D1298)
Pour point:	-58 °C (ASTM D97)	-48 °C (ASTM D97)

Tab. 23 Cooling oil recommendation

2.4.9 Cooling oil charge (gearbox)

Cooling oil	Fluid volume [l]
Total oil capacity	95

Tab. 24 Cooling oil charge

2.4.10 Hydraulic oil recommendation

The hydraulic oil type used is identified on the container for the hydraulic oil.
Information on ordering hydraulic oil is found in chapter 11.

The hydraulic oil must meet the following classification/specification:

- DIN 51524
- ISO 11185

Hydraulic oils not meeting the above requirements can shorten the useful life of the engine.

Filling:

Use *Tellus S2 VX 46* hydraulic oil.
Hydraulic oil must be filtered separately prior to filling.
Purity class 20/18/15 according to ISO 4406 required.
Use only the same brand when replenishing the oil.

Bulk oil does not meet the required purity class.
Filter the hydraulic oil prior to filling.

Fluid volume:

Description	Fluid volume [l]	Initial quantity
Hydraulic oil	110.0	Shell Tellus S2 VX 46

Tab. 25 Hydraulic oil recommendation

2.5 Engine

2.5.1 Engine specification

Engine specification (EU stage IV):

Feature	Specification
Make/Model	Caterpillar / C18
Engine control	Electronic
Fuel injection	Common rail system
Rated engine power [kW]	447.5
Speed at LOAD operation [min^{-1}]	1900

Feature	Specification
Speed at IDLE operation [min^{-1}]	1250
Type of fuel	Diesel
Fuel consumption under LOAD operation [l/h]*	approx. 81
Engine oil consumption relative to fuel consumption [%]	approx. 0.5
Reduction agent consumption (relative to fuel consumption) [%]*	approx. 3 – 7
*	at nominal system pressure 10.3 bar(g)

Tab. 26 Engine specification

Further information * For more information on factors that influence the reducing agent consumption, please see Chapter 2.5.5 Reduction Agent.

2.5.2 Oil recommendation

The engine oil must meet the following classification:

- ACEA, class E9
- API, class CJ-4
- Caterpillar ECF-3 – specification

➢ Use only engine oil with low white ash accumulation.

- Engine oils that do not conform to the above can shorten the useful life of the engine!
- The use of unlisted engine oils requires prior authorisation by KAESER.

➢ Please contact the authorised KAESER SERVICE.

Viscosity:

For selecting the appropriate viscosity class, you must take the ambient temperature at the installation site or the machine deployment area into account. Excessively high viscosity can cause starting difficulties, while a viscosity that is too low reduces the lubricating capacity and may cause very high oil consumption.

Viscosity is classified by SAE.

Always use multi-grade lubricating oils!

Always ensure the prescribed lubricating oil quality when selecting the viscosity class!

Ambient temperature [°C]	Viscosity class
–40 10	SAE 0 W–20
–40 30	SAE 0 W–30
–40 40	SAE 0 W–40
–30 30	SAE 5 W–30
–30 50	SAE 5W–40
–18 40	SAE 10 W–30
–18 50	SAE 10 W–40

Ambient temperature [°C]	Viscosity class
−10 50	SAE 15W–40

Tab. 27 Engine oil recommendation

Initial engine oil quantity:

The engine is filled initially with the following engine oil:

Ambient temperatures [°C]	Viscosity class
−18 50	SAE 10 W–40

Tab. 28 Initial engine oil quantity

2.5.3 Fuel recommendation

To comply with emission regulations, diesel engines fitted with an exhaust gas treatment system must be operated only with a sulphur-free diesel fuel. Compliance with the emission requirements but also the durability of the individual exhaust gas treatment components is not assured if this requirement is ignored!

The diesel fuel must meet the requirements of EN 590 and ASTM D975 respectively.

The use of other fuels as well as the mixing with additives is only permitted after consultation with the engine manufacturer.

The following fuel specifications are approved:

- Diesel fuels according to EN 590
  - (≤0.0010% Sulphur – EU: Level IIIB and higher)
- Diesel fuels according to ASTM D975
  - (≤0.0015% Sulphur – EPA: Tier 4 interim and higher)

The following fuel specifications are not approved:
These fuel type causes irreversible damage the engine and exhaust after-treatment system and reduce the expected service life significantly!

- Sulphur-containing fuel ≥0.005% of sulphur
- Marine diesel fuel
- Turbine fuel
- Heating oils
- Fatty acid methyl ester FAME (biodiesel)

Never store fuel in galvanised containers!

The fuel must be filtered before it is filled into the machine when it has been supplied in barrels or canisters. This procedure prevents malfunctions in the fuel system caused by contamination.

2.5.4 Engine coolant recommendation

In fluid-cooled engines, the cooling fluid must be treated and monitored to prevent engine damage.

The engine coolant must meet the following requirements:

- Caterpillar extended life coolant (ELC)

- Caterpillar-Specification EC-1 (Engine Coolant-1)
- ASTM D6210

Coolant quality:

The coolant (cooling fluid) is treated by adding anti-freeze with corrosion protection additives on the basis of ethylene glycol to the water.

Coolant features:

- Heat transfer
- Corrosion protection
- Cavitation protection (protection against pitting corrosion)
- Antifreeze
- Increasing the boiling point

Within the scope of further technical development, new corrosion inhibitors/antifreeze have been approved by the engine manufacturer.

Compared to the previously approved corrosion inhibitors/antifreeze, they feature the following advantages:

- Less residue in the engine cooling system
- Improved heat flow
- Higher environmental sustainability
- Longer operational lives (longer replacement intervals)

➢ Do not use a corrosion inhibitor/antifreeze that has not been approved by the engine manufacturer.

Extended life coolant:



The engine manufacturer CATERPILLAR recommends the use of the extended life coolant CAT ELC.

CAT ELC (Extended Life Coolant):

- Meets performance requirements pursuant to ASTM D6210
  - No coolant addition necessary
- Meets the requirements of the CATERPILLAR recommendation for operating fluids/materials SEBU6251
- Useful life: 12000 h, or at least 6 years
- After half of the useful life: addition of coolant refresher
  - (CAT ELC Extender)
- Ready-to-use mixture with 50 percent of distilled water
  - Frost protection up to -37 °C
  - Addition of possibly unsuitable water not necessary
  - Impermissible mixing not possible
- CAT ELC is available from all CAT dealers worldwide
- CAT ELC handling and cooling system care known to all CAT dealers worldwide
- Cooling system analysis and evaluation by manufacturer CATERPILLAR

Coolant refresher:



As coolant refresher (extended life additive) you must always only use CAT ELC Extender!

Many coolant additives that improve the coolant properties are consumed during the engine's operation and must be replaced on a regular basis.

The coolant refresher is an additive that is added to extended life coolants in order to regenerate coolant properties and accordingly the coolant's service life.

The quantity of refresher to be added is 2% of the coolant system's capacity.

Miscibility with other corrosion inhibitors/antifreeze agents:



Only use coolants that meet specification Cat EC-1 for ready-to-use coolants and coolant concentrates.



NOTICE

Damages to engine cooling system/engine from significantly decreased corrosion protection/ antifreeze!

- ➢ Do not use conventional coolants and coolant additives in connection with CAT ELC. Incompatibilities may exist between the different brands or types.
- ➢ Only fill CAT ELC and CAT ELC Extender (refresher) into the cooling system.



Therefore, the use of different corrosion inhibitors/antifreeze agent is only allowed after consulting with and approval from the engine manufacturer!

Initial filling of engine cooling system:

The cooling system is filled initially with the following extended life coolant:

Components	Description	Remarks
Corrosion inhibitor/antifreeze	Caterpillar CAT ELC	Ready-mix

Tab. 29 Initial filling of engine cooling system

2.5.5 Reduction agent

Feature	Specification
Type	Urea solution AUS 32
Description	AdBlue® DEF (Diesel Exhaust Fluid)
Quality	according to EN 70070/ISO 22241 or ATSTM D 7821
Application temperature [°C]	−11 ... 45
Switching point for engine torque reduction (Fuel level of the fuel tank) [%]	approx. 14

Tab. 30 Reduction agent

Reduction agent consumption:

The injected quantity of reduction agent is not a fixed set value. It is based on the measured values of the sensors of the exhaust after-treatment. The injection time and injection quantity are calculated by the engine controller. The higher the concentration of nitrogen oxides, the more reduction agents are injected.

Influencing factors for nitrogen oxide concentration in exhaust gas:

- Engine temperature
- Quality of the diesel fuel (standard EN 590 and ASTM D975)
- Quality of the reduction agent (standard EN 70070/ISO 22241)
- Weather (temperature/humidity)
- frequent change between LOAD/IDLE
- frequent switching the machine on and off

2.5.6 Fill quantities

Description	Fill quantity [l]
Engine oil	60.0
Engine oil additive container	40.0
Fuel	940
Coolant	93.0
Coolant refresher	1.87
Reduction agent	44.5

Tab. 31 Fill quantities

2.5.7 Batteries

Feature	Value
Voltage [V]	24 (2 x 12)
Capacity [Ah]	2 x 225
PTC testing current [A] (according to EN 50342)	1150

Tab. 32 Batteries

2.6 Auxiliary electrical systems

Power supply details

Mains supply	Value	
Mains voltage [V/1~/N/PE]	230	115
Frequency [Hz]	50	50
Supply cable cross-section [mm^2] (Cu multi-core)	3 x 1.5	3 x 1.5
User's fusing [A]	16	16

Mains supply	Value	
Wall plug type	1 x CEE 230V / 2–pol + PE	2 x CEE 115V / 3–pol + PE

Tab. 33 Power supply details

Battery charger specification

Battery charger	Value
Charging voltage [V]	24
Maximum charging current [A]	25
Enclosure protection	IP 54

Tab. 34 Battery charger

Low-temperature equipment:

Coolant heater, diesel engine

Coolant heater	Specification	
Voltage [V]	230	115
Power [W]	1500	750
Thermostat switching points [°C]	ON: <38 OFF: >49	

Tab. 35 Coolant heater, diesel engine

Heater oil circuit, compressors

Heater oil circuit	Specification	
Voltage [V]	230	115
Power [W]	1000	500
Thermostat switching point [°C]	30	

Tab. 36 Heater oil circuit, compressors

Tank heater, hydraulic oil

Tank heater	Specification	
Voltage [V]	230	115
Power [W]	500	500
Thermostat switching points [°C]	ON: <17 OFF: >20	

Tab. 37 Tank heater, hydraulic oil

Heater, condensate drain

Heater, condensate drain	Specification
Voltage [V]	24
Heating cable, water drainage (3x) Power [W]	25
Heating plate, drainage valve (2x) Power [W]	5

Tab. 38 Heater, condensate drain

Heater, fuel pre-filter

Filter heating (2x)	Specification
Voltage [V]	24
Power [W]	300
Thermostat switching points [°C]	ON: <10 OFF: >27

Tab. 39 Heater, fuel pre-filter

2.7 Remote control

The remote control permits an operation of the machine's functions from some distance.

Remote control, technical data:

- Radio remote control with two function keys
- Transmitting power < 1 mW
- Average range:
  - Open country: 150 m
  - Industrial environment: 50 m
- Working temperature: -20 °C to +50 °C
- Degree of protection: IP65
- Batteries: 2 x 1,5 V (Typ AAA)

2.8 Connection to external fuel supply

External fuel lines	
Maximum cable length* [m]	15
* Auxiliary tank and machine must be at approximately the same level.	

Tab. 40 External fuel lines

Hydraulic coupling	Connection (ISO 7241–1–B)
Rapid action coupling, Connection to fuel feed line	DN 20
Rapid action coupling, Connection to fuel return line	DN 12.5

Tab. 41 Connection to external fuel supply

2.9 Connecting for external reduction agent addition (AdBlue®)

Filling pump for reduction agent:

Characteristic	Value
Connection [V DC]	12
Fuse (AdBlue®) plug-in connection [A]	15
Recommended external pump capacity [l/min]	Maximal 30
Switching point at *Reduction agent minimum* of the internal fuel tank [%] (Switch on)	approx. 20
Switching point at *Reduction agent maximum* of the internal fuel tank [%] Switch off	approx. 85
Maximum operating time [s]	30
Switching point for torque reduction, engine (Fuel level of the internal fuel tank) [%]	approx. 14
Application temperature (AdBlue®) [°C]*	−10 ... 45

Tab. 42 External filling pump for reduction agent

* Below −11°C, auxiliary heater and insulations required!

2.9.1 Connection for external reduction agent addition

Hydraulic coupling	
Flat-face coupling Sleeve	1/2 V4A

Tab. 43 Connecting to an external reduction agent supply

3 Safety and Responsibility

3.1 Basic instructions

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

- danger to life and limb of the operator or third parties,
- Impairments to the machine and other material assets.



Disregard of warning or safety instructions can cause serious injuries!

➢ Use this machine only if it is in a technically perfect condition and only for the purpose for which it is intended; observe all safety measures and the instructions in the service manual!

➢ Immediately rectify (have rectified) any faults that could be detrimental to safety!

3.2 Specified use

The machine is intended solely for generating compressed air for industrial use. Any other use is considered incorrect. The manufacturer is not liable for any damages that may result from incorrect use. The user alone is liable for any risks incurred.

➢ Keep to the specifications listed in this service manual.

➢ Operate the machine only within its performance limits and under the permitted ambient conditions.

➢ Do not use compressed air for breathing purposes unless it is specifically treated.

3.3 Incorrect Use

Improper usage can cause damage to property and/or (severe) injuries.

➢ Only use the machine as intended.

➢ Never direct compressed air at persons or animals.

➢ Do not use untreated compressed air for breathing purposes.

➢ Do not allow the machine to take in toxic, acidic, flammable of explosive gases or vapours.

➢ Do not operate the machine in areas in which specific requirements with regard to explosion protection are in force.

3.4 User's responsibilities

3.4.1 Observe statutory and universally accepted regulations

+This includes, for example, nationally implemented European directives and/or applicable national legislation, safety and accident prevention regulations.

➢ Observe relevant statutory and accepted regulations during transport, operation, and maintenance of the machine.

3.4.2 Determining personnel

Suitable personnel are experts who, by virtue of their training, knowledge and experience as well as their knowledge of relevant regulations can assess the work to be done and recognize the possible dangers involved.

Authorised operators possess the following qualifications:

- are of legal age,
- are conversant with and adhere to the safety instructions and sections of the service manual relevant to operation,
- have received adequate training and authorization to operate vehicles and electrical and compressed air devices.

Authorised maintenance personnel possess the following qualifications:

- are of legal age,
- are conversant with and adhere to the safety instructions and sections of the service manual relevant to maintenance,
- are fully conversant with the safety concepts and regulations of motor vehicle, electrical and compressed air engineering,
- are able to recognise the possible dangers of motor vehicle, electrical and compressed air devices and take appropriate measures to safeguard persons and property,
- have received adequate training in and authorization for the safe installation and maintenance of this machine.

Authorised transport personnel possess the following qualifications:

- are of legal age,
- are conversant with and adhere to the safety instructions and sections of the service manual relevant to transporting,
- are trained and authorised in safe vehicle transporting,
- are conversant with the safety regulations relating to handling motor vehicles and transport goods,
- are able to recognise the possible dangers of motor vehicles and take appropriate measures to safeguard persons and property.

➢ Ensure that personnel entrusted with transport, operation, and maintenance are qualified and authorised to carry out their tasks.

3.4.3 Installing accessories at the machine

The operator is obliged to ensure the compliance with relevant occupational safety regulations when accessories are installed at the machine.

➢ Ensure the compliance with relevant occupational safety regulations.

Example:
Protect against burns resulting from hot components connected to the hot-air connection of the machine.

➢ Install sufficient thermal insulation of hot pipes installed by the user outside of the machine paneling.

3.4.4 Complying with inspection schedules and accident prevention regulations

The machine is subject to local inspection schedules.

Examples of operation in Germany

- ➢ Have the pre-commissioning inspection carried out according to the Ordinance on Industrial Safety and Health, §15.
- ➢ Carry out recurring inspections to *DGUV Regel 100–500*, chapter 2.11:
  The user must ensure that the machine's safety devices are checked for function as required or at least annually.
- ➢ Carry out oil changes to *DGUV Regel 100–500*, chapter 2.11:
  The user must ensure that the cooling oil is changed as required or at least annually and the oil change must be documented. Intervals may be varied if an analysis proves that the oil is still usable.
- ➢ Keep to inspection intervals in accordance with the Ordinance on Industrial Health and Safety with maximum intervals as laid down in §16:

Inspection	Inspection interval	Inspection authority
Equipment inspection	Before commissioning	Approved supervisory body
Internal inspection	Every 5 years after commissioning or the last inspection	Competent person (e. g. KAESER SERVICE technician)
Strength test	Every 10 years after commissioning or the last inspection	Competent person (e. g. KAESER SERVICE technician)

Tab. 44 Inspection intervals according to Ordinance on Industrial Health and Safety

Checking the lifting point

The user is responsible for ensuring that the machine's lifting point and fixings are regularly inspected according to national or application-specific regulations for wear and damage.

- ➢ Have lifting eye checked.

  Lifting eye is not in order: The machine must not be transported by crane. Have the machine repaired immediately.

Upon request, KAESER will have acceptance test performed for the machine's crane suspension (optional). The testing agency charged with this task will create an inspection report. According to this inspection report, the crane suspension must then be inspected at least once every year. This inspection must be performed and documented according to the inspection instructions in the separate "Inspection Manual - Crane Suspension" manual.

Inspecting the service ladder

The user is responsible for ensuring that the machine's service ladder is regularly inspected according to national or application-specific regulations for wear and damage.

- ➢ Have the service ladder inspected.

  Service ladder is not okay: Do not use the service ladder. Have the service ladder replaced or repaired.

Checking the anchoring points for attaching the personal protective equipment

The user is responsible for ensuring that the machine's anchoring points for the attachment of the personal protective equipment (falling protection) are inspected for wear and damage according to national regulations.

➢ Have the anchoring points checked.

Do not step on the roof if the anchoring points are not in proper condition. Have the machine repaired immediately.

Checking the anti-slip coating on the accessible roof

The user is responsible for ensuring that the machine's anti-slip coating is inspected for wear and damage according to national regulations.

➢ Have the anti-slip coating checked.

The anti-slip coating is not OK Do not step on the roof. Have the anti-slip coating repaired.

Checking strapping points (anchoring points for securing during transport)

The user is responsible for ensuring that the machine's strapping points (anchoring points, transport security) are inspected for wear and damage according to national regulations.

➢ Have the strapping points checked.

The strapping point is not OK Machine must not be transported on the truck bed. The strapping point must be repaired.

3.4.5 Complying with inspection intervals for diesel particulate filters

The machine is subject to local inspection schedules. KAESER SERVICE is an inspecting authority.

➢ Have the TRGS 554 inspection carried out annually and the TÜV (or local equivalent) every two years.

3.4.6 Attachment of a "Hazardous goods" label

The special regulation 363 "Transport of machines and equipment with liquid fluids" of the European regulations for the hazardous goods transport (ADR) has taken effect.

This regulation requires that machines filled with more than 1 litre petrol or 5 litres diesel (in the fuel tank) during transport must be identified with hazardous goods labels on the machine's exterior.

Number of labels per machine:

- *Fuel tank content 450l - 1500l*
  - ➢ Attach one label on every exterior side.



The operator of the machine but also the authorised users and transport personnel are responsible for compliance with this requirement. Please instruct your employees accordingly.

A violation of this regulation will be punished with a fine and the further machine transport will be forbidden.

➢ Have a "Hazardous goods" label attached.

Further information Chapter 3.7 “Safety signs” indicates the suggested position(s) for the hazardous goods label(s).

3.5 Dangers

Basic instructions

The following describes the various forms of danger that can occur during machine operation.

Basic safety instructions are found in this service manual at the beginning of each chapter in the section entitled 'Safety'.

Warning instructions are found before a potentially dangerous task.

3.5.1 Safely dealing with sources of danger

The following describes the various forms of danger that can occur during machine operation.

Exhaust fumes

Exhaust gases from combustion engines contain carbon monoxide, a colour- and odour-less but highly toxic gas. The inhalation of minute quantities can be lethal.
Furthermore, diesel exhaust contains soot particles, some of which are noxious.

- ➢ Do not inhale exhaust fumes.
- ➢ Park the machine in such a manner that the exhaust cannot blow towards the operators.
- ➢ Never use the machine in enclosed spaces, only in the open.

Fire and explosion

Spontaneous ignition and combustion of fuel can result in serious injury or death.

- ➢ Allow no open flames or sparks at the place of use.
- ➢ Do not smoke while refuelling.
- ➢ Never refuel the machine when it is running.
- ➢ Do not allow fuel to overflow.
- ➢ Wipe up spilled fuel immediately.
- ➢ Provide a fire extinguisher in the immediate vicinity.

Hot coolant

The cooling system of a liquid-cooled engine at running temperature is under high pressure. If the filler cap is unscrewed, hot coolant can spray out under pressure and cause severe scalding.

- ➢ Let the machine cool down before opening the cooling system.
- ➢ Unscrew the filler cap carefully by a quarter to half a turn at first. Remove the filler cap only when pressure has escaped completely.

Electricity

Touching voltage-carrying components can result in electric shocks, burns or even death.

- ➢ Allow only qualified and authorised certified electricians or trained personnel under the supervision of a qualified and authorised certified electrician to carry out work on electrical equipment according to electrical engineering rules.
- ➢ Regularly check that all electrical connections are tight and in proper condition.
- ➢ Remove any external power sources.
  For example, the connections to electrical accessories such as heaters and the battery charger.

Compressive forces

Compressed air is contained energy. Uncontrolled release of this energy can cause serious injury or death. The following information concerns any work on components that could be under pressure.

- ➢ Shut down the machine.
- ➢ Wait until the compressor has automatically vented (check: the pressure gauge: it must read 0 bar!)
- ➢ Then open an outlet valve carefully to ensure that the line between the minimum pressure check valve and the compressed air outlet is vented.
- ➢ Do not carry out welding, heat treatment or mechanical modifications to pressurised components (e.g. pipes and vessels) as this influences the components' resistance to pressure. The safety of the machine is then no longer ensured.

Compressed air quality

Oil should not be present in the compressed air if the machine is properly operated and maintained.

- ➢ Never directly inhale compressed air.
- ➢ If there is oil or oil vapour in the intake air, use appropriate systems for air treatment before using the compressed air from this machine as breathing air (ventilation) and/or for the processing of foodstuffs.
- ➢ Use comestibles-compatible cooling oil whenever compressed air is to come into contact with comestibles.

Spring forces

Springs under tension or compression store energy. Uncontrolled release of this energy can cause serious injury or death.
Check valve, safety valve, and inlet valve are powerfully spring-loaded.

- ➢ Do not open or dismantle any valves.

Rotating components

Touching the fan wheel, the coupling or the belt drive while the machine is switched on can result in serious injury.

- ➢ Do not open the service doors or panels while the machine is running.
- ➢ Prior to opening the service doors or the enclosure, switch off the engine, disconnect from power source and secure against unintended reactivation.
- ➢ Wear close-fitting clothes and a hair net if necessary.
- ➢ Ensure that all covers and safety guards are in place and secured before re-starting.

Temperature

The operation of the combustion engine and the compression generate high temperatures. Touching hot components may cause injuries.

- ➢ Avoid contact with hot components.
  These include, for example, combustion engine, diesel particulate filter, compressor airends or blocks, oil and compressed air lines, coolers, pulsation dampers, and machine heaters. Any objects in or near the flow of exhaust gas or discharged cooling air may become very hot.
- ➢ Wear protective clothing.

- ➢ Wear protective gloves when connecting or disconnecting external compressed air hoses to the outlet valves.
- ➢ Allow the machine to cool down before commencing any maintenance work.
- ➢ If welding is carried out on or near the machine, take adequate measures to prevent sparks or heat from igniting oil vapours or parts of the machine.

Noise

The housing absorbs the machine noise to a tolerable level. This function will be effective only if the body is closed.

- ➢ Operate the machine only with closed body and intact sound insulation.
- ➢ Wear hearing protection if necessary.
  Safety valve blow-off results in high noise emission.
- ➢ Never generate compressed air without consumers being connected.

Operating fluids/materials

The operating fluids and materials used can cause adverse health effects. Suitable safety measures must be taken in order to prevent injuries.

- ➢ Strictly forbid fire, open flame and smoking.
- ➢ Follow safety regulations when dealing with fuel, oils, lubricants, antifreeze and chemical substances.
- ➢ Avoid contact with skin and eyes.
- ➢ Do not inhale fumes or vapours from fuel or oil.
- ➢ Do not eat or drink while handling fuel, reduction agent, oil, coolants and lubricating fluids or antifreeze.
- ➢ Keep suitable fire-extinguishing media ready for use.
- ➢ Use only KAESER approved operating materials.

Unsuitable spare parts

Unsuitable spare parts compromise the safety of the machine.

- ➢ Use only spare parts approved by the manufacturer for use in this machine.
- ➢ Use only original KAESER spare parts on pressure bearing parts.

Conversion or modification of the machine

Modifications, additions or conversions to or of the machine can result in unpredictable hazards.

- ➢ Do not convert or modify the machine!
- ➢ Do not install any non-approved additional components.
- ➢ Do not make any changes to the machine that will increase its weight beyond the permissible limit and/or endanger its safe use or transportation.
- ➢ Prior to any technical modification and expansions of the machine, obtain the written approval of the manufacturer.

3.5.2 Save handling of the AdBlue® reduction agent



WARNING
Ammonia fumes!
When AdBlue® is heated beyond 50° C for some time, it may decompose resulting in Ammonia fumes.
Ammonia fumes can cause severe health damage.

- ➢ Replenish AdBlue® only when the machine has cooled down.
- ➢ Do not inhale AdBlue® fumes.

Handling AdBlue® contaminated with foreign matter:

Individual components of the SCR system will react very sensitively to even the smallest traces of contaminants in AdBlue®.

- ➢ Always use clean containers and bowls reserved for this purpose when handling AdBlue®.
- ➢ Do not use AdBlue® containing contaminant traces. Dispose of the contaminated liquid according to environmental protection regulations.

Handling fluids contaminated with AdBlue®:

Fluids contaminated with AdBlue® may cause damage to the machine's components.
For example, a small amount of AdBlue® in the coolant circuit will damage thermostats and sensors.

- ➢ Ensure that AdBlue® is stored separately from other fluids such as fuel, coolants and lubricants as well as hydraulic and brake fluids, and that it is never used in the same containers and bowls.
- ➢ Do not use any fluids containing traces of AdBlue®. Dispose of the contaminated fluids according to environmental protection regulations.

3.5.3 Safe machine operation

The following is information supporting you in the safe handling of the machine during individual product life phases.

Personal protective equipment

When working on the machine you may be exposed to dangers that can result in accidents with severe adverse health effects.

- ➢ Wear protective clothing as necessary.

Suitable protective clothing (examples):

- Safety work wear
- Protective gloves
- Safety boots
- Eye protection
- Ear protection

- ➢ When working on the accessible machine roof, please note the following:

- Do not step on the roof when the machine is in operation.

- Certain areas of the roof (e.g., particle filter, exhaust outlet) may still be hot after the machine has been shut down.
- The roof must be clear of snow, ice, leaves and similar items.
- The soles of your safety boots must be clean and have an anti-slip surface.
- Use only the provided service ladder to access the roof (attached beneath the machine).
  - Check the ladder for visible damage; don't use a defective ladder.
  - Don't use a dirty ladder (e.g., dirt, snow or oil).
  - Lean the ladder only against the machine rear and attach it at the designated bracket.
- Step only on roof surfaces with anti-slip coating.
  Stepping on other areas is forbidden!
- If the roof must be accessed:
  - only one person for each roof segment
  - only one person secured by any anchoring ring
  - Subsequently to a fall: Check the anchoring ring and replace, if necessary.
- Use fall protection equipment (two anchoring rings are provided).
  - Subsequently to a fall: Replace the fall protection equipment.

3.5.3.1 Transport

The weight and size of the machine require safety measures during its transport to prevent accidents.

➢ Allow transport only by personnel trained in safely dealing with motor vehicles and the transport of goods.

➢ Ensure that no persons are on the machine when transporting.

Transport as trailer

Non-compliance with the basic rules for a safe trailer operation may cause severe accidents during machine transport.

➢ Ensure the compatibility of the towing device at the towing vehicles with the towing height and eye of the machine's towbar.

➢ Comply with the maximum permissible towed load for the towing vehicle.

➢ Do not over-stress the machine, and the chassis in particular, by unreasonable driving on dirt roads and in curves in particular.

➢ Maximum driving speed is 6 km/h.

➢ Before moving the machine, ensure that any transport and security devices (e.g. anti-theft chain) are disassembled or turned off.

Transport on truck bed

Non-compliance with the basic rules for a safe transport on lorries, trains or ships may cause severe accidents during machine transport.

➢ Park the machine with the wheels in a wooden frame and secure with chocks.

➢ Install anti-slip mats between the wooden frame and loading bed.

➢ Pull the parking brake and lock the bogie of the steering axle.

➢ Secure the machine by bracing at the strapping points of the machine with diagonal strapping.

➢ Do not use humps when transporting by rail.

Transporting with a crane

Non-compliance with the safety regulations for load suspension and hoisting equipment may cause severe accidents during lifting and moving the machine with cranes.

- ➢ Do not enter the danger zone while the machine is being lifted.
- ➢ Never lift and move the machine over people or occupied buildings.
- ➢ Avoid extreme weight shifting caused by additional loads or additions (permissible tilting: ±3°).
- ➢ Do not exceed the lifting capacity on the machine's lifting point (lifting eye).
- ➢ Only the crane suspension traverse should be used as the designated lifting points, and under no circumstances are handles, anchoring rings, strapping points, the towbar or other components to be used.
- ➢ Lift the machine only simultaneously at both lighting points of the crane suspension traverse (dual anchoring means).
- ➢ Use only chains of equal length to hang, and do not exceed the permissible shifting angle of the chains.
- ➢ Use only hooks and shackles that comply with local safety regulations
- ➢ Do not attach cables, chains or ropes directly to the crane lifting eyes.
- ➢ Do not manipulate the crane suspension system, in particular the holding points of the crane lifting eye.
- ➢ If screwed crane fixings had to be removed, please use only new self-locking nuts when installing.
- ➢ Avoid jerking when lifting, as this may damage components.
- ➢ Loads must be slowly lifted and carefully set down.
- ➢ Never allow the load to hang from the crane longer than necessary.



The following are forbidden:

- Air transport of the machine by slinging beneath a helicopter.
- Dropping the machine by parachute.

3.5.3.2 Installation



The operator must ensure that only authorised personnel has access to the machine.

General instructions

A suitable installation location for the machine prevents accidents and faults.

- ➢ Do not position the machine under a low roof or covering. Hot air back pressure caused by hot exhaust gases from the exhaust system, and waste heat (cooling air flow) may damage the machine.
- ➢ Ensure accessibility so that all work on the machine can be carried out without danger or hindrance.
- ➢ Do not operate in areas in which specific requirements with regard to explosion protection are in force.
  For instance, the requirements of ATEX directive 94/9/EC "Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres".
- ➢ Ensure adequate ventilation.

➢ Place the machine in such a manner that the working conditions in its environment are not impaired.
➢ Do not exceed the threshold values for ambient conditions.
➢ The intake air must not contain any damaging contaminants,

Damaging contaminants are for instance:
- Exhaust gases from combustion engines,
- Combustible, explosive or chemically unstable gases or vapours,
- Acid- or base-forming chemicals such as ammonia, chlorine, or hydrogen sulphide.

➢ Do not position the machine in the warm exhaust air flow from other machines.
➢ Keep suitable fire extinguishing agents ready for use.

Parking the machine:

Improper parking and use of the parked machine endangers personnel and material.
➢ To park the machine, select an even and solid surface which is capable of bearing the machine's weight.
➢ Move the machine only with a towing vehicle.
➢ Secure the parked machine:

- Chock the wheels to prevent unwanted movement.
  - Place chocks under the wheels.
  - Pull on the parking brake.

➢ Unauthorised persons must not be present in the parking area of the machine. The parking area must be properly secured.
➢ Do not place additional loads on the machine (e.g. excavator bucket as anti-theft measure).

3.5.3.3 Commissioning, operation and maintenance

During commissioning, operation and maintenance you may be exposed to dangers resulting from, e.g., electricity, pressure and temperature. Careless actions can cause accidents with severe adverse effects for your health.
➢ Allow maintenance work to be carried out only by authorised personnel.
➢ Wear close-fitting, flame-resistant clothing. Wear protective clothing as necessary.
➢ Switch off the machine and lock out the supply disconnecting device.
➢ De-pressurise all pressurised components and enclosures.

- Wait until the machine has automatically vented.
- Carefully open the compressed air outlet valve.
- Check: The pressure gauge must read 0 bar!

➢ For maintenance and repair work, isolate machines with "automatic start/stop" (Option ob) from the compressed air network and secure against automatic start.
➢ Allow the machine to cool down.
➢ Do not open the body while the machine is switched on.
➢ Do not open or dismantle any valves.
➢ Use only spare parts approved by KAESER for use in this machine.

➢ Operate the machine only in technically sound condition.
➢ Carry out regular inspections:

- for visible damage and leakage,
- of safety devices,
- of EMERGENCY STOP devices,
- of parts needing monitoring.

➢ Pay particular attention to cleanliness during all maintenance and repair work. Cover components and openings with clean cloths, paper or tape to keep them clean.
➢ Do not leave any loose components, tools or cleaning rags on or in the machine.
➢ Components removed from the machine can still be dangerous.
Do not attempt to open or destroy any components taken from the machine.
➢ Self-locking nuts removed for the installation must not be reused but replaced by new nuts, because the non-positive safety is no longer ensured.
➢ Use only suitable compressed air hoses.

Compressed air hoses must meet the following requirements:

- they are of the right type and size for the highest permissible machine working pressure,
- they are not damaged, worn or of reduced quality,
- they have couplings and connections of the right type and size.

➢ Wear protective gloves when connecting or disconnecting compressed air hoses.
➢ Make sure compressed air hoses are de-pressurised before disconnecting from the machine.
➢ Secure the open end of an air hose before applying air pressure. An unsecured hose may whip and cause injury.
➢ At working pressures>7 bar, compressed air hoses should be secured by a cable to their respective outlet valves.
➢ Connect and operate only suitable air tools.

- The air tools must meet the set output pressure of the machine.
- Use a pressure reducer for air tools requiring a lower pressure.
- Use compressed air tools only with the pressure appropriate for its purpose (tool working pressure).

➢ Use only suitable connection pipes when drawing hot compressed air.

- Thermally isolated pipe connections
- Appropriate type and size and designed for the maximal permissible temperature and working pressure
- Higher quality
- Undamaged

3.5.3.4 De-commissioning, storage and disposal

Improper handling of old operating fluids and components represent a danger for the environment.

➢ Drain off fluids and dispose of them according to environmental regulations.
These include, for example, fuel, engine, cooling, and hydraulic oils as well as engine coolant.
➢ Dispose of the machine in accordance with local environmental regulations.

3.5.4 Using the remote control function



DANGER
Risk of injury caused by an automatic machine start!

- ➢ Prior to any work at the machine:
  - Shut down the machine.
  - Turn off the «battery isolating switch».
- ➢ Operate the machine only with doors closed.



Use of radio transmitters (remote control):

- The user must be appropriately trained and authorised to operate radio remote control equipment.
- The remote control should not be left unattended and, when not in use, should be stored appropriately.
- If multiple radio remote controls are in use at the same location, then differing frequencies must be transmitted that are at least two channels apart from one another (e.g. channels 05; 07; 09; ...). The further apart the channels, the lower the risk of interference.
- Prior to using the radio remote control, check the transmitter's battery charge and replace batteries if necessary.

3.5.5 Organisational Measures

- ➢ Designate personnel and their responsibilities.
- ➢ Give clear instructions on reporting faults and damage to the machine.
- ➢ Give instructions on fire reporting and fire-fighting measures.

3.5.6 Danger areas

The table gives information on areas dangerous to personnel.
Only authorized personnel may enter these areas.

Task	Danger area	Authorized personnel
Transport	Within a 3 m radius of the machine.	Operating personnel to prepare for transport. No personnel during transport.
	Beneath the lifted machine.	No personnel!
Commissioning	Within the machine. Within a 1 m radius of the machine.	Maintenance personnel
Operation	Within a 1 m radius of the machine.	Operating personnel
Maintenance	Within the machine. Within a 1 m radius of the machine.	Maintenance personnel

Tab. 45 Danger areas

3.6 Safety devices

Various safety devices ensure safe working with the machine.

- ➢ Do not change, bypass or disable safety devices.

- ➢ Regularly check safety devices for their correct function.
- ➢ Do not remove or obliterate labels and notices.
- ➢ Ensure that labels and notices are clearly legible.

Further information More information on safety devices is contained in chapter 4.5.

3.7 Safety signs

The tables list the various safety signs used and their meanings. The figures show the position of the safety signs on the machine, inside and outside.

During cleaning or maintenance work, a check should be made that safety signs have not been removed or obliterated. Have missing or illegible signs replaced!

Safety signs outside:

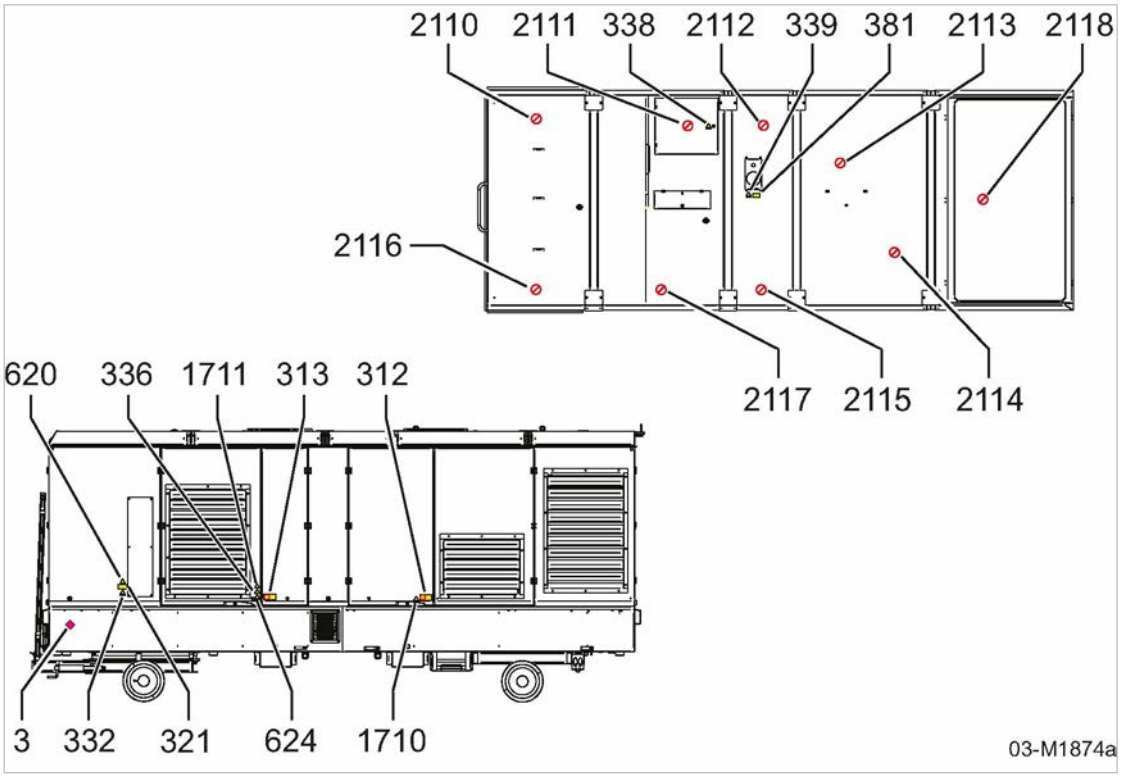


Fig. 2 Location of safety signs, outside (right + top)

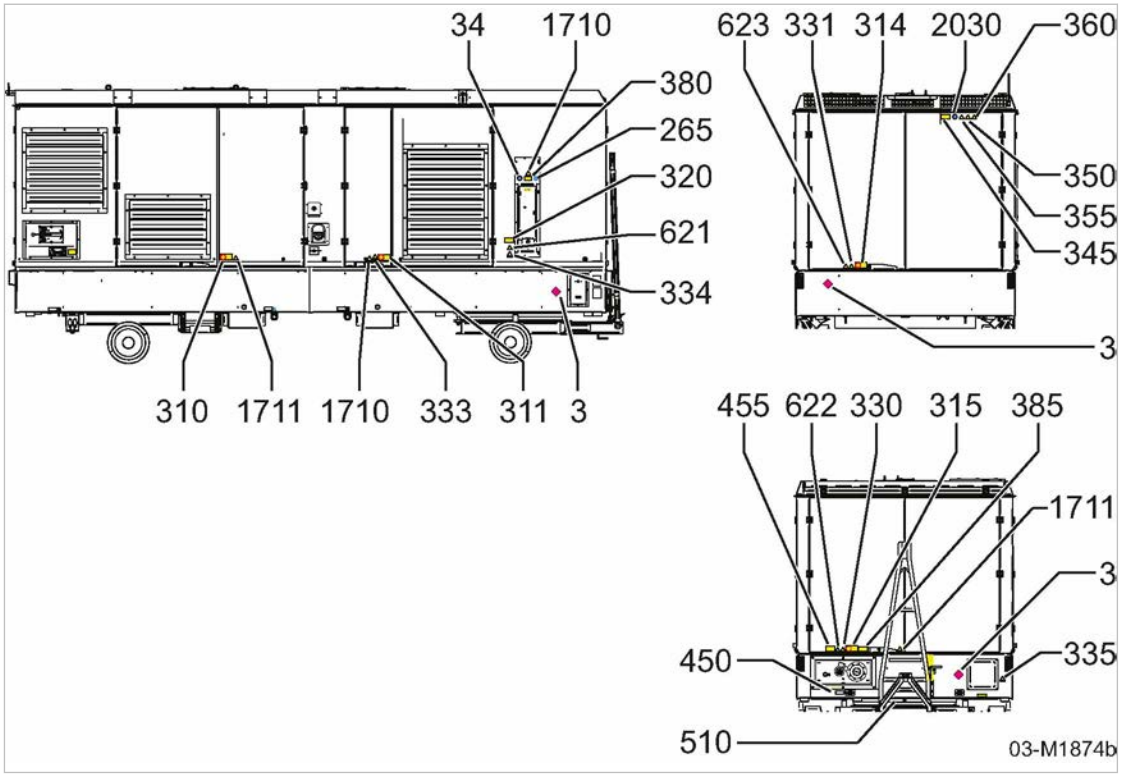


Fig. 3 Location of safety signs, outside (left + rear + front)

Location	Symbol	Meaning
3		Hazardous good! Identifies machines filled with fuel during transport as a hazardous good.
34		Caution! Hearing loss due to noise! ➢ Wear hearing protection when working at a running machine. ➢ Operate the machine only with doors closed.
265		Caution! Personal injury or damage to the machine due to incorrect operation! ➢ Read and understand the operating manual and all safety information before switching on this machine.
310 - 315		Warning It is forbidden to operate the machine with open doors or enclosure! Personal injury or machine damage can result from an open machine enclosure. ➢ Operate only with the enclosure fully closed. ➢ Transport only with the enclosure fully closed.

Location	Symbol	Meaning
320 - 321		Warning Loud noise and oil mist! Hearing damage and burns from safety valve blow off. ➢ Wear hearing protectors and protective clothing. ➢ Close the enclosure or doors. ➢ Work with caution.
330 - 336 338 - 339		Warning Hot surface! Risk of burns caused by contact with hot components! ➢ Allow the machine to cool down. ➢ Do not touch the surface. ➢ Wear long-sleeved garments (no synthetics such as polyester) and protective gloves.
		Hot surface ≤270 °C!
		Hot surface ≤650 °C!
345		Danger! Danger of fatal injury caused by high-voltage conduits! ➢ Maintain sufficient distance from electrical high-voltage conduits: ■ when installing the machine, ■ when accessing the roof.
350		Danger! Risk of falling from the machine! ➢ Wear safety harness! ➢ Step only on marked areas of the roof.
355		Danger! Risk of stumbling on the roof! ➢ Step only on marked areas of the roof. ➢ Walk carefully. ➢ Avoid projecting components.
360		Danger! Risk of slipping on the roof! ➢ Step only on marked areas of the roof (anti-slip coating). ➢ Step only on a clean roof: ■ Roof is free of ice and snow. ■ Roof is free of leaves. ➢ Step on the roof only with shoes with a slip-proof and clean sole.

Location	Symbol	Meaning
380 381		Danger! Toxic gases into areas of work! ➢ Never use the machine in enclosed spaces, only in the open. ➢ Direct the exhaust fumes to the open air. ➢ Do not inhale dangerous gases.
385		Warning Pressure! Injuries resulting from sudden opening of the doors. ➢ Operate only with the enclosure fully closed. ➢ Shut down the machine before opening any doors.
450		Warning Loud noise and compressed air blast! Damage to hearing and injury if ball valve is opened without a compressed air hose being connected. ➢ 1. Connect a compressed air hose. ➢ 2. Open the ball valve.
455		Danger! Serious injury can result from caused by high pressure fluid jets! ➢ Operate only with the enclosure fully closed.
		Pressure within the hose ≤220 bar. ➢ Remove any non-pressurised lines.
510		Warning Malfunction due to deficient maintenance. Injury and machine damage possible. ➢ Regularly maintain the chassis. ➢ Note the instructions in the operating manual regarding the chassis.
620 - 624		Warning Risk of serious injuries (to the hands, in particular) or even severing of extremities from rotating components! ➢ Operate the machine only with closed safety guards, access doors and panels. ➢ Shut down the machine before opening a door or canopy and prevent from restarting.
1710 1711	 	Warning Risk of injury caused by an automatic machine start! ➢ Prior to any work at the machine: ■ Shut down the machine. ■ Turn off the «battery isolating switch». ➢ Operate the machine only with closed doors.

Location	Symbol	Meaning
2030		Danger! Risk of falling from the machine! ➢ Wear protective harness and attach it to the anchoring point.
2110 - 2118		Danger! Risk of slipping and falling and collapsing roof. ➢ Step only on marked surfaces with anti-slip coating. ➢ Do not step on any other surfaces.

Tab. 46 Safety signs outside

Safety signs inside:

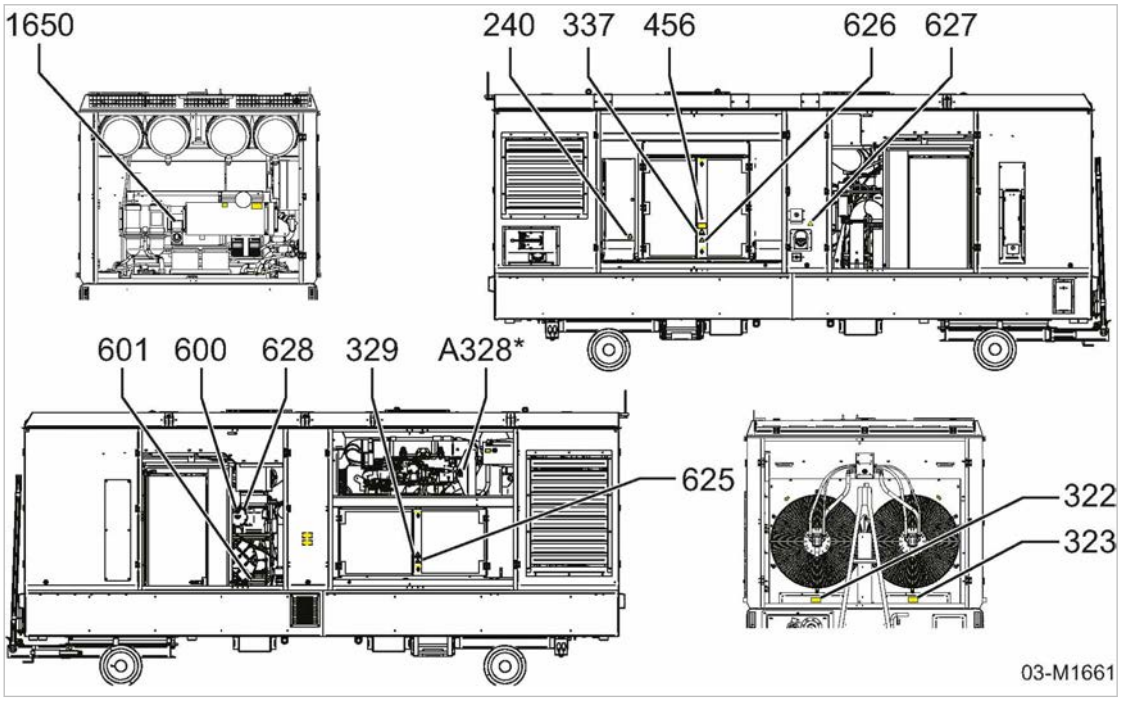


Fig. 4 Location of safety signs (inside)

Location	Symbol	Meaning
240		Danger! Risk of fatal injury caused by contact with live components! ➢ Take protective measures. ➢ Prior to any work at the machine: ■ Disconnect the external voltage supply. ■ Turn off the «battery isolating switch». ■ Verify the absence of any voltage.

** Aluminium sign

Location	Symbol	Meaning
322 - 323		Warning Loud noise and oil mist! Hearing damage and burns from safety valve blow off. ➢ Wear hearing protectors and protective clothing. ➢ Close the enclosure or doors. ➢ Work with caution.
A328* 327 329		Warning Hot surface! Risk of burns caused by contact with hot components! ➢ Allow the machine to cool down. ➢ Do not touch the surface. ➢ Wear long-sleeved garments (no synthetics such as polyester) and protective gloves.
	270 °C	Hot surface ≤270 °C!
	650 °C	Hot surface ≤650 °C!
456		Warning Serious injury can result from caused by high pressure fluid jets! ➢ Operate only with the enclosure fully closed.
	220 bar	Pressure within the hose ≤220 bar. ➢ Remove any non-pressurised lines.
600 601		Danger! Spring-loaded or under pressure! Risk of fatal injury caused by dismantling valves ➢ Never dismantle the valve. ➢ Call an authorised Service Technician in the event of a fault.
62* - 628		Warning Risk of serious injuries (to the hands, in particular) or even severing of extremities from rotating components! ➢ Operate the machine only with closed safety guards, access doors and panels. ➢ Shut down the machine before opening a door or canopy and prevent from restarting.
1650		Caution! Machine damage if switched while the engine is running! ➢ Use the «battery isolating switch» only with the engine stopped. ➢ Do not use the «battery isolating switch» as a main or emergency switch.
** Aluminium sign		

Tab. 47 Safety signs inside

3.8 Emergencies

3.8.1 Correct actions in the event of a fire

Suitable extinguishing media:

- Foam
- Carbon dioxide
- Sand or earth

Unsuitable extinguishing agents:

- Strong jet of water

1. Keep calm.
2. Report fire.
3. If possible: Turn off engine using control devices.
4. Make safe:
   - Warn persons in danger
   - Help incapacitated persons
   - Close the doors
5. When trained accordingly: Attempt to extinguish the fire.

3.8.2 Treating injuries from handling operating fluids/materials

The following operating fluids/materials are in the machine:

- Fuel
- Lubricating oils
- Compressor cooling oil
- Engine coolant
- Battery electrolyte
- Hydraulic oil
- Reduction agent

Eye contact:

Fuel, oil and other fluids/materials can cause irritation.

➢ Rinse eyes thoroughly with lukewarm water and seek medical assistance immediately.

Skin contact:

Fuel, oil and other fluids/materials may irritate after prolonged contact.

➢ Wash thoroughly with skin cleaner, then with soap and water.

➢ Contaminated clothing should be intensively cleaned before reuse.

If inhaled:

Fuel and oil vapours impair breathing.

➢ Clear the respirator tract from fuel or oil vapour.

Any difficulty with respiration: seek immediate medical help.

If swallowed:

➢ Wash out the mouth immediately.

➢ Do not induce vomiting.
➢ Seek medical aid.

3.9 Warranty

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

A condition of our warranty is that the machine is used solely for the purpose for which it is intended and under the conditions specified.
Due to the multitude of applications for which the machine is suitable, the user is obliged to determine its suitability for his specific application.

Furthermore, we do not assume any warranty obligation for damages caused by:

- the use of unsuitable parts or operating materials,
- arbitary modifications,
- incorrect maintenance,
- incorrect repair.

Correct maintenance and repair includes the use of genuine KAESER spare parts and operating materials.

➢ Obtain confirmation from KAESER that your specific operating conditions are suitable.

3.10 Identifying the effects of improper modifications

The machine and various modules are designed according to applicable regulations and are submitted for approval procedures by the relevant authorities (where applicable).

Concerned modules include:

- Compressor drive engine
- Fuel system
- Exhaust system
- Chassis (if available)
- Compressor.
- Pressure-bearing components (e.g., valves, vessels, pipelines)

Remodeling or modifications can have the result that the interaction of the individual modules according to regulations is no longer ensured. Thus, the prerequisites required for approval by the authorities may no longer be given.

The concerned directives and regulations can be:

- Machinery directive
- Pressure equipment directive
- EMC Directive
- Directive on environmental noise

In machines requiring a national road traffic permit, remodeling or modifications may adversely affect their approval for road traffic.

- Exhaust emission limits may not be met.
- The prerequisites for approval are no longer given.

Remodeling or modifications restrict the service work that can be performed for you (examples):

- Warranty (if directly and originally affected by the remodeling or modification)
- Reduced replacement part supply (scope, delivery times)
- SIGMA CONTROL MOBIL:
  Program changes result in a reduced capability of software updating.

3.11 Environment protection

The operation of this machine may cause dangers for the environment.

➢ Do not allow operating materials to escape to the environment or into the sewage system.

➢ Store and dispose of operating materials and replaced parts in accordance with local environment protection regulations.

➢ Observe national regulations.
This applies particularly to parts contaminated with fuel, oil, coolants and acids.

4 Design and Function

4.1 Bodywork

Bodywork is understood to be the exterior of the machine mounted on the chassis.

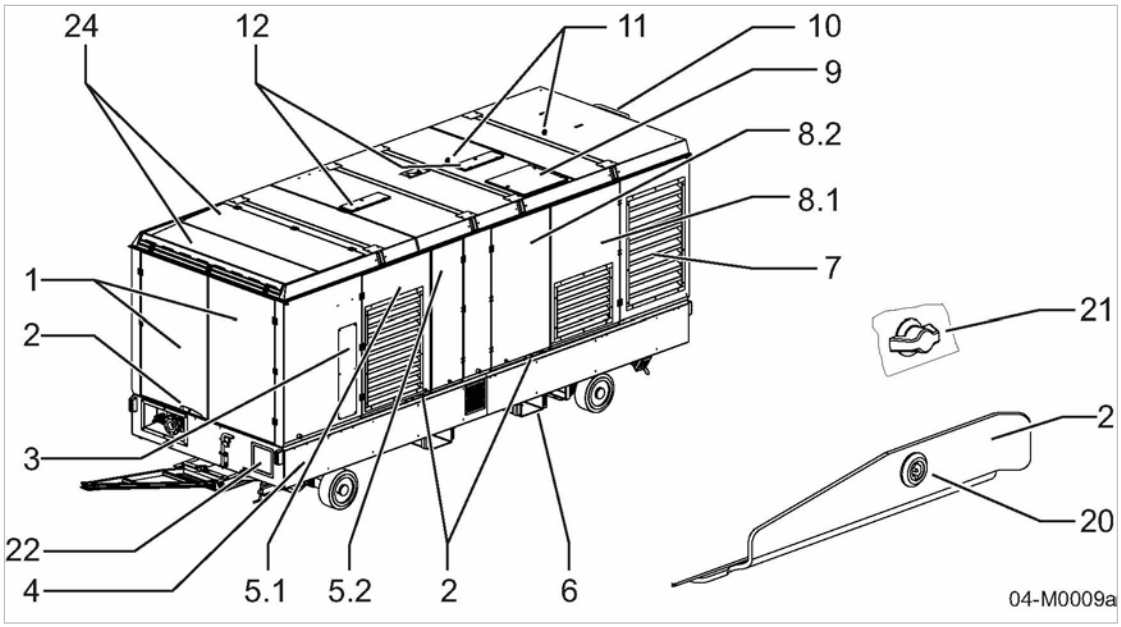


Fig. 5 Bodywork overview, from front to left

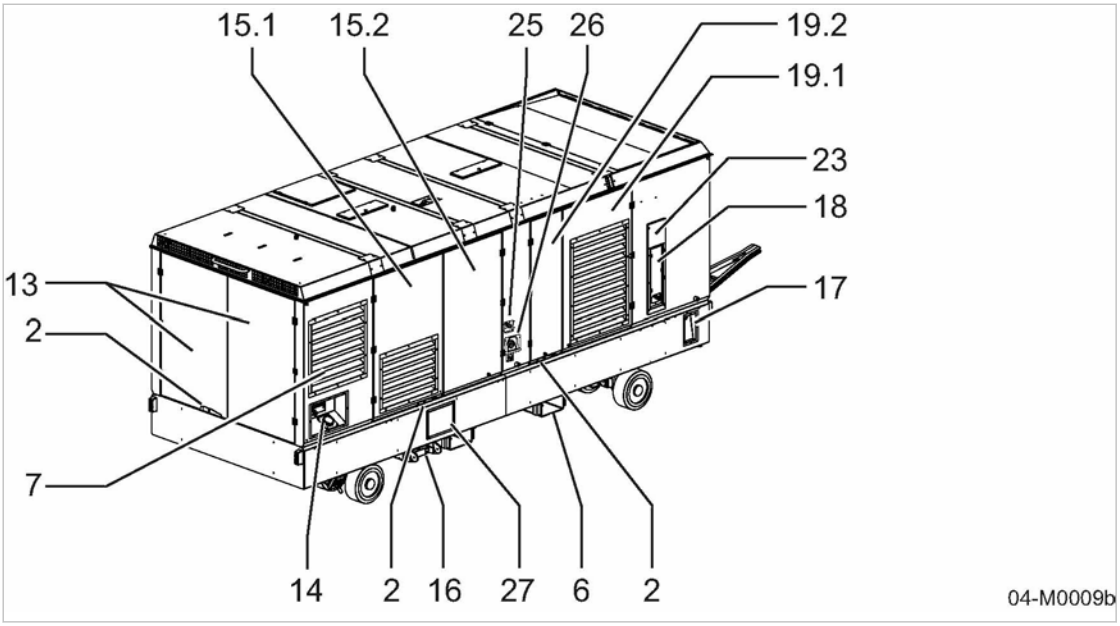


Fig. 6 Bodywork overview, from rear to right

[1] Doors, machine front
[2] Locking lever
[3] Cover plate, cleaning access for cooler
[4] Lower part
[5.1] Side door, front left (with lock), integrated air inlet grille
[5.2] Side door, left (narrow)
[6] Lifting brackets for forklift
[7] Air inlet grille
[8.1] Side door, rear left, integrated air inlet grille
[8.2] Side door, rear left (with lock)
[9] Service cover
[10] Service ladder suspension bracket
[11] Anchoring ring (for attaching personal protective equipment)
[12] Cover for lifting eye
[13] Doors, machine rear
[14] Tank filler neck, internal fuelling / Connection for external filling device
[15.1] Side door, front right (with lock), integrated air inlet grille
[15.2] Side door, rear right
[16] Service ladder
[17] Holder for wall plug
[18] Instrument panel, control cabinet key fixed inside
[19.1] Side door, front right, integrated air inlet grille
[19.2] Side door, front right (narrow with lock)
[20] Lock (sash fastener)
[21] Toggle actuation at the inner door (sash fastener with knob handle)
[22] Cover, hot air connection
[23] Cover plate, cleaning access for cooler
[24] Exhaust air flaps
[25] Connecting an external reduction agent tank
[26] Filler piece for internal reduction agent tank
[27] Cover for reduction agent feed pump

Option rw

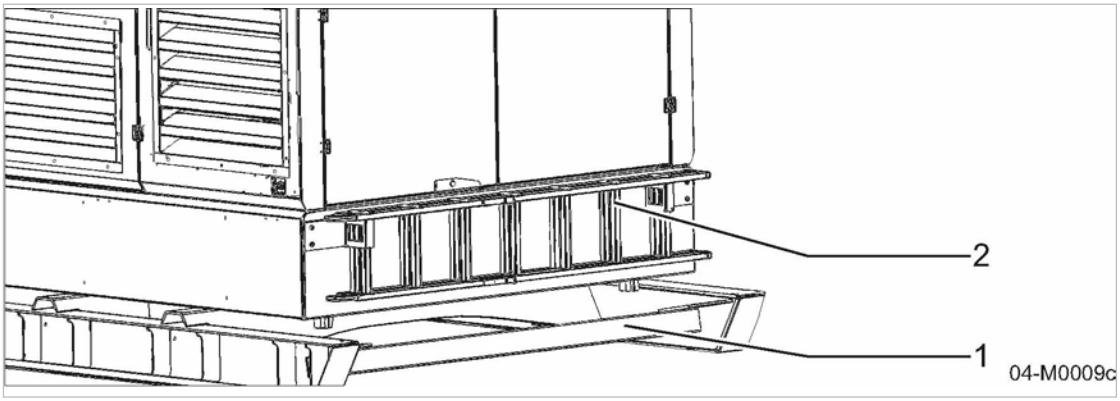


Fig. 7 Stationary machine on skid

[1] Stationary frame on skid
[2] Service ladder
fastened to the rear of the machine

The bodywork has several functions when it is closed:

- Weather protection
- Sound insulation
- Guarding against touching
- Cooling air flow

The bodywork is not suitable for the following uses:

- Walking, standing or sitting, except on the designated surfaces during maintenance work.
- Use as a resting place or storage of any kind of load.



CAUTION
Pinch hazard!
Risk of serious pinch injury to fingers when closing doors and covers.

➢ Work with caution.
➢ Wear protective gloves as necessary.

Safe and reliable operation is only ensured when the bodywork is closed.

The outer doors can be opened by moving a locking lever. To open the locking levers, they must be unlocked with the control cabinet key fixed inside the instrument panel cover.

Additional inner doors are placed behind the side doors (for noise reduction, protection against unintended touching, and for passing the cooling air). These doors are secured with a knob to be unlocked with a knob handle. The inner doors must be locked before closing the outer side doors.

The exhaust air flaps on the machine's roof are automatically opened and closed by the controller. In an emergency, you can manually open the exhaust air flaps using an emergency actuator (see Chapter 8.7).

Service work on the machine roof:

- The service cover and the covers for the crane lifting eyes are accessible from the machine roof which can be reached with the service ladder supplied.

- Two anchoring rings are provided on the roof for attaching the anti-fall protection (protective equipment). Attach the protective equipment to the rings.
- Before opening the covers, unlock the locks with the control cabinet key (attached inside the instrument panel).

4.2 Machine layout

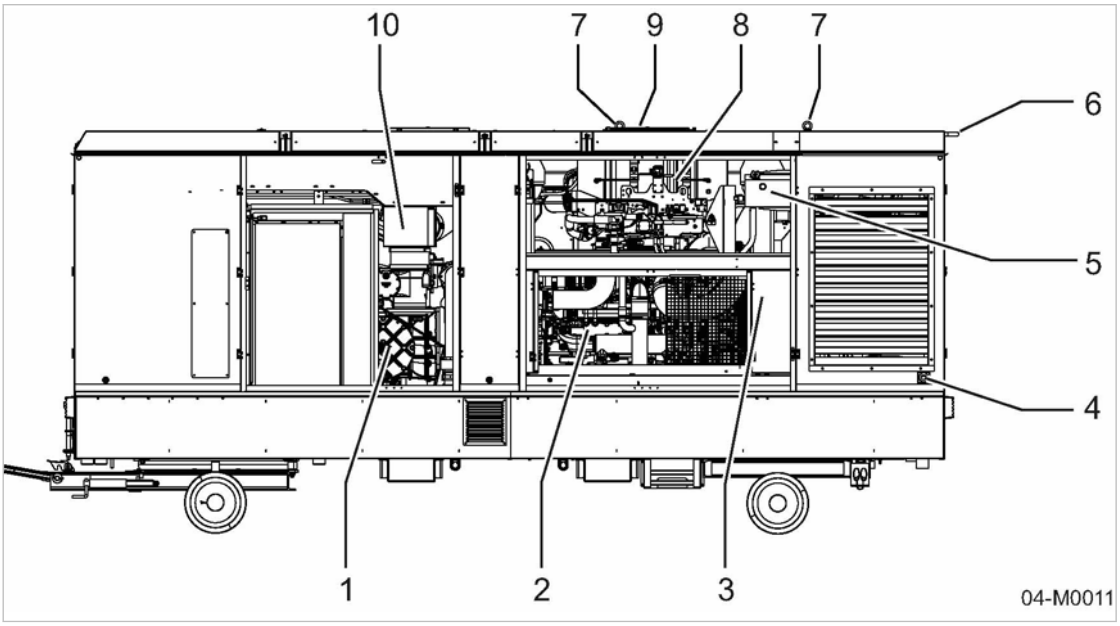


Fig. 8 Left-hand doors opened

1. Pulse damper (1st stage)
2. Engine
3. Coolant cooler
4. «EMERGENCY STOP» push button
5. Coolant expansion tank
6. Service ladder suspension bracket
7. Anchoring ring (for attaching personal protective equipment)
8. Diesel particulate filter
9. Service cover
10. Inlet valve

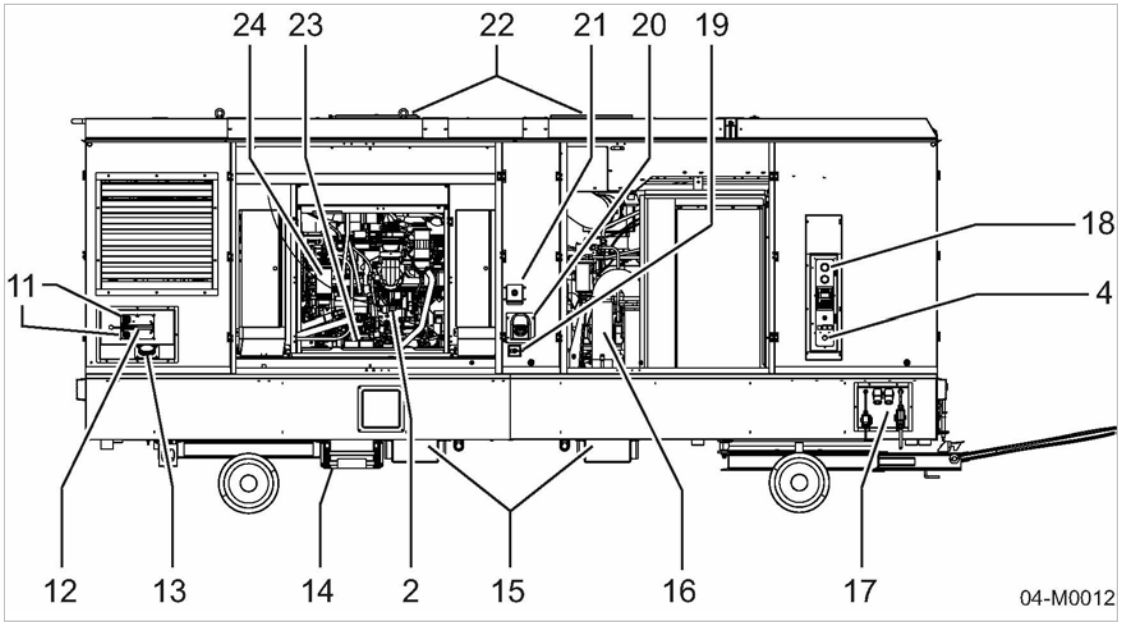


Fig. 9 Right-hand doors, opened

[2] Engine
[4] «EMERGENCY STOP» push button
[11] Connection port, external fuelling
[12] Switch-over between internal and external fuelling
[13] Filler piece, fuel tank
[14] Service ladder
[15] Lifting brackets, forklift
[16] Centrifugal separator (1st stage)
[17] Electrical connections:
- Wall plug
(Power supply for auxiliary electrical systems)
- External contacts
[18] Operating panel
[19] Electrical connection for external reduction agent filling device
[20] Reduction agent filler piece
[21] External reduction agent tank connection
[22] Lifting eye cover
[23] Fuel filter
[24] Fuel prefilter (with integrated water separator)

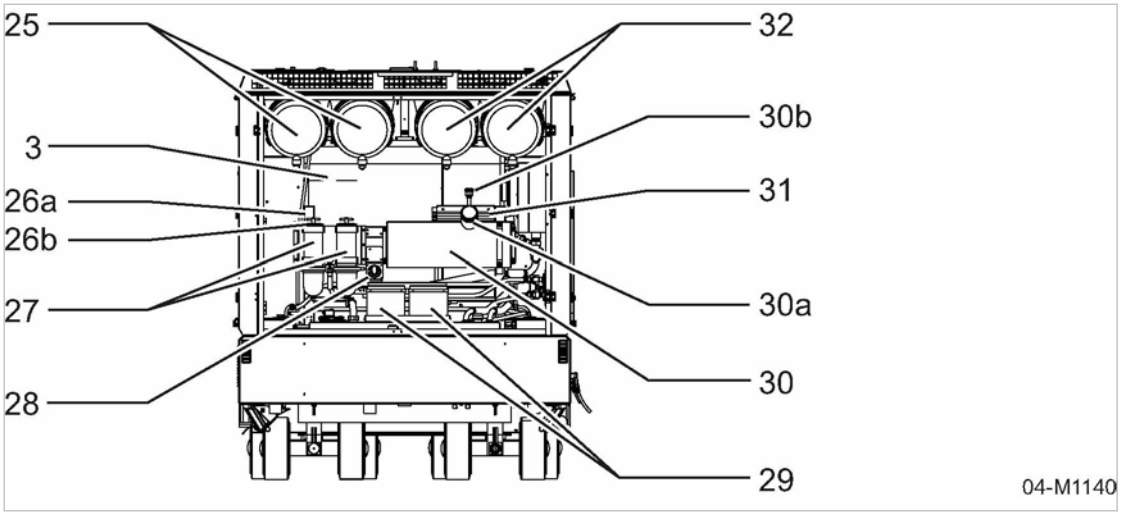


Fig. 10 Doors at rear opened

[3] Coolant cooler
[25] Engine air filter
[26a] Ventilation, fuel tank
[26b] Roll-over valve
[27] Fuel dual filter (fuel pre-filter with integrated water separator)
[28] Battery isolating switch
[29] Batteries
[30] Engine oil, auxiliary tank
[30a] Engine oil filler piece, auxiliary tank
[30b] Venting engine oil, auxiliary tank
[31] Fuel cooler
[32] Compressor air filter

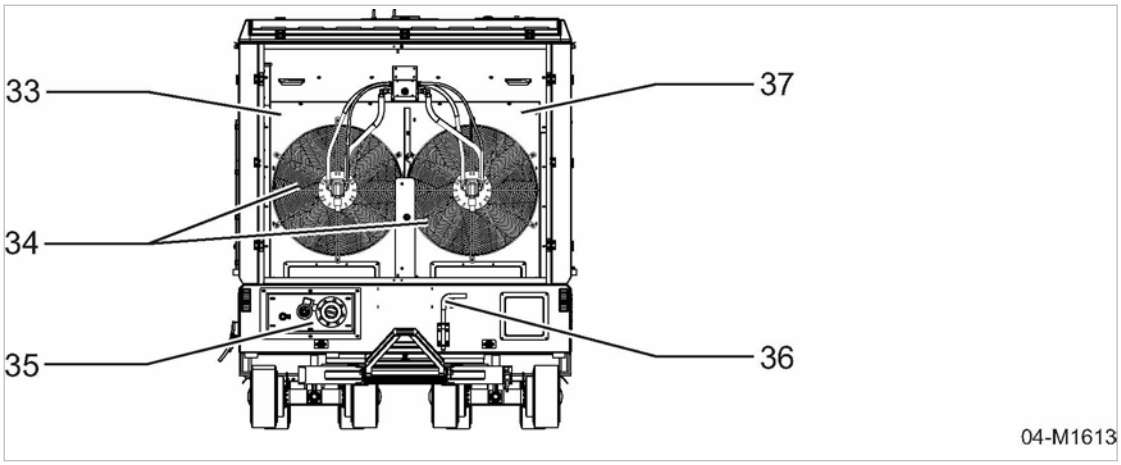


Fig. 11 Doors at front opened

[33] Compressed air intermediate cooler
[34] Fan
[35] Compressed air connections
[36] Transport fitting, drawbar
[37] Compressed air after-cooler

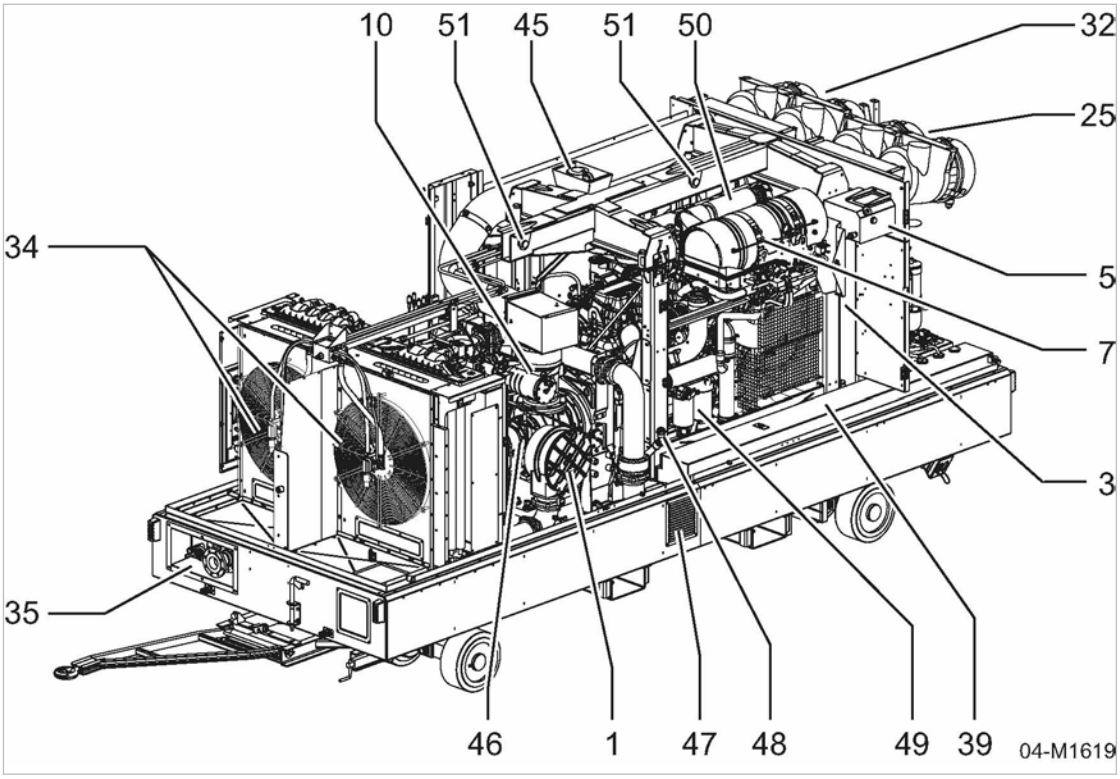


Fig. 12 Machine left side, without panelling

1 Pulse damper (1st stage)
3 Coolant cooler
5 Coolant expansion tank
7 Diesel particulate filter
10 Inlet valve
25 Engine air filter
32 Compressor air filter
34 Fan
35 Air connections
39 Fuel tank
45 Exhaust silencer with spark arrestor
46 Airend (1st stage)
47 Ventilation, coupling space
48 Filler piece, cooling oil (gear)
49 Engine oil filter
50 SCR catalytic converter
51 Lifting points traverse crane suspension (two-stranded)

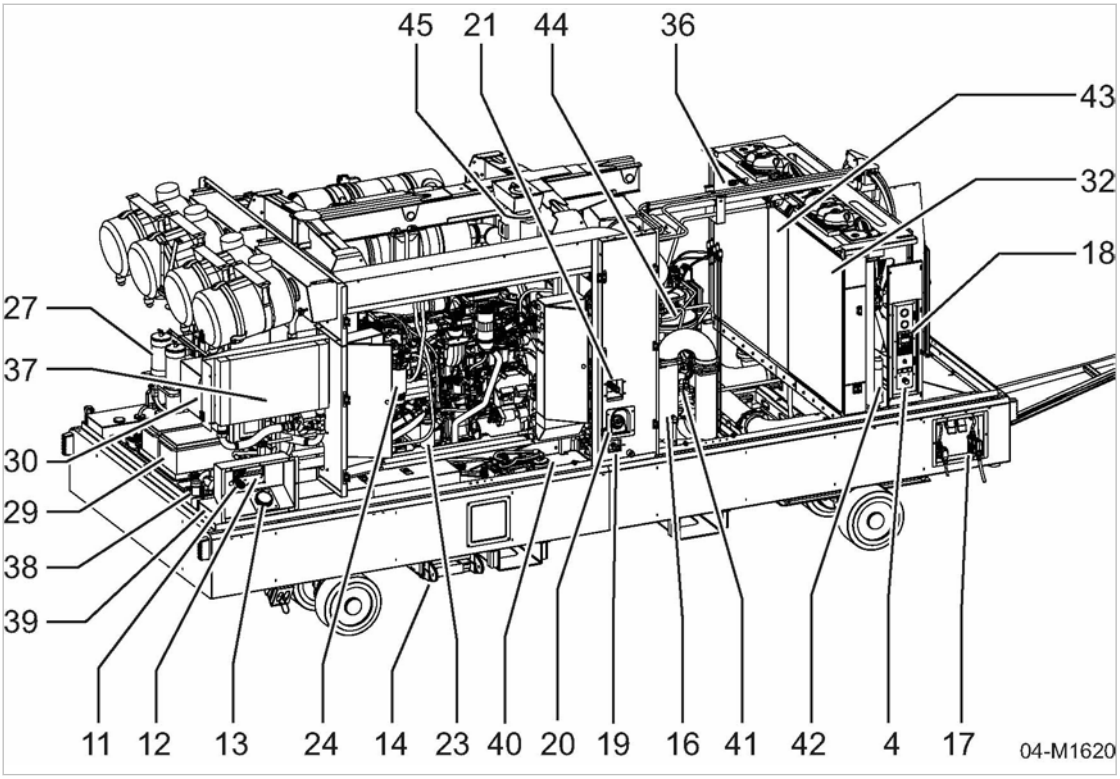


Fig. 13 Machine right side, without panelling

- [4] «EMERGENCY STOP» push button
- [11] Connection port, external fuelling
- [12] Switch-over between internal and external fuelling
- [13] Filler piece, fuel tank
- [14] Service ladder
- [16] Centrifugal separator (1st stage)
- [17] Electrical connections:
  - Wall plug
  (Power supply for auxiliary electrical systems)
  - External contacts
- [18] Operating panel
- [19] Electrical connection for external reduction agent filling device
- [20] Reduction agent filler piece
- [21] External reduction agent tank connection
- [23] Fuel filter
- [24] Fuel prefilter (with integrated water separator)
- [27] Fuel dual filter (fuel pre-filter with integrated water separator)
- [29] Batteries
- [30] Engine oil, auxiliary tank
- [32] Compressed air intermediate cooler
- [36] Compressed air after-cooler
- [37] Hydraulic oil cooler
- [38] Hydraulic oil tank
- [39] Fuel tank
- [40] Reduction agent tank
- [41] Airend (2nd stage)
- [42] Safety valve
- [43] Compressor oil cooler
- [44] Pulse damper (2nd stage)
- [45] Exhaust silencer with spark arrestor

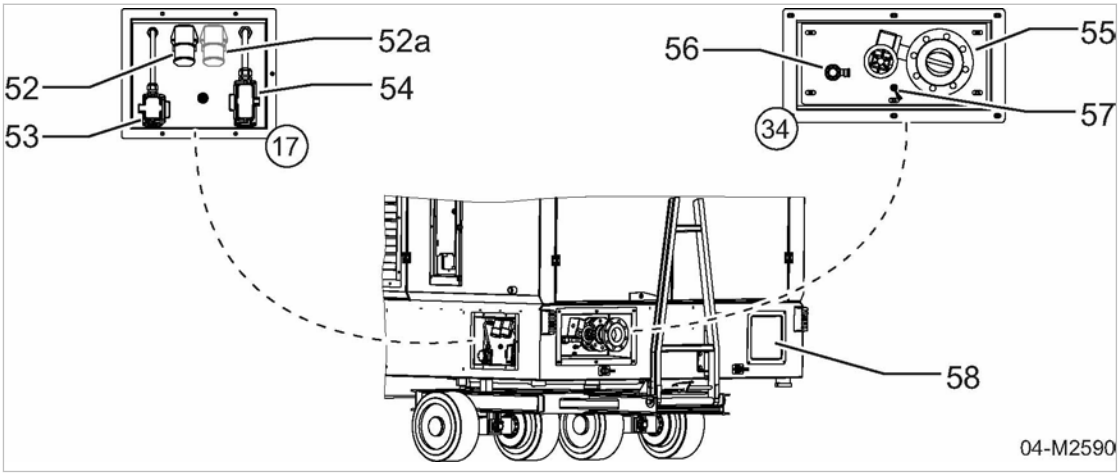


Fig. 14 External connections

17 Details - electrical connections:
52 Connection for wall plug socket (at 230V power supply, 1 x socket)
52a (at 115V power supply, 2 x socket)
53 External contacts for warning messages
54 floating contacts for messages
34 Details - compressed air connections:
55 Compressed air discharge (butterfly valve)
56 Compressed air discharge (discharge valve)
57 Network pressure connection
58 Hot air connection cover

4.3 Machine operation

4.3.1 Overview

Item numbers correspond to the pipe and instrument flow diagram (P&ID) in chapter 13.2.

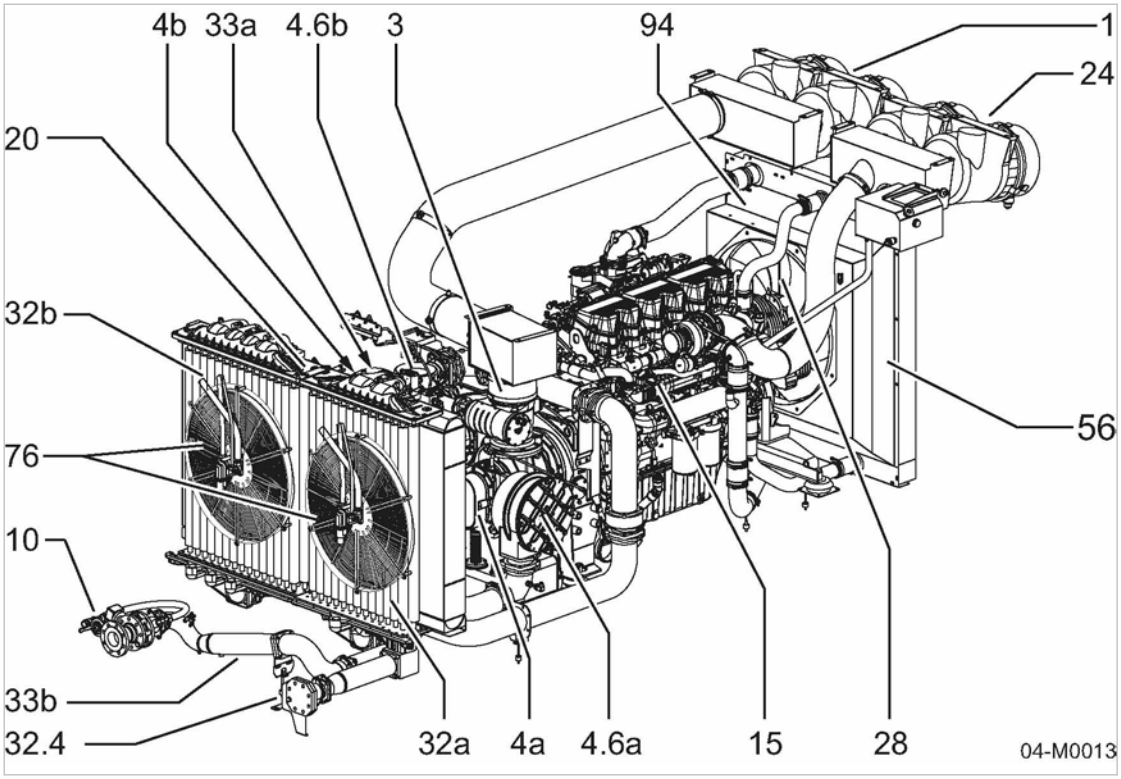


Fig. 15 Machine overview

1	Compressor air filter	28	Fan, engine
3	Inlet valve	32a	Air cooler (1st stage)
4a	Airend (1st stage)	32b	Air cooler (2nd stage)
4b	Airend (2nd stage)	32.4	Hot air connection
4.6a	Snubber (1st stage)	33a	Centrifugal separator (1st stage)
4.6b	Snubber (2nd stage)	33b	Centrifugal separator (2nd stage)
10	Air distributor	56	Coolant cooler (engine)
15	Drive engine	76	Fan, compressor
20	Compressor oil cooler	94	Charge air cooler
24	Engine air filter		

Air system

Ambient air is cleaned as it is drawn in through the filter.

The air is then compressed in the first stage airend, and passed through a pulsation damper into an air cooler. The cooled compressed air is further compressed in the second stage airend and passes through a pulsation damper, and an air cooler into the air network.

The airends are driven over a transmission by a combustion engine.

Condensate separation system:

Two cyclone separators are installed for the condensate accrued in the air cooling:

- After the air cooler of the 1st stage stage
- After the air cooler of the 2nd stage stage

The accrued condensate is separated.

Oil system

A pump transports cooling oil from the gearbox oil pan and passes it through the oil cooler and filter. The cooling oil lubricates the bearings, the main gear, the synchronisation gear, and cools the second stage airend. A minimum oil pressure is required to open the hydraulic inlet valve.

4.3.2 Conceptual sketch of the simplified flow diagram

The simplified flow diagram provides an overview of the

- Compressed air system
- Hydraulic oil circuit
- Compressor oil circuit
- Engine fuel circuit
- Engine cooling circuit
- Temperature monitoring
- Pressure monitoring

Further information This simplified flow diagram is also provided above the machine's operating panel.

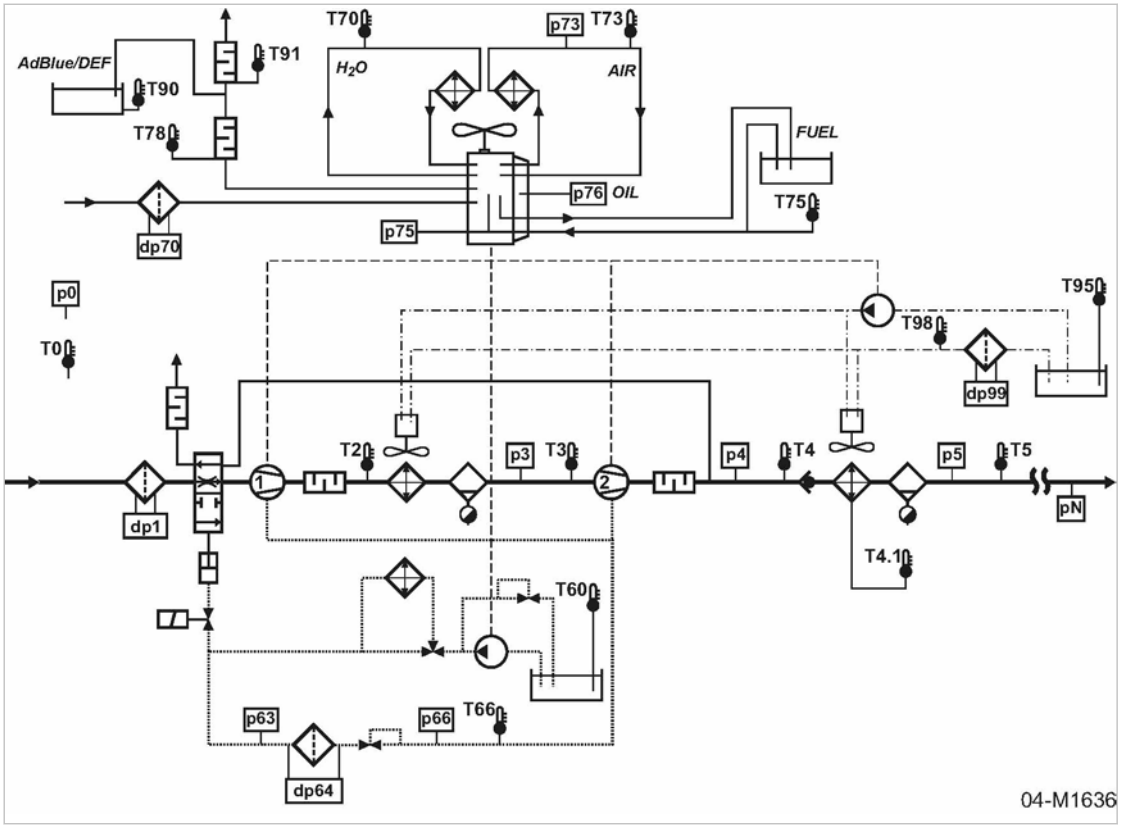


Fig. 16 Schematic diagram (flow diagram)

- 1 Airend [1st stage]
- 2 Airend [2nd stage]
- T0 Ambient temperature
- p0 Ambient air pressure
- dp1 Pressure differential over the compressor air filter
- T2 Discharge temperature of the compressed air downstream of the first stage
- T3 Compressed air temperature after intermediate cooler of stage 1 and before inlet stage 2
- p3 Inlet pressure of compressed air in stage 2
- T4 Discharge temperature of the compressed air downstream of the second stage (ADT)
- p4 Discharge pressure of the compressed air downstream of the second stage
- T4.1 Compressed air temperature at outlet steel precooler and inlet aluminum cooler in stage 2
- T5 Compressed air temperature at machine outlet
- p5 Compressed air pressure at machine outlet
- pN Compressed air network pressure
- T60 Compressor oil temperature in the gearbox oil pan
- p63 Compressor oil pressure, control pressure for inlet valve
- dp64 Pressure differential over the compressor oil filter
- T66 Compressor oil temperature, lubrication
- p66 Compressor oil pressure, lubrication
- T70 Engine coolant discharge temperature
- dp70 Pressure differential over the engine air filter
- T73 Turbo air inlet temperature in the engine
- p73 Turbo air inlet pressure in the engine
- T75 Fuel temperature, engine
- p75 Fuel pressure in the engine
- p76 Engine oil pressure
- T78 Exhaust air temperature in the diesel particulate filter
- T90 Reduction agent temperature in reduction agent tank
- T91 Temperature in SCR catalytic converter
- T95 Hydraulic oil temperature in the hydraulic oil tank
- T98 Hydraulic oil temperature downstream of the engine
- dp99 Pressure differential over hydraulic oil return filter

4.4 Operating modes and control mode

4.4.1 Machine operating modes

The machine operates in the following modes:

- LOAD/PARTIAL LOAD
  - The inlet valve is open. The venting valve coupled to the inlet valve is closed.
  - The engine runs between minimum and maximum speed.
  - The airends deliver compressed air.
- IDLE
  - The inlet valve is closed.
  - The check valve blocks the machine after the 2nd stage compression.
  - The venting valve opens to de-pressurise the machine.
  - The area between the check valve after the 2nd stage compression up to the outlet valves will remain under system pressure even in IDLE.
  - The engine runs at minimum speed.
- READY (Standstill, shut down)
  - The inlet valve closes.
  - The check valve blocks the machine after the 2nd stage compression.
  - The venting valve is open and the machine is de-pressurised.
  - The area between the check valve after the second stage compression up to the outlet valves will remain under system pressure even in READY.
  - The engine stops.

4.4.2 Control modes

A regulating system is integrated in the SIGMA CONTROL MOBIL controller. It regulates the compressed air volumetric flow in dependence to the nominal system pressure by adjusting the speed of the drive engine.

- If the nominal system pressure drops below the set initial pressure, the inlet valve opens and the engine speed is increased.
- If less air is required, the nominal system pressure rises and the engine speed is reduced.
- If no air is required, the nominal system pressure continues to rise, the engine runs in IDLE, and the inlet valve is closed.
- If the nominal system pressure drops again, the inlet valve opens and the engine speed is increased.
- The load and fuel consumption of the engine rises and falls with the air demand.

SIGMA CONTROL can work in the following control modes:

- Standard MODULATING control
- DUAL control

MODULATING control:

Two values are set for the nominal system pressure (operational overpressure) for the machine operation: the cut-in pressure and the cut-out pressure. The machine switches to LOAD as soon as the cut-in pressure is attained, and to IDLE when the upper value (cut-out pressure) is reached.

MODULATING control

- In the MODULATING LOAD control mode, the machine is switched back and forth between LOAD and IDLE to maintain the nominal system pressure between the preset cut-in and cut-out values.
- When cut-out pressure is reached, the machine switches to IDLE.

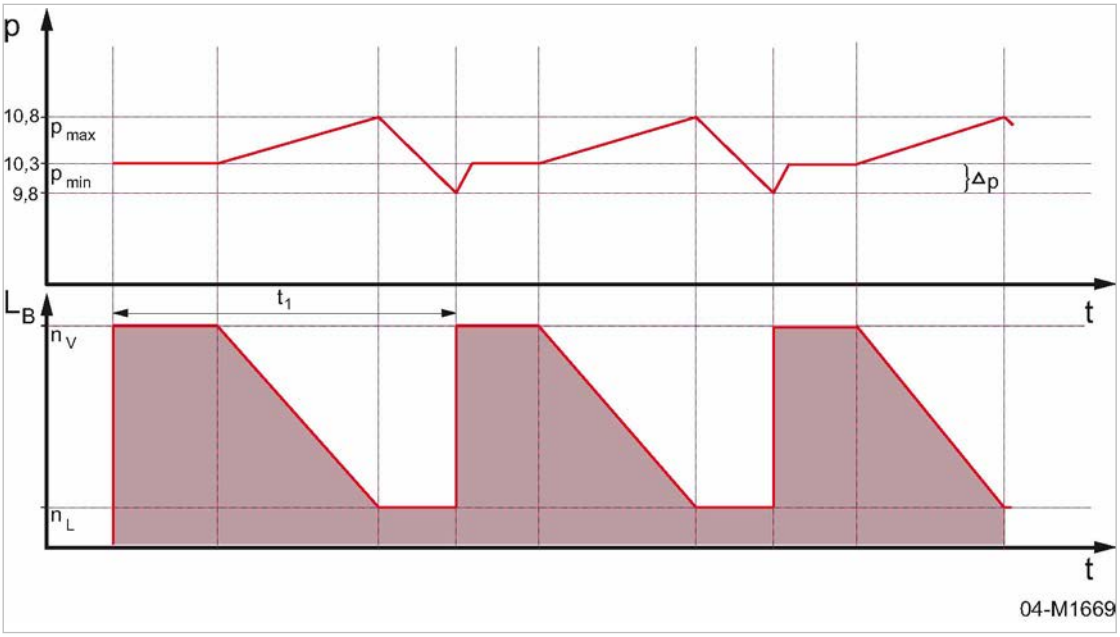


Fig. 17 MODULATING control

- p = Nominal system pressure [bar(g)]
- p_{max} = Maximum pressure (cut-out pressure)
- p_{min} = Minimum pressure (cut-in pressure)
- Δp = Pressure differential
- L_B = Volumetric flow [m^3/min]
- n_v = LOAD speed
- n_L = IDLE speed
- t_1 = CYCLE time [s]

Examples, by way of illustration

- p = 10.3 [bar (g)]
- n_{max}: 1650 min^{-1}; ≙ $L_{B\,max}$: 38.0 m^3/min
- n_{min}: 1250 min^{-1}; ≙ $L_{B\,min}$: 28.8 m^3/min

If the compressed air demand drops < $L_{B\,min}$; ≙ n_L, the machine switches to IDLE mode.

Engine increases speed (machine switches to LOAD) if:

- After IDLE operation for at least ten seconds

At volumetric flow demand (<28 m^3/min), the CYCLE time t_1 may cause the nominal pressure to drop below ($p_{min} - \Delta p$).

The following actions can be taken to avoid this occurrence:

- Larger buffer
- High values for Δp
- Additional air consumption (e.g., via compressed air outlet, outlet valve G1)

DUAL control:

If the intake pressure of the compression stages is in the underpressure range during IDLE operation, you must ensure that the maximum duration of IDLE operation does not exceed **15 minutes**. After this time, you either switch back to LOAD or switch the machine off.

The portion of IDLE operation relative to the overall operating times should not exceed 50% for technical but also economical reasons.

DUAL control

- operates according to the rules of MODULATING control.
- In addition:
  After a preset IDLE time (t_2), the machine switches to READY.

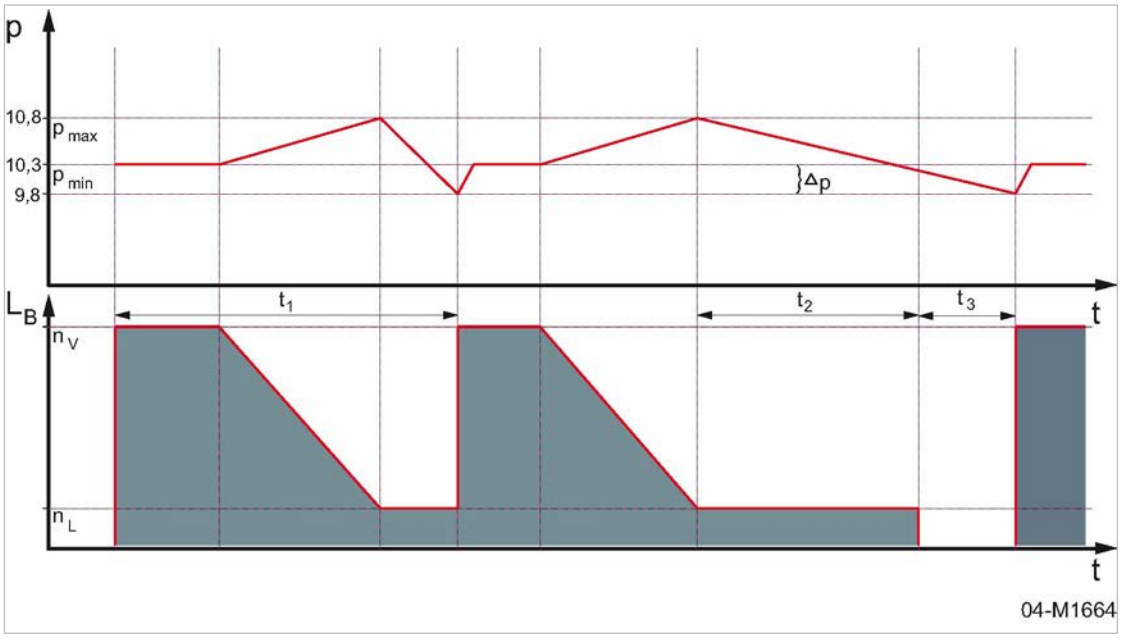


Fig. 18 DUAL control

- t_1 = CYCLE time [s]
- t_2 = RUN-ON time [s] (adjustable **)
  ** RUN-ON time t_2 can be adjusted between 300 and 600 seconds (5 and 10 min).
- t_3 = READY-time [min]

Examples, by way of illustration

- As in MODULATING control
- In addition:
  - Engine switches off after t_2 if $p \geq 9.8$ bar(g)

At volumetric flow demand (<28 m^3/min), the CYCLE time t_1 may cause the nominal pressure to drop below ($p_{min} - \Delta p$).

The following actions can be taken to avoid this occurrence:

- Larger buffer
- High values for Δp
- Additional air consumption (e.g., via compressed air outlet, outlet valve G1)

We recommend to operate the machine in DUAL mode.

Further information For more information on the parameter settings for DUAL control, please see the separate operating manual for SIGMA CONTROL MOBIL.

4.5 Safety devices

4.5.1 Monitoring functions with shut-down

The SIGMA CONTROL MOBIL monitors the important machine parameters. The machine is automatically shut down if an alarm occurs.

The SIGMA CONTROL MOBIL saves the alarm message in the message memory.

Further information Further information on alarm messages at the controller is provided in chapter 9.2.1.

4.5.2 Further safety devices

The following safety devices are provided and may not be modified in any way.

- Safety valves:
  Pressure relief valves in both airends protect the air system against unacceptable pressure rise. They are factory set.
- Housing and covers for moving parts and electrical connections:
  Protect against unintentional contact.
- Temperature sensors:
  Trigger a machine shutdown at excessive temperatures.
- Pressure transducers:
  Monitor the pressure conditions at different locations in the machine.

4.5.3 «EMERGENCY STOP» push button

Two «EMERGENCY-STOP» control devices are installed for an immediate shut-down of the machine in the event of an emergency.

- The engine comes to a stop.
- The engine air shut-off valve is closed.
- The pressure system is vented.

NOTICE
Machine overload!
Sudden machine shut-down can cause faults or damages in the machine.
- ➢ Use the «EMERGENCY STOP» control device only in an **emergency**.
- ➢ Do not use the «EMERGENCY STOP» control device as an OFF switch

4.5.4 Battery isolating switch

The «battery isolating switch »disconnects the battery completely from the machine's electrical system (electronic controller protection, fire protection, battery discharge protection).

NOTICE
Danger of short circuit!
Damage to the machine electrics is possible.
- ➢ Use the «battery isolating switch» only when the machine is switched off.
- ➢ Do not use the «battery isolating switch» as a main or emergency switch.

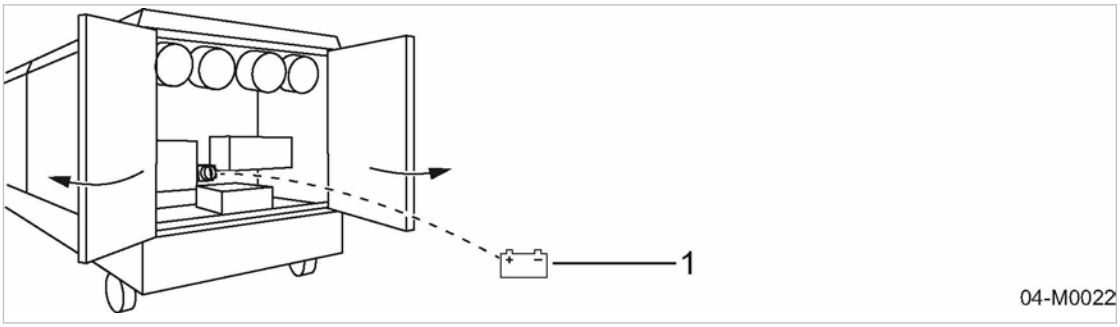


Fig. 19 Battery isolating switch
[1] «Battery isolating switch»

4.6 Operating controls of the SIGMA CONTROL MOBIL controller

The machine can be operated using the integrated SIGMA CONTROL MOBIL controller. It is also possible to remotely start the machine using a separate radio-controlled remote control.

4.6.1 SIGMA CONTROL MOBIL control panel

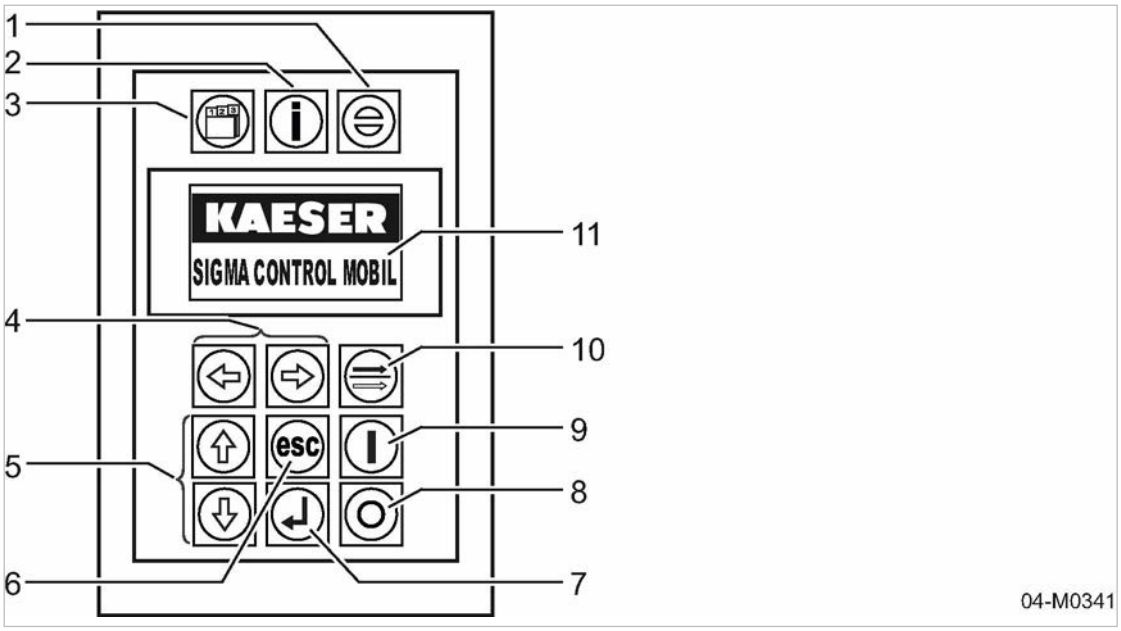


Fig. 20 SIGMA CONTROL MOBIL main display – overview

Item	Symbol	Description	Function	Background LED indicator
1		«Acknowledge» key	Acknowledge key. Confirms active and displayed messages (acknowledging).	Flashes when a message is active and waiting for acknowledgement.
2		«Information» key	Operating indicator: Display event memory.	Flashes if a message is active.
3		«Menu» key	Displays the main menu.	–
4		«Change value» keys: «LEFT» and «RIGHT» keys	To change a parameter value, move cursor left or right.	–
5		«Up» and «Down» keys	Scrolls upwards or downwards through the menu options.	–

«LOAD»* operation key = «LOAD/IDLE»

Item	Symbol	Description	Function	Background LED indicator
6		«ESC» key	Jumps back to next higher menu level. Exits the edit mode without saving.	–
7		«Enter» key	Jump into the selected submenu. Accepts an input.	–
8		«STOP» key	Stops the machine.	Continuous light when a fault has occurred.
9		«START» key	Starts the machine.	Flashes when ready to start. Lights continuously, when the engine is running.
10		«LOAD»* key	Toggles the compressor between LOAD and IDLE operating modes.	Flashes when ready to switch to LOAD. Continuous light when the machine is running under LOAD.
11	–	Indicator field or display	Graphical display.	–

«LOAD»* operation key = «LOAD/IDLE»

Tab. 48 Instrument panel keys and displays

4.6.2 Radio remote control functions for SIGMA CONTROL MOBIL

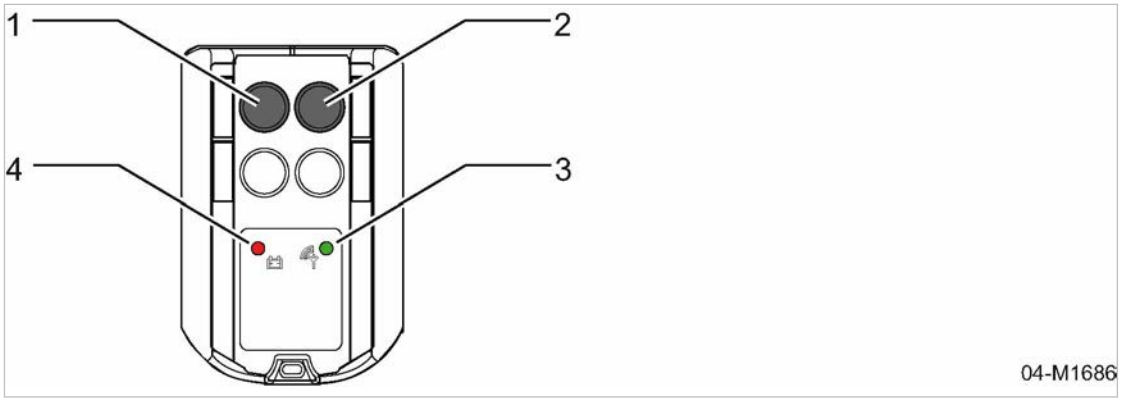


Fig. 21 Overview – operating panel, remote control

Item	Description	Function
1	«START/STOP» key	Starts the machine.
		Stops the machine.

Item	Description	Function
2	«LOAD/IDLE» toggle key	Toggles the compressor between LOAD and IDLE operating modes.
3	Display *Transmitter keypad active*	Upon pressing function keys, the green LED is illuminated and flashes.
4	Display *Battery low*	The red LED flashes quickly when the remote control's batteries are low.

Tab. 49 Remote control keys and displays

Further information For further information regarding the controller's functionality, please see the separate SIGMA CONTROL MOBIL operating manual. Details regarding configuration of the remote control can be found in chapter 13.8, as an excerpt from the manufacturer's operating manual.

4.7 Variable pressure flow rate control (pV control)

The machine is fitted with a variable pressure flow rate control.

The flow rate is flexible in accordance with the preselected pressure setting and adjustment of the engine speed. With it, the machine can be operated from the minimum pressure to the maximum working pressure.

Further information Further information about the variable flow rate control can be found in chapter 2.4.1.

4.8 Exhaust gas after-treatment

The increasingly stringent emission regulations force engine manufacturers to significantly reduce the emission of soot particulates and nitrogen oxides.

The goal is to achieve less polluting fuel combustion, that is, an engine-specific solution.

However, a fundamental dependency must be taken into account:

- High combustion temperatures generate less soot particulate but more nitrogen oxides.
- Low combustion temperatures generate less nitrogen oxides but more soot.

For a proper balance, all parameters affecting combustion must be optimally adjusted to each other. In interaction with injection and turbo-charging in particular, the exhaust gas recirculation allows for combustions with significantly less nitrogen oxides.

Furthermore, all engines are fitted with various after-treatment facilities. The total of these measures therefore contribute to the protection of human health and the environment.

4.8.1 Engine optimisation

The engine series is equipped with a common rail diesel injection system, exhaust gas recirculation and charging pressure control. The engines are set to a maximum of efficiency and low particle emissions.

Electronic engine management:

The engine system is equipped with an electronic engine management that communicates with the SIGMA CONTROL MOBILE system controller.

In addition to monitoring the engine and exhaust gas after-treatment, the engine control module (ECM) also monitors itself. Any faults or malfunctions are stored as fault codes in the alarm memory and forwarded to the SIGMA CONTROL MOBIL controller.

If applicable, operating restrictions are activated.

Common rail injection system:

The engine is fitted with a common rail injection system for mixture preparation. It is a high-pressure accumulator injection system for diesel engines. The common rail injection allows you to optimise the combustion process so that fewer contaminants are generated whilst consuming less fuel. The fuel is injected into the combustion chamber from a highly pressurised joint distributor pipe (common rail). The common rail injection system is controlled by the engine control unit.

Exhaust gas recirculation::

Exhaust gas recirculation is a measure to reduce the emissions of nitrogen oxides. At high combustion temperatures, damaging nitrogen oxides (NO_x) increasingly develop in the engine. To reduce these levels, the combustion temperature must be lowered. The cooled and controlled exhaust gas recirculation circulates a portion of the exhaust gas back to the suction side of the engine where it is added to the inlet air. This reduces the available oxygen volume and thus the combustion temperature. Both measures reduce the development of nitrogen oxides.

Exhaust gas recirculation occurs only in the partial load area of the engine because the engine runs particularly lean in this area. Exhaust gas recirculation is not practical in cold start, warm-up and full load.

Exhaust gas turbo-charging:

The performance of the combustion engine can be enhanced by means of turbo-charging. A turbocharger compresses the air to allow more oxygen to flow into the combustion chamber. As a result, more fuel can be combusted and the engine performance increases accordingly. The turbocharger is driven by exhaust gas which makes turbo-charged engines very efficiently.

4.8.2 Reduction of particle emissions

Diesel particulate filter (DPF):

The diesel particulate filter is used for reducing the particulates present in the diesel engine exhaust (fine solids and mostly soot). Nearly all of these particulates are trapped in the filter and burnt to carbon dioxide at high exhaust gas temperature. A control unit monitors the function of the diesel particulate filter system.

At a low exhaust gas temperature when the particulates do not burn spontaneously, a pressure difference occurs between inlet and outlet of the diesel particulate filter. This initiates a regeneration of the filter.

The diesel particulate filter collects soot and ashes. Soot is removed during regeneration. Regeneration is activated when the filter medium is saturated with soot to a certain degree. Ashes must be removed manually.

4.8.3 Diesel particulate filter regeneration

The removal of soot from the diesel particulate filter is called regeneration. For this task, the "after-treatment regeneration device" is used.

As a rule, the engine control unit automatically starts the regeneration. A manual initiation of the regeneration should occur only in exceptional cases (adverse application conditions).

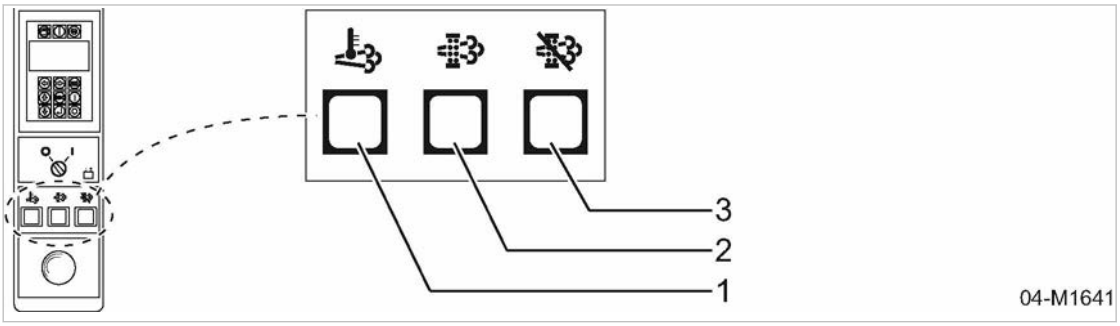


Fig. 22 Operating elements, diesel particulate filter regeneration

Location	Symbol	Description	Function *Operation*	Background lighting
1		Indicating light *High exhaust gas system temperature* Key (no function)	Warning light when regeneration is active	Illuminated during regeneration. Extinguishes with completed regeneration.
2		Indicating light *Diesel particulate filter* key «Forced regeneration»	Manual start, regeneration. ➢ *Press the button for two to three seconds*.	Illuminated when regeneration is required - soot saturation is 80%.
3		Indicating light *Regeneration deactivated* Key «Regeneration OFF»	Deactivation of regeneration. ➢ *Press the button for two to three seconds*.	Illuminated when regeneration is deactivated.

Tab. 50 Keys and indicating lights, diesel particulate filter regeneration

Soot saturation monitoring:

The diesel particulate filter is fitted with soot saturation monitoring. It indicates the saturation level of the filter medium with soot. Using the soot saturation monitoring, you can optimise the regeneration of the diesel particulate filter with the engine's duty cycle. If the application conditions do not permit an automatic regeneration, you should execute a manual regeneration before the soot saturation display has reached 100 %.

"Automatic" regeneration modes:

The engine control unit (Engine Control Unit) uses several electric input signals from the engine to determine the optimum time for an automatic regeneration. Automatic regeneration is possible during the entire duty cycle of the engine. It can be initiated, whether the engine runs in IDLE or operating speed. The indicating light *High exhaust gas system temperature* illuminates when a regeneration is run.

If regeneration starts in IDLE speed, the engine may switch to normal operation at any time. Regeneration may stop when returning to normal operation. The engine control unit continues to monitor input signals to determine the ideal time for restarting the regeneration.

Interruptions of the regeneration process are permitted. Press «Regeneration OFF» or switch off the engine when a regeneration process has been interrupted.

The system may automatically adjust the speed during automatic regeneration. If IDLE speed is set during a regeneration process, the engine may still continue in a higher speed to continue the regeneration process.

Automatic regeneration is not possible when the regeneration system is deactivated!

"Manual" regeneration modes:

Manual regeneration is initiated by actuating the «Force regeneration» key (see figure 22).

Manual regeneration may be executed in IDLE or normal operating speed of the engine. The soot saturation must be between 15 and 120% for a manual regeneration in IDLE mode to be performed. The soot saturation must be between 65 and 100% for a manual regeneration in normal operating speed to be performed

A *"Low Speed Regeneration* (LSR) started in IDLE mode cannot be continued in LOAD mode. Automatic switching to *"High Speed Regeneration"* (HSR) is not possible. This means that the machine cancels the regeneration process as soon as the machine is switched from IDLE mode to LOAD mode.

Regeneration (HSR) started in LOAD mode is switched to LSR once the machine is switched to IDLE mode.

Required conditions for "forced regeneration":

Conditions:

- Coolant medium temperature ≥ 40 °C
- Saturation of the diesel particulate filter ≥ 15%
- Machine must have been running for at least 3 minutes

We recommend to perform a "forced regeneration" in IDLE mode.

Further information See chapter 8.8 for information on the process of manually initiated "forced regeneration".

4.8.4 Reduction of nitrogen oxide emissions

In order to comply with the TIER 4 FINAL emissions level, the engine is additionally equipped with an SCR system for the reduction of nitrogen oxide (NOx).

Principle:

The nitrogen oxide emissions that are emitted by the engine are reduced by the SCR system. A reduction agent (AdBlue®) that is injected into the exhaust system in a controlled manner, releases ammonia in the exhaust system and reacts in the SCR catalytic converter with the nitrogen oxides (NOx) that are contained in the exhaust gas. During this process, they are converted to nitrogen and water. The injection quantity of the reduction agent is controlled by means of the machine electronics.

- The engine is optimised in such a manner that very few soot particles are generated but a purposely large quantity of nitrogen oxides.
- The reduction agent is then injected into the exhaust flow.
- Due to the high exhaust temperature, the reduction agent is converted into ammonia and carbon dioxide.
- Thanks to the ammonia, the nitrogen oxides on the catalytic converter's surface react to nitrogen and water which are natural components of our atmosphere.

SCR system:

A heater is located in the reduction agent tank which melts sufficient liquid any time when there is severe frost (AdBlue® freezes at −11,5 °C), in order to quickly activate the system. Heatable pipes lead the AdBlue® from the tank to a dosing module controlled by the engine control unit. This module ensures that the correct quantity of reduction agent required for the speed and engine load is always injected. The exhaust gas system behind the dosing module is designed in a manner that AdBlue®, or the released ammonia is optimally distributed via the actual catalytic converter. Sensors in front and behind the SCR catalytic converter measure, for example, the nitrogen oxide concentration and temperature and send signals to the engine control unit. This process ensures even more precise dosing and monitors the correct functioning of the SCR system at the same time.

Reduction agent:

As operating fluid the synthetically produced watery urea solution AUS 32 is used as reduction agent. Alternatively, the reduction agent is also known by the trade name AdBlue®, which is also known as "Urea" or, in North America, as "DEF" (Diesel Exhaust Fluid).

AdBlue® consists of 32.5% of urea and 67.5% of pure water. In this mixture ratio, the urea concentration always remains steady. The high purity and quality is guaranteed by the standard EN 70070/ISO 22241. AdBlue® is neither a hazardous material as defined by the Chemicals Control Act nor a hazardous good as defined by the Dangerous Goods Regulation. It must not be mixed with any additives or diluted with water, or contaminated with other substances.

AdBlue® – a non-toxic and odour-free urea solution – is easily filled at the petrol pump and carried in a separate container.

Further information

Instructions regarding the safe handling of the AdBlue® reduction agent are provided in chapter 3.5.2.

Monitoring the addition of the reduction agent:

Well-functioning exhaust air after-treatment is necessary in order to meet the stricter emission limits. For this reason, the SRC system is monitored by various sensors, including the filling level of the reduction agent tank.

Once the filling level in this tank reaches a certain minimum level, the engine control switches the engine to "torque reduction". The SIGMA CONTROL MOBIL controller displays the warning message "Torque reduction active" (message code 3182).

In "torque reduction" mode, the engine reduces its output to force the operator to replenish the reduction agent and/or to have the exhaust system inspected.

This means that the engine runs in IDLE speed and no longer generates compressed air. The machine is no longer operational.

The engine will operate with normal speeds only after the reduction agent has been replenished.

4.9 Auxiliary electrical systems

The following auxiliary electrical equipment is provided in the machine:

- Battery charger for automatic start/stop
- Low temperature equipment:
  - Coolant heater for diesel engine
  - Heater oil circuit, compressors
  - Tank heater, hydraulic oil
  - Heater, condensate separation
  - Heater, fuel prefilter

The auxiliary electrical equipment is pre-wired for operation. A separate mains connection provides power, except for the condensate separator which is fed by the machine's starter batteries.

A flexible power cable (supplied) connects the machine's power plug to the user's power socket.

(For 115 V supply: 2 power sockets and 2 power cables)

Battery charger for automatic start/stop:

The automatic start/stop option can be set in the SIGMA CONTROL MOBIL controller for automatic machine start. The engine's starting batteries must be sufficiently charged at any time, in order for the engine to be started even after longer standstill times. Use a battery charger.

Low temperature equipment:

The machine is fitted with low-temperature equipment for the operation in low temperatures ($\leq$ 5 °C).

Coolant heater for diesel engine

The engine's coolant should be pre-heated in order to protect the engine at low temperatures. A coolant heater is installed.

Heater oil circuit, compressors

Heat the oil circuit of the compressors before starting the machine at low temperatures. A heater is installed for this purpose.

Tank heater, hydraulic oil

Heat the hydraulic oil in order to ensure an improved flow of the hydraulic oil at low temperatures. A heater is installed in the tank for the hydraulic oil.

Heater, condensate separation

The cyclone separators are equipped with heating elements in order for the condensate accumulated in the air cooling to drain at low temperatures, and to prevent freezing of the water drainage.

Heater, fuel prefilter

The fuel should be warmed up, in order to ensure improved flow behaviour of the diesel fuel in low temperatures. For this purpose, a heater is installed for the fuel pre-filter.

4.10 Operation in fire hazard zones

Diesel engines represent a potential source of ignition in environments with concentrations of gas, vapour or dust, and may cause major fires with disastrous consequences for people, the environment and production.

The machine is designed for the operation in fire hazard zones.

The following relevant components are installed as standard:

- Engine air shut-off valve
- Spark arrestor

Engine air shut-off valve:

If flammable gases and vapours are drawn by the diesel engine from the environment into the air intake, they will act like additional fuel. This causes a sudden and uncontrolled increase in engine speed that can result in serious mechanical damage. Without appropriate preventive measures, the engine and the engine-driven devices can be destroyed. Explosion or fire are also possible.

When flammable gas is drawn into the engine, shutting off the fuel supply will no longer stop the engine. In order to shut down the engine quickly and reliably in these events, the intake of the combustion air must be interrupted.

If a certain engine speed is exceeded, the engine air throttle valve will close automatically. The feed of intake air is interrupted and causes the engine to immediately stand still.

Subsequent to the automatic shut-down of the engine by the engine air throttle valve, it must be unlocked manually. Otherwise, the engine will no longer receive combustion air, and you are unable to start the machine.
→ See Chapter 8.4 for more information regarding the unlocking of the engine air throttle valve.

Spark arrestor

Sparks in exhaust fumes represent a considerable risk in environments with flammable materials. Flying sparks combined with flammable materials may cause fires and explosions.

A spark arrestor on the exhaust silencer is required when operating a diesel engine in a fire hazard area and in forestry and agricultural applications. In such applications, a spark may ignite flammable materials.

The spark arrestor prevents the exhaust silencer emitting any glowing fuel residue.

4.11 Sealed floor pan

The machine is fitted with a closed floor pan catching liquids in the event of leaks. Thus, direct contamination of the floor is prevented.

The closed floor pan:

- Cannot catch all liquids contained in the machine, but is intended only to capture small leaks in the vicinity of endangered components.
- Is equipped with service openings which are closed with bungs. These openings must be tightly re-closed after performing any cleaning work.

When other components are removed from the sealed floor pan, they must be properly re-sealed prior to installation.

Position of service openings in the closed floor pan:

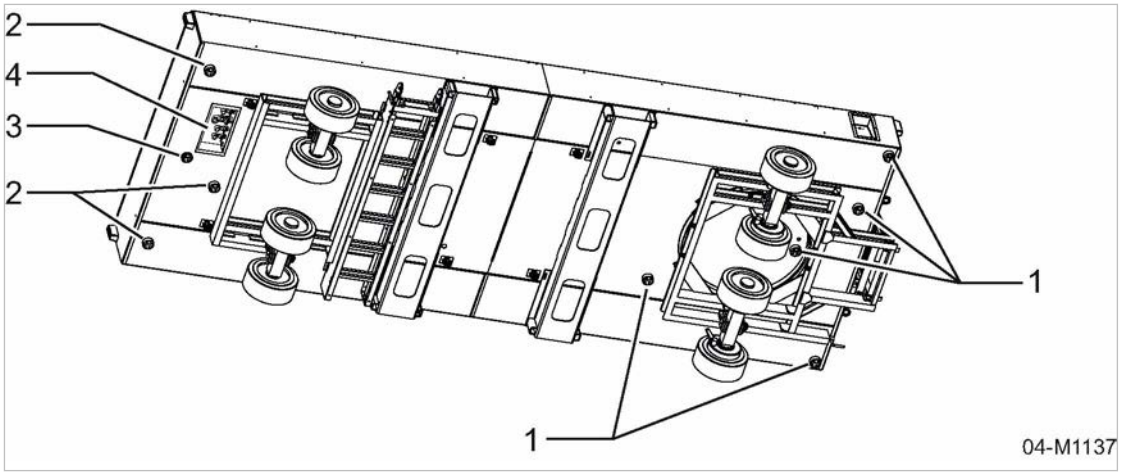


Fig. 23 Position of service openings in the closed floor pan

[1] Cleaning opening*
[2] Drain opening, fuel tank*
[3] Drain opening, hydraulic tank*
[4] Central drain point for oil/coolant
[*] Closed with bung

The drain points for compressor cooling oil and engine coolant are led to a central point outside.

Position of drains for oil and coolant from engine and compressor:

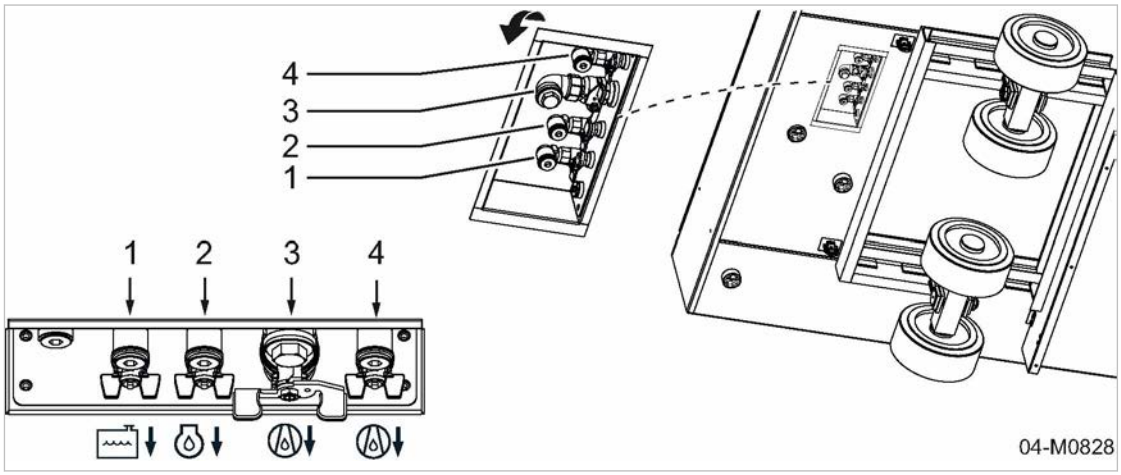


Fig. 24 Drain points for oil and coolant from engine and compressor

[1] Coolant drain - coolant cooler - engine
[2] Engine oil drain device
[3] Cooling oil drain, compressor gear housing
[4] Coolant drain - oil cooler - compressor

4.12 Connection to external fuel supply

The machine is prepared for the connection to an external fuel tank. Hydraulic couplings (rapid action couplings) are used for the connection to an external refueling system.

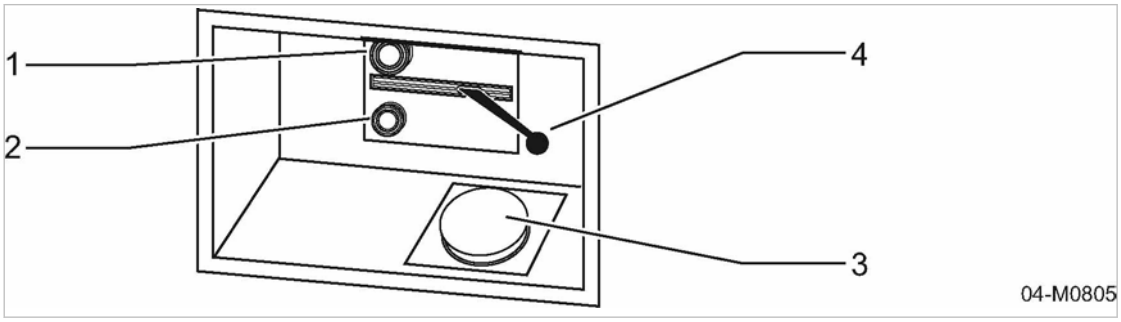


Fig. 25 Connection to external fuel supply

[1] Rapid action coupling, connection to fuel inlet
[2] Rapid action coupling, connection to fuel return line
[3] Fuel filler plug, internal fuel tanks
[4] Selection lever, fuel supply

Further information See chapter 2.8 for more information about the connecting devices to an external fuel supply.

It is recommended to connect an external fuel pump with the following characteristics:

Pump capacity [l/h]	480
Pump pressure P_{max} [bar]	1

Tab. 51 Characteristics – external fuel pump

4.13 Connecting to an external reduction agent supply

The machine is prepared with a connection to an external reduction agent supply. The external reduction agent tank is connected directly by means of the internal reduction agent tank filler piece via an adapter.

An operating fluid with the trade name AdBlue® is used as reduction agent.

The machine is prepared for the connection to an external reduction agent tank. The SIGMA CONTROL MOBIL controller actuates an external pump for filling the internal reduction agent tank.

➢ When using the AdBlue® reduction agent, comply with the safety instructions shown in chapter 3.5.2 “Safe handling of AdBlue® reduction gent”.

Connecting the external reduction agent tank:



Fig. 26 Connecting the external reduction agent tank

1 Filler piece tank cap, internal reduction agent tank
2 Connecting an external reduction agent tank
3 Plug for the external pump connection

Only containers, hoses, fittings and pumps made from the following materials are approved for the storage and connection to an external reduction agent system AdBlue®):

- CrNi steels to DIN EN 10 088–1/2/3
- MoCrNi steels to DIN EN 10 088–1/2/3
- Polypropylene
- Polyethylene

Not approved are:

- Aluminium
- Copper
- Cupriferous alloys
- Unalloyed steels
- Galvanised steel

Contact with such materials may cause the separation of these metals' components resulting in the destruction of the exhaust treatment components.

4.14 GPS unit

The machine is equipped with a GPS unit. This is equipped with a SIM card and provides fleet management capability for the customer.

4.15 Remote Starting

The machine can be started remotely.

You can activate and deactivate the machine with the supplied radio-controlled remote control

4.16 Automatic start/stop

Automatic engine start/stop

For automatic machine start-up, an automatic start/stop system can be set via the SIGMA CONTROL MOBIL controller.

Trickle charging of starter batteries

The engine's starter batteries must be sufficiently charged at all times, in order for the engine to be started even after prolonged periods of downtime. To ensure that this is the case, use a battery charger. This battery charger should be connected to the user's electrical system.

External connections for connection to master control systems

The machine is equipped with two external connections (sockets) for customer connection of the SIGMA CONTROL MOBIL controller. These are used to connect the controller to the master control system.

Connection X51:

- Remote On/Off contact:
  - Switch-on contact to be provided by the customer

Connection X50:

- Release contact to be provided by the customer
- Message contacts:
  - Group alarm
  - Group warning
  - Group maintenance
  - Fuel level
  - Message *Engine running*
  - Message *LOAD operation*

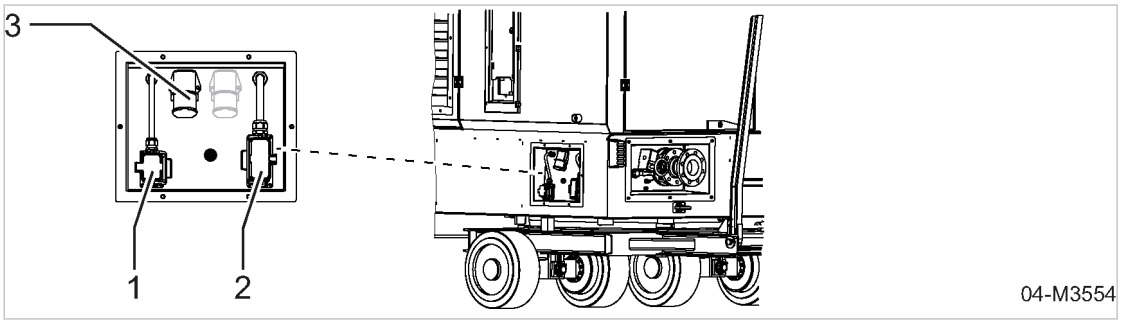


Fig. 27 Automatic start/stop - external connections

1 Socket 1 (X51)
2 Socket 2 (X50)
3 Device connection for electrical auxiliary equipment, such as battery charger for automatic start/stop

The connection plugs for the two sockets are included with the machine. They must be connected to the connection cable of the customer's control technology equipment by a qualified electrician.

5 Installation and Operating Conditions

5.1 Ensuring safety

The conditions in which the machine is installed and operated have a decisive effect on safety.

Warning instructions are located before a potentially dangerous task.



Disregard of warning instructions can cause serious injuries!

Complying with safety notes

Disregard of safety notes can cause unforeseeable dangers!

- ➢ Strictly forbid fire, open flame and smoking.
- ➢ If welding is carried out on or near the machine, take adequate measures to prevent sparks or heat from igniting fuel or oil vapours or parts of the machine.
- ➢ Do not store inflammable material in the vicinity of the machine.
- ➢ The machine is not explosion-proof!
  Do not operate in areas in which specific requirements with regard to explosion protection are applied.
  For instance, the requirements of ATEX directive 94/9/EC "Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres".
- ➢ Suitable fire extinguishing material must be to hand.
- ➢ Ensure that required ambient conditions are maintained.

Required ambient conditions may be:

- Ambient temperature
- Air composition at the installation site:
  - clean with no damaging contaminants (e.g., dust, fibres, fine sand)
  - free of explosive or chemically unstable gases or vapours
  - free of acid/alkaline forming substances, particularly ammonia, chlorine or hydrogen sulfide.

5.2 Installation conditions

Precondition The floor must be level, firm and capable of bearing the weight of the machine.

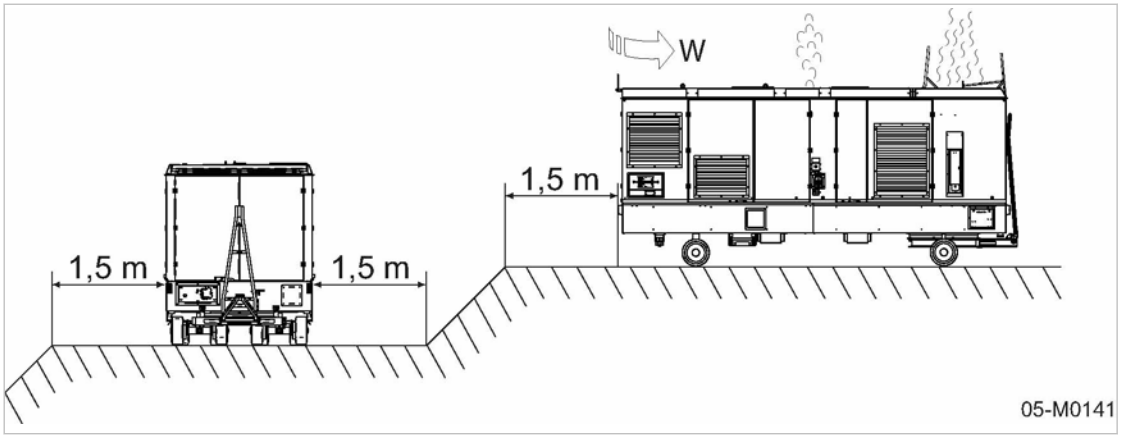


Fig. 28 Minimum distance from excavations/slopes and walls
Ⓦ Wind direction

1. Keep sufficient distance (at least 1.5 m) from the edges of excavations and slopes.
2. Ensure that the machine is as level as possible.

The machine can be temporarily operated on a slope of not more than 5°.

3. Ensure accessibility so that all work on the machine can be carried out without danger or hindrance. The operator panel with the «EMERGENCY STOP button» must be accessible and within reach at any time.

4. *NOTICE!*
Fire hazard from build-up of heat and hot exhaust system!
Insufficient clearance above the machine may well cause heat build-up that could damage the machine.
   - ➢ Do not position the machine directly under a low roof or covering.
   - ➢ Ensure always sufficient ventilation space around the machine.
5. Ensure there is enough free space all round and above the machine.
6. Keep air inlet and outlet openings free of obstructions so that the cooling air can flow freely through the machine.
7. Install the machine ensuring that
   - exhaust gases and heated exhaust air can escape freely.
   - Do not allow exhaust gases and heated cooling air to be drawn into the compressor. Note the wind direction! (see figure 28)
   - Ensure the unimpeded intake of fresh air (air intake, cooling air).
8. *NOTICE!*
Ambient temperature too low!
Frozen condensate and highly viscous engine oil, hydraulic oil, or compressor cooling oil can cause damage when starting the machine.
   - ➢ Use winter grade engine oil.
   - ➢ Use winter diesel fuel.
   - ➢ Use low viscosity compressor cooling oil.
   - ➢ Activate the low-temperature equipment (heaters for oils, coolant, and condensate drain).
9. At ambient temperatures below 0 °C, follow the instructions in chapter 7.5.

6 Installation

6.1 Ensuring safety

Follow the instructions below for safe installation.

Warning instructions are located before a potentially dangerous task.



Disregard of warning instructions can cause serious injuries!

Complying with safety notes

Disregard of safety notes can cause unforeseeable dangers!

- ➢ Follow the instructions in chapter 3 'Safety and Responsibility'.
- ➢ Installation work may only be carried out by authorised personnel.
- ➢ Do not reuse removed self-locking nuts but replace with new ones. The non-positive safety against loosening is no longer ensured when the nut is unscrewed.

Further information Details of authorised personnel are found in chapter 3.4.2.

Details of dangers and their avoidance are found in chapter 3.5.

6.2 Reporting Transport Damage

1. Check the machine for visible and hidden transport damage.
2. Inform the carrier and the manufacturer in writing of any damage found.

6.3 Automatic engine start/stop - External connection

The machine must be connected to the customer's control system in order to be able to operate the machine’s controller with "automatic start/stop”.

Precondition The controller is switched off

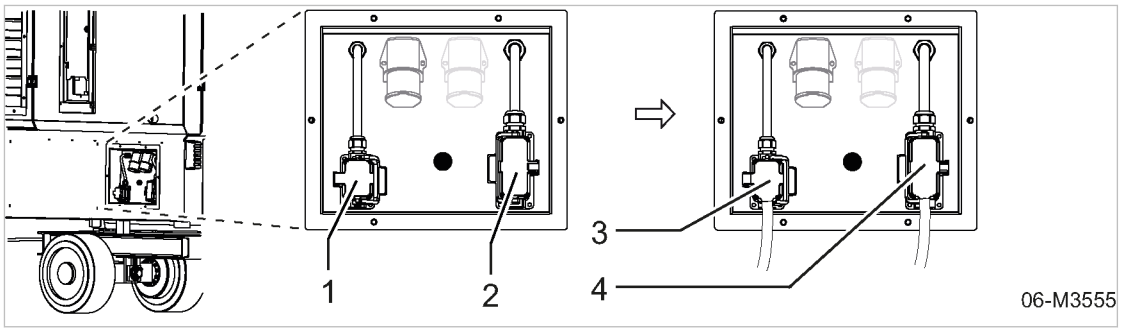


Fig. 29 Externally connect “automatic start/stop”

[1] Socket 1 (Cover closed)
[2] Socket 2 (Cover closed)
[3] «Remote On/Off» plug connected
[4] «Messages» plug connected

1. Establish plug connection [X51]:
   - ➢ Open the cover of the socket 1.
   - ➢ Plug in the corresponding connector of the connection cable.
   - ➢ Secure plug connection with locking clip.
   - Remote On/Off contact is connected.
2. Establish plug connection [X50]:
   - ➢ Open the cover of the socket 2.
   - ➢ Plug in the corresponding connector of the connection cable.
   - ➢ Secure plug connection with locking clip.
   - Release and message contacts are connected.

Result The machine’s SIGMA CONTROL MOBIL controller is connected to the customer's control system and is ready to start in automatic mode.

7 Initial Start-up

7.1 Ensuring safety

Here you will find instructions for a safe commissioning of the machine.
Warning instructions are located before a potentially dangerous task.



Disregard of warning instructions can cause serious injuries!

Complying with safety notes

Disregard of safety notes can cause unforeseeable dangers!

- ➢ Follow the instructions in chapter 3 'Safety and Responsibility'.
- ➢ Commissioning tasks may only be carried out by authorised personnel!
- ➢ Make sure that no one is working on the machine.
- ➢ Ensure that all service doors and panels are locked.

Further information

Details of authorised personnel are found in chapter 3.4.2.
Details of dangers and their avoidance are found in chapter 3.5.

7.2 Before Initial Start-up (or Recommissioning)

Incorrect or improper commissioning can cause injury to persons and damage to the machine.

7.2.1 Note when commissioning



The initial start-up of every machine takes place at the factory. Every machine is also given a trial run and passes a careful check.

- ➢ Commissioning may only be carried out by authorised installation and service personnel who have been trained on this machine.
- ➢ Remove all packing materials on and in the machine.
- ➢ Observe the machine during the first few hours of operation to ensure that it is operating correctly.

7.2.2 Special measures for re-commissioning after storage or de-commissioning

➢ Carry out the following before every start-up after long period of storage or de-commissioning:

Storage/de-commissioning period longer than:	Remedy
5 months	➢ Remove the desiccant from the openings in the air intake filters of the engine and compressor. ➢ Check the air and oil filters. ➢ Fill with cooling oil (gear). ➢ Drain the preserving oil from the engine (KAESER SERVICE). ➢ Fill with engine oil (KAESER SERVICE). ➢ Check the engine coolant level. ➢ Check the battery charge. ➢ Reconnect the batteries. ➢ Check all fuel lines, engine oil lines and compressor cooling oil lines for leaks, loose connections, wear and damage. ➢ Clean the bodywork with a grease and dirt dissolving agent.
12 months	➢ Change the transmission oil filter. ➢ Change the hydraulic oil return filter. ➢ Replace the engine oil filter. ➢ Change the cooling oil (gear) KAESER SERVICE).
36 months	➢ Have the overall technical condition checked by an authorised KAESER SERVICE technician.

Tab. 52 Measures for re-commissioning the compressor after a long period of storage or de-commissioning



Commissioning is to be performed by authorised KAESER SERVICE technician.

7.3 Checking installation and operating conditions

➢ Check and confirm all the items in the check list before first start-up of the machine.

To be checked	See chapter	Confirmed?
➢ Are the operators fully conversant with the applicable safety regulations?	–	
➢ Have all the installation conditions been fulfilled?	5	
➢ Sufficient cooling oil in the gearbox oil pan? (oil level within the sight glass)	10.5.7	
➢ Is there sufficient hydraulic oil in the container?	10.5.1	
➢ Is there sufficient oil in the engine?	10.4.4	
➢ Is the maintenance indicator on the air intake filters (engine and compressor) OK?	10.4.2, 10.5.6	

To be checked	See chapter	Confirmed?
➢ Is there sufficient coolant in the coolant expansion tank?	10.4.1	
➢ Is there sufficient fuel in the fuel tank?	–	
➢ Is there sufficient reducing agent (emission treatment) in the tank?	–	
➢ Are all access doors closed and all body panels in place?	–	

Tab. 53 Installation conditions checklist

7.4 Commissioning electrical equipment

The electrical auxiliary equipment is pre-wired for operation. A separate mains supply provides power. A common wall plug is provided at the lower part of the machine, beneath the operator panel, for the connection with the supplied power cable. (For 115 V supply: 2 power sockets and 2 power cables)

To ensure gentle operation of the machine, it is recommended that the electrical auxiliary equipment is operated year round.

The supply voltage must be permanently connected as long as the compressor is to be operated in standby mode. Trickle charging of the batteries ensures that the machine is able to start up as required.

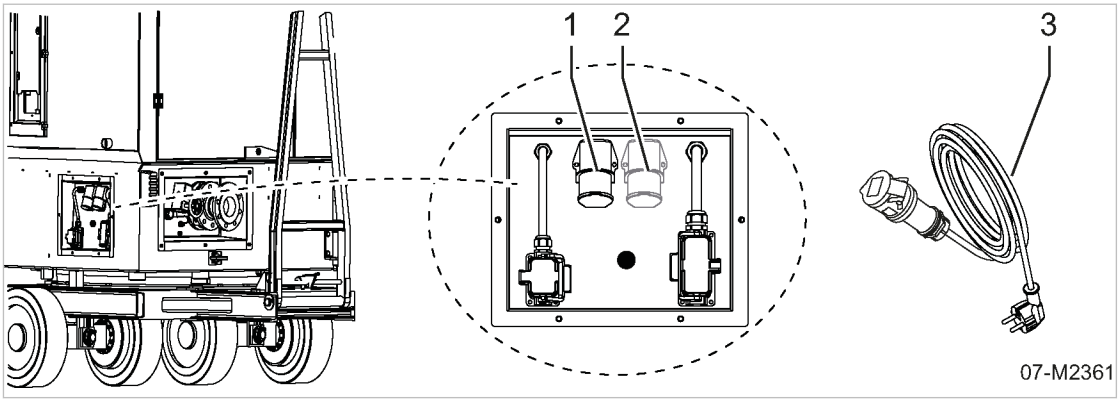


Fig. 30 Connect electrical auxiliary equipment

1 Connection for wall plug socket (for 230 V – power supply 1x socket)
2 (for 115 V – power supply 2x sockets)
3 Power cable

1. **DANGER!**
   Danger of fatal injury from electric shock!
   Serious injury or death can result from a short-circuit in the electrical auxiliary equipment.
   - ➢ The power cable for the electrical equipment (power supply cable) may only be plugged into electrical sockets fitted with a protective earth.
   - ➢ Have the electrical equipment and associated wiring checked according to the maintenance schedule.
2. Connect the power cable with the user's power outlet.

Further information Chapter 4.9 gives an overview of the electrical equipment.

7.5 Low-temperature operation (winter)

The machine's electrical equipment is designed for starting at ambient temperatures as low as −10 °C.

1. In temperatures below 0°C, use the following operating materials:
   - Winter grade engine oil
   - Winter grade diesel fuel
   - Low viscosity cooling oil for the compressor,
2. Activate the low-temperature equipment (heaters for oils, coolant, and condensate drain).

Use air hoses that are as short as possible under extremely cold conditions.

7.5.1 Starting assistance

If the machine's starter batteries are discharged, it can be started with the batteries of another vehicle or engine-driven machine.

Material Jumper cables

Precondition The machine is disconnected from the towing vehicle and safely parked.

WARNING
Fire and explosion hazard.
High currents can flow if the battery is short-circuited. A shorted battery can catch fire or explode.
Battery casing may crack and allow acidic fluid to spray out.
- ➢ Observe the instructions provided with the battery jumper cables.
- ➢ Work with caution.

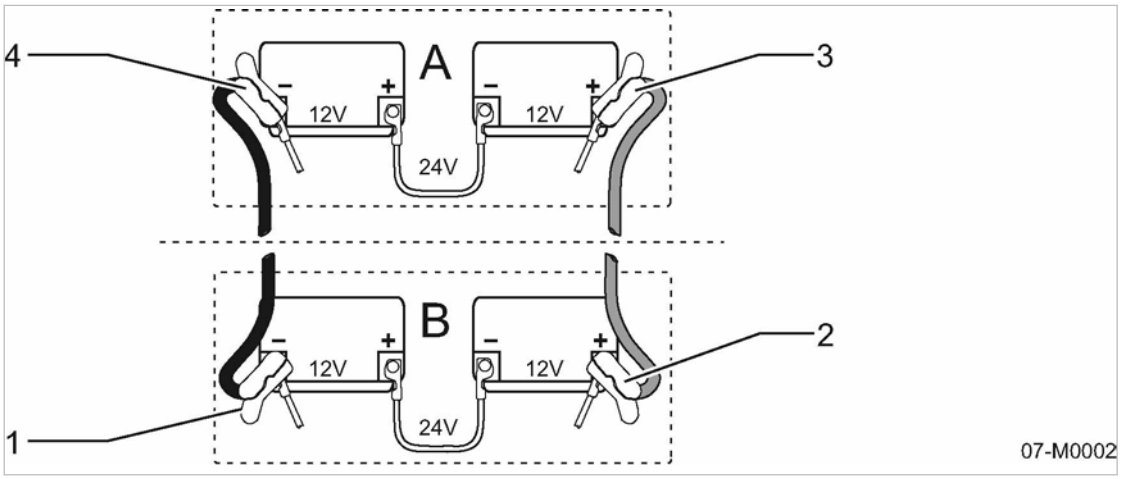


Fig. 31 Jumper cable connection diagram

[A] Engine batteries (receiving batteries)
[B] Assisting vehicle batteries (external donor batteries)
[1] Negative pole clamp (black/blue) on battery of assisting vehicle
[2] Positive pole clamp (red) on battery of assisting vehicle
[3] Positive pole clamp (red) on engine battery
[4] Negative pole clamp (black/blue) on machine battery

Complying with safety notes



1. **WARNING!**
   Fault in starting aid process!
   - ➢ Connect batteries of the same voltage only.
   - ➢ Ensure that machine and assisting vehicle do not touch.
   - ➢ Switch off all consumers prior to connecting and disconnecting the batteries.
   - ➢ Only use battery jumper cables of sufficient diameter and with insulated terminal clamps.
   - ➢ Observe the instructions provided with the battery jumper cables.
   - ➢ Keep jumper cables away from rotating parts.
   - ➢ Avoid short-circuits due to incorrect poling and/or bridging with tools.
   - ➢ Do not bend over the batteries when attaching jumper cables.
   - ➢ Do not attempt to start the machine if its batteries are frozen. Allow the batteries to thaw first.
   - ➢ Do not try to start the machine with a boost charger.
2. Comply with the safety instruction shown when using starting aids and starter batteries.

Preparations:

1. Park the assisting vehicle in close distance to the engine, without their bodywork touching each other.
2. Stop the engine of the assisting vehicle.
3. Open the accesses to the batteries (remove maintenance panels/bonnet and pole caps).
4. Switch off all power consumers.

Connecting the battery jumper cables

1. Clamp the first terminal clamp [3] of the red jumper cable to the positive pole of the engine's battery.
2. Clamp the second terminal clamp [2] of the red jumper cable to the positive pole of the assisting vehicle's battery.



3. **DANGER!**
   Danger of fire from spontaneous ignition of fuel!
   Serious injury or death could result from the ignition and combustion of fuel.
   - ➢ Never connect the minus pole of the jumper cables to metal parts of the fuel supply system. This can cause sparks and may ignite fuel and fuel vapours, when connecting and disconnecting.
   - ➢ Work with caution.
4. Clamp the first terminal clamp [4] of the black jumper cable to the negative pole of the engine's battery.
5. Clamp the second terminal clamp [1] of the black jumper cable to the negative pole of the assisting vehicle's battery.

Starting the engine:

1. Start the engine of the assisting vehicle and run at high speed.
2. Start the compressor engine.

Upon a successful start, run both engines run for approximately 10 – 15 minutes.
This is important, in particular for fully discharged batteries. They will pick up little current only in the beginning and have a high internal resistance. Any voltage peaks occurring in the engine generator in this state can be attenuated only by the batteries of the assisting vehicle. The engine electronics in particular, of the machine is sensitive to overvoltages and could be damaged easily.

Disconnecting the battery jumper cables

1. Stop the engine of the assisting vehicle.
2. Disconnect the jumper cables in the reverse order, first negative (-) then positive (+).
3. Place the pole caps.
4. Close the maintenance panels and/or bonnet.

A stop of the compressor engine as soon as the cables are disconnected could indicate major damage to the alternator or batteries to be repaired by a specialised workshop.

7.6 Connecting to and disconnecting from an external fuel supply

The machine is prepared for the connection to an external fuel tank. For this purpose, two quick couplings are provided at the machine. The fuel hose lines with matching hose spouts are used to connect to this quick couplings.

The fuel feed line and the fuel return line have different diameters for correct identification. The line with the larger diameter is the feed line.

Material Cleaning cloth

Precondition The machine is shut down.
The machine is cooled down.

DANGER
Danger of fire from spontaneous ignition of fuel!
Serious injury or death could result from the ignition and combustion of fuel.

- ➢ Allow no open flames or sparks at the place of use.
- ➢ Stop the engine.
- ➢ Wipe up escaped fuel.
- ➢ Keep fuel away from hot machine parts.
- ➢ Ensure that the maximum ambient temperature is not exceeded at the place of use.
- ➢ Both, the fuel feed line and the fuel return line must be connected.

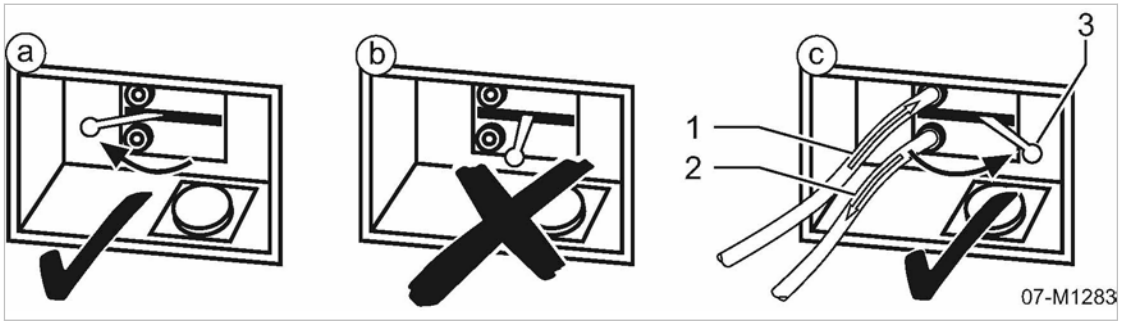


Fig. 32 Connecting and disconnecting the external fuel supply

1 Fuel feed line
2 Fuel return line
3 Selection lever, fuel supply
a Selection lever, position *Internal fuel supply*
b ⚠ Prohibited setting: Selection lever in intermediate position
c Selection lever, position *External fuel supply*

Connecting with the external fuel supply

➢ Connecting with the external fuel supply (see Fig. 32; Item c).
- Latch the external fuel feed line.
- Latch the external return fuel line.
- Check that both quick couplings are fully latched. If necessary, release the quick coupling and re-latch.
- Move the selection lever to position *External fuel supply*.

Result Machine with *external fuel supply* is ready.

Further information See chapter 2.8 for more information about the connecting devices to an external fuel supply.

Connecting with the internal fuel supply

➢ Connecting with the internal fuel supply (see Fig. 32; Item a).
- Move the selection lever to position *Internal fuel supply*.
- Unlatch and remove the external fuel feed line.
- Unlatch and remove the external fuel return line.

Result Machine with *internal fuel supply* is ready.

Wipe up escaped fuel. Dispose of any working material contaminated with fuel according to environmental regulations.

7.7 Connecting to and disconnecting from an external reduction agent supply

The machine is prepared for the connection to an external reduction agent supply.

➢ The following work is necessary for commissioning the external supply with a reduction agent:
- Connecting the external reduction agent tank to the machine.
- Operating the external reduction agent pump.

Connecting the external reduction agent tank to the machine:

The machine is equipped with a quick-release coupling (flat-face plug-in coupling) for connection to an external tank.

When using the AdBlue® reduction agent, comply with the safety instructions shown in chapter 3.5.2 “Safe handling of AdBlue® reduction gent”.

Use only reduction agents (AdBlue®), meeting the EN 70070/ISO 22241 standard!

It must not be mixed with any additives or diluted with water, or contaminated with other substances.

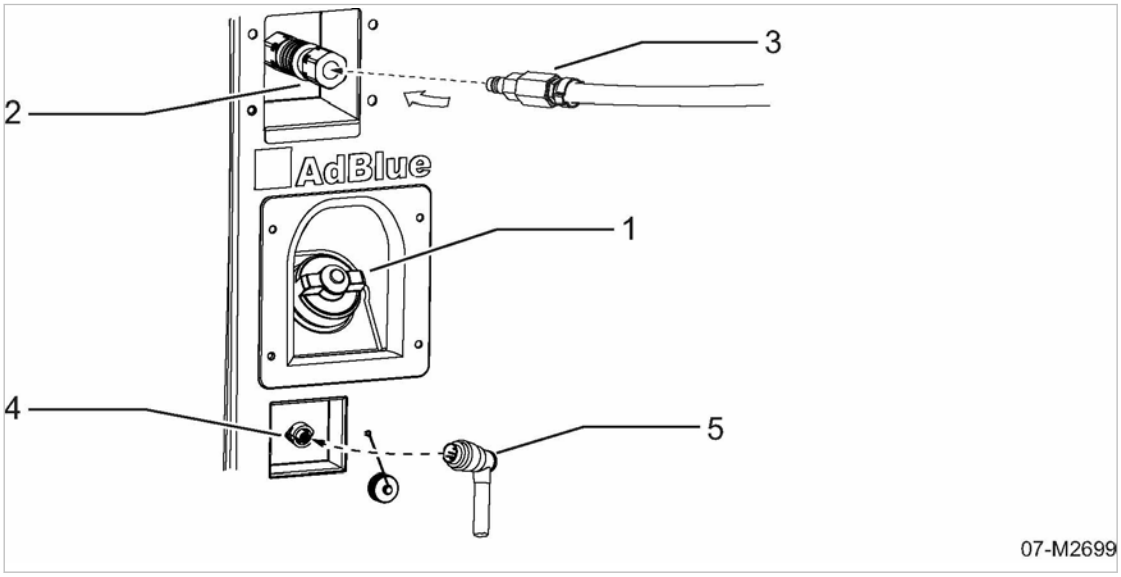


Fig. 33 Connecting the external reduction agent tank

1. Filler piece tank cap, internal reduction agent tank
2. Connecting an external reduction agent tank
3. External reduction agent feed line with plug-in socket
4. Plug for the external pump connection
5. External connection plug for the reduction agent pump

1. Connect the external reduction agent feed line with the quick-release coupling of the machine's fuel connection:
   - Insert the connection hose plug-in socket into the quick-release coupling socket and use some pressure to latch.
   - A slight click automatically completes the coupling process.
2. Check for proper seating of the hydraulic coupling. If necessary, push back the sleeve to undo the hydraulic coupling and attempt to latch again.

Operating the external reduction agent pump:

The SIGMA CONTROL MOBIL controller actuates an external pump for filling the internal reduction agent tank.

The connection for the pump is located underneath the filler piece for the reduction agent internal tank and is closed with a protective cap.

Precondition
The filled external reduction agent tank is connected.
Filling level of the internal reduction agent tank at *Minimum filling level*
The controller is switched on.

1. Connect the external reduction agent pump to the machine:
   - Remove the protective cap from the corresponding socket.
   - Insert the connection plug of the external pump into the socket.
2. Start the machine and check whether the internal reduction agent tank is being filled.
   Check the operation of the external pump*:
   - Switch on at *Minimum filling level* of the internal reduction agent tank.
   - Switch off at *Maximum filling level* of the internal reduction agent tank.
   - Switch off after specified maximum operating time.
   - Visually check the external hose connection of the reduction agent, including the quick-release coupling for leaking during pump action.

Further information
* See chapter 2.9 for the switching points of the external pump.

Disconnect the external reduction agent supply:

1. Unlatch and remove the external reduction agent supply (quick-release coupling).
2. Disconnect the electrical connection plug of the external pump from the outlet and screw the cap onto the socket.



Wipe up any escaped reduction agent. Dispose of any working material contaminated with reduction agent according to environmental regulations.

7.8 Creating and disconnecting the air system connection

You can convert the machine to regulating the air system pressure (pN). For this purpose, the external system pressure must be constantly measured. Besides the connections for tapping compressed air, a quick-release coupling for the air system connection is provided at the machine. This coupling allows the connection of an external hose. See chapter 2.4.4 for the connection dimensions.

Precondition
Install a shut-off valve at the user's air system connection.

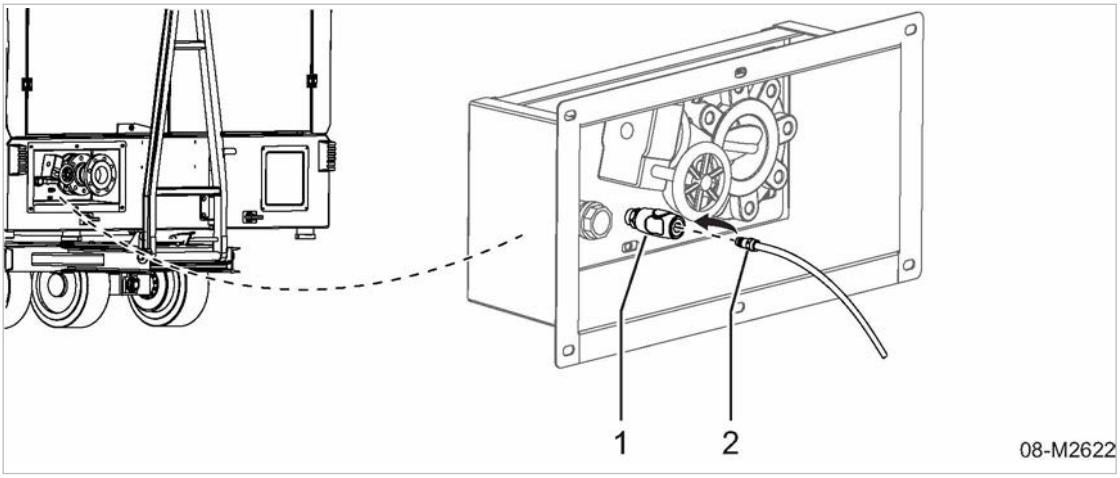


Fig. 34 Creating the air system connection

[1] Quick-release coupling
[2] External hose with hose coupling

Creating the air system connection:

1. Plug the external hose with hose coupling into the quick-release coupling at the machine until it latches.
2. Open the user's shut-off valve to the air system.

Disconnecting the air system:

A double pressure impulse for uncoupling the quick-release coupling prevents uncontrolled flinging of pressurised hoses.

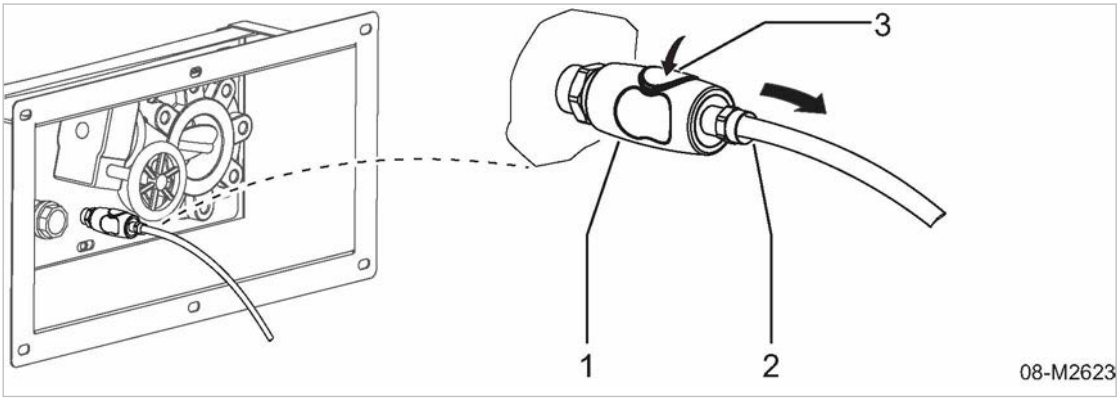


Fig. 35 Disconnecting the air system

[1] Quick-release coupling
[2] External hose with hose coupling
[3] Coupling release button

1. Close the user's shut-off valve to the air system.
2. Actuate the coupling release button.
   The pressure in the hose drops automatically.
3. Actuate the coupling release button once more.
   The de-pressurised hose is released.

8 Operation

8.1 Ensuring safety

Here you will find instructions for a safe operation of the machine.
Warning instructions are located before a potentially dangerous task.



Disregard of warning instructions can cause serious injuries!

Complying with safety notes

Disregard of safety notes can cause unforeseeable dangers!

- ➢ Follow the instructions in chapter 3 'Safety and Responsibility'.
- ➢ Make sure that no one is working on the machine.

Preventing accidental contact

Intensely heated, rotating or electrically live components can cause severe injuries.

- ➢ Ensure that all doors, canopy, and panels are closed,
- ➢ Do not carry out any checks or settings while the machine is running.
- ➢ Shut down the machine before opening any doors/canopy.

Safe working with compressed air tools and hoses

Open and pressurised compressed air hoses move erratically and can cause serious injury to people.

- ➢ Pressurise compressed air hoses only after the tool has been connected.
- ➢ Do not pressurise open compressed air hoses.
- ➢ Detach compressed air hoses only after the hose has been purged of compressed air.
- ➢ At working pressures >7 bar, compressed air hoses should be secured by a cable to their respective outlet valves.

Condensate formation in compressed air hoses

Use the shortest possible compressed air hoses to minimise the temperature difference between the machine's compressed air outlet and the air tool. The hose length represents a cooling section. With increasing cooling, the compressed air gives off moisture capable of damaging the air tool.

- ➢ Use short compressed air hoses.

Condensate formation in compressed air receivers

Compressed air stored in a containers will cool down. The compressed air precipitates moisture that collects at the container's bottom. Corrosion may damage the container.

- ➢ Regularly drain the condensate.

Further information

Details of authorised personnel are found in chapter 3.4.2.
Details of dangers and their avoidance are found in chapter 3.5.

8.2 Starting and stopping

Precondition
No personnel are working on the machine.
Service doors and panels are locked.

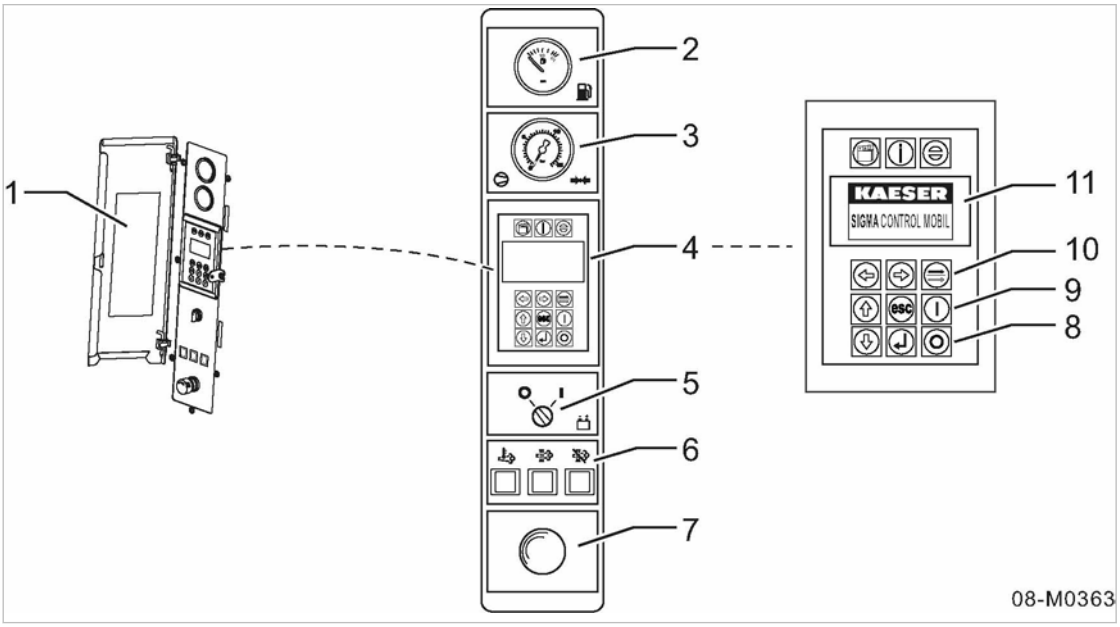


Fig. 36 Starting instruments

1. Instrument panel cover with sticker giving brief instructions
2. *Fuel gauge*
3. Compressed air outlet pressure gauge
4. SIGMA CONTROL MOBIL controller
5. «Controller ON/OFF» switch
6. Operating elements, diesel particulate filter regeneration
7. «EMERGENCY STOP» push button
8. «STOP» key
9. «START» key
10. «LOAD/IDLE» toggle key
11. Display

8.2.1 Follow the brief instructions

Brief instructions containing symbolic information on starting and stopping are attached at the inside of the instrument panel cover.

Starting sequence:

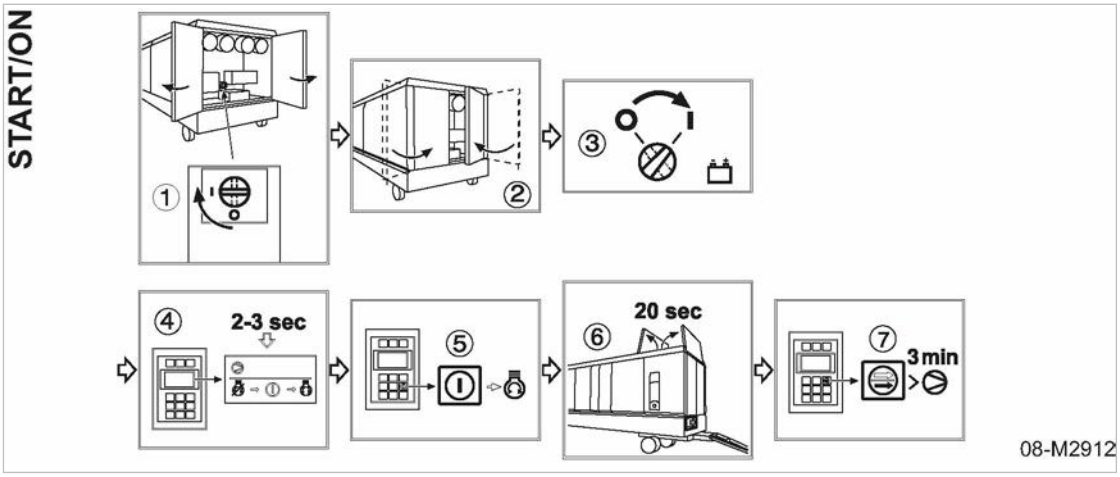


Fig. 37 Brief instructions on starting procedure

➢ Open the instrument panel cover and follow the brief instructions on the starting procedure attached at the inside.

Shut-down sequence:

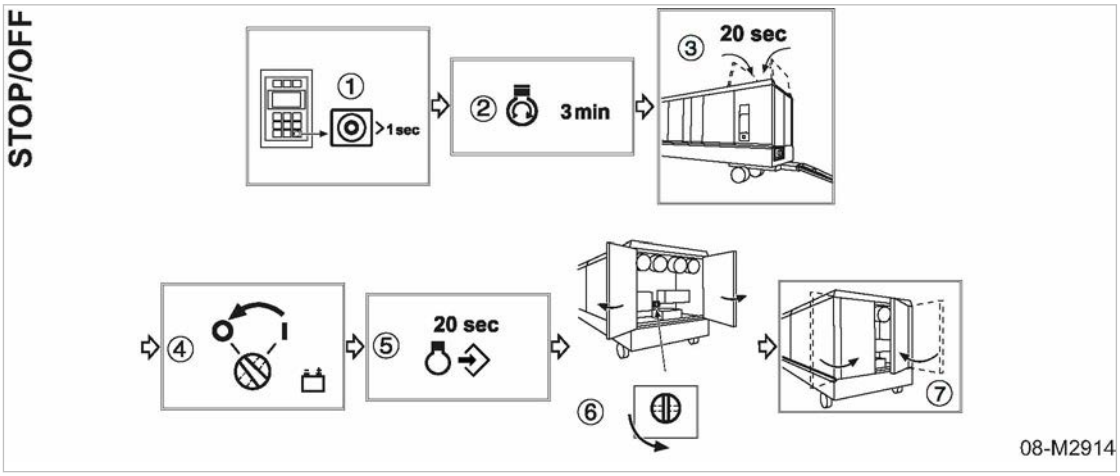


Fig. 38 Brief instructions on stopping procedure

➢ Open the instrument panel cover and follow the brief instructions on the stopping procedure attached at the inside.

The individual steps are fully explained below.

8.2.2 Note before commissioning:

Prepare the machine for snow and ice:

Considerable snow or ice may build up on the machine under low temperature conditions.

➢ Remove any snow and ice from the machine before operating.

8.2.3 Commissioning the machine

As a safety measure, you must check the mechanical functioning of the «EMERGENCY-STOP» control device. The position of both «EMERGENCY-STOP» control devices are shown in Chapter 4.2.

1. **WARNING!**
   «EMERGENCY STOP» push-button locked out!
   The machine cannot be stopped quickly in an emergency.
   - ➢ Check the functioning of both «EMERGENCY-STOP» control devices.
   - ➢ Do not operate the machine if either of the «EMERGENCY STOP» control devices does not work.
2. Push the «EMERGENCY STOP» push-button.
   The «EMERGENCY STOP» push-button cannot be pressed or does not engage: Defrost the «EMERGENCY STOP» push-button.
3. Disengage the «EMERGENCY STOP» push-button again.

The «EMERGENCY STOP» push-button still does not function after defrosting.
- ➢ Have the «EMERGENCY STOP» pushbutton replaced.

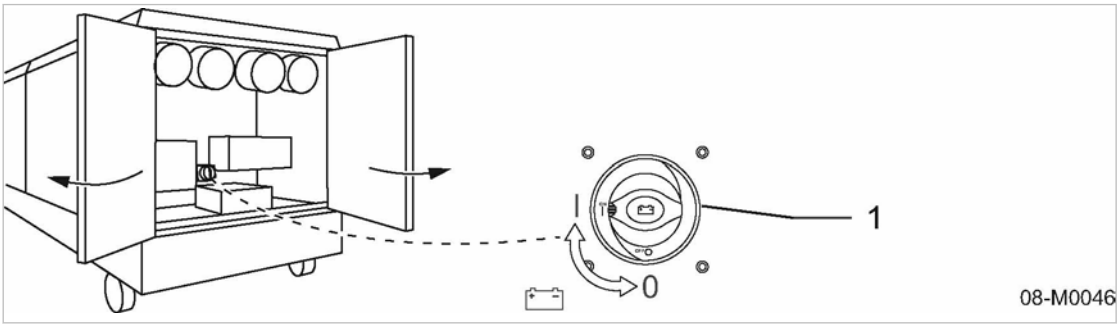


Fig. 39 «Battery isolating switch»

[1] «Battery isolating switch»
I – on
0 – off

1. Open both doors at the rear of the machine.
2. Turn on the «battery isolating switch».
   The machine's batteries are now connected to the machine's electrical system.
3. Close the doors.
   The machine can now be started.

8.2.4 Starting the machine

NOTICE
Serious damage to the engine from cold starting sprays!
Cold-start assists, such as ether or other sprays, can cause severe engine damage.
- ➢ Do not use cold start sprays.

Preparing the start:

1. Open the control panel cover.

2. Switch on the «Controller ON/OFF» key.
   - The controller boots up and the front page is displayed.
   - If the controller does not display any unacknowledged messages (see separate SIGMA CONTROL MOBIL operating manual, chapter “Functional description”), the display switches to *Operating mode* and signals readiness.
   - The «Start» key flashes.

Starting the engine:

➢ Press the «START» key.
   - The signal lamps on all four corners of the machine roof are flashing, and the signal horn sounds.
   - Exhaust louvers on machine roof are opening.
   - The engine is started, the machine is in *warm-up phase* and runs at IDLE speed.

Result ⧗ → *after three minutes operation in IDLE speed,*
or
coolant temperature ≥40 °C:
– The machine is ready to be switched to LOAD.

8.2.5 Switching the machine to IDLE operation

➢ Press «LOAD/IDLE» key.
   - The machine switches to LOAD mode and is ready to deliver compressed air.
   - «LOAD/IDLE» key illuminates.



- If the starting sequence fails or is interrupted by pressing the «EMERGENCY STOP» pushbutton, the *“re-start inhibitor”* is activated for 20 seconds. The display shows the remaining time before another start can be attempted.

Further information A representation of the operating sequence of the SIGMA CONTROL MOBIL is provided in the separate operating manual for the controller.

8.2.6 Setting the compressed air discharge pressure (p5)



As an alternative to regulation via air system pressure (pN), you can convert the unit to regulating the compressed air discharge pressure (p5).

For selecting the compressed air regulation, see the separate SIGMA CONTROL MOBIL controller manual.

The output pressure (p5) is set from the instrument panel.

Setting is in increments of 0.1 bar and shown as a scale on the display.

The Settings menu option for the discharge pressure can be reached in two ways:

- Quick access
- Entry via the menu structure

CAUTION
Danger from incorrectly set pressure!
Danger from malfunctioning or not functioning compressed air tools when the machine's discharge pressure is set incorrectly.

- ➢ Use connected compressed air tools only with the pressure appropriate for its purpose (tool working pressure).
- ➢ Comply with the information and notes provided in the compressed air tool's operating instruction.

Quick access:

Precondition LOAD operation.
The regulation is set to "Compressed air discharge pressure (p5)".
<Main menu> (operating state) is selected.

- ➢ Press either «LEFT» or «RIGHT».
  This immediately selects the setting menu for the compressed air discharge pressure (p5).

Access via menu structure:

Precondition LOAD operation.
The regulation is set to "Compressed air discharge pressure (p5)".
<Main menu => Settings => Compressor settings> selected.
Set the compressed air discharge pressure in the "set compressed air discharge pressure (p5)" menu item.

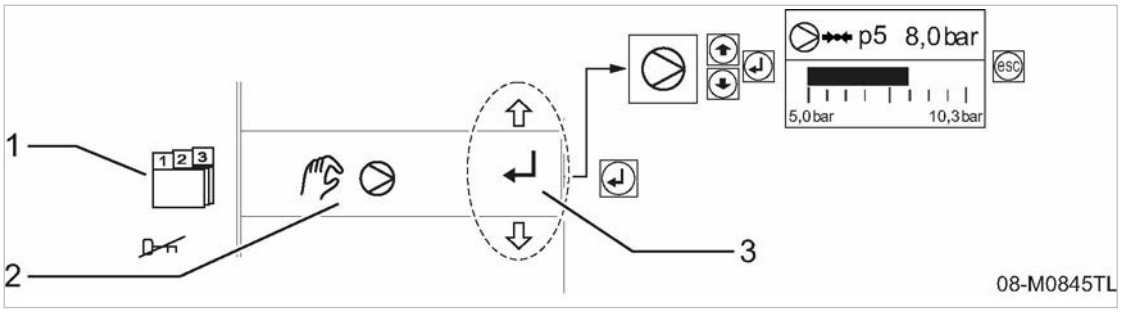


Fig. 40 Selecting the "Compressed air discharge temperature (T5)" menu
[1] Main menu
[2] Compressor settings
[3] Menu navigation

- ➢ Press either «up» or «down».
  The setting menu for the compressed air discharge pressure (p5) is selected.

Setting the compressed air discharge pressure:

The pressure can only be set at lower than the nominal working pressure of the machine.

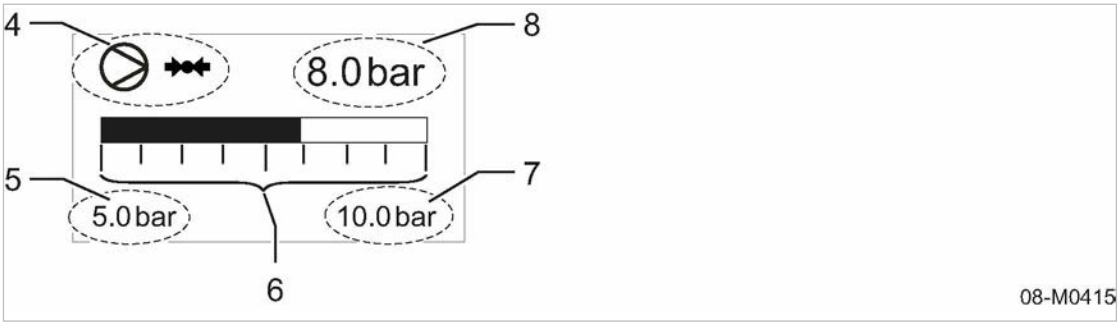


Fig. 41 Setting the output pressure

4 The "Compressed air discharge temperature (T5)" menu
5 Minimum working pressure (lower setting limit)
6 Setting scale with indicator bar
7 Maximum working pressure (upper setting limit)
8 Current setting

➢ Use «Right» and/or «Left» key to select the compressed air output pressure and check on the instrument panel pressure gauge.

The set pressure is saved when leaving the setting menu option.

Closing the Settings menu:

➢ Press «Esc».

The required compressed air discharge pressure is set and the display changes to "*operating mode*.

8.2.7 Setting the compressed air network pressure (pN)

As an alternative to regulation via compressed air discharge pressure (p5), you can convert the unit to regulating the air system pressure (pN).

For selecting the compressed air regulation, see the separate SIGMA CONTROL MOBIL controller manual.

The compressed air network pressure (pN) is set from the instrument panel.

Setting is in increments of 0.1 bar and shown as a scale on the display.

The Settings menu option for the discharge pressure can be reached in two ways:

- Quick access
- Entry via the menu structure

Precondition The air network connection is established (see chapter 7.8).

Quick access:

Precondition LOAD operation.

The compressed air control is set to compressed air network pressure (pN).

<Main menu> (operating state) is selected.

➢ Press either «LEFT» or «RIGHT».
This immediately selects the setting menu for the compressed air network pressure (pN).

Access via menu structure:

Precondition LOAD operation.
The compressed air control is set to compressed air network pressure (pN).
<Main menu => Settings => submenu compressor settings> selected.
Set the network pressure in the "compressed air network pressure (pN)" submenu item.

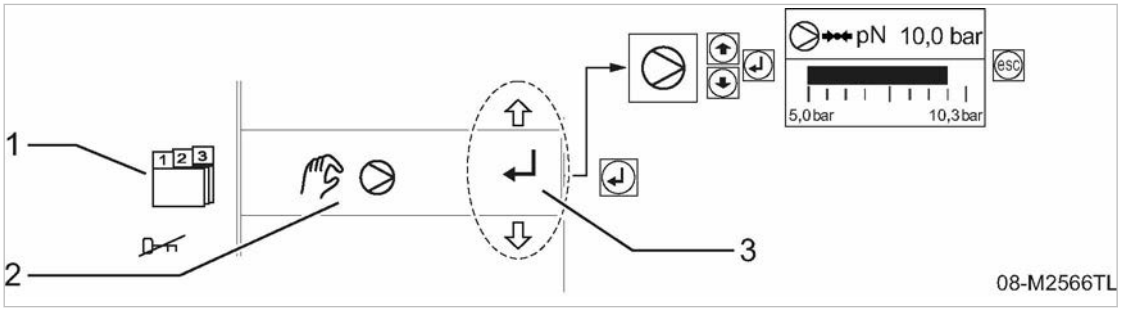


Fig. 42 Selecting the "Compressed air network pressure (pN)" menu
[1] Main menu
[2] Compressor settings
[3] Menu navigation

➢ Press either «up» or «down».
This selects the setting menu for the compressed air network pressure (pN).

Setting the compressed air network pressure

The air pressure network pressure can only be set at lower than the nominal working pressure of the machine.

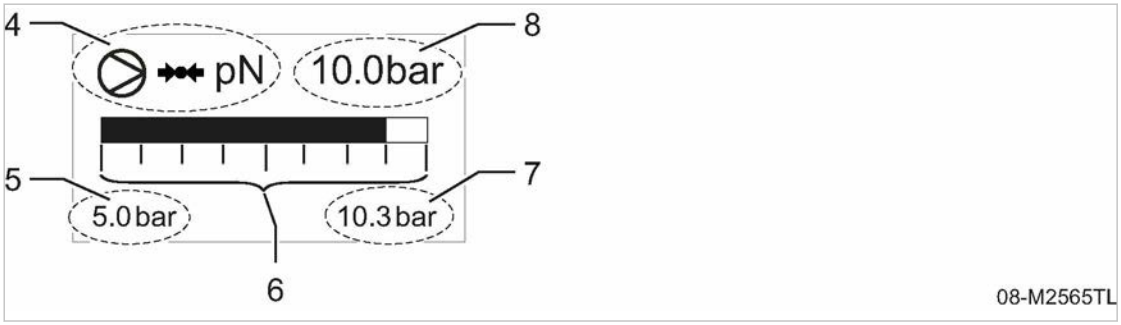


Fig. 43 Setting the compressed air network pressure
[4] Setting the "Compressed air network pressure (pN)" menu*
[5] Minimum network pressure (lower setting limit)
[6] Setting scale with indicator bar
[7] Maximum network pressure (upper setting limit)
[8] Current setting

➢ Use the «RIGHT» and/or «LEFT» keys to set the required compressed air network pressure.

The set value is saved when leaving the setting menu option.

Closing the Settings menu:

➢ Press «Esc».
The required compressed air network pressure is set and the display changes to "*operating mode*.

8.2.8 Setting the compressed air discharge temperature (T5)

The discharge pressure (T5) is set from the instrument panel.
Setting is in increments of 1 and shown as a scale on the display.

The setting menu option for the compressed air discharge temperature can be reached in two ways:

- Quick access
- Entry via the menu structure

Quick access

Precondition LOAD run
<Main menu> (operating state) is selected.

1. Press either «LEFT» or «RIGHT».
2. Press either «UP» or «DOWN».
The setting menu for the compressed air discharge temperature (T5) is selected.

Access via menu structure

Precondition LOAD run
<Main menu => Settings => Compressor settings> selected.
Set the compressed air discharge temperature in the "Compressed air discharge temperature (T5)" menu item.

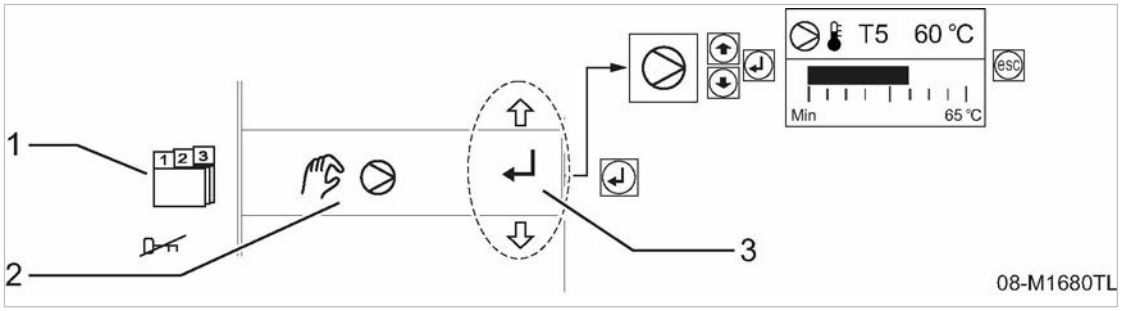


Fig. 44 Selecting the "Compressed air discharge temperature (T5)" menu
[1] Main menu
[2] Compressor settings
[3] Menu navigation

➢ Press either «UP» or «DOWN».
The setting menu for the compressed air discharge temperature (T5) is selected.

Setting the compressed air discharge temperature:

The minimum compressed air discharge temperature is dependent on the ambient temperature (T0).

- T_{Min} = T0 + 10k
- T_{Max} = T0 + 40k; ≤ 65 °C

T_{Max} may not be attained as internal temperature must not be exceeded!

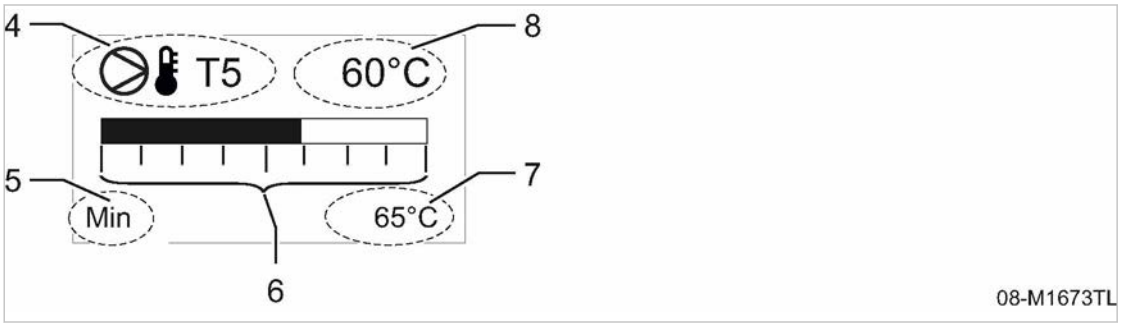


Fig. 45 Setting the output pressure

4	The "Compressed air discharge temperature (T5)" menu	7	Maximum compressed air discharge temperature (upper setting threshold)
5	Minimum compressed air discharge temperature (lower setting threshold)	8	Current setting
6	Setting scale with indicator bar		

➢ Use the «RIGHT» and/or «LEFT» keys to set the required compressed air discharge temperature.

The set value is saved when leaving the setting menu option.

Closing the Settings menu:

➢ Press «Escape»
The required compressed air discharge temperature is set and the display changes to "*operating mode*.

8.2.9 Switching the machine to the run-on phase

➢ Press «LOAD/IDLE» key.
- The machine switches to *unloaded run-on*, i.e. the engine runs at IDLE speed and the inlet valve is closed.
- The machine vents and cools down.
- The machine may be switched to LOAD/IDLE when the «LOAD» key flashes.
- The cooled down machine can be switched off with the «STOP» key.

8.2.10 Shutting down the machine

NOTICE
Thermal overload of the turbocharger!
Abrupt stopping of the engine under load can cause a fault or damage to the turbo charger.
➢ Run the engine a few minutes in idle before shutting down to allow the turbocharger to cool.

Operating the machine in the run-on phase

➢ Press and hold the «Stop» key for more than one second.
- The machine switches to *unloaded run-on*, i.e. the engine runs at IDLE speed and the inlet valve is closed.
- The «LOAD/IDLE» key flashes.
- When the preset cool-down period* has elapsed, the machine has cooled enough so that the engine can stop automatically.
  (* See also the separate SIGMA CONTROL MOBIL operating manual, chapter “Engine settings”.)
- The exhaust air flaps on the machine roof are closing.

- Upon the stop, the "re-start inhibitor" runs, signalled by a down-counting timer on the display (20 sec).
- As soon as the "re-start lockout" is finished, the display changes to *ready to start*.

Switch the controller off:

Precondition The exhaust valves on the machine top are closed.

1. *NOTICE!*
   Memory fault!
   Damage to the machine electronics and/or controller is possible.
   ➢ Shut down the controller only after the engine control unit has completed save process.
2. Switch the controller off:
   - ⌛ approx. 3 minutes.
   - Switch off the «controller ON/OFF» key.

Shutting down the machine:

If the machine is not to be used again, the «Battery isolating switch» should be switched off.

The exhaust gas treatment unit requires the system to run on to ensure cooling, depending on the operational states of the machine and the ambient temperature. The duration is defined by the engine control unit. Power supply must be ensured during the entire run-on duration! After the end of the system run-on, the red *control lamp* switches off.

The maximum run-on time is 5 minutes.

The «battery isolating switch» must only be switched off when the red *control lamp* is no longer illuminated!

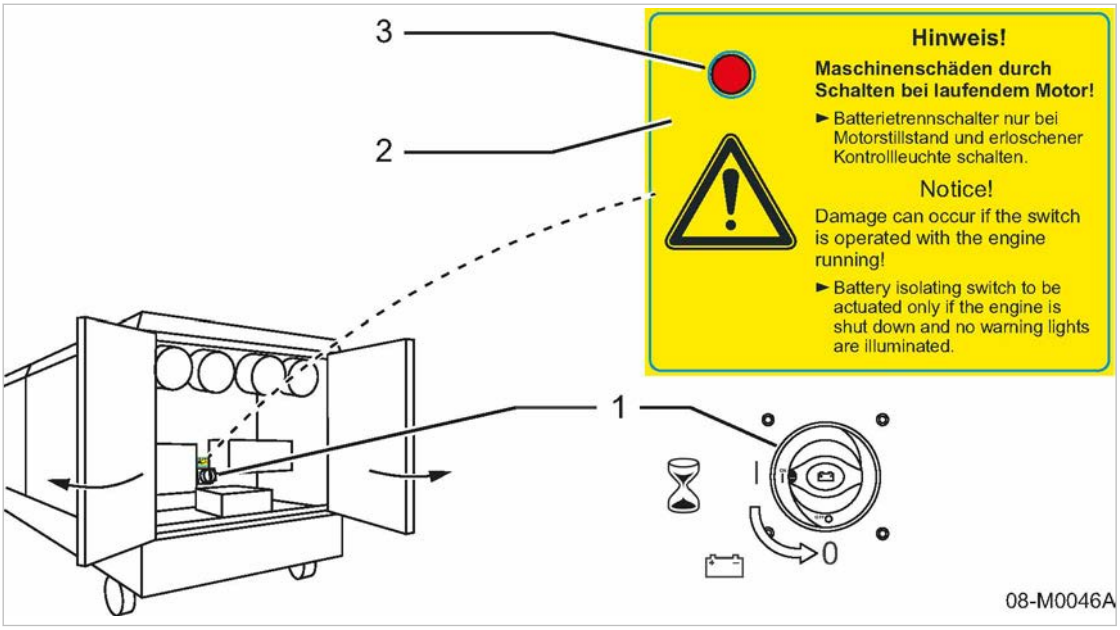


Fig. 46 Switch off the machine's power supply

1 «Battery isolating switch»
2 Indicator plate «Battery isolating switch»
3 red *control lamp*

1. ***NOTICE!***
   Machine damage if switched while the engine is running!
   - ➢ Switch «battery isolating switch» only with the engine stopped and the *control lamp* no longer illuminated.
   - ➢ Do not use the «battery isolating switch» as a main or emergency switch.
2. Open both doors on the machine's rear.
3. Disconnect the machine's voltage supply:
   - ■ Wait until the red *control lamp* is no longer illuminated.
     (⧗ 0 - 5 minutes)
   - ■ Turn off the «battery isolating switch».

Result The battery is disconnected from the machine's electrical system.

Secure the machine:

1. Close all «compressed air outlet valves» on the air distributor.
2. Close the operating panel cover and all doors. Lock if necessary.

8.2.11 Shutting down in an emergency

In case of danger, immediately stop the machine by pressing the «EMERGENCY STOP» push button.

Use the «EMERGENCY STOP» push button to stop the machine only in **emergencies**.

Quick shut-down:

➢ Actuate the «EMERGENCY STOP» push button.
- The engine stops immediately.
- The «EMERGENCY STOP» pushbutton remains latched in after being pressed.
- The re-start inhibitor is activated (20 seconds).
- The «Information» and «STOP» keys are illuminated.
- The «Acknowledge» key flashes.

Put the machine back into operation:

When the fault has been cleared, the machine must be reset.

Precondition Fault rectified.

➢ «EMERGENCY STOP» push button unlatched.
➢ Confirm the message with the «Acknowledge» key.
The «Information», «Stop» and «Acknowledge» keys extinguish.
The machine can now be started again.

8.2.12 Controlling the machine remotely

The machine can be started remotely. You can activate and deactivate the machine with the included radio-controlled remote control.

In order for the machine to be operated via the remote control, the operator must be within the radio transmission range of the remote control device to the machine.

Precondition Machine is ready to start:
– The «Battery isolating switch» in the machine's interior is switched on.
– Both «EMERGENCY STOP» control devices unlocked.
– The «Controller ON/OFF» key is switched on.
The remote control is activated in the settings menu of the SIGMA CONTROL MOBIL.



Fig. 47 Remote control for the SIGMA CONTROL MOBIL controller
[1] «START/STOP» key
[2] «LOAD/IDLE» toggle key

Starting the machine:

➢ Starting the engine:
- ▹ Actuate the «START/STOP» push button on the remote control.
  - The signal lamps on all four corners of the machine roof are flashing, and the signal horn sounds.
  - Exhaust louvres on machine roof are opening.
  - Engine is started.
  - The machine is in *warm-up phase* and runs at IDLE speed.
  - ⌛ → *after three minutes operation in IDLE speed,*
    or
    coolant temperature ≥40 °C:
    The machine is ready to be switched to LOAD operation.

Switching the machine to LOAD operation:

➢ Switching the machine to LOAD operation:
- ▹Actuate the «LOAD/IDLE» key on the remote control.
  - The machine switches to LOAD operation and is ready to deliver compressed air.

Switching the machine to IDLE operation:

➢ Switching the machine to IDLE operation:
- ▹Actuate the «LOAD/IDLE» key on the remote control.
  - The machine switches to *unloaded run-on*, i.e. the engine runs at IDLE speed.
  - The inlet valve closes.

Shutting down the machine:

➢ Shutting down the engine:
- ▹ Actuate the «START/STOP» push button on the remote control.
  - The machine switches to *unloaded run-on*, i.e. the engine runs at IDLE speed.
  - The inlet valve is closed.
  - The engine switches off, controlled by a timer.
  - Exhaust louvres on machine roof close.

8.3 Operating the machine with "automatic start/stop"

The operator can set the machine controller to regular *manual operation* or to *automatic mode*. By default, the machine is shipped with the controller's "automatic start/stop" feature deactivated.

The “automatic start/stop" feature can be selected in the settings menu of the SIGMA CONTROL MOBIL controller.



The battery may deplete if the controller is always switched on (readiness for automatic machine start-up). The starting voltage is insufficient to start the engine when needed. Moreover, deep discharge of the battery may result in battery damage.

➢ Use battery maintenance charge.

Precondition Master controller external connection cable connected.
The «battery isolating switch» is activated.
No personnel are working on the machine.
Service doors and panels are locked.

Select automatic mode (automatic start/stop):

Precondition The controller is switched on
<Main menu => Settings menu => submenu "Settings menu for control mode/automatic start/stop"> selected

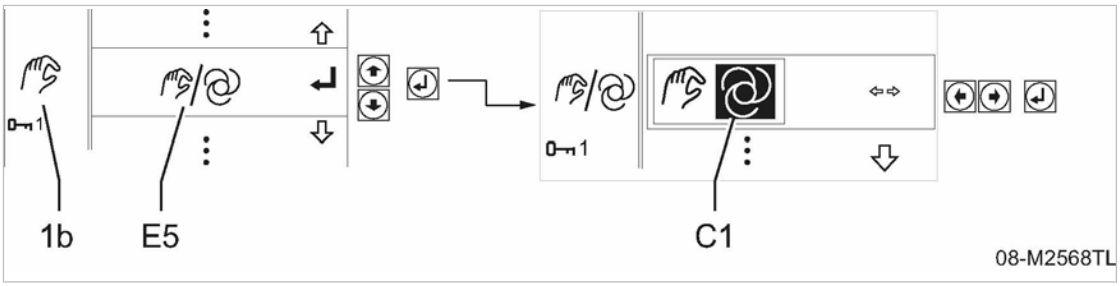


Fig. 48 Select automatic mode

(1b) Settings menu
(E5) Settings menu:
Control mode/automatic start/stop
(C1) Status of controller operating mode:
Automatic mode (selected)

1. Press the «Right» and/or «Left» keys to select the required regulation mode *Automatic mode*.
2. Press «Enter».
   Automatic mode (automatic start/stop) is set. The setting is saved.
3. Closing the Settings menu:
   - ➢ Press the «Esc» key repeatedly.
   - The display changes to show the *operating mode*.

Further information For more information about the "automatic start/stop" setting, see the separate operating manual of the SIGMA CONTROL MOBIL controller.

Preparing the start:

➢ Switch on the «Controller ON/OFF» key.
- The controller boots up and the Welcome page is displayed.
- If the temperature is below zero, the engine control unit will switch on engine pre-heating.
- If the controller does not display any unacknowledged messages (see separate SIGMA CONTROL MOBIL User Manual, chapter “Functional description”), the display switches to the display image 49 and signals readiness.
- The «START» key flashes.

After switching on the machine (with automatic mode active) the «START» key must be pressed once to *Prepare start*. Until this status, the following message appears on the controller display:



Fig. 49 Ready "automatic start/stop" for start

➢ Press the «START» key.

Wait for start command:

The display image 50 appears on the controller display and signals *Wait for start command*.

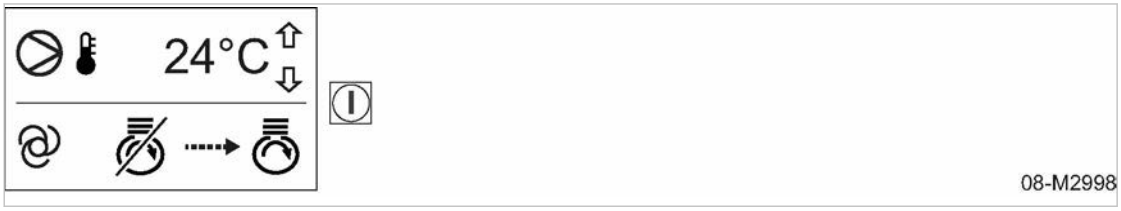


Fig. 50 Wait for start command

➢ Press the «START» key.

The machine is ready for operation.

The remote contact of the master control system signals the compressed air demand to the controller:

- The signal lamps on all four corners of the machine roof flash, and the signal horn sounds.
- Exhaust air flaps on machine roof open.
- The engine is started, the machine is in *warm-up phase* and runs at IDLE speed.
- *After three minutes of operation in IDLE speed*
  or
  once a coolant temperature of ≥35 °C has been reached, the controller automatically switches to LOAD mode.
- If the starting sequence fails or is interrupted by pressing the «EMERGENCY STOP» push button, the “re-start inhibitor” is activated for 20 seconds. The display shows the remaining time before another start can be attempted.

Suspend automatic mode for operating cycle (forced manual operation)

If the «START» or «STOP» keys are pressed for longer than two seconds, the controller changes to manual operation (manual mode) for this operating cycle.

➢ Push the «START», or «STOP» key longer than 2 seconds.
The machine controller can be used as usual, as in normal operation.

The activated manual operation can be cancelled again by activating the «Controller ON/OFF» switch.

Shutting down the machine:

When the compressed air demand via the remote contact of the master controller stops, the machine shuts down as follows:

Machine switches to *run-on phase*:

- The engine runs at IDLE speed.
- The inlet valve closes.
- When the preset cool-down period* has elapsed, the machine has cooled enough so that the engine can stop automatically.
  (* See also the separate SIGMA CONTROL MOBIL operating manual, chapter “Engine settings”.)
- The exhaust air flaps on the machine roof close.



- Upon the stop, the "re-start inhibitor" runs, signalled by a countdown timer on the display (20 sec).
- As soon as the "re-start inhibitor" phase has finished, the display changes to *ready to start*.



1. *NOTICE!*
   Memory fault!
   Damage to the machine electronics and/or controller is possible.
   ➢ Shut down the controller only after the engine control unit has completed its save process.
2. Switch the controller off:
   - ⌛ approx. 3 minutes.
   - ➢ Switch off the «controller ON/OFF» key.

Further information — Please see the separate User Manual for the SIGMA CONTROL MOBIL for details regarding the changing of parameters for the “start-stop” option and for changing the operating mode to *manual mode*.

8.4 Unlatch the engine air shut-off valve

Subsequent to the automatic shut-down of the engine by the engine air shut-off valve, it must be unlocked manually. Otherwise, the engine will no longer receive combustion air, and you are unable to start the machine.

- The engine is switched off and cannot be started.
- The «Information» and «STOP» keys are illuminated.
- The «Acknowledge» key flashes.
- The system displays the fault message "Engine air shut-off valve closed (See Fig. 52).

Material — Hexagon wrench

Precondition — No flammable gas mixture in the ambient air

Unlatch the engine air shut-off valve:

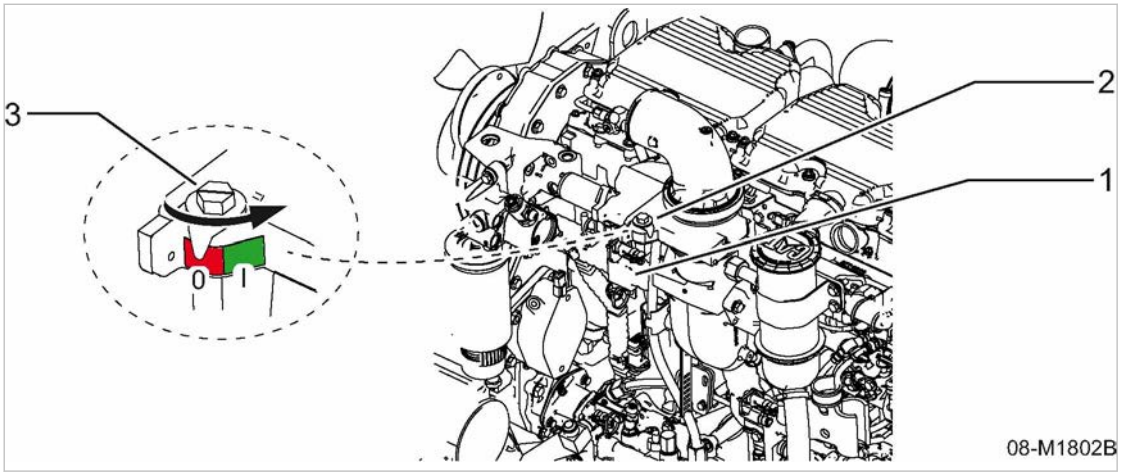


Fig. 51 Unlocking the engine air shut-off valve (engine with emission treatment)

[1] Airend
[2] Engine air shut-off valve
[3] Unlocking the engine air shut-off valve:
0 - Closed
I - Open

➢ Use the hexagon wrench to set the engine air shut-off valve to position "I" (open).
The engine air shut-off valve is open.

Acknowledging the fault message:

Precondition No flammable gas mixture in the ambient air
The engine air shut-off valve is unlatched

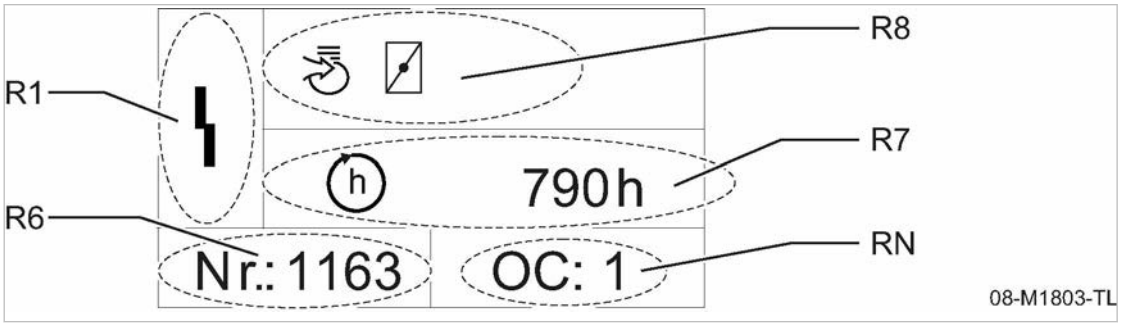


Fig. 52 ”Engine air shut-off valve closed” fault message

[R1] Event memory category: Fault
[R6] Message codes
[R7] Operating hours since this occurred last time
[R8] Symbols for error localisation "Engine air shut-off valve closed"
[RN] Frequency of fault occurrence

➢ Confirm the message with the «Acknowledge» key.
The «Information», «Stop» and «Acknowledge» keys extinguish.

Result The engine can now be started.

8.5 Acknowledging alarm, warning and maintenance messages

Information from the controller is interpreted as displayed messages.

The message is stored in the event memory at the same time.

8.5.1 Confirming alarm messages

When an alarm message is displayed,

- the machine is shut down and cannot be restarted.
- The «Information» and «STOP» keys are illuminated.
- The «Acknowledge» key flashes.

Precondition Fault rectified.

➢ Confirm the message with the «Acknowledge» key.
The «Information», «Stop» and «Acknowledge» keys extinguish.

8.5.2 Acknowledging warning and maintenance messages

A fault warning message or notification of maintenance due is displayed, and:

- The «Information» key illuminates.
- The «Acknowledgement» key flashes.

Precondition The cause of the warning is rectified.

Maintenance has been carried out.

➢ Confirm the message with the «Acknowledge» key.
The «Acknowledge» key is extinguished but the «Information» key is still illuminated.



The «Information» key continues to be illuminated when the machine is restarted until the fault is rectified or maintenance has been carried out.
Upon maintenance, the maintenance interval counter must be reset.

Further information For more information about the event memory and resetting the maintenance timer, see the separate operating manual of the SIGMA CONTROL MOBIL

8.6 Cleaning the machine after operation

Material High-pressure cleaner

Precondition The machine is switched off.

The machine has cooled down.

The machine is fully vented, the pressure gauge reads 0 bar.

All compressed air consumers are disconnected and the air outlet valves are open.

Maintain the following minimum distances to the object to be cleaned in order to prevent damages to the machine when cleaning with the high-pressure cleaner.

- Circular section jets: approximately 70 cm
- Fan jets: approximately 30 cm
- Dirt blasters: approximately 30 cm

Keep the water jet in permanent motion during the cleaning process. You prevent thus damage.

Cleaning with dry-ice jets is strictly forbidden as it could cause unforeseeable damages.

1. *NOTICE!*
   Machine damage caused by strong water jet!
   Direct water jets can damage or even destroy sensitive components.
   - ➢ Do **not** directly focus a strong water jet towards sensitive components.
   - ➢ Work carefully.
2. Carefully clean the machine with the high-pressure cleaner.

Water has accumulated in the sealed floor pan.
- ➢ Drain the water.

Catch the liquid and dispose in accordance with applicable environmental regulations.

Further information See chapter 10.9 for information to the draining of liquids within the machine.

8.7 Manually operating the exhaust air flaps

In an emergency, you can manually open and close the exhaust air flaps on the machine roof.

Material Hexagon bit crown 6mm (long type)
Electric wrench

Precondition Machine at standstill
The machine's power supply is disconnected

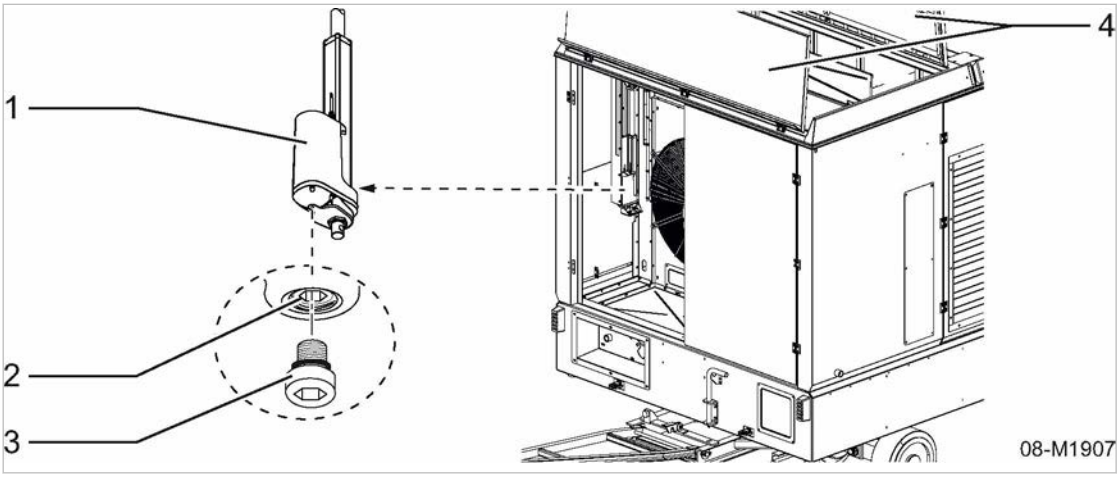


Fig. 53 Manually operating the exhaust air flaps
1 Emergency operation
2 Internal hexagon
3 Cover screw for internal hexagon

1. *NOTICE!*
   Over-stressing the emergency actuator drive!
   The drive of the exhaust flap actuation can be damaged.
   ➢ Apply the electric wrench very carefully!
2. Open both doors at the front of the machine.
3. Remove the cover screw for the internal hexagon.
4. Insert the electric wrench with bit crown into the internal hexagon of the emergency actuation.
5. Operate the emergency actuation with the electric wrench.
   - Operate the electric wrench very carefully, maximum torque 16 Nm (at maximum load).
   - Open or close the exhaust air flap until the end stop.
6. Attach the cover screw for the internal hexagon.
7. Close the doors.

8.8 Manually starting the regeneration of the diesel particulate filter

Manual regeneration is initiated by actuating the «Force regeneration» key.

Manual regeneration may be executed in IDLE or normal operating speed of the engine.

Precondition Coolant medium temperature ≥ 40 °C

Saturation of the diesel particulate filter ≥ 15%

Machine must have been running for at least 3 minutes

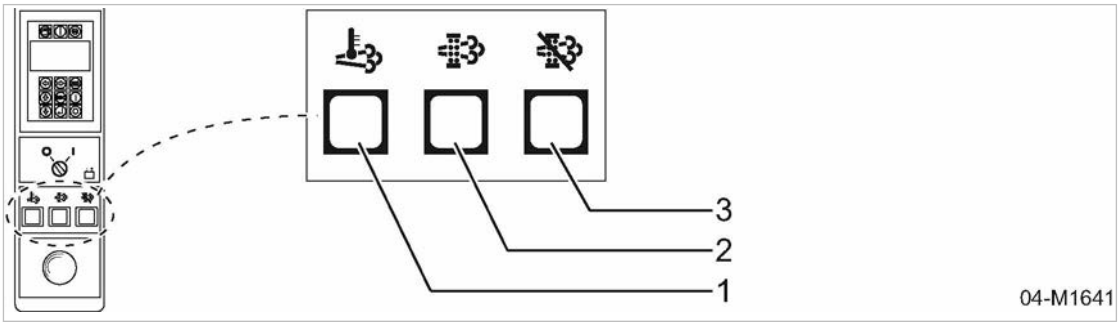


Fig. 54 Operating elements, diesel particulate filter regeneration

[1] Indicating light *High exhaust system temperature*
[2] «Force regeneration» key with indicating lights, *diesel particulate filter*
[3] «Regeneration OFF» key with indicating lights, *regeneration deactivated*

1.

8.8.1 Start “force regeneration” at soot load up to 100%

The regeneration process is not immediately started as soon as the «Force regeneration» key is actuated, but only after a restart of the controller and if all of the aforementioned prerequisites have been met.

➢ Press and hold the «Force regeneration» key for ≥ 3 seconds.
- The *High exhaust air temperature* and *Force regeneration* indicating lights are illuminated.
- The temperature [T78] (diesel particulate filter exhaust air temperature) rises.
- The diesel particulate filter regeneration is running.

8.8.2 Start “force regeneration” at soot load over 100%

A fault message is triggered as of a soot load of >100%:

- *Fault 1187*
  “Fault – exhaust gas after-treatment regeneration”
- The machine is shut down and/or cannot be restarted.
- The «Information» key and the «STOP» key are illuminated.
- The «Acknowledgement» key flashes.

After acknowledging the fault, the machine can be started in an emergency operating function
by activating the *“Kl.15 mode) and the “forced regeneration” can be performed.*

Precondition Soot load > 100%, up to 120% max.

1. Acknowledge the fault message with the «Acknowledgement» key.
   The «Information» key and the «STOP» key are no longer illuminated.
2. Activate the emergency operating function via *“Kl.15 mode”*.
   - Menu path:
     << Main menu - ECU (engine control unit) - *“Kl.15 mode”* selected.
     (For selection, see Figure 55.)

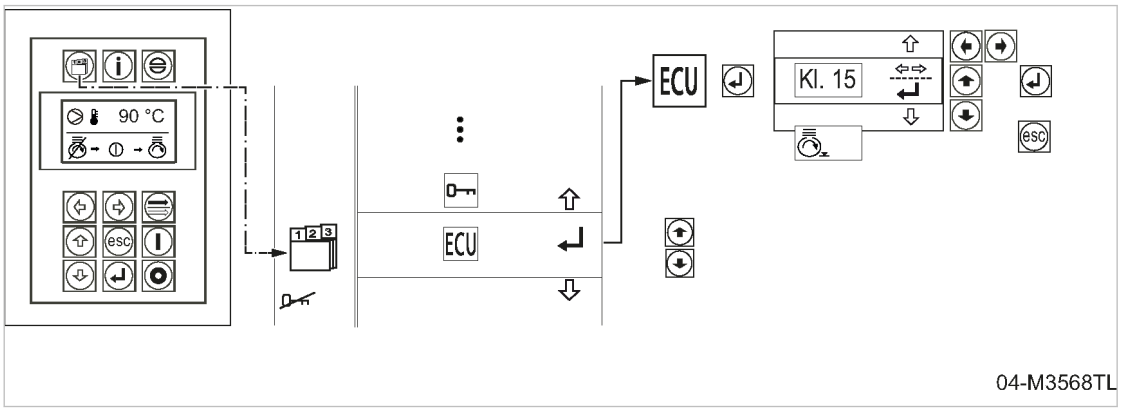


Fig. 55 Menu for selecting Kl.15 mode

3. Press «Enter».
   - *“Kl.15 mode”* is now activated.
   - The machine can now be started.
   - “Force regeneration” can now be started.

The *“Kl. 15 mode”* must not be exited during the entire regeneration phase, otherwise the function is reset and regeneration is cancelled!

Starting the machine:

➢ Start the engine and run it in IDLE speed.
- Temperature [T70] coolant temperature ≥ 40 °C
- Let the engine run for at least three minutes.

Start “Force regeneration”:

➢ Press and hold the «Force regeneration» key for ≥ 3 seconds.
- The *High exhaust air temperature* and *Force regeneration* indicating lights are illuminated.
- The temperature [T78] (diesel particulate filter exhaust air temperature) rises.
- The diesel particulate filter regeneration is running.

Further information

Further information on the diesel particulate filter regeneration are provided in chapter 4.8.3.

9 Fault Recognition and Rectification

9.1 Basic instructions

The following tables are intended to assist in fault finding and rectification.

1. Do not attempt fault rectification measures other than those given in this manual!
2. In all other cases:
   Have the fault rectified by an authorised KAESER SERVICE representative.

Further information

Observe the instructions in chapter 3 "Safety and Responsibility" and prevailing local safety regulations when rectifying faults and malfunctions.
Comply also with local applicable safety provisions!

9.2 Analysing SIGMA CONTROL MOBIL messages

There are three types of message:

- Alarm messages, see chapter 9.2.1
- Warning messages, see chapter 9.2.2
- Maintenance messages, see chapter 10.2

The messages valid for your machine are dependent on the controller factory settings and individual equipment with which the machine is provided.

9.2.1 Alarm messages on the controller (machine off)

Alarm with automatic deactivation of the machine.
The «Acknowledge» key flashes. The «Information» key and the «STOP» key are illuminated.



You must acknowledge the alarm message upon correction of the fault before you can restart the machine.

Further information

Further information on the acknowledgement of alarm messages can be found in Chapter 8.5.



Information in ▭ correspond to the positions in the flow diagram, chapter 4.3.2.

Message codes, range 1100 – 1199 “Engine faults”:

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
1100	Fault message [p76] - pressure low ([p76] – Engine oil pressure)	Check the engine oil level.	10.4.4	–	X
		Have the engine oil pressure checked.	–	X	X
		Have the oil pressure switch checked.	–	X	X
1102	Fault – drive engine oil level low.	Check the engine oil level and replenish if necessary.	10.4.4	–	X
1103	Fault – drive engine oil level high.	Check the engine oil level and drain, if necessary.	10.4.4	X	X
1110	Fault [T70] – temperature high ([T70] - Coolant temperature)	Check the coolant and replenish if necessary.	10.4.1	–	X
		Have the cooler cleaned.	–	–	X
		Have the coolant cooling checked.	–	X	X
1111	Fault – coolant level too low.	Check the coolant and replenish if necessary.	10.4.1	–	X
1121	Fault message [T73] – temperature high ([T73] - charge air temperature)	Check setup conditions. Allow the machine to cool down.	5.2	–	–
		Have the cooler cleaned.	–	–	X
1130	Fault – fuel level too low.	Refuel.	–	–	–
1131	Fault [T75] – temperature high	Allow the machine to cool down.	–	–	–
	([T75] - Fuel temperature)	Have fuel cooler checked and cleaned if necessary	–	–	X
1151	Fault - ECU-SCM communication (ECU end)	Have it checked.	–	X	X
1162	Fault - drive engine speed high.	Have it checked.	–	X	X
1163	”Engine air shut-off valve closed” fault	Disengage the engine air shut-off valve.	8.4	X	X
1170	Fault – automatic start mode fault.	Have it checked.	–	–	X
1181	Fault – AdBlue level low.	Fill tank.	–	–	–
1185	Fault – fault in emission treatment.	Have the emission treatment checked.	–	–	X

SW = Specialised workshop; KS = KAESER SERVICE

SCR - Selective Catalytic Reduction

SCM - SIGMA CONTROL MOBIL; ECU - Engine Control Unit

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
1186	Fault message emission treatment – temperature high.	Have the emission treatment checked.	–	–	X
1187	Fault message emission treatment – regeneration.	Have the emission treatment checked.	–	–	X
1189	Fault – SCR catalytic system error.	Have it checked.	–	X	X
1191	Fault – AdBlue quality deficient.	Have it checked. Have it changed if necessary.	–	X	X

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SCR - Selective Catalytic Reduction

SCM - SIGMA CONTROL MOBIL; ECU - Engine Control Unit

Tab. 54 Alarm messages and actions concerning the engine.

Message codes, range 1200 – 1299 “Compressor faults”:

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
1205	Fault p3 – pressure high (p3 - Compressor air pressure)	Have it checked.	–	–	X
1206	Fault p3 - pressure low (p3 - Compressor air pressure)	Have it checked.	–	–	X
1207	Fault p3 – pressure high IDLE. (p3 - Compressor air pressure)	Have it checked.	–	–	X
1208	Fault message p3 - pressure low LOAD. (p3 - Compressor air pressure)	Have it checked.	–	–	X
1209	Fault p3 - pressure low READY. (p3 - Compressor air pressure)	Have it checked.	–	–	X
1210	Fault message p3 - pressure high READY. (p3 - Compressor air pressure)	Have it checked.	–	–	X

SW = Specialised workshop; KS = KAESER SERVICE

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
1211	Fault [p4] – pressure high IDLE. ([p4] - Compressor air pressure)	Have it checked.	–	–	X
1212	Fault message [p4] - pressure low LOAD. ([p4] - Compressor air pressure)	Have it checked.	–	–	X
1214	Fault [p4] – pressure high ([p4] - Compressor air pressure)	Have it checked.	–	–	X
1215	Fault [p5]–[p4] - pressure low. (Compressor air pressure between [p5] and [p4])	Have it checked.	–	–	X
1216	Fault [p5]-[p4] pressure high LOAD. (Compressor air pressure between [p5] and [p4])	Have it checked.	–	–	X
1217	Fault [p5] – pressure high ([p5] - Compressor air pressure)	Have it checked.	–	–	X
1218	Fault [p66] – pressure high ([p66] Compressor oil pressure)	Have it checked.	–	–	X
1219	Fault [p66] - pressure low ([p66] Compressor oil pressure)	Have it checked.	–	–	X
1220	Fault [p63] – pressure high ([p63] Compressor oil pressure)	Have it checked.	–	–	X
1230	Fault [T0] - temperature low ([T0] ambient temperature/compressed air inlet temperatures)	Check setup conditions.	5.2	–	–
		Have controller checked.	–	–	X
1231	Fault [T0] – temperature high ([T0] ambient temperature/compressed air inlet temperatures)	Have it checked.	–	–	X

SW = Specialised workshop; KS = KAESER SERVICE

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
1232	Fault T2 – temperature high (T2 Compressed air discharge temperature)	Have it checked.	–	–	X
1233	Fault T2-T0 – temperature high. (Compressed air temperature between T2 and T0)	Have it checked.	–	–	X
1234	Fault T2-T0 - temperature low. (Compressed air temperature between T2 and T0)	Have it checked.	–	–	X
1235	Fault T3 – temperature high (T3 compressed air temperature)	Have it checked.	–	–	X
		Have the cooler cleaned.	–	–	X
1237	Fault T4 – temperature high (T4 compressed air temperature)	Have it checked.	–	–	X
1238	Fault M (T3, T4) temperature high. (Maximum temperature T3, T4)	Have it checked.	–	–	X
1239	Fault T4-T3 - temperature low. (Temperature between T4 and T3)	Have it checked.	–	–	X
1240	Fault T4.1 – temperature high (T4.1 compressed air temperature)	Have it checked.	–	–	X
		Have the cooler cleaned.	–	–	X
1241	Fault T66 – temperature high (T66 compressor oil temperature)	Have it checked.	–	–	X
1243	Fault T60 - temperature low (T60 compressor oil temperature)	Operate the machine with low temperature equipment (heaters). * Have it checked.	7.4	–	X

SW = Specialised workshop; KS = KAESER SERVICE

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
1244	Fault T5 – temperature high (T5 compressed air discharge temperature)	Have it checked.	–	–	X

SW = Specialised workshop; KS = KAESER SERVICE

Tab. 55 Alarm messages and actions concerning the compressor unit



* The fault can be "bridged":
- The fault message must be acknowledged.
- The fault is saved to the fault memory of the controller.

➢ Confirm the fault message with the «Acknowledgement» key:

- The «Acknowledgement» key flashes. The «Information» and «STOP» keys are illuminated.
- → Press «Acknowledgement» key.
- The fault is saved to the fault memory of the controller.
- The «Information», «Stop» and «Acknowledgement» keys are no longer illuminated.
- The machine can be started.

We urgently ask to refrain from this action because it could cause the destruction of some of the machine's components!

Message codes, range 1300 – 1399 “Controller faults”:

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
1300	Fault – PLC memory error. (Memory fault, controller)	Have it checked.	–	–	X
1301	PLC/GSM modem communication fault. (Fault in bus communication with modem)	Have it checked.	–	–	X
1302	Fault – PLC – HMI communication. (Bus communication with the operating unit)	Have it checked.	–	–	X
1303	Fault – PLC temperature high. (Temperature, controller)	Check setup conditions. Allow the machine to cool down.	5.2	–	–

SW = Specialised workshop; KS = KAESER SERVICE

PLC = Programmable Logic Controller; GSM = Global System for Mobile Communication; HMI = Human Machine Interface; IO-Module = IO Module; ECU = Electronic Control Unit; Watchdog = Function Monitoring

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
1304	Fault – PLC voltage supply. (Power supply, controller)	Have it checked.	–	–	X
1305	PLC / IO module communication fault. (Bus communication controller - IO module)	Have it checked.	–	–	X
1306	PLC / ECU communication fault. (Bus communication controller - engine)	Have it checked.	–	–	X
1307	IO module power supply fault.	Have it checked.	–	–	X
1308	IO module function fault - temperature.	Have it checked.	–	–	X
1309	IO module watchdog fault. (IO module function fault)	Have it checked.	–	–	X
1310	Fault - watchdog malfunction. (Controller function fault)	Have it checked.	–	–	X

SW = Specialised workshop; KS = KAESER SERVICE

PLC = Programmable Logic Controller; GSM = Global System for Mobile Communication; HMI = Human Machine Interface; IO-Module = IO Module; ECU = Electronic Control Unit; Watchdog = Function Monitoring

Tab. 56 Fault messages and actions concerning the controller

Message codes, range 1400 – 1499 “General faults”:

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
1400	Fault - EMERGENCY STOP.	Disengage «EMERGENCY STOP» push button.	8.2.11	–	–
		Have it checked.	–	–	X
1428	Fault - valve K2. (Oil mist outlet)	Have it checked and repaired.	–	–	X
1450	Fault - GSM module control locked.	Have the GSM modem unlocked.	–	–	X
1460	Fault - hydraulic oil filter clogged.	Have it replaced.	–	–	X

SW = Specialised workshop; KS = KAESER SERVICE

BAM = Separate operating manual for machine

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
1461	Fault - hydraulic oil level low.	Have the hydraulic oil checked and replenished, if necessary.	10.5.7	–	X
1462	Fault message T95 - temperature low (T95 - Hydraulic oil temperature)	Operate the machine with low temperature equipment (heaters). * Have it checked.	7.4	–	X
1463	Fault message T98 – temperature high. (T98 - Hydraulic oil temperature)	Have it checked.	–	–	X
1470	Fault - sensor B15 / p3. (B15 - pressure transducer, p3 - compressor air pressure)	Have it checked and repaired.	–	–	X
1471	Fault - sensor B16 / p4. (B16 - pressure transducer, p4 - compressor air pressure)	Have it checked and repaired.	–	–	X
1472	Fault - sensor B1 / p5. (B1 - pressure transducer, p5 - compressor air pressure)	Have it checked and repaired.	–	–	X
1473	Fault - sensor B17 / p66. (B17 - pressure transducer, p66 - compressor oil pressure)	Have it checked and repaired.	–	–	X
1474	Fault - sensor B18 / p63. (B18 - pressure transducer, p63 - compressor oil pressure)	Have it checked and repaired.	–	–	X
1475	Fault - sensor B13 / pN. (B13 - pressure transducer, pN network pressure)	Have it checked and repaired.	–	–	X
1480	Fault - sensor B80 / T0. (B80 - temperature sensor, T0 ambient temperature)	Have it checked and repaired.	–	–	X

SW = Specialised workshop; KS = KAESER SERVICE

BAM = Separate operating manual for machine

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
1481	Fault - sensor B82 / T2. (B82 - temperature sensor, T2 compressed air temperature)	Have it checked and repaired.	–	–	X
1482	Fault - sensor B83 / T3. (B83 - temperature sensor, T3 compressed air temperature)	Have it checked and repaired.	–	–	X
1483	Fault - sensor B84 / T4. (B84 - temperature sensor, T4 compressed air temperature)	Have it checked and repaired.	–	–	X
1484	Fault - sensor B85 / T5. (B85 - temperature sensor, T5 compressed air temperature)	Have it checked and repaired.	–	–	X
1485	Fault - sensor B86 / T66. (B86 - temperature sensor, T66 compressor oil temperature)	Have it checked and repaired.	–	–	X
1486	Fault - sensor B87 / T60. (B87 - temperature sensor, T60 compressor oil temperature)	Have it checked and repaired.	–	–	X
1487	Fault - sensor B90 / T4.1. (B90 - temperature sensor, T4.1 compressed air temperature)	Have it checked and repaired.	–	–	X

SW = Specialised workshop; KS = KAESER SERVICE

BAM = Separate operating manual for machine

Tab. 57 Fault messages and troubleshooting in "General faults"

***** The fault can be "bypassed":

- The fault message must be acknowledged.
- The fault is saved to the fault memory of the controller.

➢ Confirm the fault message with the «Acknowledgement» key:

- The «Acknowledgement» key flashes. The «Information» key and the «STOP» key are illuminated.
- → Press «Acknowledgement» key.
- The fault is saved to the fault memory of the controller.
- The «Information», «Stop» and «Acknowledgement» keys are no longer illuminated.
- The machine can be started.

We urgently ask to refrain from this action because it could cause the destruction of some of the machine's components!

9.2.2 Warning messages on the controller

The machine is not shut down.
The «Acknowledgement» key flashes. The «Information» key illuminates.

- In the case of an overheating warning, the machine switches automatically to IDLE to cool down.
- The warning message must be confirmed after remedying the fault.

Further information — Further information on the acknowledgement of warning messages can be found in chapter 8.5.

Information in ▭ corresponds to the positions in the flow diagram, chapter 4.3.2.

Message codes, range 3100 – 3199 “Engine warning":

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
3100	Warning message p76 - pressure low (p76 – Engine oil pressure)	Check the engine oil level.	10.4.4	–	–
		Have the engine oil pressure checked.	–	X	X
3101	Warning message p76 sensor is faulty. (p76 – Engine oil pressure)	Have the oil pressure sensor checked.	–	X	X

SW = Specialised workshop; KS = KAESER SERVICE
ECU - engine electronics; SCR - Selective Catalytic Reduction
UM SCM = Separate user manual for the SIGMA CONTROL SMART controller

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
3110	Warning message T70 – Temperature high (T70 - Coolant temperature)	Check the coolant level.	10.4.1	–	–
		Have the cooler cleaned.	–	–	X
		Have the coolant cooling checked.	–	X	X
3112	Warning message T70 sensor is faulty. (T70 - Coolant temperature)	Have the coolant temperature sensor checked.	–	X	X
3121	Warning message T73 – Temperature high (T73 - Turbo air temperature)	Check setup conditions. Allow the machine to cool down.	5.2	–	–
		Have the cooler cleaned.	–	–	X
		Have the charge air pressure sensor checked.	–	X	X
3122	Warning message p73 – Sensor is faulty. (p73 - Turbo air pressure)	Have the charge air pressure sensor checked.	–	X	X
3123	Warning message T73 – Sensor is faulty. (T73 - Turbo air temperature)	Have the turbo air temperature sensor checked.	–	X	X
3130	Warning – fuel level low.	Refuel.	–	–	–
3131	Warning message T75 – Temperature high (T75 - Fuel temperature)	Have fuel cooler checked and cleaned, if necessary	–	X	X
3132	Warning message p75 – Pressure high. (p75 fuel pressure)	Have it checked.	–	X	X
3133	Warning message T75 – Sensor is faulty. (T75 - Fuel temperature)	Have the fuel temperature sensor checked.	–	X	X
3134	Warning message p75 – Sensor is faulty. (p75 fuel pressure)	Have the fuel pressure sensor checked.	–	X	X
3136	Warning - fuel filter water level.	Empty the fuel filter (water separator).	10.4.3	–	–
3138	Warning message - floor pan liquid level.	Drain the liquid from the floor pan.	10.9	–	–

SW = Specialised workshop; KS = KAESER SERVICE

ECU - engine electronics; SCR - Selective Catalytic Reduction

UM SCM = Separate user manual for the SIGMA CONTROL SMART controller

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
3140	Warning - engine generator does not load.	Have the engine generator and the regulator checked.	–	X	X
3141	Warning - ECU power supply malfunctioning.	Have it checked.	–	X	X
3150	Warning - ECU miscellaneous error.	Have it checked.	–	X	X
3154	Warning – drive engine sensor fault.	Have engine electrics/ electronic systems checked.	–	X	X
3155	Warning - drive engine actuator fault.	Have it checked.	–	X	X
3161	Warning - speed sensors malfunctioning.	Have it checked.	–	X	X
3162	Warning - engine speed high.	Have it checked and adjusted.	–	X	X
3181	Warning – AdBlue level low	Fill AdBlue tank.	–	–	X
3182	Warning – torque reduction active.	Fill AdBlue tank.	–	–	X
3183	Warning – torque reduction next start.	Fill AdBlue tank.	–	–	X
3185	Warning - fault in exhaust gas treatment.	Have the exhaust gas treatment checked.	–	–	X
3186	Warning – exhaust gas treatment – temperature high.	Have the exhaust gas treatment checked.	–	–	X
3187	Warning – exhaust gas treatment – regeneration.	Have the exhaust gas treatment checked.	–	–	X
3188	Warning - standstill regeneration required.	Start the standstill regeneration.	UM SCM	–	–
3189	Warning – SCR catalytic converter system error.	Have it checked.	–	X	X
3191	Warning – AdBlue quality insufficient.	Have it checked. Have it changed if necessary.	–	X	X

SW = Specialised workshop; KS = KAESER SERVICE

ECU - engine electronics; SCR - Selective Catalytic Reduction

UM SCM = Separate user manual for the SIGMA CONTROL SMART controller

Tab. 58 Warning messages and measures relating to the engine

Message codes, range 3200 – 3299 “Compressor unit warnings”:

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
3205	Warning message p3 – pressure high (p3 - Compressor air pressure)	Have it checked.	–	–	X
3206	Warning message p3 - pressure low (p3 - Compressor air pressure)	Have it checked.	–	–	X
3207	Warning message p3 – pressure high IDLE. (p3 - Compressor air pressure)	Have it checked.	–	–	X
3208	Warning message p3 - pressure low LOAD. (p3 - Compressor air pressure)	Have it checked.	–	–	X
3211	Warning message p4 – pressure high IDLE. (p4 - Compressor air pressure)	Have it checked.	–	–	X
3212	Warning message p4 - pressure low LOAD. (p4 - Compressor air pressure)	Have it checked.	–	–	X
3213	Warning message p4 high pressure before start. (p4 - Compressor air pressure)	Have it checked.	–	–	X
3214	Warning message p4 – pressure high (p4 - Compressor air pressure)	Have it checked.	–	–	X
3215	Warning message p5– p4 - pressure low. (Compressor air pressure between p5 and p4)	Have it checked.	–	–	X
3216	Warning message p5- p4 - pressure high LOAD. (Compressor air pressure between p5 and p4)	Have it checked.	–	–	X

SW = Specialised workshop; KS = KAESER SERVICE

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
3218	Warning message [p66] – pressure high ([p66] Compressor oil pressure)	Have it checked.	–	–	X
3219	Warning message [p66] - pressure low ([p66] Compressor oil pressure)	Have it checked.	–	–	X
3220	Warning message [p63] – pressure high ([p63] Compressor oil pressure)	Have it checked.	–	–	X
3221	Warning message [p63] - pressure low ([p63] Compressor oil pressure)	Have it checked.	–	–	X
3222	Warning message [pN] – pressure inplausible. ([pN] Compressed air network pressure)	Have the compressed air connection line been checked.	–	–	X
3230	Warning message [T0] - temperature low ([T0] ambient temperature/compressed air inlet temperatures)	Check setup conditions.	5.2	–	–
		Have controller checked.	–	–	X
3231	Warning message [T0] – temperature high ([T0] ambient temperature/compressed air inlet temperatures)	Check setup conditions. Allow the machine to cool down.	5.2	–	–
		Have controller checked.	–	–	X
3232	Warning message [T2] – temperature high ([T2] Compressed air discharge temperature)	Have it checked.	–	–	X
3233	Warning message [T2]-[T0] – temperature high (Compressed air temperature between [T2] and [T0])	Have it checked.	–	–	X
3234	Warning message [T2]-[T0] - temperature low. (Compressed air temperature between [T2] and [T0])	Have it checked.	–	–	X

SW = Specialised workshop; KS = KAESER SERVICE

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
3235	Warning message T3 – temperature high (T3 compressed air temperature)	Have it checked.	–	–	X
		Have the cooler cleaned.	–	–	X
3236	Warning message T3-T2 – temperature high (Compressed air temperature between T3 and T2)	Have it checked.	–	–	X
3237	Warning message T4 – temperature high (T4 compressed air temperature)	Have it checked.	–	–	X
3238	Warning message M (T3, T4) temperature high. (Maximum temperature T3, T4)	Have it checked.	–	–	X
3240	Warning message T4.1 – temperature high (T4.1 compressed air temperature)	Have it checked.	–	–	X
		Have the cooler cleaned.	–	–	X
3241	Warning message T66 – temperature high (T66 compressor oil temperature)	Have it checked.	–	–	X
3242	Warning message T66 - temperature low (T66 compressor oil temperature)	Have it checked.	–	–	X
3243	Warning message T60 - temperature low (T60 compressor oil temperature)	Have it checked.	–	–	X
SW = Specialised workshop; KS = KAESER SERVICE					

Tab. 59 Warning messages and measures relating to the compressor

Message code range 3400 – 3499 “general warnings”:

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
3416	Warning message [B37] sensor is faulty. ([B37] - fuel level sensor)	Have it checked.	–	X	X
3429	Warning message - condensate drain 1st stage faulty.	Have it checked.	–	–	X
3430	Warning message - condensate drain 2nd stage faulty.	Have it checked.	–	–	X
3431	Warning message - short circuit valve [K18] (fan 1).	Have it checked and repaired.	–	–	X
3432	Warning message - short circuit valve [K18] (fan 1).	Have it checked and repaired.	–	–	X
3433	Warning message - short circuit valve [K19] (fan 2).	Have it checked and repaired.	–	–	X
3434	Warning message - short circuit valve [K19] (fan 2).	Have it checked and repaired.	–	–	X
3435	Warning message - valve (inlet valve) [K1] faulty.	Have it checked and repaired.	–	–	X
3436	Warning message - valve (oil return) [K3] faulty.	Have it checked and repaired.	–	–	X
3451	Warning message - external contact 1 faulty.	Have it checked and repaired.	–	–	X
3452	Warning message - external contact 2 faulty.	Have it checked and repaired.	–	–	X
3455	Warning message - exhaust valve stop "CLOSED" not reached	Have it checked.	–	–	X
3456	Warning message - exhaust valve stop "OPEN" not reached.	Have it checked.	–	–	X
3457	Warning message - exhaust valve position unknown.	Have it checked.	–	–	X
3461	Warning message - hydraulic oil level low.	Have it checked and replenished.	–	–	X
3462	Warning message [T95] - temperature low ([T95] - Hydraulic oil temperature)	Have it checked.	–	–	X

SW = Specialised workshop; KS = KAESER SERVICE

Code	Meaning (Note)	Action	See chapter	Where can I get help?	
				SW	KS
3463	Warning message T98 – temperature high (T98 - Hydraulic oil temperature)	Have it checked.	–	–	X
3490	Warning message B39 / T98 sensor is faulty. (B39 - level / temperature sensor, T98 - hydraulic oil temperature)	Have it checked.	–	–	X
3491	Warning message B39 level measuring faulty. (B39 - level / temperature sensor hydraulic oil)	Have it checked.	–	–	X
3492	Warning message B95 / T95 sensor is faulty. (B95 - temperature sensor, T95 - hydraulic oil temperature)	Have it checked.	–	–	X
3493	Warning message B38 sensor is faulty. (B38 - level sensor, engine oil)	Have it checked.	–	–	X
SW = Specialised workshop; KS = KAESER SERVICE					

Tab. 60 General warning messages and measures

9.3 Evaluating engine faults and alarms

9.3.1 Engine refuses to start or does not turn over

Possible cause	Measure	Where can I get help?	
		SW	KS
«EMERGENCY STOP» control device activated.	Unlatch the «EMERGENCY STOP» control device, see chapter 8.2.11.	–	–
Defective starter.	Have changed.	X	–
Engine electrical fault	Have repaired/changed.	X	–
Fuel tank empty.	Fill up the fuel tank	–	–
Airlock in the fuel line between fuel tank and injector pump.	Bleed the fuel line (see chapter 10.4.3).	–	–
Fuel filter clogged.	Clean or replace, see chapter 10.4.3.	–	–
Fuel line broken.	Have changed.	X	–
SW = Specialised workshop; KS = KAESER SERVICE			

Possible cause	Measure	Where can I get help?	
		SW	KS
Defective control fuse or relay.	Have repaired or replaced if necessary.	X	X
Discharge temperature too high.	Have it checked.	–	X
SIGMA CONTROL MOBIL defective.	Have repaired/changed.	–	X
Electrical connections and/or cables loose or broken	Tighten the connection or have the cable replaced.	X	–
Defective battery or low charge.	Maintain battery, see chapter 10.7.4.	–	–
Engine alternator defective.	Have changed.	X	–
Defective alternator regulator.	Have changed.	X	–
Oil pressure switch indicating insufficient oil pressure.	Check the engine oil level (see chapter 10.4.4).	–	–
	Have the engine repaired or exchanged.	X	–
SW = Specialised workshop; KS = KAESER SERVICE			

Tab. 61 Fault: engine refuses to start or comes to a stop.

9.3.2 Engine does not reach full speed

Possible cause	Measure	Where can I get help?	
		SW	KS
Airlock in the fuel line between fuel tank and injector pump.	Bleed the fuel line (see chapter 10.4.3).	–	–
Fuel filter clogged.	Clean or replace, see chapter 10.4.3.	–	–
Fuel line broken.	Have changed.	X	–
Engine electrical fault	Have repaired/changed.		–
SIGMA CONTROL MOBIL defective.	Have repaired/changed.	–	X
Torque reduction active.	Check/top up the reducing agent in the tank.	X	X
	Have the exhaust system checked.	X	X
SW = Specialised workshop; KS = KAESER SERVICE			

Tab. 62 Alarm: "engine does not reach full speed".

9.4 Analysing compressor faults and alarms

9.4.1 Working pressure too high

Possible cause	Measure	Where can I get help?
		KS
Inlet valve does not close, or closes only partially.	Repair or have replaced if necessary.	X
Pressure gauge indicating incorrect reading.	Have it repaired or replaced if necessary.	X
Venting valve does not blow off.	Check the connections and function and have it repaired or replaced as necessary.	X
KS = KAESER SERVICE		

Tab. 63 Fault: working pressure too high

9.4.2 Working pressure too low

Possible cause	Measure	Where can I get help?
		KS
Inlet valve not opening or only opening partially.	Repair or have it replaced if necessary.	X
Pressure gauge indicating incorrect reading.	Have it repaired or replaced if necessary.	X
Safety valve maladjusted and/or leaking.	Have it repaired or replaced if necessary.	X
Venting valve blowing off.	Check the connections and function and have it repaired or replaced as necessary.	X
Engine does not run at maximum speed (in LOAD mode).	See chapter 9.3	X
Engine air filter and/or compressor air filter clogged.	Clean or change, see chapters 10.4.2 and 10.5.6.	X
KS = KAESER SERVICE		

Tab. 64 Fault: working pressure too low

9.4.3 Safety valve blows off

Possible cause	Measure	Where can I get help?
		KS
Inlet valve does not close.	Check the controller, control line and inlet valve and replace if necessary.	X
KS = KAESER SERVICE		

Possible cause	Measure	Where can I get help?
		KS
Safety valve maladjusted and/or leaking.	Adjust or have it replaced if necessary.	X
KS = KAESER SERVICE		

Tab. 65 Fault: safety valve blowing off

9.4.4 Machine overheating

Possible cause	Measure	Where can I get help?
		KS
Defective fan wheel of machine. Fans are defective.	Have the blades or the complete fan wheel replaced. Have fans checked and repaired.	X
Oil cooler surface clogged.	Have the surface cleaned.	X
The working element of the combination valve not workingl.	Have repaired or replaced if necessary.	X
Cooling oil level (gear) too low:	Replenish, see chapter 10.5.2.	X
Oil pipes leaking.	Seal leaks or have pipes changed.	X
Engine coolant cooling or engine cooling fan defective.	Have it repaired.	X
Ambient temperature too high.	See installation conditions in chapter 5.2.	–
KS = KAESER SERVICE		

Tab. 66 Fault: machine overheating

9.4.5 Cooling oil leaking into the machine.

Possible cause	Measure	Where can I get help?
		KS
Oil cooler leaking.	Seal and have replaced, if necessary.	X
Leaking pipe joints.	Tighten the screw connections, have gaskets replaced.	X
KS = KAESER SERVICE		

Tab. 67 "Cooling oil in the machine" fault.

10 Maintenance

10.1 Ensuring safety

Follow the instructions below to ensure safe machine maintenance.
Warning instructions are displayed prior to a potentially dangerous task.



Disregarding warning instructions can cause serious injuries!

Compliance with safety instructions

Ignoring safety instructions can cause unforeseeable dangers.

- ➢ Follow the instructions in chapter 3 'Safety and Responsibility'.
- ➢ Allow maintenance work to be carried out only by authorised personnel.
- ➢ Do not reuse removed self-locking nuts but replace with new ones. The non-positive safety against loosening is no longer ensured when the nut is unscrewed.
- ➢ Use one of the safety signs below to advise others that the machine is currently being serviced:

Symbol	Meaning
	Do not switch on the machine.
	Warning: The machine is being serviced.

Tab. 68 Advise others that the machine is being serviced.

- ➢ Before switching on, make sure that:

- ■ nobody is working on the machine,
- ■ all protective guards and cover panels are attached,
- ■ all doors, canopy, and panels are closed,
- ■ all tools have been removed from the machine.

- ➢ Do not perform any checks or maintenance while the machine is running.

When working on live components

Touching voltage carrying components can result in electric shocks, burns or death.

- ➢ Work on electrical equipment may only be carried out by authorised electricians.
- ➢ Verify the absence of any voltage.
- ➢ If necessary, remove electrical connection cables.

When working on the compressed air system

Compressed air is contained energy. Uncontrolled release of this energy can cause serious injury or death. The following safety instructions relate to any work on components that could be under pressure.

➢ Disconnect the air consumers.

➢ De-pressurise all pressurised components and enclosures. Verify the vented state.

- Wait until the machine has automatically vented.
- Carefully open the compressed air outlet valve.
- Check: The pressure gauge must read 0 bar!

➢ Do not open or dismantle any valves.

➢ When operating the machine on a compressed air system, close shut-off valves or otherwise isolate the machine from the compressed air system to ensure that no compressed air can flow back into the machine.

When working on the drive system

Touching rotating, very hot or current-carrying components can cause severe injuries.

➢ Shut down the machine before opening any doors/canopy.

➢ Turn off the «battery isolating switch».

➢ Ensure that the machine has cooled down.

➢ Do not open the doors or panels while the machine is switched on.

Further information

Information regarding authorised personnel can be found in chapter 3.4.2.

Information regarding dangers and their avoidance can be found in chapter 3.5.

10.2 Note the maintenance messages on the controller

The SIGMA CONTROL MOBIL displays selected maintenance intervals. The display begins 25 operating hours before the maintenance interval will expire.

When the machine is switched on, the «Information» key illuminates. The «Acknowledge» key flashes.

➢ Read the message code from the controller's display.

10.2.1 Evaluating the maintenance message

➢ Use the following table to determine the maintenance tasks due and perform the tasks according to the Maintenance Table in chapter 10.3.3 or have it performed by an authorised KAESER SERVICE technician.

Code	Meaning	Remedy	Note
Message code, range 2100 – 2199 “engine maintenance”			

Code	Meaning	Remedy	Note
2100	Maintenance message drive engine - renew oil filter	Change the engine oil filter (see chapter 10.4.6),	Please contact KAESER SERVICE.
2101	Maintenance message drive engine - clean/replace air filter.	Clean or change air filter, see chapter 10.4.2.	
2102	Maintenance message drive engine - change the oil	Have the the engine oil changed.	
Message codes, range 2200 – 2299 “compressor unit maintenance”			
2200	Maintenance message compressor - renew cooling oil and oil filter.	Change the oil filter (see chapter 10.5.3).	Please contact KAESER SERVICE.
2201	Maintenance message compressor - clean/replace the air filter.	Clean or change air filter, see chapter 10.5.6.	
2202	Maintenance message compressor - change the cooling oil.	Have the cooling oil changed.	
Message codes, range 2400 – 2499 “general warnings”:			
2460	Maintenance message - replace the hydraulic oil filter.	Have the hydraulic oil filter replaced.	Please contact KAESER SERVICE.
2461	Maintenance message - replace the hydraulic oil.	Have the hydraulic oil replaced.	

Tab. 69 Maintenance messages and required actions

10.2.2 Concluding the maintenance

Acknowledge the maintenance message:

Precondition Maintenance has been carried out.

➢ Acknowledge the maintenance message as described in chapter 8.5.

Resetting the maintenance interval counter

Precondition Maintenance is carried out and
the maintenance message is acknowledged.

➢ Reset the maintenance timer as described in the separate operating manual for the SIGMA CONTROL MOBIL controller, chapter “Reset maintenance timer”.

10.3 Following the maintenance plans

10.3.1 Logging maintenance work

The maintenance intervals given are those recommended for KAESER original components with average operating conditions.

➢ In adverse conditions (e.g. oil and filter changes), perform maintenance work at shorter intervals.

Adverse conditions are, e.g.:

- poor fuel quality
- high/low temperatures
- much dust
- frequent use

➢ Adjust the maintenance intervals with regard to local installation and operating conditions.

➢ Logging all maintenance work.

This enables the frequency of individual maintenance tasks and deviations from our recommendations to be determined.

Further information A list is given in chapter 10.10.

10.3.2 Regular maintenance tasks

The following table lists the various maintenance intervals for the machine.

Maintenance interval	Short description
Daily	–
Every 500 h, at least annually	A500
Every 1000 h, at least annually	A1000
Every 2500 h, at least every two years.	A2500
Every 3000 h, at least every 2 years	A3000
Every 5000 h, at least every 3 years	A5000
Every 6000 h, at least every 3 years.	A6000
Every 7500 h, at least every five years.	A7500
Every 12000 h, at least every 6 years	A12000
Every 15000 h, at least every six years.	A15000

Tab. 70 Maintenance intervals and regular maintenance tasks

The table below lists regular maintenance tasks.

1. Carry out maintenance tasks punctually taking ambient and operating conditions into consideration.
2. Change consumables and operating fluids according to each site.

10.3.3 Machine maintenance schedule

➢ Carry out engine maintenance tasks according to the following schedule:



The maintenance work marked with (*) in the tables must additionally be carried out every 6 months if the annual operational performance is more than 500 operational hours.

Engine maintenance:

Assembly: Task	Daily	A500	A1000	A2500	A3000	A5000	A6000	A7500	A12000	A15000	See chapter	Note
Engine:												
Check the engine oil level.	X										10.4.4	
Check the engine coolant level.	X										10.4.1	
Fill up the fuel tank.	X											
Empty the fuel dual filter (water trap).	X										10.4.3.3	
Empty the fuel prefilter (water separator).	X										10.4.3.4	
Display SCM: Compressor air filter maintenance.		X									10.4.2	KS
Have the engine belt checked and replaced, if necessary.		X										KS
Check the battery electrolyte level and maintain the connections.		X									10.4.7	
Check and replenish the coolant.		X									10.4.1	KS
Add coolant refresher.							X				10.4.1	KS; SW
Change the coolant.									X		10.4.1	KS; SW (Pos5195)
Have coolant cooler checked/ cleaned.		X										KS (Pos5170)
Have the charge air cooler checked and cleaned, if necessary.		X										KS (Pos5180)
Have the fuel return cooler checked and cleaned.		X										KS (Pos7935)

KS = call KAESER SERVICE

SCM = SIGMA CONTROL MOBIL controller; CAT = serviced by the representative of the engine manufacturer (Zeppelin Power Systems)

DPF = Diesel particulate filter; SCR = Selective Catalytic Reduction

Pos = Item number in the service replacement part lists in chapter 11.4.

Assembly: Task	Daily	A500	A1000	A2500	A3000	A5000	A6000	A7500	A12000	A15000	See chapter	Note
Clean the tank strainer.		X										
Have tank checked and cleaned, if necessary.		X										KS
Have the spark arrestor blown out with compressed air.		X									10.4.8	KS
Have the valve plates checked.				X								CAT
Have the valve clearance checked and adjusted.				X								CAT
Have the air disconnect device (engine air shut-off valve) checked.				X								CAT
Have the starter checked.						X						KS
Have the engine support checked.		X										KS
Display SCM: Have the engine oil changed(*).		X										KS (Pos1925)
Display SCM: Replace the engine oil filter(*).		X									10.4.6	KS (Pos1905)
Replace the fuel double filter (pre-filter)(*).		X									10.4.3.3	(Pos1915)
Replace the fuel prefilter(*).		X									10.4.3.4	(Pos1985)
Replace the fuel filter(*).		X									10.4.3.5	(Pos1920)
Have the venting filter for the engine oil auxiliary tank replaced.				X								KS
Have the venting filter for the fuel tank replaced.				X								KS
Have the filter for crankcase venting replaced.			X									KS
Display SCM: Replace the engine air filter.			X								10.4.2	KS (Pos1280)
Have the fuel venting pump replaced.						X						CAT
Have the roll-over valve for the tank ventilation replaced.								X				KS

KS = call KAESER SERVICE

SCM = SIGMA CONTROL MOBIL controller; CAT = serviced by the representative of the engine manufacturer (Zeppelin Power Systems)

DPF = Diesel particulate filter; SCR = Selective Catalytic Reduction

Pos = Item number in the service replacement part lists in chapter 11.4.

Assembly: Task	Daily	A500	A1000	A2500	A3000	A5000	A6000	A7500	A12000	A15000	See chapter	Note
Have the proximity switch for fuel selector checked.		X										KS
Have the proximity switch fuel selector replaced.								X				KS (Pos3832)
Have the engine belt replaced.								X				KS (Pos1800)
Have the drive belt checked and replaced, if necessary.		X										KS
Have the V belt replaced.								X				KS (Pos4470)
Exhaust gas treatment with diesel particulate filter:												
Check the exhaust system and the components of the exhaust gas treatment system for leaks.	X											
Have the spark plug for diesel particulate filter replaced.						X						CAT
Have the diesel particulate filter cleaned/replaced.						X						CAT
Exhaust gas treatment with SCR catalytic converter:												
Fill the reduction agent tank.	X											
Have the SCR system checked/ serviced.		X										CAT
Replace the filter insert for the reduction agent pump.		X										CAT
KS = call KAESER SERVICE SCM = SIGMA CONTROL MOBIL controller; CAT = serviced by the representative of the engine manufacturer (Zeppelin Power Systems) DPF = Diesel particulate filter; SCR = Selective Catalytic Reduction Pos = Item number in the service replacement part lists in chapter 11.4.												

Tab. 71 Regular maintenance tasks on the engine

➢ Carry out machine maintenance tasks according to the following schedule:

Maintenance tasks on the machine:

Assembly: Task	Daily	A500	A1000	A2500	A5000	A7500	A15000	A36000	See chapter	Note
Compressor:										
Check the cooling oil level.	X								10.5.1	
Have the solenoid valve for the condensate drain checked.		X								KS
Have gear oil cooler checked and cleaned, if necessary		X								KS
Have the intake hose checked.		X								KS
Display SCM: Compressor air filter maintenance		X							10.5.6	
Have the coupling for the drive engine checked.			X							KS
Display SCM: Change the compressor air filter.			X						10.5.6	(Pos1260)
Have the check valve for the condensate drain replaced.				X						KS (Pos2135)
Have the solenoid valve for the condensate drain replaced.				X						KS (Pos2490 + 6464)
Have the pulse damper check valve checked.				X						KS (Pos2125 + 2128)
Display SCM: Transmission: Change the oil filter.			X						10.5.3	KS (Pos1210)
Have the fan for the engine coupling replaced.					X					KS (Pos4915)
Change the filter for gear ventilation.					X				10.5.4	KS (Pos1551 + 1548)
Change the control air filter.						X			10.5.5	KS (Pos1556 + 1547)

KS = contact KAESER SERVICE; SCM = SIGMA CONTROL MOBIL controller

Pos = Item number in the service replacement part lists in chapter 11.4.

Assembly: Task	Daily	A500	A1000	A2500	A5000	A7500	A15000	A36000	See chapter	Note
Display SCM: Transmission: Have the cooling oil changed.					X					KS (Pos1610)
Have the heating for the oil circuit of the compressor checked.			X							KS
Have the heating for the condensate separation checked.		X								KS
Hydraulics:										
Check the hydraulic oil level.	X								10.5.7	
Have the hydraulic oil checked.			X							KS
Display SCM: Have the hydraulic oil replaced.				X						KS (Pos1620)
Display SCM: Have the hydraulic oil return filter checked.			X							KS (Pos1562)
Have the fan for the hydraulic system replaced.						X				KS (Pos4920)
Have hydraulic oil cooler checked and cleaned, if necessary.		X								KS
Have the heating for the hydraulic oil tank checked.		X								KS
Safety functions:										
Check the EMERGENCY STOP device.	X								10.8.1	
Check the EMERGENCY STOP device for correct functioning.		X								KS; SW
Have the safety valve(s) checked.		X							10.8.2	KS
Have the function of the safety shut-down at excessive temperature checked.		X							10.8.3	KS
Bodywork/chassis:										
Check all screw connections, hinges, locks, handles and snap fasteners of the doors for wear and secure seat.		X								
Grease the door hinges.		X								

KS = contact KAESER SERVICE; SCM = SIGMA CONTROL MOBIL controller

Pos = Item number in the service replacement part lists in chapter 11.4.

Assembly: Task	Daily	A500	A1000	A2500	A5000	A7500	A15000	A36000	See chapter	Note
Carry out rubber sealing strip maintenance.		X							10.7.4	
Pipes and hose lines (fuel hoses, pressure hoses):										
Check all pipes and hose lines of machine for proper seating, leaks and wear; have them replaced if necessary.		X							10.6	KS
Have the fuel lines of the drive engine replaced.								X	10.6.1	KS
Have the pressure hoses of the drive engine replaced.								X	10.6.2	KS
Have the pressure hoses of the compressor replaced.								X	10.6.3	KS
Other maintenance tasks:										
Have the wireless remote control checked.		X								KS
Check the machine interior for liquid accumulations and drain, if required.	X								10.9	
Check that all electrical connections are tight.		X								KS
Prior to stepping on the roof, and when necessary, clean the anti-slip mats and check them for damage.	X									
KS = contact KAESER SERVICE; SCM = SIGMA CONTROL MOBIL controller Pos = Item number in the service replacement part lists in chapter 11.4.										

Tab. 72 Regular machine maintenance tasks

Further information Further information on the change intervals and maintenance packages of the SERVICE is provided in the Annex, chapter 13.10 "MOBILAIR service intervals".

10.3.4 Chassis maintenance schedule

The following table lists the maintenance intervals for the chassis.

➢ Carry out maintenance tasks according to the following schedule:

Component: Task	A500	see chapter	Note
Wheels/axles:			
Check the wheels' condition.	X		KS
Check the axle for deformation and cracks.	X		KS
Grease axles and wheels.	X	10.7	KS
Tow bar:			
Have the towing mechanism checked.		10.7.2	KS
Have the safety catch maintained.	X	10.7.2	KS
Clean and oil the bearing parts.	X		KS
Parking brake:			
Service the parking brake.	X	10.7.3	KS
Have the parking brake checked and adjusted.	X		KS
General:			
Tighten screw connections.	X		KS
Have the chassis and the steering system checked and serviced.	X		KS
KS = call KAESER SERVICE			

Tab. 73 Regular chassis maintenance tasks

10.3.5 Carry out regular inspections



The user is responsible for ensuring that the following components and assemblies are regularly inspected for wear and damage (according to national and application-specific regulations).

- Crane suspension
- Service Manager
- Anchoring points for attaching the personal protective equipment
- Anti-slip mats on walkable roof
- Strapping points for attaching the transport securing device

➢ The user is responsible for ensuring that the crane suspension and all add-on components and equipment required to step on the roof are regularly inspected for wear and damage (according to national and application-specific regulations).

Further information See also Chapter 3.4.4 “Adherence to inspection schedules and accident prevention regulations” for more information.

10.3.6 Regular service tasks

The table below lists necessary service tasks.

Maintenance interval	Short description
Every 2500 h, at least every two years.	A2500
Every 5000 h, at least every four years.	A5000
Every 7500 h, at least every six years.	A7500
every 15000 h, at least every twelve years or after the consumption of 760000 litre of fuel	A15000

Tab. 74 Maintenance interval, regular service tasks

➢ Have an authorized KAESER SERVICE technician carry out service tasks.

The table below lists necessary service tasks.

1. Have service tasks carried out punctually taking ambient and operating conditions into account.
2. Change spares for service according to each site.

Task	A2500	A5000	A7500	A15000	Note
Have the following valves serviced/replaced: ■ Check valve for condensate drain ■ Shut-off valve for condensate drain ■ Shut-off valve for condensate drain hose	X				KS
KS = call KAESER SERVICE; CAT = serviced by the representative of the engine manufacturer (Zeppelin Power Systems)					

Task	A2500	A5000	A7500	A15000	Note
Have the following valves serviced/replaced: ■ Inlet valve ■ Pressure-reducing valve ■ Overflow valve ■ Combination valve ■ Check valves – Pulsation damper – Hydraulic system – Condensate drain ■ Solenoid valves – Auxiliary oil tank – Ventilation filter, gearbox – Inlet valve regulation ■ Hydraulic-oil thermostat ■ Control valves			X		KS
Have the temperature sensor changed.			X		KS
Have the venting silencer changed.			X		KS
Have hose lines replaced. ■ Pressure lines ■ Control air lines ■ Fuel lines			X		KS
Have the engine refurbished.				X	CAT
KS = call KAESER SERVICE; CAT = serviced by the representative of the engine manufacturer (Zeppelin Power Systems)					

Tab. 75 Regular service tasks at the machine

10.4 Engine maintenance

➤ Perform maintenance tasks according to the schedule in chapter 10.3.3.

10.4.1 Maintaining the coolant cooler

Material
Coolant: CAT ELC
Coolant refresher: CAT ELC Extender
Coolant tester
Funnel
Cleaning cloth

Precondition
The machine is switched off.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
The machine has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.



WARNING
Danger of scalding from hot coolant!
Serious injuries can be caused by hot coolant.
➢ Let the machine cool down before opening the cooling system.



CAUTION
Risk of chemical burns from coolant containing antifreeze!
➢ Avoid eye and skin contact with coolant. If the eyes are affected, rinse immediately with running water.
➢ Wear protective glasses and gloves.



NOTICE
Insufficient coolant can damage the machine!
Insufficient coolant will cause the engine to overheat. Overheating can cause serious damage to the engine.
➢ Check the coolant level daily.
➢ Top up the coolant as necessary.

➢ Open both rear doors on the left side.

10.4.1.1 Checking coolant level

The coolant level in the engine cooling circuit must be checked daily prior to start-up.

Use the sight glass of the coolant expansion tank to check the coolant level. The coolant must be visible in the sight glass.

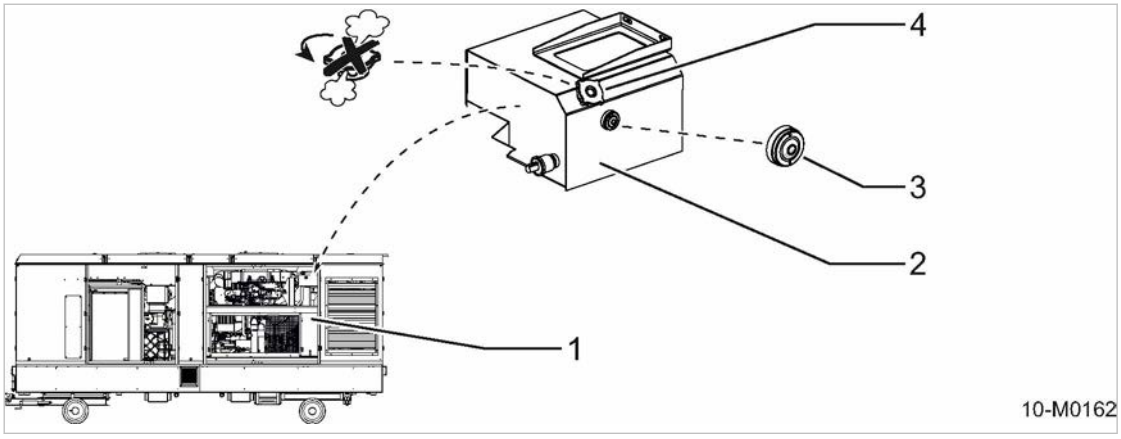


Fig. 56 Check the coolant level

1	Machine, left side doors are opened	3	Coolant level sight glass
2	Coolant expansion tank	4	Filler neck with cap

1. Check coolant level.
   If you cannot see coolant in the sight glass: Replenish the coolant.
2. Close the doors.

Have the cause for the coolant loss determined and rectified.

10.4.1.2 Checking the coolant

The coolant should be checked according to the maintenance schedule to ensure quality and operational life.

Coolant quality can be determined by the following parameters:

- Visual check
- Antifreeze concentration measuring

1. Slowly and carefully open the cap on the coolant filler neck to allow pressure to escape.
2. Then remove the filler cap completely.

Performing visual check:

The coolant should be checked for its colour and any particles or sediments floating in it.

➢ Take a coolant sample and analyse.
   The coolant is badly discoloured and/or contains floating particles: Change the coolant.

Perform antifreeze concentration measuring:

An instrument (e.g. refractometer) is used to check the antifreeze concentration of the coolant.

Maximum frost protection is ensured with an antifreeze concentration of 55% volume, as frost protection and heat transfer properties deteriorate beyond this point. Higher concentrations also lead to higher operating temperature.



1. **CAUTION!**
   The engine can be damaged if the antifreeze concentration is insufficient!
   Corrosion
   Damage to the cooling system
   Engine casing fracture
   - ➢ Check coolant.
   - ➢ Protect the coolant against freezing.
   - ➢ Top up immediately if necessary.
2. Use the coolant tester as instructed by the manufacturer to test the coolant.
   Concentration of antifreeze is too low: Change the coolant.

Performing final work steps:

1. Replace the cap in the filler port.
2. Close the doors.

10.4.1.3 Filling and topping up the coolant

The percentage of antifreeze in the coolant should not fall below 33% to ensure optimal frost and corrosion protection and prevent the build-up of deposits (sludge) in the cooling circuit. Topping up with water alone dilutes the antifreeze concentration and is forbidden.

For reasons of corrosion protection and the need to raise the boiling point, the coolant must remain in the cooling system throughout the year.

CAT ELC is available as a ready-to-use mixture with 50 percent of distilled water.

The maximum permissible coolant life is 12000 operating hours or 6 years. After 6000 operating hours or 3 years, a refresher must be added to the coolant.



Make sure that there is sufficient room for the coolant to expand without overflowing when hot!

Precondition The «battery isolating switch» is turned off.

1. Slowly and carefully open the cap on the coolant filler neck to allow pressure to escape.
2. Then remove the filler cap completely.
3. Top up the coolant level to not higher than 3 cm below the filling neck.
   The coolant must be visible in the sight glass.
4. Replace the cap in the filler port.
5. Open both doors at the rear of the machine.
6. Turn on the «battery isolating switch».
7. Close all the doors.
8. Start the engine and allow to IDLE for about 1 minute.
9. Stop the engine.
10. Open both rear doors on the left side.
11. Check the coolant level.
    If the coolant level in the coolant expansion tank has decreased: Top up the coolant.
12. Visually inspect for leaks.
13. Close the doors.

10.4.1.4 Adding coolant refresher

After half of the utilisation time of the extended life coolant CAT ELC, the refresher CAT ELC Extender must be added to the cooling system. It is used to regenerate the coolant properties of CAT ELC, accordingly extending the coolant's service life.

CAT ELC Extender is added to the cooling system after half of the utilisation time of extended life coolant CAT ELC.

➢ Determine the amount of coolant refresher required.

Further information See table 31 for the fill quantity of the coolant refresher.

If required:

- Make sure that there is sufficient room for the coolant to expand without overflowing when hot.
- ➢ Check the coolant level in sight glass of the coolant expansion tank.
- ➢ Drain the corresponding amount of coolant to allow for coolant refresher to be added.

1. Filling in coolant refresher.
2. Check coolant level.

10.4.1.5 Draining and replacing coolant

➢ The draining and/or replacement of coolant should be performed by an authorised KAESER Service.

For cooling systems that are already filled with CAT ELC you do not need to use any cleaning agents when the coolant change is due. Cleaning agents are only required if the system has been contaminated by adding a different coolant or by damaging the cooling system. Only use clean water for rinsing.

➢ Dispose of used coolant and coolant-contaminated working materials according to applicable environmental protection regulations.

10.4.2 Engine air filter maintenance

Clean the air filter as per the maintenance table but at the latest when the controller displays the corresponding maintenance message.

The air filter element consists of the following components:

- Filter element (primary filter)
- Safety element (secondary filter)

With correct cleaning, the filter element can be reused several times; however, it must be replaced after every 1000 operating hours but at least once every year.

The safety element cannot be cleaned and should be replaced after 1000 operating hours, at least once a year.

- Operating the engine without an air filter element is not permitted!
- Do not use a filter element with damaged folds or gasket.
- The use of an unsuitable air filter can permit dirt to enter the engine and cause premature wear and damage.

Material
Compressed air for blowing out
Spare parts (as required)
Cleaning cloth

Precondition
The machine is switched off.
The machine is fully vented, the pressure gauge reads 0 bar.
The machine has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.

NOTICE
Damaged air filter element.
Wear in the engine from intake of contaminated air.
- ➢ Do not try to clean the filter element by striking or knocking it.
- ➢ Do not wash the filter element.

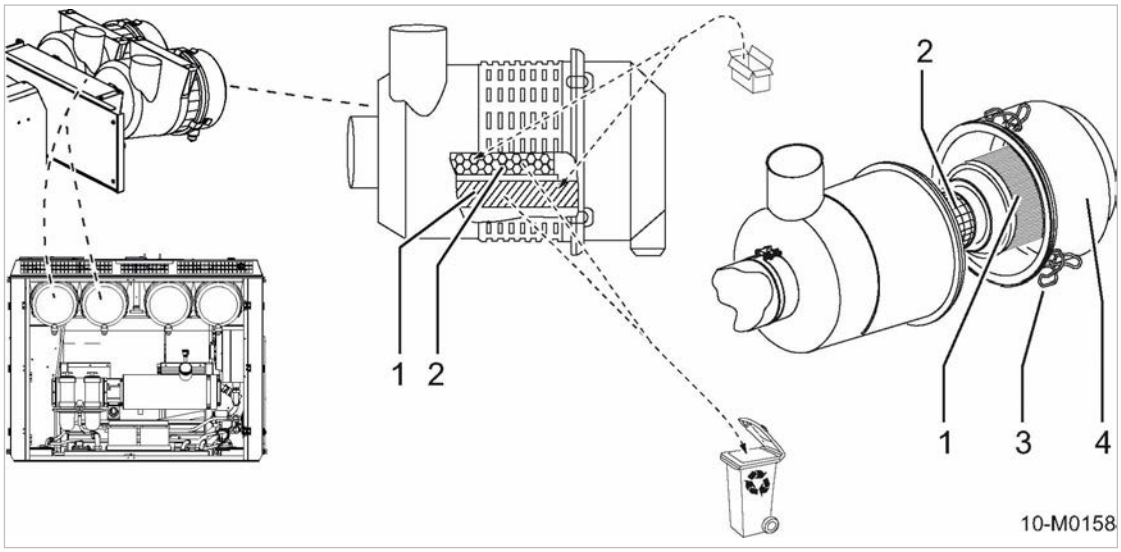


Fig. 57 Engine air filter maintenance

[1] Filter element (primary filter, main element)
[2] Safety element (secondary filter)
[3] Retaining clip
[4] Filter cap

Analyzing the warning message on the controller

The air filter is connected by a sensor to the controller. The controller returns a warning message with rising degree of contamination in the air filter.

- It displays *Air filter engine intake maintenance* on the controller display.
- The «Information» key illuminates.
- The «Acknowledgement» key flashes.

When this warning message appears, a maintenance of the engine air filter becomes necessary.

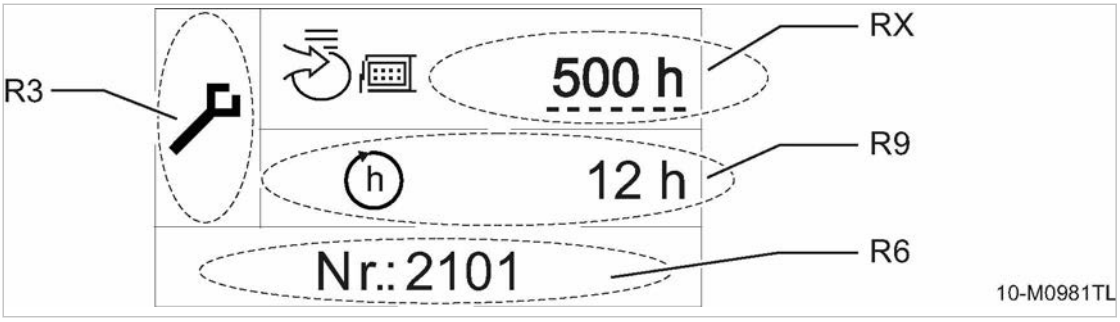


Fig. 58 Warning messages: Air filter engine intake maintenance

R3 Event memory category: Maintenance
R6 Message codes
R9 Time when maintenance is due.
RX Maintenance interval

➢ Maintain the filter.
➢ Open both doors at the rear of the machine.

Air filter maintenance (cleaning the filter element)

These tasks must be carried out **each** time the air filter is maintained.

1. Release the retaining clip. Remove the filter cap and take out the filter element.
2. Carefully clean the inside of the housing, the cover and sealing faces with a damp cloth.

When cleaning the filter housing, do not remove the safety element!

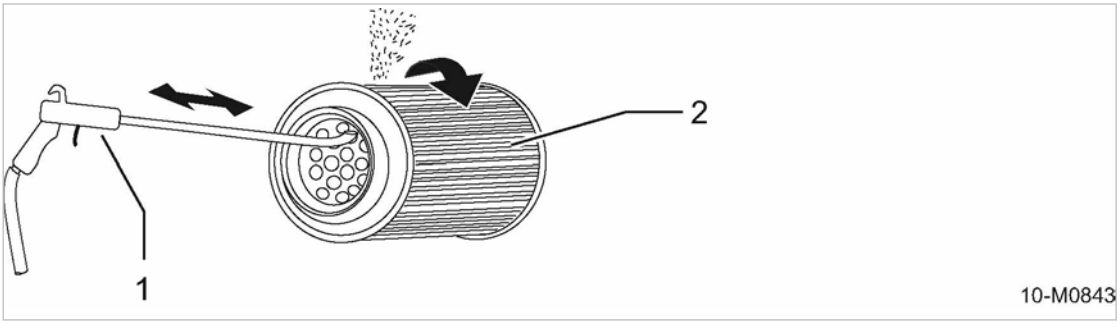


Fig. 59 Cleaning the filter element

1 Compressed air gun with blast pipe (bent to approx. 90° at the end)
2 Filter element

3. Cleaning the filter element:
   - Use dry compressed air (≤ 5 bar!) at an angle to blow dust from the element from inside to outside until no further dust develops.
   - The blast pipe must be long enough to reach the bottom of the element.
   - The tip of the blast pipe must not touch the filter element.
   - Cleaning sealing faces.
4. Inspect the element carefully for any damage.
   Damaged filter element: Replace filter element.
5. Insert the cleaned or new filter element into the filter housing. Make sure it is properly in place and sealed by its gaskets.
6. Replace the cap and secure with the clips.

Replacing the safety element:

These tasks must be carried out every **third** time the air filter is maintained.

1. Remove the safety element and dispose of it.
2. Use duct tape to seal off the engine intake port to prevent ingress of dirt.
3. Remove the tape after the filter housing has been cleaned.
4. Fit the new safety element.
5. Insert the cleaned or new filter element into the filter housing.
6. Check that the filter element and safety element are properly seated and their gaskets sealed.

➢ Close the doors.

Concluding the maintenance:

Maintenance must be acknowledged after the air filter has been maintained.



For more information about acknowledging the maintenance message and resetting the maintenance timer, see the separate operating manual of the SIGMA CONTROL MOBIL

Precondition Air filter maintained

1. Acknowledge the maintenance message.
   - Confirm the message with the «Acknowledge» key.
   - The «Acknowledge» key is extinguished but the «Information» key is still illuminated.
2. Resetting the maintenance interval counter.
   - Simultaneously press and hold the «Acknowledge» and «ENTER» keys for 2 seconds.
   - The system will automatically display the input menu for the password if no password is active.
   - Password (for example: Customer password: 4512) enter and confirm with the keypad.
   - Simultaneously press and hold the «Acknowledge» key and «ENTER» for 2 seconds.

Result The maintenance interval counter is reset and the «Information» key extinguishes.



Dispose of old parts and contaminated materials according to applicable environmental regulations.

10.4.3 Fuel system maintenance

Make sure no dirt enters the fuel system during maintenance. Clean components and their surroundings before dismounting.



Tighten the components only manually, do not use tools!

Material
Spare parts
Collecting vessel
Cleaning cloth

Precondition
The machine is switched off.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
The machine has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is turned off.



DANGER
Fire hazard from spontaneous ignition of fuel!
Serious injury or death could result from the ignition and combustion of fuel.
- ➢ Allow no open flames or sparks at the place of use.
- ➢ Ensure that the maximum ambient temperature is not exceeded at the place of use.
- ➢ Shut down the engine.
- ➢ Wipe up escaped fuel.
- ➢ Keep fuel away from hot machine parts.

➢ Open both rear doors on the right side.

10.4.3.1 Bleeding the fuel system

Air can enter the fuel system if the fuel tank is empty after a fuel filter change or when carrying out work on the fuel lines.
If the engine refuses to start despite a full tank, bleed the fuel system.



Do not fill the fuel prefilter and/or fuel filter with fuel. The fuel is unfiltered and may be contaminated. In order to facilitate the venting process, fill fuel in the fuel double filter.

Ventilation with electric pump at the fuel prefilter:

The system is vented by activating an electric fuel pump at the prefilter.

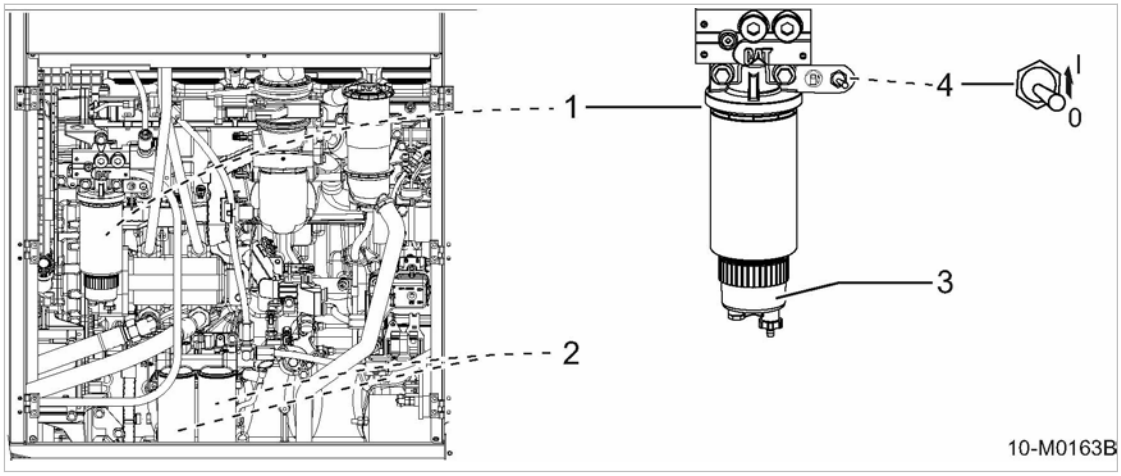


Fig. 60 Ventilation with electric pump at the fuel prefilter

[1] Fuel prefilter with integrated water separator and electric fuel pump
[2] Fuel filter
[3] Collection pan, water trap
[4] Switch «Fuel pump»
0 - Pump “OFF”
I - Pump “ON”

1. Turn on the «battery isolating switch».
2. Hold the «Fuel pump» switch for two minutes in the "ON" position.
   Upon release, the switch automatically returns to the "OFF" position.
3. At the transparent water trap, check whether the separator tank is filled with fuel.
   Repeat the procedure if the separator tank is not filled with fuel.
   The engine can be started as soon as the separator tank is filled with fuel.
4. Close all doors.

In the event that the engine starts but runs untrue or back-fires, operate in IDLE until it runs true. Continue for some minutes to run the engine in IDLE when the engine is running true.
If the engine cannot be started or if it continues to back-fire or starts to smoke, repeat the ventilation procedure.

10.4.3.2 Fuel water trap – analysing the warning message

The following fuel filters in the machine are fitted with water traps:

- Both filters of the fuel double filter
- Fuel prefilter

The aforementioned fuel filters are fitted with integrated water traps. Water, being denser than diesel fuel, sinks to the bottom of the water trap.

The water traps are connected to the controller via sensors. If the water in the traps reaches a set level, the controller displays a warning.

- The display indicates water in the fuel filter by returning *Fuel filter water level*.
- The «Information» key illuminates.
- The «Acknowledgement» key flashes.

Upon display of this warning message, you must immediately check the water traps of the fuel filters, and empty the traps of contamination.

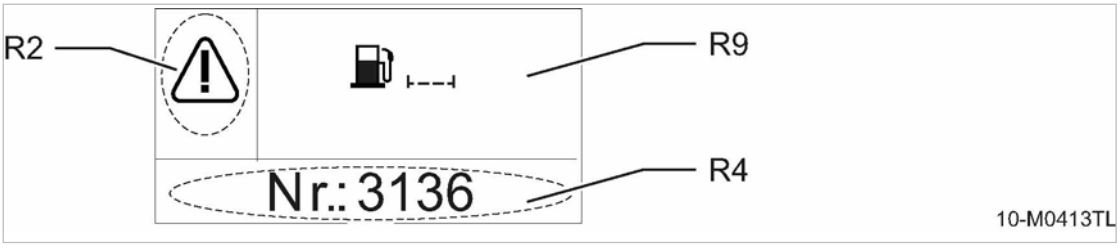


Fig. 61 Warning message: Fuel filter water level

[R2] Event memory category: Warning
[R4] Message codes
[R9] Fuel filter water level (fuel filter maintenance)

➢ Check the water traps of thew fuel filters for contamination and empty, if necessary.
- Fuel dual filter: For the procedures to check and empty the water traps, please see section 10.4.3.3
- Fuel prefilter: For the procedures to check and empty the water traps, please see section 10.4.3.4

Maintenance must be acknowledged after the water trap(s) has/have been emptied.

10.4.3.3 Fuel dual filter maintenance

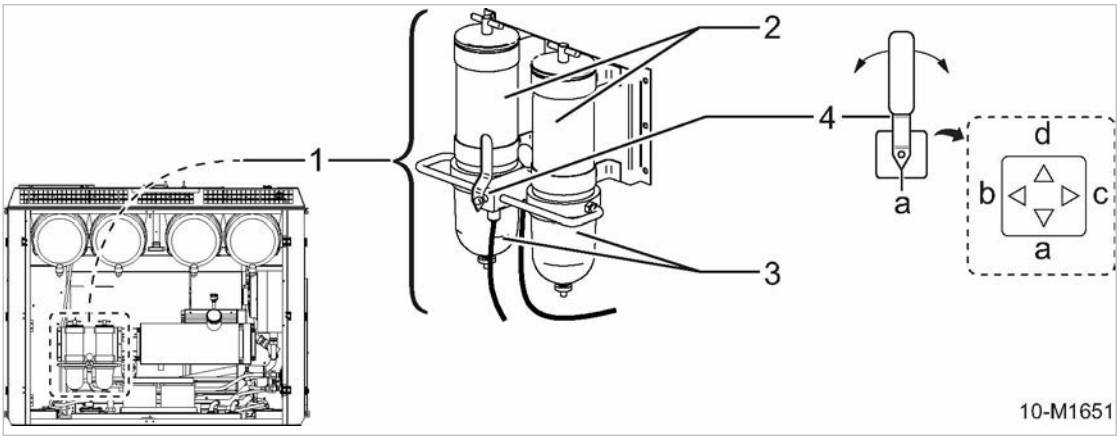


Fig. 62 Select the fuel dual filter

[1] Fuel dual filter
[2] Filter element
[3] Water trap
[4] Selection lever (filter selection)
a- both filters in operation
b- only left filter in operation
c- only right filter in operation
d- no filter selected (fuel stop)

➢ Open both doors at the rear of the machine.

Selecting the fuel filter

In standard operation, both filters should be used simultaneously (lever position: *a*). However, you have the option to separate one of the filters from the fuel circuit (lever position: *b* or *c*). this may be necessary when replacing the filter elements, for example.

With lever position: *d*, the fuel circuit is interrupted. The engine stops or won't start.

➢ Select a fuel filter for operation.

Checking/emptying the water trap:

Water, being denser than diesel fuel, sinks to the bottom of the water trap. The presence of water can be verified by its different colour to the fuel.

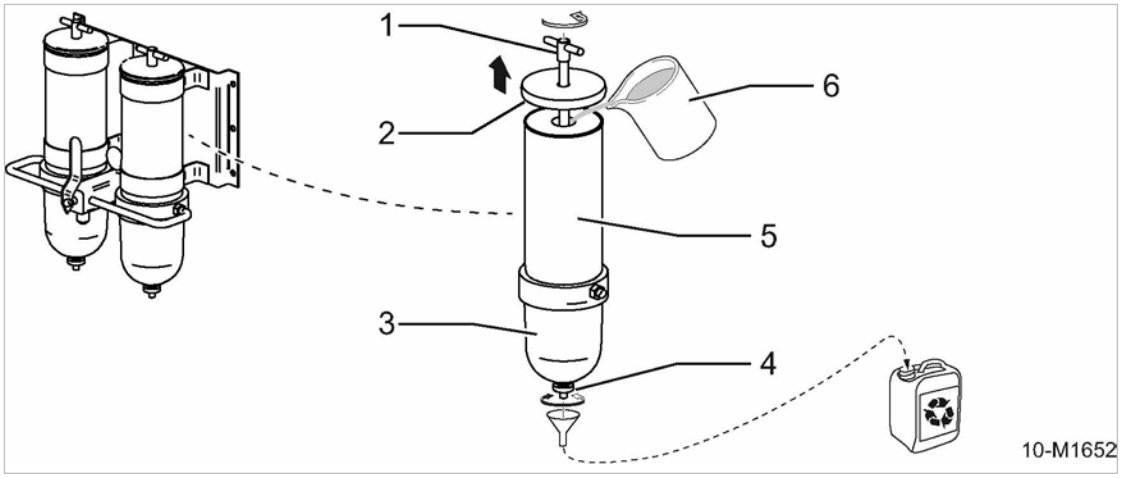


Fig. 63 Emptying the fuel dual filter water trap

[1] T-handle
[2] Filter cap
[3] Water trap
[4] Water draining stopper (water drain valve)
[5] Filter element
[6] Fuel

1. Visually check the fuel in both transparent water traps.
   Fuel contaminated: empty the water trap concerned.
2. Empty the water trap:
   - Place a receptacle beneath the relevant fuel filter housing.
   - Open the draining stopper in the bottom of the trap and drain water and contamination.
   - Close the draining stopper.
3. Venting the filter:
   - Loosen the T-handle and remove the filter cap.
   - Fill the filter with clean fuel.
   - Replace the filter cap and manually tighten the T-handle.

Concluding the maintenance:

Maintenance must be acknowledged after the water separator has been emptied.

Precondition The water separator has been emptied.

➢ Confirm the maintenance with the «Acknowledgement» key.
The illuminated «Acknowledge» and «Information» keys are extinguished.

The mixture of fuel and water and any materials contaminated with fuel must be disposed of in accordance with environment protection regulations.

Changing the filter element

Replace the filter elements annually or when you identify a decrease in engine performance.

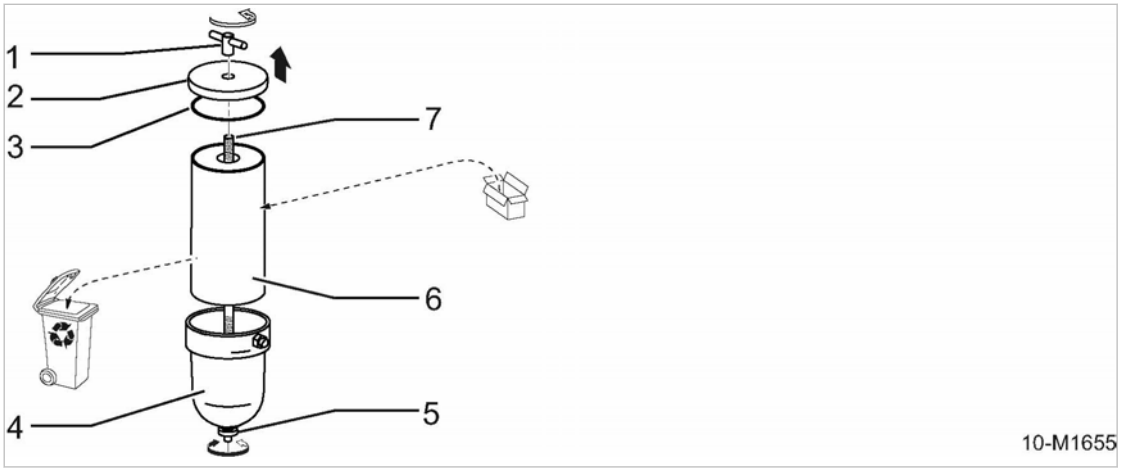


Fig. 64 Fuel dual filter - change filter element

1. T-handle
2. Filter cap
3. Gasket, filter cap
4. Water trap
5. Water draining stopper (water drain valve)
6. Filter element
7. Threaded rod

1. Drain the fuel.
   - Place a receptacle beneath the relevant fuel filter housing.
   - Open the draining stopper in the bottom of the trap and drain water and contamination.
   - Close the draining stopper.
2. Remove the old filter element.
   - Loosen the T-handle and place the filter cap aside.
   - With a turning motion, slowly pull the filter element upward and out.
   - Remove the gasket of the filter cap and clean the cap.
3. Insert the new filter element.
   - Clean the sealing faces of the filter element and the opposing side of the water trap with a damp cloth.
   - Moisten the sealing faces of the new filter element with some fuel.
   - With a slow turning motion, press the filter element downward.
   - Slightly moisten the new gasket for the filter element with some fuel and insert in filter cap.
   - Fill the filter with clean fuel.
   - Replace the filter cap and manually tighten the T-handle.
4. Turn on the «battery isolating switch».
5. Close the doors.

Start the engine as soon as the fuel double filter has been replaced and allow to run for at least 5 minutes in IDLE.

6. Open both doors at the rear of the machine.
7. Check the fuel double filter for leaks.
   Fuel has escaped: Re-tighten T-handles and all screw connections.
8. Close the doors.

The mixture of fuel and water and any materials contaminated with fuel must be disposed of in accordance with environment protection regulations.

10.4.3.4 Fuel prefilter maintenance

The fuel prefilter is equipped with an integrated water separator.
Water, being denser than diesel fuel, sinks to the bottom of the water trap.

Do not fill the fuel prefilter with fuel. The fuel is unfiltered and may be contaminated.

➢ Open both rear doors on the right side.

Check/empty the fuel water trap:

Water, being denser than diesel fuel, sinks to the bottom of the water trap. The presence of water can be verified by its different colour to the fuel.

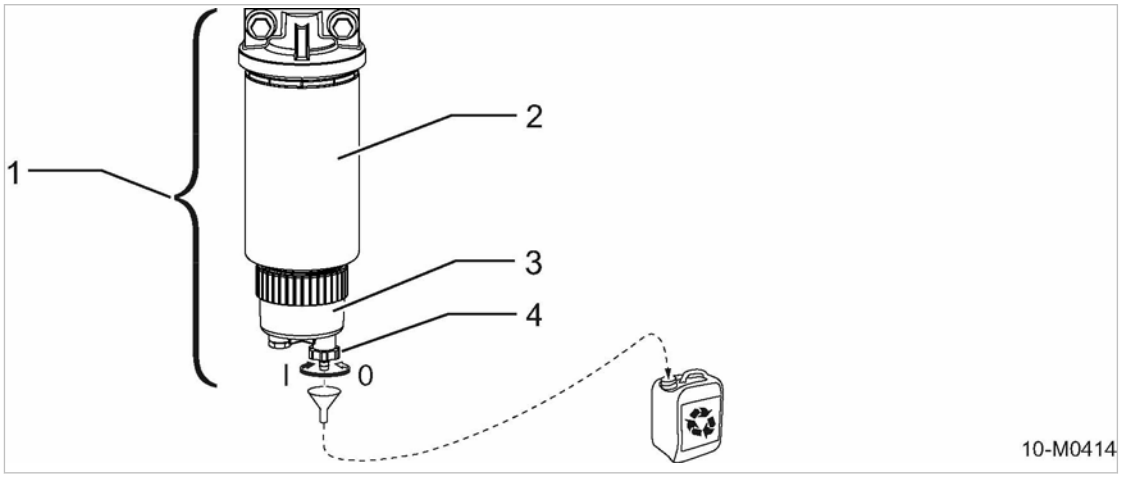


Fig. 65 Emptying the fuel prefilter and water separator

[1] Fuel prefilter with integrated water separator
[2] Filter cartridge
[3] Water trap, transparent
[4] Water draining stopper with integrated level sensor
I - open
0 - close

1. Visually inspect the fuel in the transparent water trap.
   Fuel contaminated: Empty the water trap:
2. Empty the water trap:
   - Place a receptacle beneath the fuel prefilter housing.
   - Open the draining stopper in the bottom of the trap and drain water and contamination.
   - Close the drainage stopper.
3. Turn on the «battery isolating switch».
4. Close all doors.

Concluding the maintenance:

Maintenance must be acknowledged after the water separator has been emptied.

Precondition The water separator has been emptied.

➢ Confirm the maintenance with the «Acknowledgement» key.
The illuminated «Acknowledge» and «Information» keys are extinguished.

The mixture of fuel and water and any materials contaminated with fuel must be disposed of in accordance with environment protection regulations.

Changing the filter cartridge:

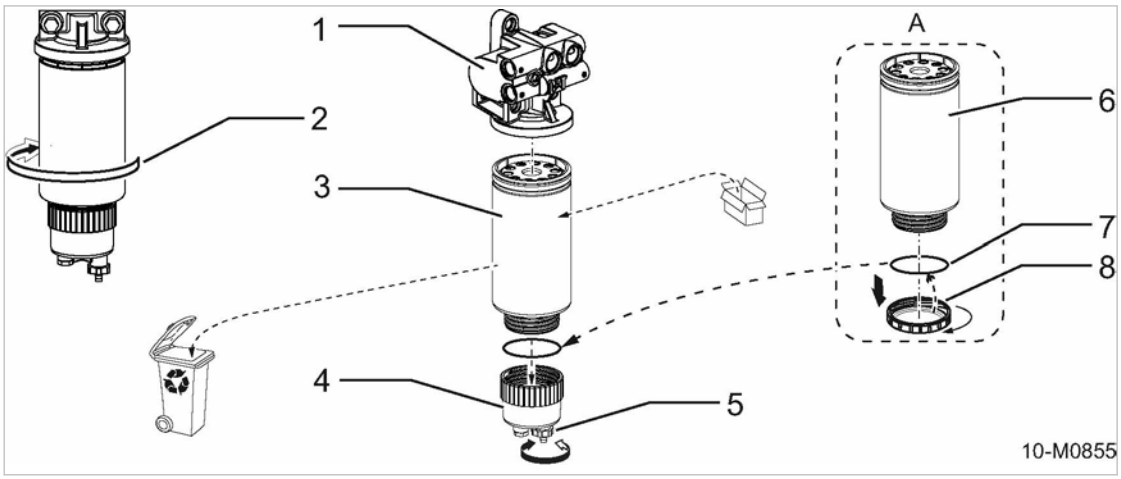


Fig. 66 Change the fuel prefilter cartridge

[1] Filter head
[2] Direction of rotation to unscrew the filter cartridge and the water trap
[3] Filter cartridge
[4] Water trap
[5] Drainage stopper
[A] Spare part
[6] New filter cartridge
[7] New gasket
[8] Protective cap

1. Place a receptacle beneath the fuel prefilter housing.
2. Open the water trap and allow water and dirt to drain out into the receptacle.
3. Close the draining stopper.
4. Use a standard wrench to loosen and unscrew (counter-clockwise) the filter cartridge with the trap from the filter head.
5. Detach the trap from the filter element.
6. Clean the following parts:
   - Separator tank
   - Filter head
7. Remove the seal at the bottom of the separator tank.
8. Unpack the new filter cartridge. Unscrew (counter-clockwise) the protective cap and place aside; ensure proper seating of the gasket inside.

9. Attach the water trap to the filter cartridge:
   - Remove the new gasket from the protective cap and insert in the seating provided in the interior of the water trap.
   - Slightly moisten the the gasket with fuel.
   - Manually screw the water trap to the new filter cartridge (clockwise), until seal is tight.
   - Manually turn until the water trap is properly seated (one rotation approximately).
   - Check whether the draining cap is closed.
10. Attach the filter cartridge (with screwed on trap) at the filter head:
   - Clean the sealing faces of the filter cartridge and filter head with a damp cloth.
   - Moisten the sealing faces of the filter cartridge with some fuel.
   - Fill the filter element with clean fuel.
   - Manually screw the filter cartridge to the filter head (clockwise), until seal is tight.
   - Manually turn until the filter cartridge is properly seated (one rotation approximately).
11. Turn on the «battery isolating switch».
12. Close all the doors.

- The fuel system must be bled after the filter cartridge has been changed.
- The fuel filter cartridge must be changed at the same time as the prefilter cartridge.

Dispose of fuel and any materials and components contaminated with it in accordance with environmental protection regulations.

10.4.3.5 Fuel filter maintenance

Do not fill the fuel filter with fuel. The fuel is unfiltered and may be contaminated.

Replacing the filter cartridges of the fuel filter:

The fuel filter consists of two filter cartridges. These filter cartridges must be exchanged together.

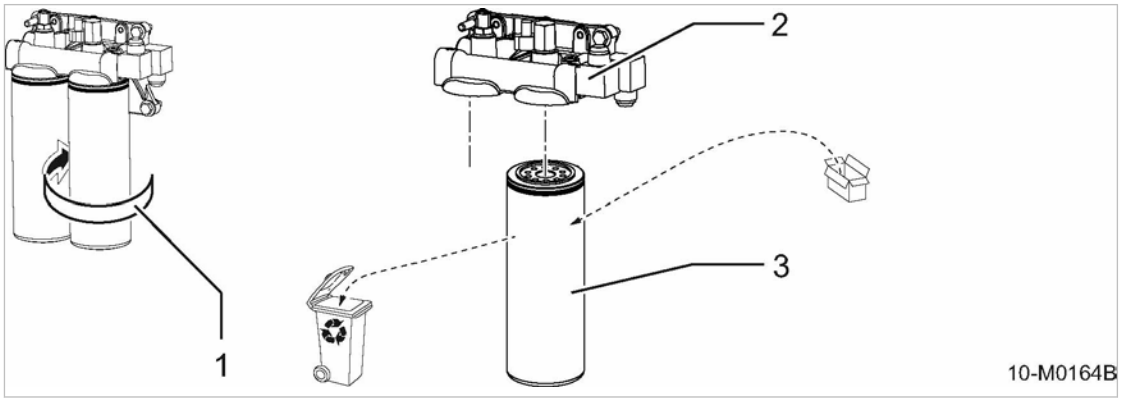


Fig. 67 Replace the fuel filter

[1] Direction of rotation to unscrew the filter cartridge
[2] Filter holder
[3] Filter cartridge

1. Place a receptacle beneath the housing of the fuel filter.
2. Use a filter wrench to loosen and unscrew the filter cartridges. Catch fuel in the receptacle.

3. Clean the sealing faces of the new filter cartridges and the opposing side of the filter holder with a damp cloth.
4. Mount the filter cartridges to the filter holder:
   - Moisten the rubber seals of the filter holder and the sealing faces of the new filter cartridges with some fuel.
   - Manually screw the filter cartridges to the filter holder (clockwise), until seals are tight.
   - Continue to manually turn until the filter cartridges are seated tightly (½ to ¾ turn approximately).
5. Turn on the «battery isolating switch».
6. Close the doors.



The fuel system must be bled after the filter cartridges have been changed.



Dispose of fuel and any materials and components contaminated with it in accordance with environmental protection regulations.

Starting the machine and performing a test run:

1. Switch the machine on and run it in IDLE mode for approx. 1 minute.
2. Shut down the machine.
3. Open both rear doors on the right side.
4. Visually check the fuel system for leaks.
5. Tighten all screw connections.
6. Close the doors.

10.4.4 Checking the engine oil level

The engine oil level must be checked daily.

The level of the engine oil can be seen directly at the dipstick at the oil pan.

If you use the oil filling level monitor, the oil level is checked on the oil level indicator of the auxiliary oil tank.

Material: Cleaning cloth

Precondition: The machine is shut down.

The machine is standing level.

The machine is fully vented, the pressure gauge reads 0 bar.

Engine cooled down.

All compressed air consumers are disconnected and the air outlet valves are open.

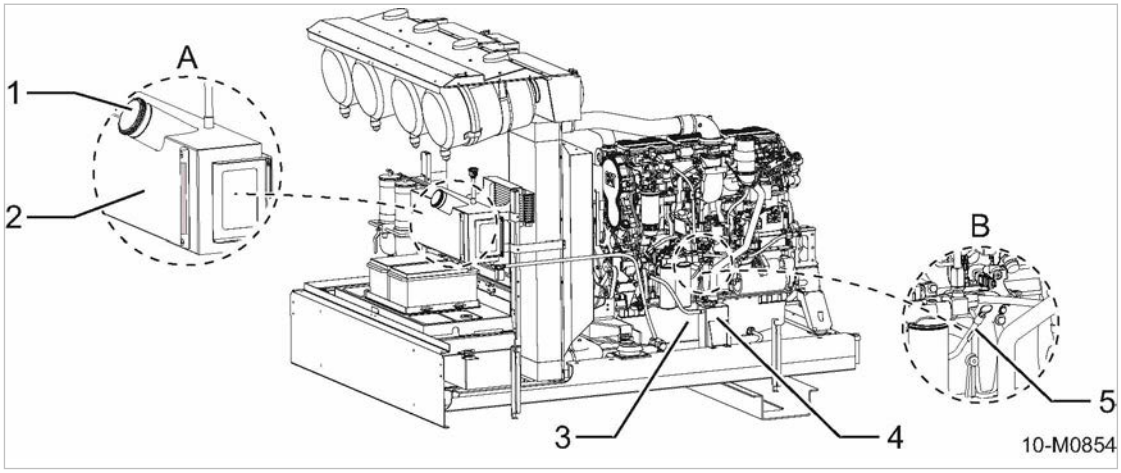


Fig. 68 Checking the engine oil level

- [A] Detail: auxiliary oil tank
- [1] Cover, oil filling opening for engine oil (green)
- [2] Auxiliary oil tank
- [3] Engine oil sump
- [4] Oil filling level monitor
- [B] Detail: oil dipstick
- [5] Oil dipstick

Reading the oil level at the dipstick:

The engine oil is indicated by a dipstick in the oil sump. The oil level should ideally be between the two marks on the dipstick. The oil level should not be allowed to fall below the *minimum level*.

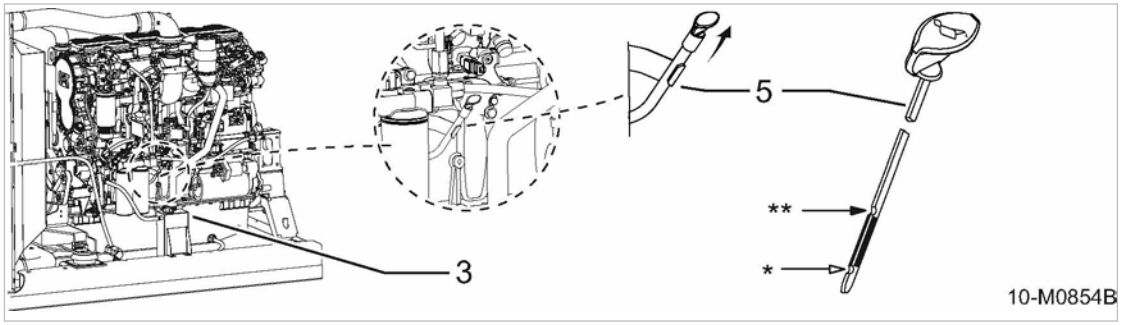


Fig. 69 Reading the engine oil level at the dipstick:

- [3] Engine oil sump
- [5] Oil dipstick
- [**] Mark for *maximum oil level*
- [*] Mark for *minimum oil level*

1. Open both rear doors on the right side.
2. Withdraw the dipstick, wipe with a lint-free cloth and insert fully.
3. Withdraw the dipstick once more and read off the oil level.
   The level should be between the maximum and minimum markings.
   Top up if the level has reached or fallen below the *minimum level* mark.
4. Close the doors.

The marked *maximum oil level* should not be exceeded in order for the level of oil in the crankcase not to reach the crankshaft. If this were to occur, it could create oil bubbles that would reduce the oil's lubricating capability and impair engine performance.

Checking the engine oil level at the oil level indicator of the auxiliary oil tank

The level of the engine oil is checked at the oil level indicator. Oil must be visible in the transparent sight glass.

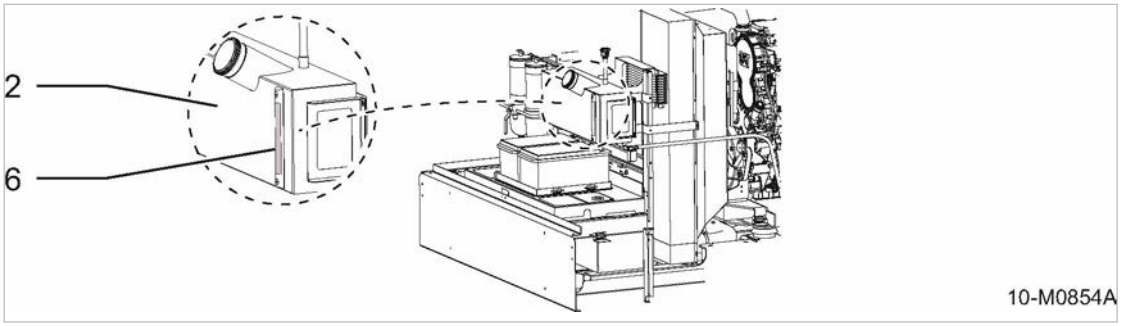


Fig. 70 Checking the engine oil level at the oil level indicator

[2] Auxiliary oil tank
[6] Oil level indicator

1. Open both doors at the rear of the machine.
2. Read off the engine oil level at the oil level indicator of the auxiliary oil tank

   Id the oil level falls below the lower third of the auxiliary oil tank, or no oil is visible: Replenish engine oil.
3. Close the doors.

10.4.5 Engine oil filling and topping up

Material
Engine oil
Cleaning cloth
Funnel

Precondition
The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is off.

Filling with engine oil



See chapter 2.5.6 for engine oil filling volume.
The oil dipstick is marked with the «maximum oil level».

1. Open both doors at the rear of the machine.
2. Remove the cover of the oil filling opening at the auxiliary oil tank and fill new engine oil.
3. Wait 5 minutes then check the oil level.



It takes a few minutes for oil to reach the sump.

Top up if the level is too low.

4. Close the oil filling opening at the auxiliary oil tank with its cover.

5. Activate the «battery isolating switch».
6. Close the doors.

Starting the machine and performing a test run:

1. Switch the machine on and run it in IDLE mode for approx. 5 minutes.
2. Shut down the machine.
3. Wait until the machine has automatically vented.
   Pressure gauge reads 0 bar!
4. Open both doors at the rear of the machine.
5. Check the oil level after about 5 minutes.
   Top up if the level is too low.
6. Visually inspect for leaks.
7. Close the doors.

10.4.6 Replacing the engine oil filter

The engine oil filter consists of two filter cartridges. These filter cartridges must be exchanged together.

Due to restricted space, a strap wrench should be used to unscrew the oil filters. The strap wrench is operated with a 1/2” ratchet.

Material
Spare parts
Strap wrench (Purchase order number 8.9410.0)
Cleaning cloth
Receptacle

Precondition
The machine is switched off.
The machine is fully vented, the pressure gauge reads 0 bar.
Engine cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is turned off.



CAUTION
Danger of burns from hot components and escaping engine oil!
➢ Wear long-sleeved clothing and gloves.

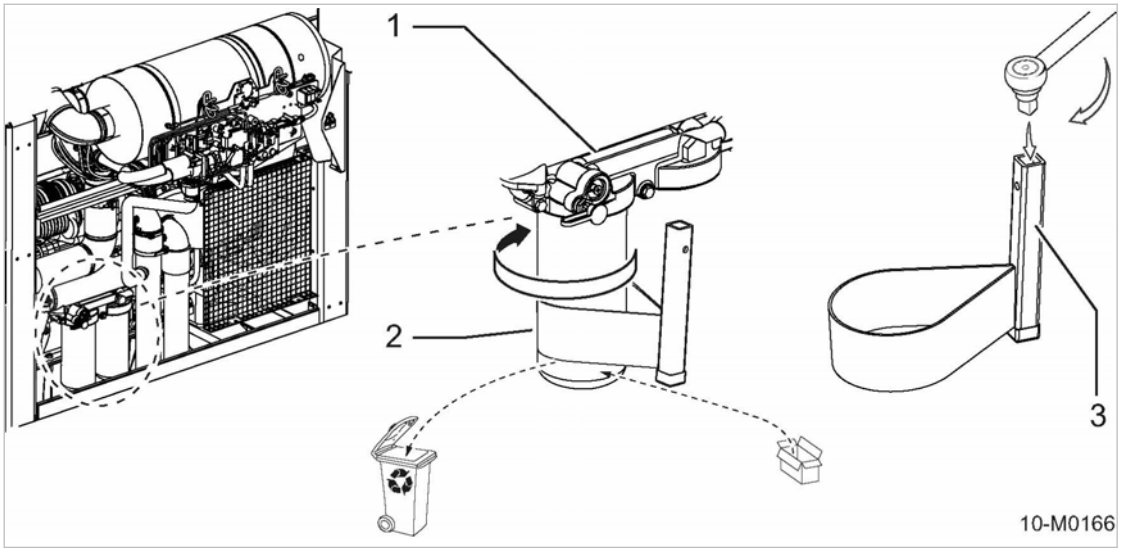


Fig. 71 Replacing the engine oil filter

1 Filter base
2 Direction of rotation to unscrew the filter
3 Strap wrench

1. Open both rear doors on the left side.
2. Place a container beneath the housing of the engine oil filter.
3. Loosen the filter cartridges with the strap wrench and unscrew. Catch any escaping engine oil.
4. Carefully clean the sealing faces of the new filter cartridges and the opposing side of the filter base with a damp cloth.
5. Attach the filter cartridges to the filter base:
   - Lightly coat the gasket of the new filter cartridges with clean engine oil.
   - Manually screw the filter cartridges to the filter base (clockwise), until the oil filter gaskets are tightly positioned at the filter base. Continue to manually turn until the filter cartridges are seated tightly (½ to ¾ turn approximately).
     Do not over-tighten the filter cartridges!
6. Check the engine oil level.

   Low oil level: Replenish engine oil.
7. Turn on the «battery isolating switch».
8. Close the doors.

Dispose of old oil filter, old oil and materials contaminated with oil according to applicable environmental protection regulations.

10.4.7 Battery maintenance

➢ Check the charging system if the batteries discharge without obvious reason.

10.4.7.1 Safety

WARNING
Danger of acid burns from escaping electrolyte!
- ➢ Wear appropriate protective clothing including acid-proof rubber gloves.
- ➢ Always wear eye and face protection.
- ➢ Do not tip the battery. Electrolyte may escape from vent holes.
- ➢ Work with caution.

When working on batteries, comply with the following safety signs:

A warning label with safety signs is attached to the battery.



Fig. 72 Safety signs - warning labels on the battery

- ➢ Take heed of any safety signs on the battery warning label.
  The individual safety signs have the following meaning:
  - 1 – Fire, sparks, open flame and smoking are forbidden!
  - 2 – Eye and face protection must be worn because of the danger of acid burns.
  - 3 – Keep children well away from batteries and electrolyte.
  - 4 – Wear protective gloves, batteries are filled with caustic electrolyte!
  - 5 – Observe the battery manufacturer's instructions!
  - 6 – Follow the safety rules, explosion hazard!

Further instructions on working with batteries:

- ➢ Do not remove battery terminal covers unnecessarily.
- ➢ Do not lay tools on the battery. This can lead to short circuiting, overheating and battery bursting!
- ➢ Take particular care when the battery has been in service for a long time or has just been charged, as highly explosive gas is emitted!
  Ensure adequate ventilation!

10.4.7.2 Ensuring battery charge condition

If the machine has not been operated for a longer period of time, the batteries may self-discharge. The starting voltage may be insufficient to start the motor/engine when needed. Moreover, exhaustive discharge of batteries can result in battery damage.

Always consider the following for starter batteries:
Recharge if stored for 30 days or longer!

The current charge level of the starter batteries can be read from the *Battery voltage* operating mode display at the SIGMA CONTROL MOBIL.

Starter batteries charge level:

Charge level [%]		Voltage display [V]	Electrolyte density [kg/l]	Notes
		24 V		
100		25.4 - 25.7	1.27	Battery OK, fully charged.
75		25.0	1.24	Recharging required!
65		24.8	1.22	
50		24.6	1.21	Limit of starting capacity!
25		24.0	1.16	Battery discharged below permitted discharge limit.
20		23.8	1.14	
0		23.2	1.09	Battery permanently damaged due to total discharge!
Values at 25° C				

Tab. 76 Starter batteries charge level

➢ Check battery charge and recharge with suitable charging device, if necessary.

10.4.7.3 Battery check and care

Even so-called 'maintenance-free' batteries need a degree of care to obtain their maximum operational life.

The outside of the battery and the terminals should be cleaned regularly with a soft cloth. This avoids current leaks and minimises the discharge rate.

Material
Terminal grease
Distilled water
Cleaning cloth
Protective gloves
Eye protection

Precondition
The machine is switched off.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
The machine has cooled down.

➢ Open both doors at the rear of the machine.
1. Clean the casing and terminals. Do not use a wire brush!

2. Lightly grease the terminals to prevent corrosion.
3. Check that the batteries and cable connections are properly seated and tighten if necessary.

Checking the battery electrolyte level:

The fluid is generally sufficient for the life of the battery. Nevertheless, the fluid level should be checked annually. The level should be up to the mark, 1 cm above the plates.

Replace the battery immediately if the casing leaks!

1. *NOTICE!*
   Battery destruction!
   Topping up with pure acid will increase the electrolyte concentration and can destroy the battery.
   ➢ Top up only with distilled water.
2. Check the electrolyte level.

If the electrolyte level does not reach the mark -
➢ top up with distilled water.

➢ Close the doors.

Winter operation:

Battery performance is particularly affected by winter operating conditions. Only a fraction of the normal starting energy is available at low temperatures.

1. *NOTICE!*
   Danger of batteries freezing!
   Discharged batteries are subject to frost damage and can freeze at −10 °C.
   ➢ Check battery charge condition with a specific gravity tester.
   ➢ Recharge the batteries.
   ➢ Clean the battery terminals and wipe with grease.
2. Check the battery charge weekly.
   Recharge as necessary.
3. For machine standstill times of several weeks: Remove the batteries and store in a frost-free environment.

In extreme cases, the use of heavy-duty cold-start batteries and/or additional batteries is recommended.

10.4.7.4 Battery removal and installation

Precondition
The machine is switched off.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
The machine has cooled down.
The «battery isolating switch» is turned off.

1. **CAUTION!**
   There is danger of batteries bursting!
   If a battery is short circuited it will overheat and can burst.
   - ➢ Never short-circuit a battery (e.g. with a hand tool).
   - ➢ Wear gloves and eye protection.

2. ***NOTICE!***
   Excessive voltage produced by the engine generator!
   Voltage peaks can destroy the alternator regulator and diodes.
   - ➢ The batteries serve as a buffer and must not be disconnected while the engine is running.
   - ➢ Carry out work on batteries only with the machine shut down.

3. Open both doors at the rear of the machine.
4. Disconnect the negative cable first, then the positive cable.
5. Unscrew the battery fixing clamp.
6. Replace in the reverse order.
7. Make sure the battery is properly secured.
8. Turn on the «battery isolating switch».
9. Close the doors.

Replacing batteries

Replacement batteries must have the same capacity, current strength and design as the original batteries.

- ➢ Always replace batteries with the same type.

Old batteries are hazardous waste and must be disposed of correctly in accordance with local environmental protection regulations.

10.4.8 Spark arrestor cleaning

The spark arrestor must be cleaned of any soot residue every approx. 500 h (at least annually) to prevent the emission of glowing particles from the exhaust silencer.

Material
Suitable rubber hose
Soot receptacle
Cleaning cloth
Protective gloves
Eye protection

Precondition
The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
The machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.

DANGER
Danger of suffocation from toxic exhaust fumes.
Exhaust fumes from internal combustion engines contain carbon monoxide, which is odourless and deadly.

- ➢ Use the machine only outdoors!
- ➢ Do not inhale exhaust fumes.

CAUTION
Danger of burns from hot components and sparks.

- ➢ Wear long-sleeved clothing and gloves.
- ➢ Wear eye protection.

Spark arrestor cleaning

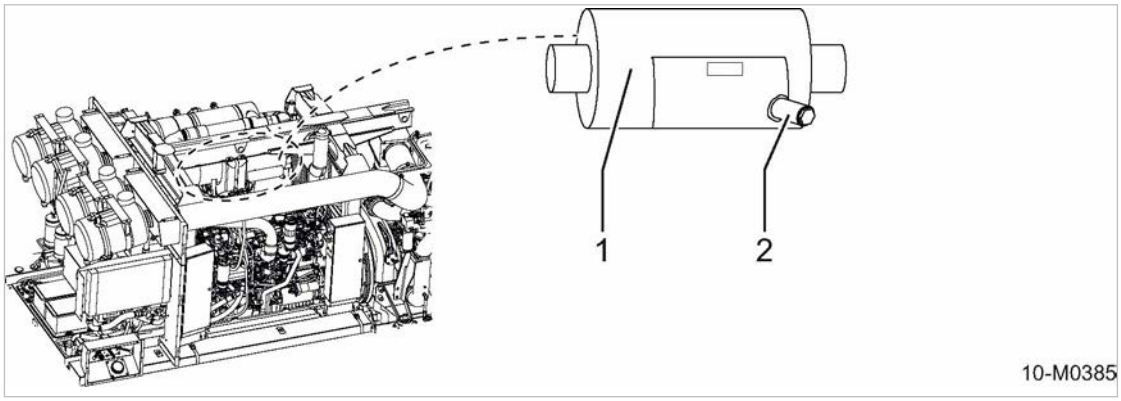


Fig. 73 Spark arrestor cleaning
[1] Exhaust silencer with integrated spark arrestor
[2] Soot drain port with plug

1. Open both rear doors on the right side.
2. Unscrew the soot drain plug.
3. Push one end of the hose over the drain port and place the other end in the receptacle.
4. Start the compressor engine.
   Soot will drain through the hose into the receptacle.
5. Shut down the engine.
6. Remove the hose and replace the plug .

It is recommended to blow out the spark arrestor with compressed air once a year.

Dispose of soot according to environment protection regulations.

10.5 Compressor Maintenance

- ➢ Perform maintenance tasks according to the schedule in chapter 10.3.3.

10.5.1 Checking the oil level (gearbox)

The oil level must be visible in the upper half of the oil sight glass.

Material Torch

Precondition The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
All compressed air consumers are disconnected and the air outlet valves are open.

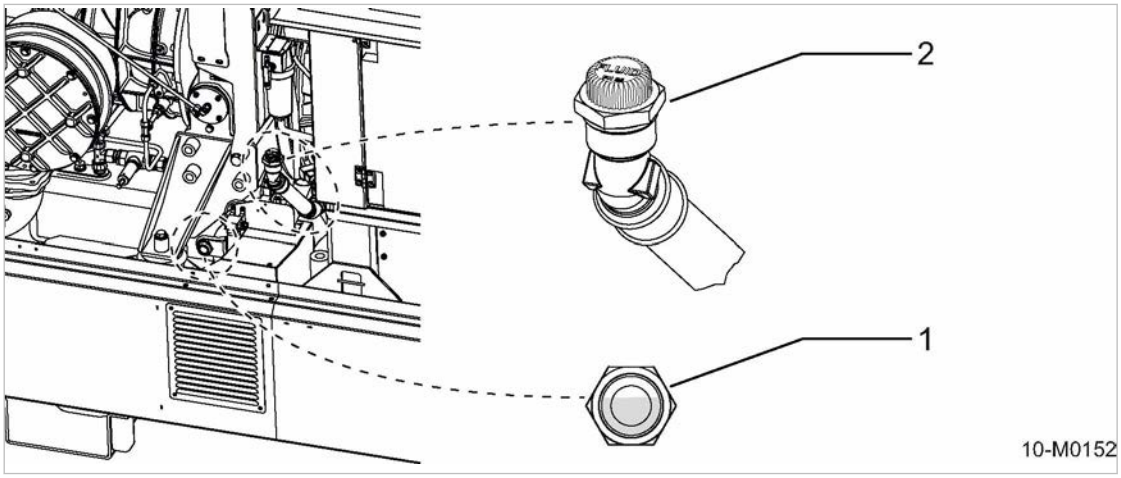


Fig. 74 Checking cooling oil level
[1] Oil sight glass
[2] Oil filler port with plug

1. Open both front doors on the left side.
2. Read the cooling oil level (use a torch, if necessary).
   If no oil can be seen in the upper half of the oil sight glass: Replenish cooling oil.
3. Close the doors.

10.5.2 Cooling oil filling and topping up

Material Cooling oil
Funnel
Cleaning cloths
Wrench

Precondition The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
The machine has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is turned off.

Filling with cooling oil

A sticker on the gear specifies the type of oil used.



1. *NOTICE!*
   The machine could be damaged by unsuitable oil!
   - ➢ Never mix different types of oil.
   - ➢ Never top up with a type of oil that differs from the one already used in the machine.
2. Open both front doors on the left side.
3. Unscrew and withdraw the plug from the oil filler port.
4. Replenish the cooling oil until the oil sight glass is nearly completely filled with cooling oil.
5. Check the oil level.
6. Check the filler plug gasket for damage.
   Damaged gasket: replace gasket.
7. Replace the plug in the filler port.
8. Turn on the «battery isolating switch».
9. Close the doors.

Starting the machine and performing a test run:

1. Start the machine and run in IDLE until the operating temperature is reached.
2. Run the machine for approximately 10 minutes in LOAD.
3. Shut down the machine.
4. Wait until the machine has automatically vented.
   Pressure gauge reads 0 bar!
5. Open the outlet valves.
6. Open both front doors on the left side.
7. Check the oil level after about 5 minutes.
   Cooling oil level too low: Top up the cooling oil.
8. Visually inspect for leaks.
9. Close the doors.

10.5.3 Replacing the compressor oil filter

Material
Spare part
Receptacle
Cleaning cloths

Precondition
The machine is switched off.
The machine is fully vented, the pressure gauge reads 0 bar.
The machine has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is turned off.



CAUTION
Danger of burning from hot components and oil.
- ➢ Wear long-sleeved clothing and gloves.

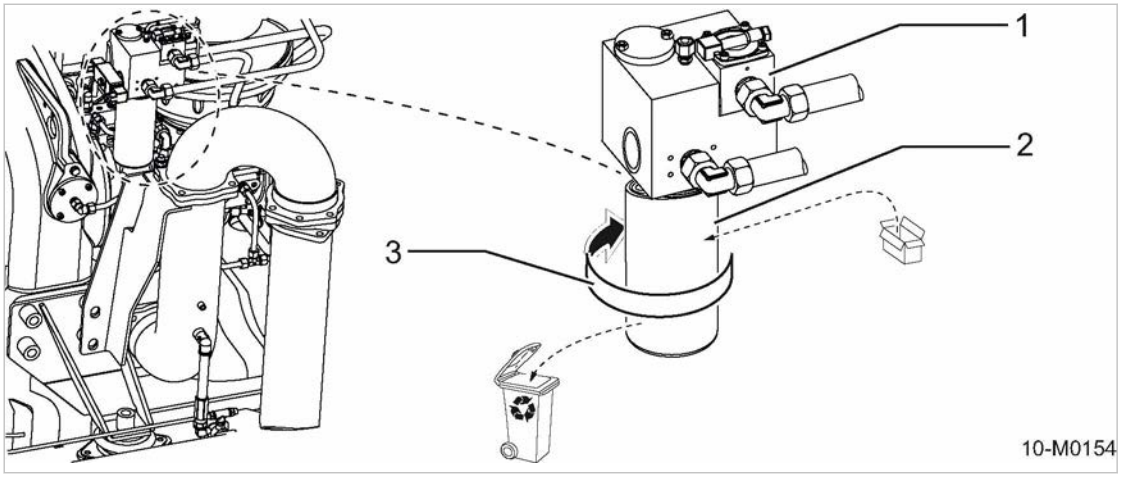


Fig. 75 Change the oil filter

[1] Combination valve
[2] Oil filter
[3] Direction of rotation to unscrew the oil filter.

Changing the oil filter:

1. Open both front doors on the right side.
2. Prepare a receptacle.
3. Loosen the filter by turning counter-clockwise and catch any escaping oil.
4. Carefully clean sealing surfaces using lint-free cloth.
5. Lightly oil the new filter's gasket.
6. Turn the oil filter clockwise by hand to tighten.
7. Check the cooling oil level in the gear.
   Cooling oil level too low: Top up the cooling oil.
8. Turn on the «battery isolating switch».
9. Close the doors.

Dispose of old cooling oil and any materials or parts contaminated with oil according to environment protection regulations.

Starting the machine and performing a test run:

1. Start the machine and run in IDLE until the operating temperature is reached.
2. Close the outlet valves.
3. Shut down the machine.
4. Wait until the machine has automatically vented.
   Pressure gauge reads 0 bar!
5. Open the outlet valves.
6. Open both front doors on the left side.
7. After approximately 5 minutes: Check the cooling oil level.
   Cooling oil level too low: Replenish with more cooling oil.
8. Open both front doors on the right side.

9. Visually inspect for leaks.
10. Close the doors.

10.5.4 Changing the filter for gear ventilation (oil mist removal)

Handle new filter element only with clean fabric gloves. Do not touch the new filter elements with bare fingers – Contamination risk!

Material
Spare parts
Filter wrench
Wrench
Cleaning cloth
Clean fabric gloves

Precondition
The machine is switched off.
The machine is fully vented, the pressure gauge reads 0 bar.
The machine has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is turned off.



CAUTION
Danger of burns from hot components
➢ Wear long-sleeved clothing and gloves.

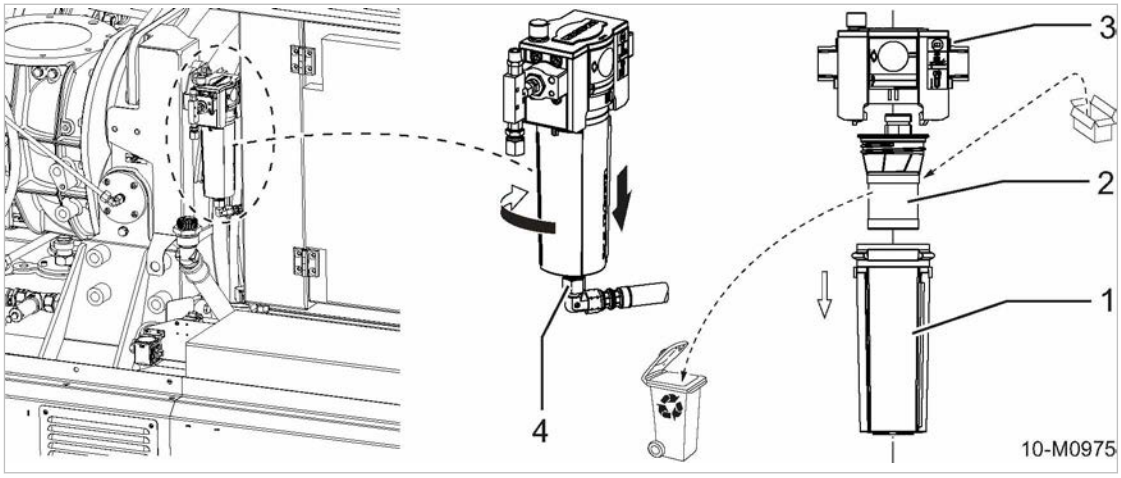


Fig. 76 Changing the filter for gear ventilation

[1] Filter housing
[2] Filter element
[3] Filter head
[4] Fitting of hose

1. Open both front doors on the right side.
2. Loosen the screw connection of the hose line [4] and remove the hose.
3. Unscrew the filter housing [1] counter-clockwise.
4. Draw the filter element [2] down and out.
5. Clean the filter head, housing and sealing surface with a lint-free cloth.
6. Check the housing gasket.
   Housing gasket is damaged: replace gasket.

7. Insert a new filter element.

Wear gloves!

8. Screw on the filter housing clockwise.
9. Install the hose line.
10. Turn on the «battery isolating switch».
11. Close the doors.

Dispose of contaminated working materials and components according to applicable environmental protection regulations.

10.5.5 Change the control air filter

You can unscrew (CCW) the filter bowl.

➢ Do not use tools to open the filter housing.

Material: Spare part
Cleaning cloths

Precondition: The machine is switched off.
The machine is fully vented, the pressure gauge reads 0 bar.
The machine has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is turned off.

WARNING
Danger of burning from hot components.
➢ Wear long-sleeved clothing and gloves.

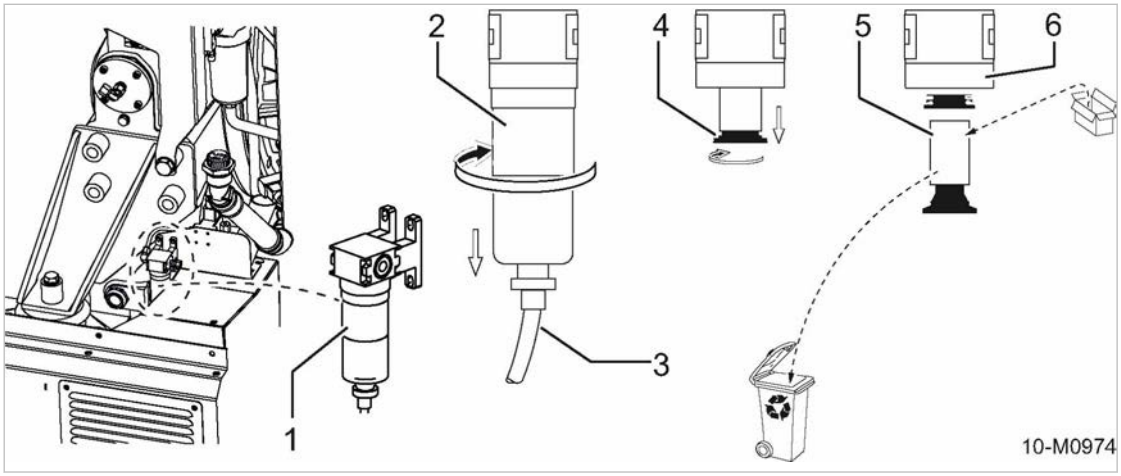


Fig. 77 Change the control air filter

1 Control air filter
2 Filter bowl
3 Hose for automatic condensate drain
4 Filter element bracket
5 Filter element
6 Filter head

1. Open both front doors on the right side.
2. Unscrew the filter bowl counter-clockwise.
3. Unscrew the filter element bracket counter-clockwise and remove the old filter element.
4. Clean the housing, filter element bracket, and filter head with a lint-free cloth.
5. Place the new filter element on the filter element bracket and tighten the screws.
6. Screw in the filter bowl.
7. Turn on the «battery isolating switch».
8. Close the doors.



Dispose of contaminated working materials and components according to applicable environmental protection regulations.

10.5.6 Compressor air filter maintenance

Clean the air filter as per the maintenance table but at the latest when the controller displays the corresponding maintenance message.

The air filter element consists of the following components:

- Filter element (primary filter)
- Safety element (secondary filter)

With correct cleaning, the filter element can be reused several times; however, it must be replaced after every 1000 operating hours but at least once every year.

The safety element cannot be cleaned and should be replaced after 1000 operating hours, at least once a year.



- Using the machine without an air filter element is not permitted!
- Do not use a filter element with damaged folds or gasket.
- The use of an unsuitable air filter can permit dirt to ingress the pressure system and cause premature wear and damage to the machine.

Material
Compressed air for blowing out
Spare parts (as required)
Cleaning cloth

Precondition
The machine is switched off.
The machine is fully vented, the pressure gauge reads 0 bar.
The machine has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.



NOTICE
Damaged air filter element.
Machine damage due to contaminated intake air.

➢ Do not try to clean the filter element by striking or knocking it.
➢ Do not wash the filter element.

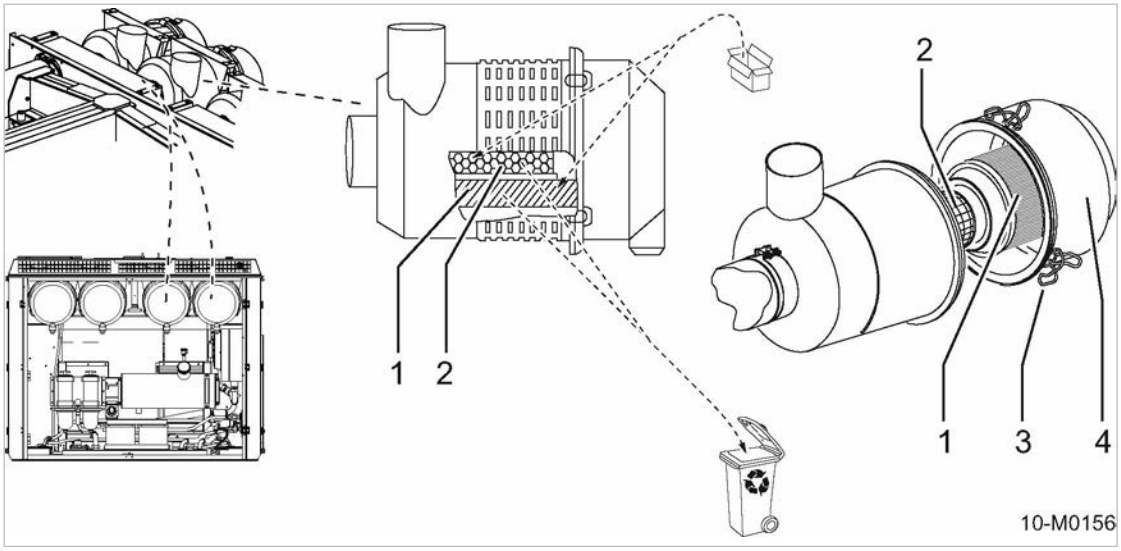


Fig. 78 Compressor air filter maintenance

1	Filter element (primary element)	3	Retaining clip
2	Safety element	4	Filter cap

Analyzing the warning message on the controller

The air filter is connected by a sensor to the controller. The controller returns a warning message with rising degree of contamination in the air filter.

- The controller display will show *"Service compressor air filter"*.
- The «Information» key illuminates.
- The «Acknowledgement» key flashes.

Servicing the compressor air filter is required as soon as this message is displayed.

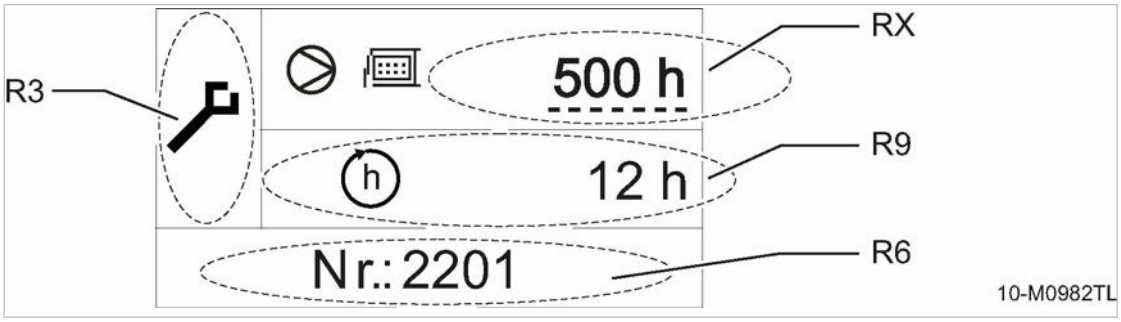


Fig. 79 Warning messages: Compressor air filter maintenance

R3	Event memory category: Maintenance	R9	Time when maintenance is due.
R6	Message codes	RX	Maintenance interval

➢ Maintain the filter.

➢ Open both doors at the rear of the machine.

Air filter maintenance (cleaning the filter element)

These tasks must be carried out **each** time the air filter is maintained.

1. Release the retaining clip. Remove the filter cap and take out the filter element.
2. Carefully clean the inside of the housing, the cover and sealing faces with a damp cloth.

When cleaning the filter housing, do not remove the safety element!

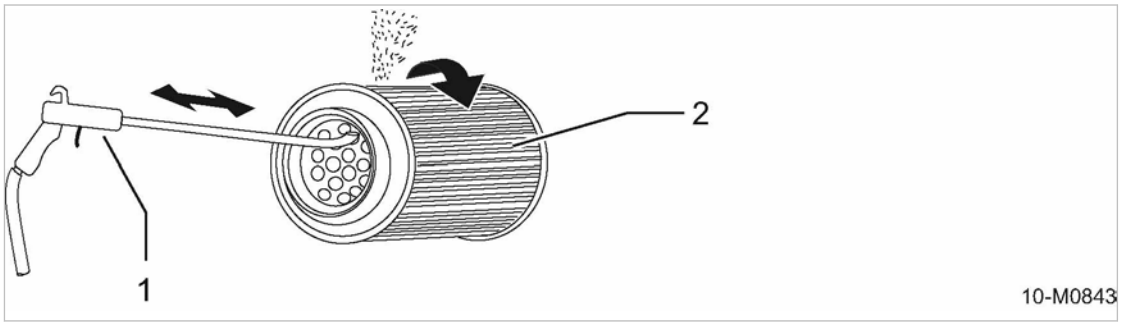


Fig. 80 Cleaning the filter element

[1] Compressed air gun with blast pipe (bent to approx. 90° at the end)
[2] Filter element

3. Cleaning the filter element:
   - Use dry compressed air (≤ 5 bar!) at an angle to blow dust from the element from inside to outside until no further dust develops.
   - The blast pipe must be long enough to reach the bottom of the element.
   - The tip of the blast pipe must not touch the filter element.
   - Cleaning sealing faces.
4. Inspect the element carefully for any damage.
   Damaged filter element: Replace filter element.
5. Insert the cleaned or new filter element into the filter housing. Make sure it is properly in place and sealed by its gaskets.
6. Replace the cap and secure with the clips.

Replacing the safety element:

These tasks must be carried out every **third** time the air filter is maintained.

1. Remove the safety element and dispose of it.
2. Use duct tape to seal off the engine intake port to prevent ingress of dirt.
3. Remove the tape after the filter housing has been cleaned.
4. Fit the new safety element.
5. Insert the cleaned or new filter element into the filter housing.
6. Check that the filter element and safety element are properly seated and their gaskets sealed.

➢ Close the doors.

Concluding the maintenance:

Maintenance must be acknowledged after the air filter has been maintained.

For more information about acknowledging the maintenance message and resetting the maintenance timer, see the separate operating manual of the SIGMA CONTROL MOBIL

Precondition Air filter maintained

1. Acknowledge the maintenance message.
   - Confirm the message with the «Acknowledge» key.
   - The «Acknowledge» key is extinguished but the «Information» key is still illuminated.
2. Resetting the maintenance interval counter.
   - Simultaneously press and hold the «Acknowledge» and «ENTER» keys for 2 seconds.
   - The system will automatically display the input menu for the password if no password is active.
   - Password (for example: Customer password: 4512) enter and confirm with the keypad.
   - Simultaneously press and hold the «Acknowledge» key and «ENTER» for 2 seconds.

Result The maintenance interval counter is reset and the «Information» key extinguishes.

Dispose of old parts and contaminated materials according to applicable environmental regulations.

10.5.7 Checking the hydraulic oil level

The hydraulic oil level must be checked daily.

The level of the hydraulic oil can be seen directly at the dipstick at the hydraulic oil container.

Material Cleaning cloth

Precondition The machine is shut down.

The machine is standing level.

The machine is fully vented, the pressure gauge reads 0 bar.

The machine is cooled down.

All compressed air consumers are disconnected and the air outlet valves are open.

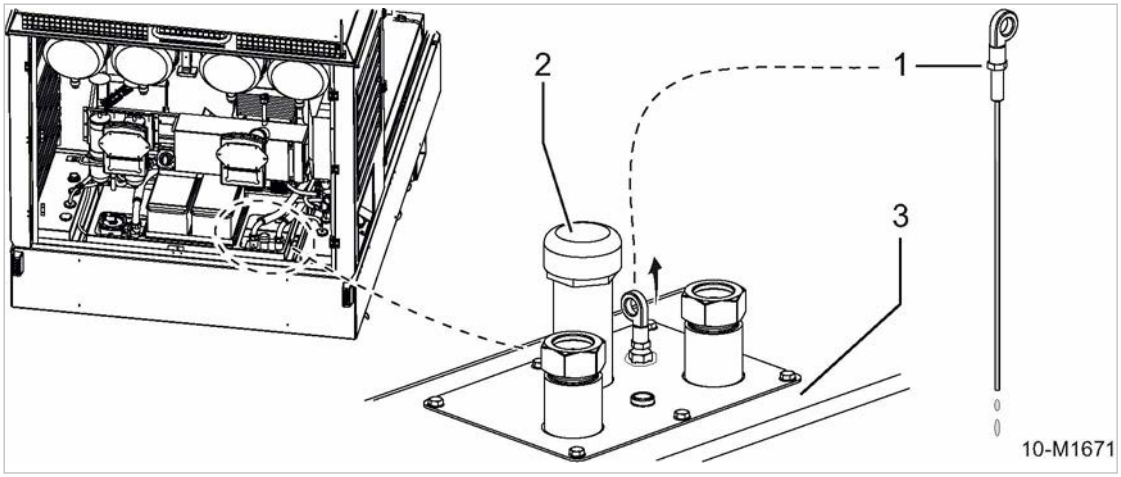


Fig. 81 Reading the hydraulic oil level at the dipstick:

1 Oil dipstick
2 Hydraulic oil filler plug
3 Container, hydraulic oil

Reading the hydraulic oil level at the dipstick:

Oil must be visible at the dipstick.

1. Open both doors at the rear of the machine.

2. Remove the dipstick and determine whether oil is on the dipstick.
   Oil traces visible for ¼ to ¾ of the dipstick length: Hydraulic oil level is OK.
   Oil traces are visible less than ¼ of the dipstick length: have hydraulic oil added.
3. Close the doors.

10.6 Check/replace hose lines

Overview of hose lines of machine:

- Fuel lines of the drive engine
- Pressure hoses of the drive engine
- Pressure hoses of the compressor

The hose line are subject to natural ageing regardless of proper storage or permitted utilisation during machine operation. This ageing changes the material and compound properties and reduces the performance capability of the hose lines. As a result the period of use for hose lines is limited.

The operator must ensure that all hose lines are checked at reasonable intervals and are replaced if required, see maintenance schedule 10.3.3

➢ Comply with all instructions!

10.6.1 Replace the fuel lines of the drive engine.

➢ Have a KAESER SERVICE technician replace the fuel lines of the drive engine.

10.6.2 Replace the pressure hoses of the drive engine.

Overview of all pressure hoses at drive engine:

- Engine oil
- Coolant for the coolant cooler
- Charge air (if available)

➢ Have a KAESER SERVICE technician replace the pressure hoses of the drive engine.

10.6.3 Replace the pressure hoses of the compressor

Overview of all pressure hoses on the compressor:

- Cooling oil
- Compressed air
- Control air
- Condensate

➢ Have a KAESER SERVICE technician replace the pressure hoses of the compressor.

10.7 Chassis maintenance

➢ Perform maintenance tasks according to the schedule in chapter 10.3.3.

10.7.1 Axle and wheel maintenance

The axles and wheels must be serviced whenever necessary, but at the latest once every year.

Material Lithium-enriched multi-purpose grease
Cleaning cloth

Precondition The machine is shut down.
The machine is disconnected from the towing vehicle and safely parked.

Wheel checks

Precondition Machine shut down and secured against restarting.

➢ Check the wheels for any defect.
Replace any damaged or worn wheels.

Axle and wheel greasing

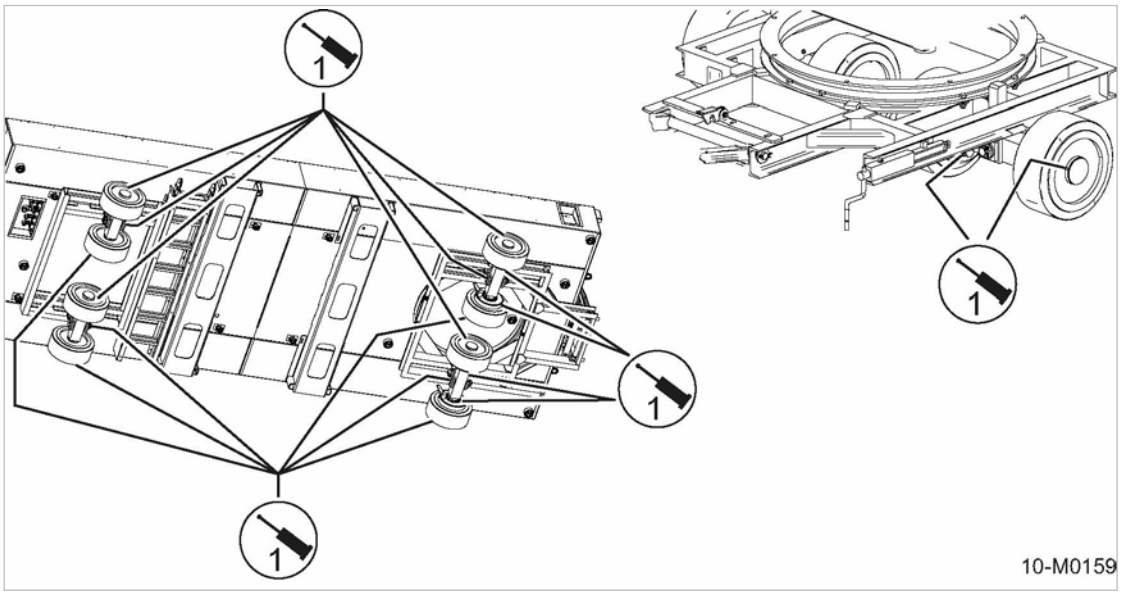


Fig. 82 Lubricating points at the chassis
[1] Greasing points

➢ Axle and wheel greasing

10.7.2 Towbar maintenance

Check, clean and lubricate the towing mechanism when required, but at least once every year.

Material Lithium-enriched multi-purpose grease
Acid-free oil
Cleaning cloth

Precondition The machine is shut down.
The machine is disconnected from the towing vehicle and safely parked.

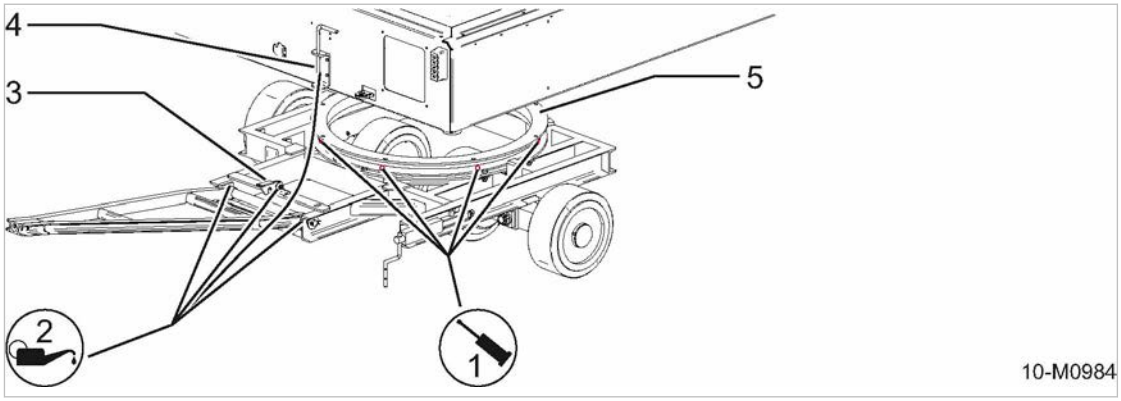


Fig. 83 Towbar maintenance

[1] Lubricating points, live ring
[2] Lubricating points, drawbar
[3] Safety lever, drawbar
[4] Locking, bogie
[5] Live ring

Drawbar maintenance:

1. Have the drawbar checked.
2. Check the functioning of the latching mechanisms (Positions [3] and [4]), clean and lubricate them.
3. Remove dirt from bearing parts and lubricate them.

Live ring maintenance

1. Have the screw fittings checked.
2. Lubricate the live ring at the marked locations, or have them lubricated.

10.7.3 Maintaining the parking brake

The parking brake must be lubricated whenever necessary, but at a minimum every half year.

Material Lithium-enriched multi-purpose grease
Cleaning cloth

Precondition The machine is shut down.
The machine is disconnected from the towing vehicle and safely parked.

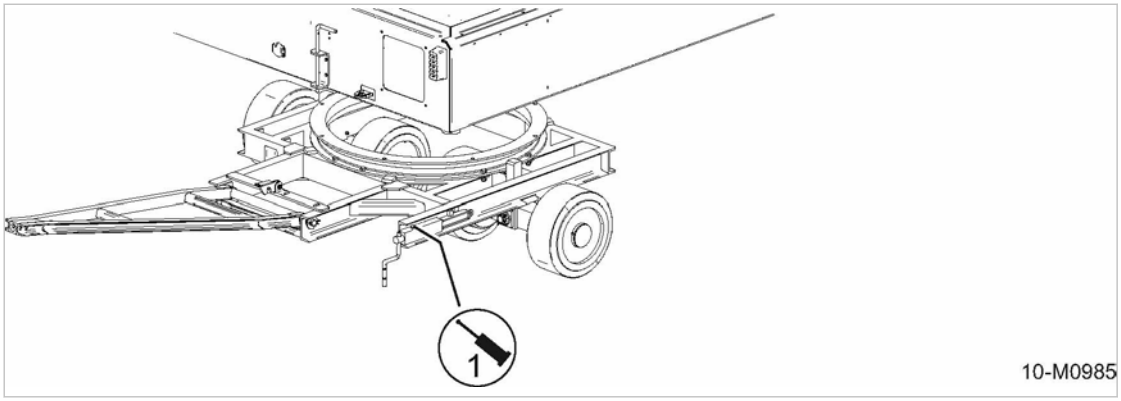


Fig. 84 Lubricating point, parking brake

[1] Lubricating point (grease nipple for trapezoid thread)

1. Clean the body of the parking brake of old and dirty grease.
2. Lubricate the trapezoid thread until grease emerges at the brake body.

10.7.4 Maintenance of rubber sealing strips

The rubber sealing strips between the body panels, the access doors, and the panels serve both as a soundproofing measure and to prevent ingress of rain water.

Care of the rubber sealing strips is especially necessary in winter to prevent the strips from sticking and tearing when the access panels are opened.

Material Cleaning cloth

Silicone or Vaseline

Precondition The machine is shut down.

The machine is fully vented, the pressure gauge reads 0 bar.

The machine is cooled down.

All compressed air consumers are disconnected and the air outlet valves are open.

1. Open all doors, covers and service panels.
2. Clean the rubber sealing strips with a lint-free cloth and check for cracks, holes and other damage.

   Have any damaged gasket replaced.
3. Properly grease the rubber strips.
4. Close all doors, covers and service panels.

10.8 Check safety functions

➢ Perform inspection tasks/have them performed according to the maintenance schedule in chapter 10.3.3.

10.8.1 Check the EMERGENCY STOP device

In order to shut down the machine in the event of danger, the machine is equipped with an EMERGENCY STOP device. The EMERGENCY STOP device of the machine is referred to as «EMERGENCY» pushbutton

The position of the «EMERGENCY-STOP» pushbutton is shown in Chapter 4.2 "Machine Design".

Use the «EMERGENCY STOP» pushbutton to stop the machine only in emergencies!

Check the mechanical function of the «EMERGENCY STOP» pushbutton daily with the machine shut down.

WARNING
«EMERGENCY STOP» pushbutton locked out!
The machine cannot be stopped quickly in an emergency.
- ➢ Check the function of the «EMERGENCY STOP» pushbutton.
- ➢ Do not operate the machine if the «EMERGENCY STOP» pushbutton does not work.

Precondition The machine is switched off.
The drive engine stands still.

1. Push the «EMERGENCY STOP» pushbutton.
2. Check if «EMERGENCY STOP» pushbutton locks properly and remains locked.
3. Check if the «EMERGENCY STOP» pushbutton unlocks by turning it in the direction of the arrow.

The «EMERGENCY STOP» pushbutton cannot be pressed or does not engage.
- ➢ Do not start the machine.
- ➢ Have the «EMERGENCY STOP» pushbutton replaced.

10.8.2 Have the activating pressure of the relief valve checked

The machine should shut down if the activating pressure of the relief valve reaches a maximum of $P_{max.}$ ($P_{max.}$ see table 77).

Check in accordance with section: Carry out "Check safety shut-down p5" in the separate operating manual for the SIGMA CONTROL MOBIL controller, chapter “Have safety functions checked”.

Maximum working pressure [bar]	Activating pressure [bar]
10.3	11.3

Tab. 77 Relief valve activating pressure

Material Hearing protection
Eye protection

WARNING
Risk of hearing damage when air is blown out through the pressure relief valve!
- ➢ Close all the doors.
- ➢ Wear hearing protection.

WARNING
Risk of burning from released compressed air when pressure relief valve blows off!
➢ Wear eye protection.

➢ Have the activating pressure of the relief valve checked.

Result When the "activating pressure" is reached, the pressure release valve actuates (blows off).

When the "activating pressure" is reached, the pressure release valve does not actuate (blow off).
➢ Immediately shut down the machine and cease any further operation.
➢ Request an inspection and/or replacement of the pressure relief valve.

10.8.3 Having excessive temperature shut-down function checked

The machine should shut down if the following compressed air temperatures are reached:
- Compressed air temperature $T2_{max}$
  - (Compressed air discharge temperature after stage 1)
- Compressed air temperature $T4_{max}$
  - (Compressed air discharge temperature after stage 2)
- Compressed air temperature $T4.1_{max}$
  - (Compressed air discharge temperature after stage 2, between air coolers)

Values, see table 78.

Check in accordance with the following sections in the separate operating manual for the SIGMA CONTROL MOBIL controller, chapter “Have safety functions checked”.
- Check safety shut-down T2
- Check safety shut-down T4
- Check safety shut-down T4.1

Machine temperature	Value [°C]
Maximum compressed air temperature T2 (automatic safety shut-down)	250
Maximum compressed air temperature T4 (automatic safety shut-down)	270
Maximum compressed air temperature T4.1 (automatic safety shut-down)	180

Tab. 78 Safety shut-down at excessive temperatures

➢ Having excessive temperature shut-down function checked.

Result When the maximum compressed air temperatures T2, T4 or T4.2 are exceeded, the SIGMA CONTROL MOBIL controller switches the machine off.

The machine does not shut down?

The excessive temperature shut-down function is no longer ensured.

➢ Immediately shut down the machine and cease any further operation.

➢ Have machine checked.

10.9 Draining liquid accumulation within the machine

The so-called "closed floor pan" contributes to the protection of the environment by preventing a contamination of the soil in the event of leaking operating fluids. In addition, water may enter the machine during service work and/or due to weather conditions.

Liquid accumulations within the machine's body can also cause corrosion or electrical faults.

Liquid accumulations must be removed as quickly as possible in order to avoid potential machine faults.

For draining the liquid, maintenance openings have been added to the floor panel of the machine which are closed with bungs.

The floor pan is fitted with a fluid sensor which issues a warning message to the controller when sensing liquids.

In order to clean the machine, see chapter 4.11 for the location of the service openings.

Material
Receptacle
Cleaning cloths

Precondition
The machine is switched off.
The machine is standing level.
The machine is secured against moving.
The machine is fully vented, the pressure gauge reads 0 bar.
The machine has cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is turned off.

Analyzing the warning message on the controller

The machine's floor pan is connected to the SIGMA CONTROL MOBIL controller via liquid sensors. The controller receives a fault message when liquid accumulates in the floor pan.

- The controller displays indicates "Liquid level in floor pan high".
- The «Information» key illuminates.
- The «Acknowledge» key flashes.

When this warning message appears, the accumulations of liquid within the machine must be drained immediately.

Precondition
Liquid leaking into the floor pan.

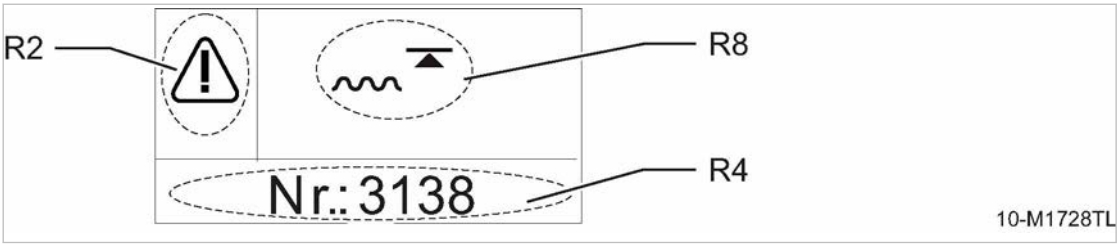


Fig. 85 Warning messages: "Liquid in the floor pan too high"

R2 Event memory category: Warning
R4 Message codes
R8 Symbols for trouble-shooting
"Liquid level in floor pan high"

➢ Drain accumulated liquid.

➢ Open all doors.

Draining the liquid:

1. Place a receptacle underneath the service opening(s).
2. Unscrew and remove the bung(s) from the service openings.
   The liquid will drain.
3. Clean the bungs and service openings.
4. Check the bung, and the sealing ring in particular, for wear and tear.
   Bung / sealing ring damaged: Replace
5. Close all service openings with bungs.
   The machine body is sealed.
6. Using the cleaning cloth, remove any dirt within the machine.
7. Close the doors.

Dispose of collected liquid and contaminated working materials according to applicable environmental protection regulations.

➢ Find the cause for the accumulation and eliminate or have eliminated the problem.

Acknowledge the warning message:

Precondition Have the liquid drained.

➢ Confirm the message with the «Acknowledge» key.
The «Information» and «Acknowledge» keys are extinguished.

10.10 Documenting maintenance and service work

Machine number:

➢ Enter maintenance and service work carried out in the list.

Date	Maintenance task carried out	Operating hours	Signature

Tab. 79 Maintenance log

11 Spares, Operating Materials, Service

11.1 Note the nameplate

The nameplate contains all information to identify your machine. This information is essential to us in order to provide you with optimal service.

➢ Please give the information from the nameplate with every enquiry and order for spares.

11.2 Ordering consumable parts and operating fluids/materials

KAESER consumable parts and operating fluids/materials are all genuine KAESER parts. They are matched to application in our machines and ensure trouble-free operation.



WARNING
There is risk of personal injury or damage to the machine resulting from the use of unsuitable spare parts or operating fluids/materials!
Unsuitable or poor quality consumable parts and operating fluids/materials may result in damage to the machine or significantly impair its proper function.
Personal injury may result from damage.

➢ Use only original parts and operating fluids/materials.
➢ Do not use alternative consumable parts and operating fluids and materials.
➢ Have an authorized KAESER SERVICE technician carry out regular maintenance.

Compressor

Name	Number/quantity	Number
Air filter insert (kit)	2	1260
Filter element gear ventilation	1	1507
Filter cartridge, control air filter	1	1505
Oil filter	1	1210
Cooling oil filter (transmission)	1	1330
Cooling oil	1	1610

Tab. 80 Compressor consumables

Hydraulics

Name	Number/quantity	Number
Hydraulic oil	1	1620

Tab. 81 Compressor consumables

CATERPILLAR engine parts

Name	Number/quantity	Number
Air filter insert (kit)	2	1280
Fuel prefilter element (dual filter)	2	1915

Name	Number/quantity	Number
Fuel prefilter cartridge	1	1985
Fuel filter cartridge	1	1920
Oil filter cartridge	2	1905
Belt (V-belt)	1	4470
Engine oil	1	1925

Tab. 82 Consumable engine parts

11.3 KAESER AIR SERVICE

KAESER AIR SERVICE offers:

- authorised service technicians with KAESER factory training,
- Increased operational reliability ensured by preventive maintenance
- Energy savings achieved by avoidance of pressure losses,
- The security of genuine KAESER spares,
- Increased legal certainty as all regulations are kept to.

➢ It make sense to sign a maintenance agreement for KAESER AIR SERVICE.
The advantages:
lower costs and higher compressed air availability.

11.4 Replacement parts for service and repair

Use these parts lists to plan your material requirement according to operating conditions and to order the required spare parts.



WARNING
Personal injury or machine damage due to incorrect working on the machine!
Incorrect inspection, service or repair can damage the machine or severely impair its function. Personal injury may result from damage.

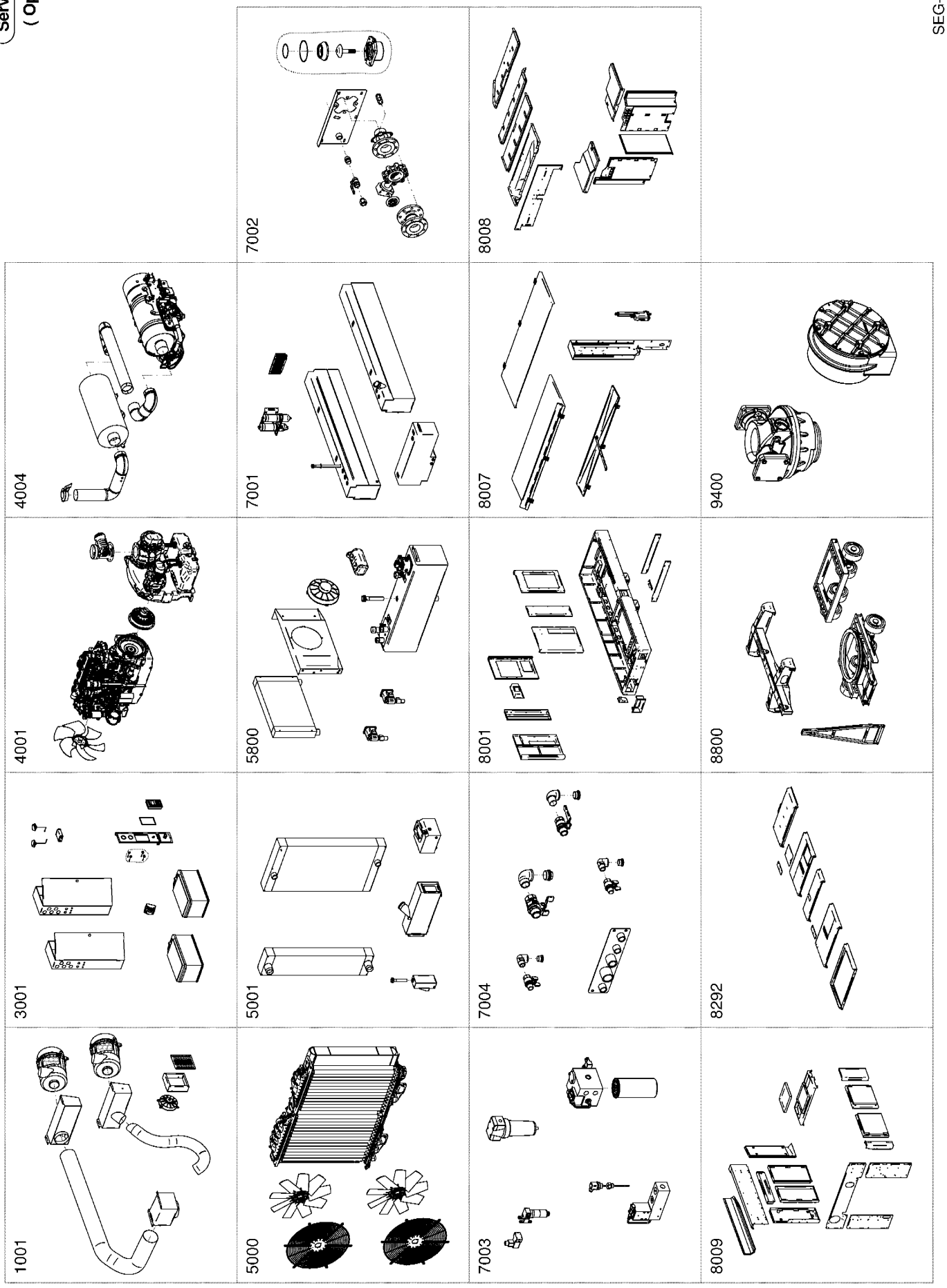
➢ Inspections, preventive maintenance or repair tasks not described in this Operating Manual must not be carried out by unqualified personnel.

➢ Have further tasks, not described in this service manual, carried out by motor vehicle workshops or KAESER SERVICE.

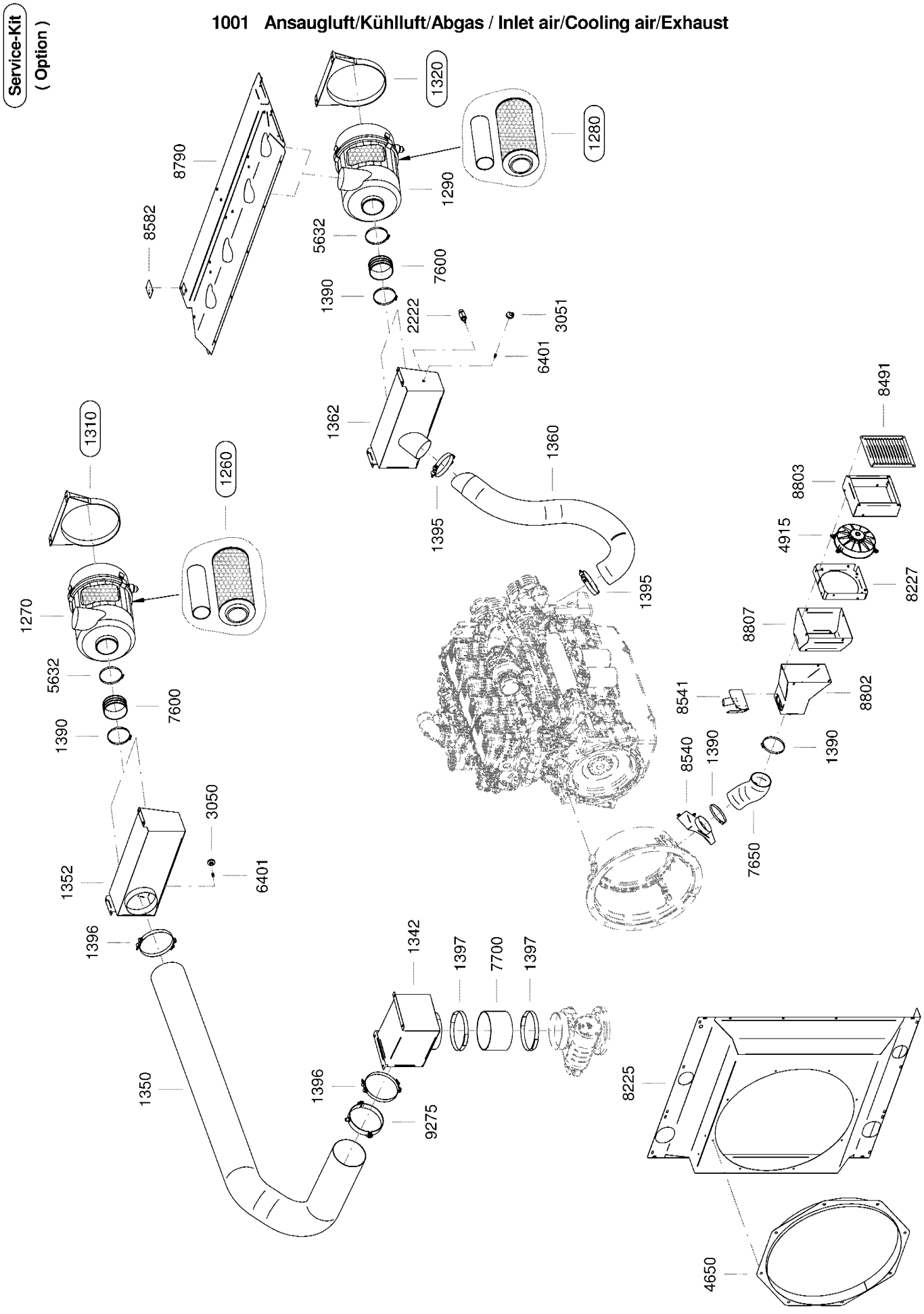
Service-Kit (Option)

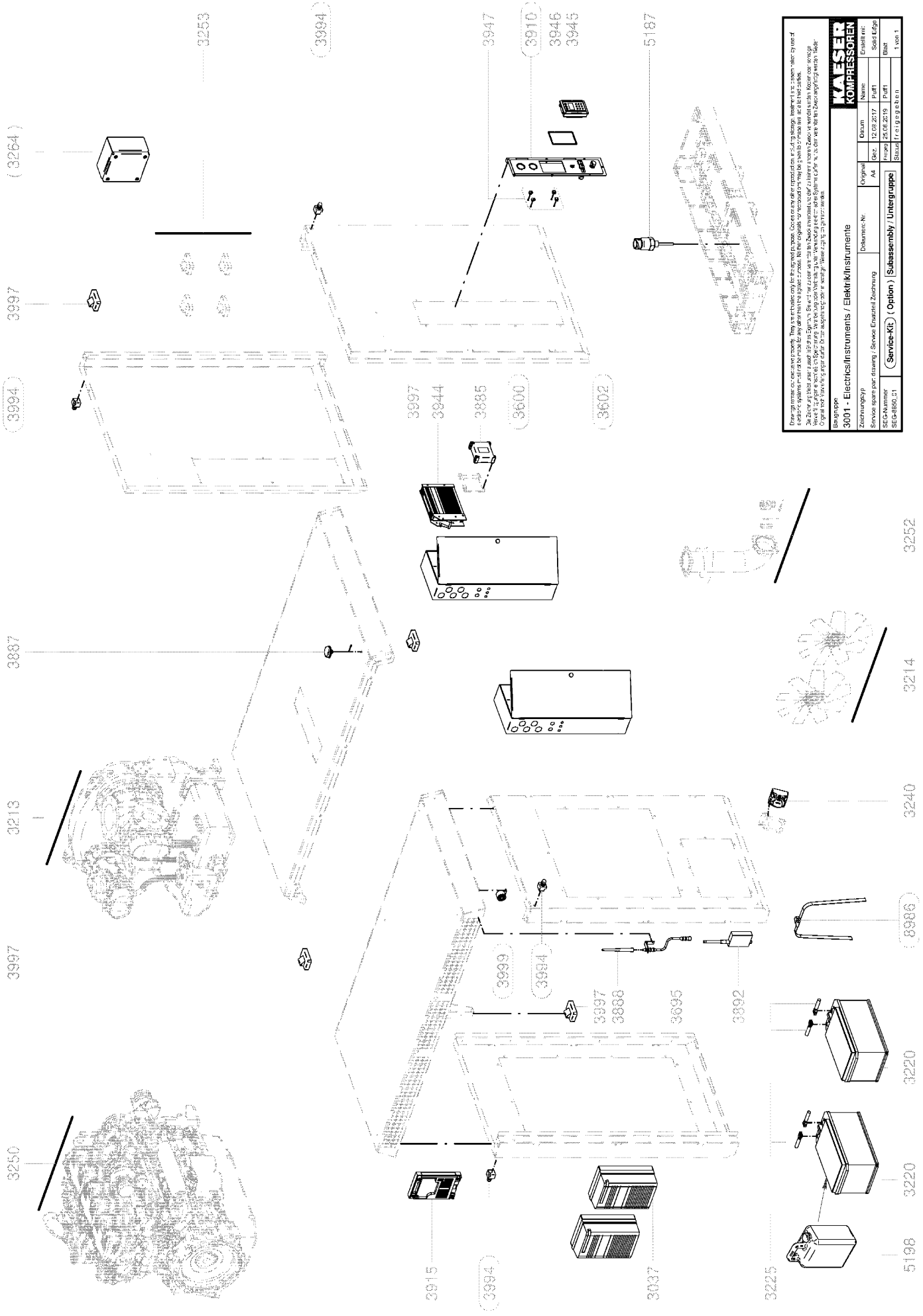
Übersicht / Overview

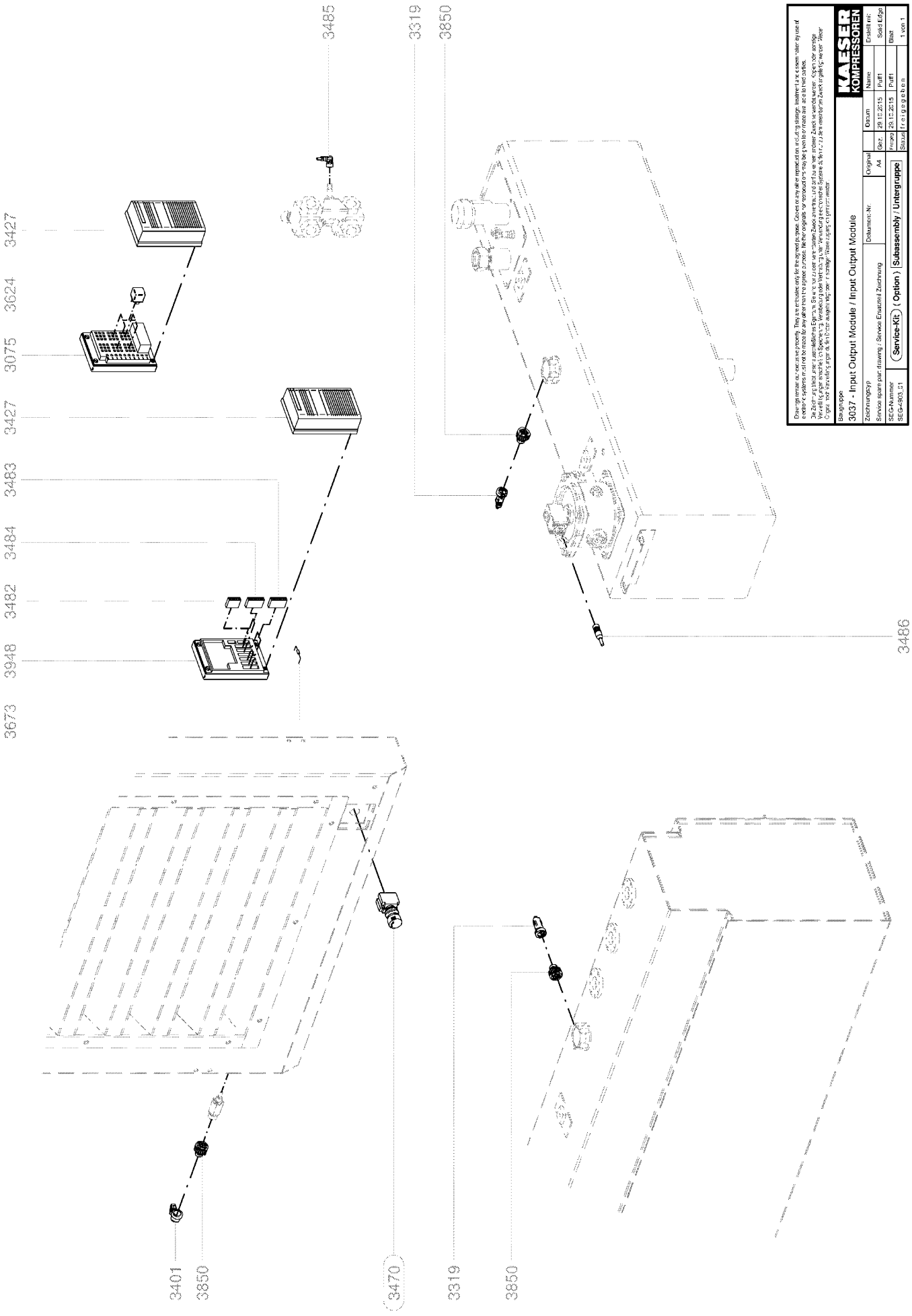
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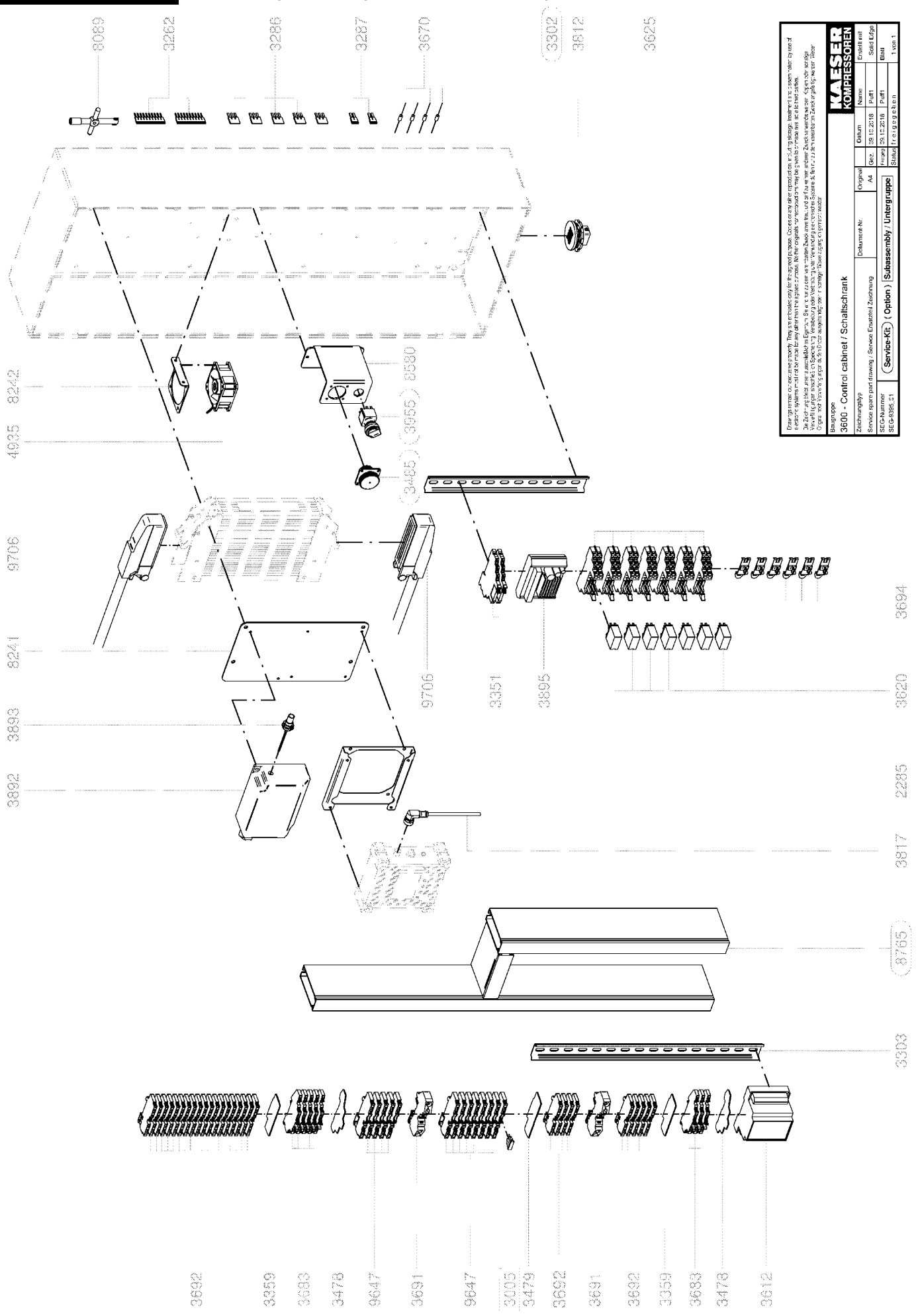


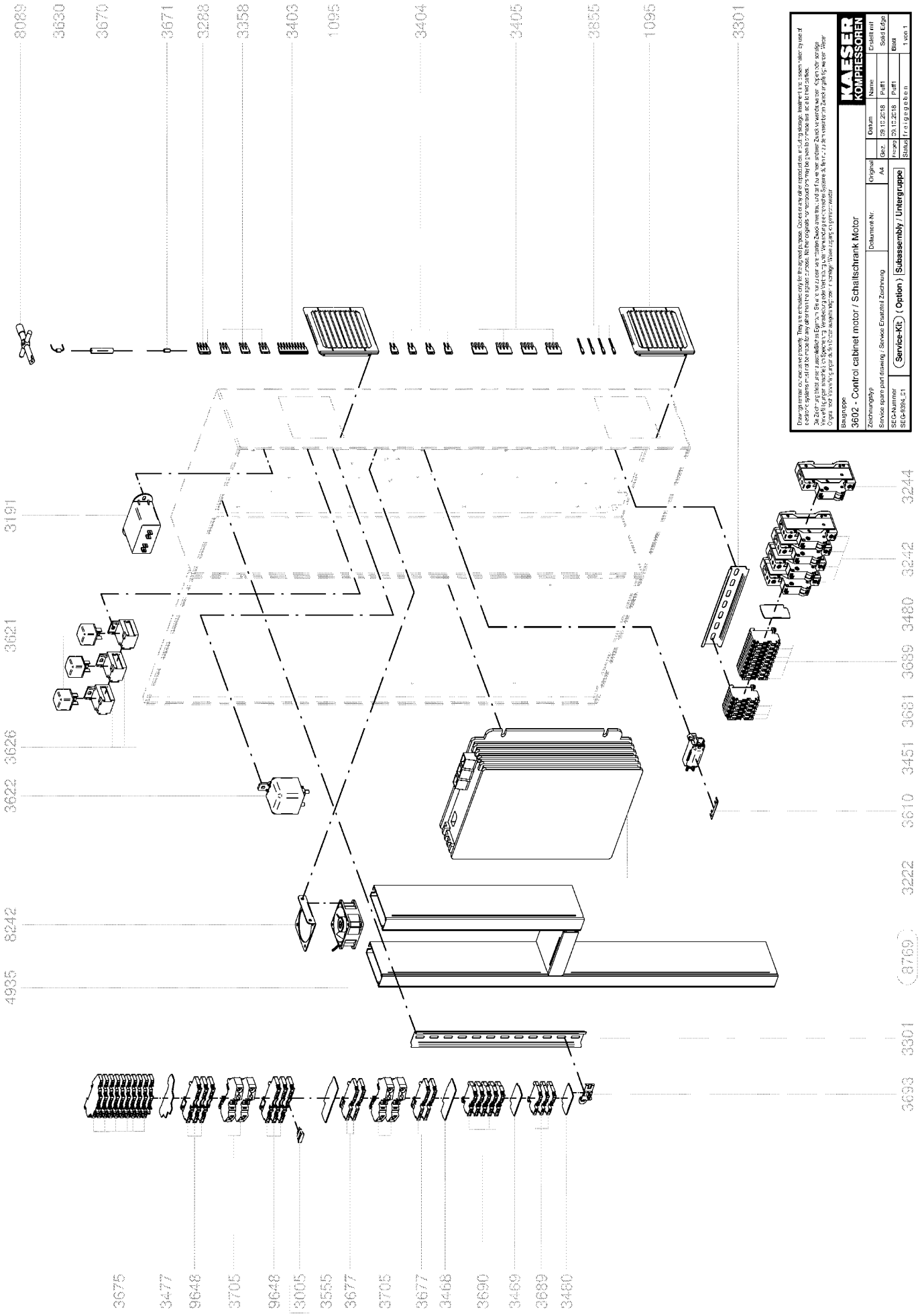
1001 Ansaugluft/Kühlluft/Abgas / Inlet air/Cooling air/Exhaust

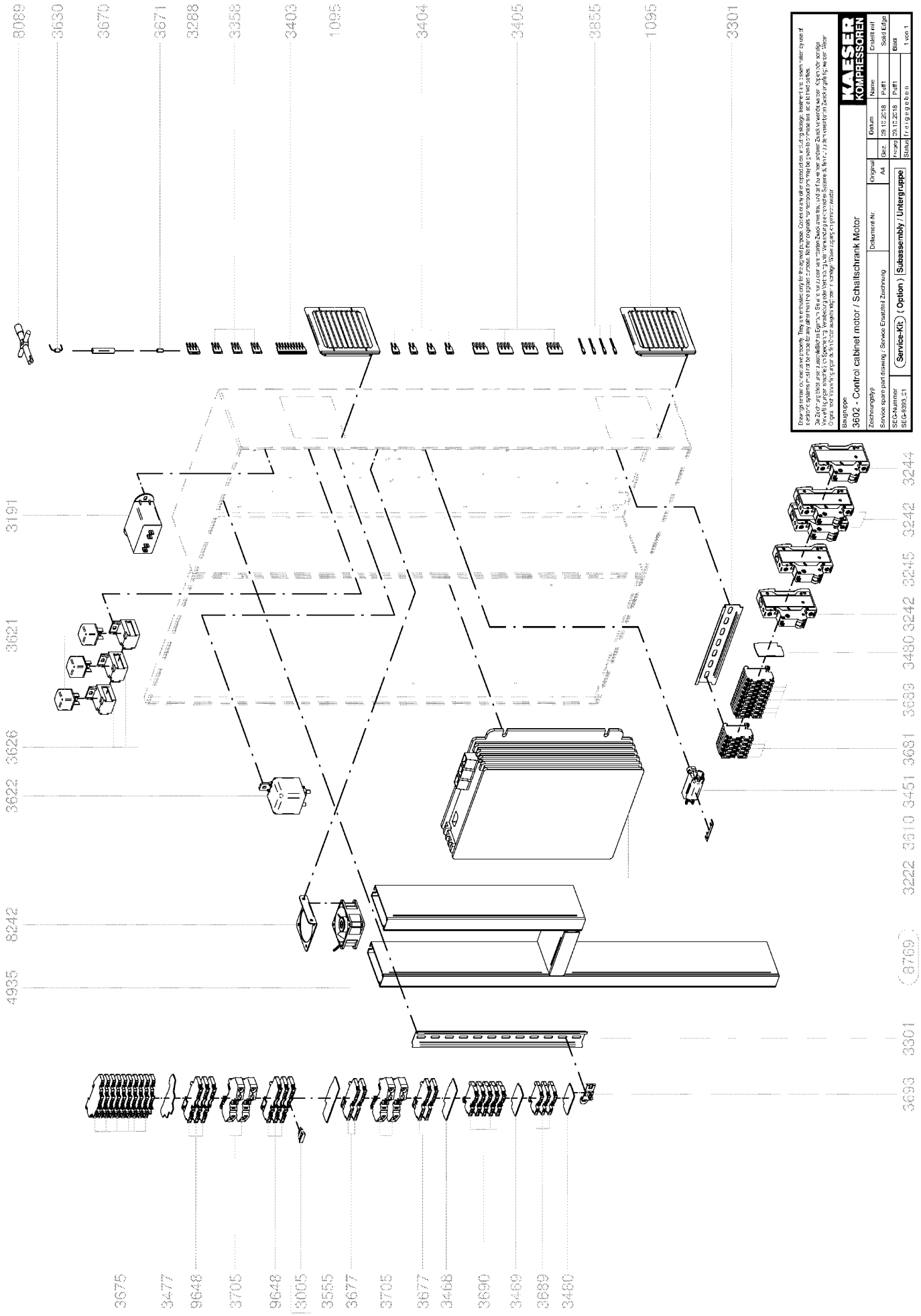


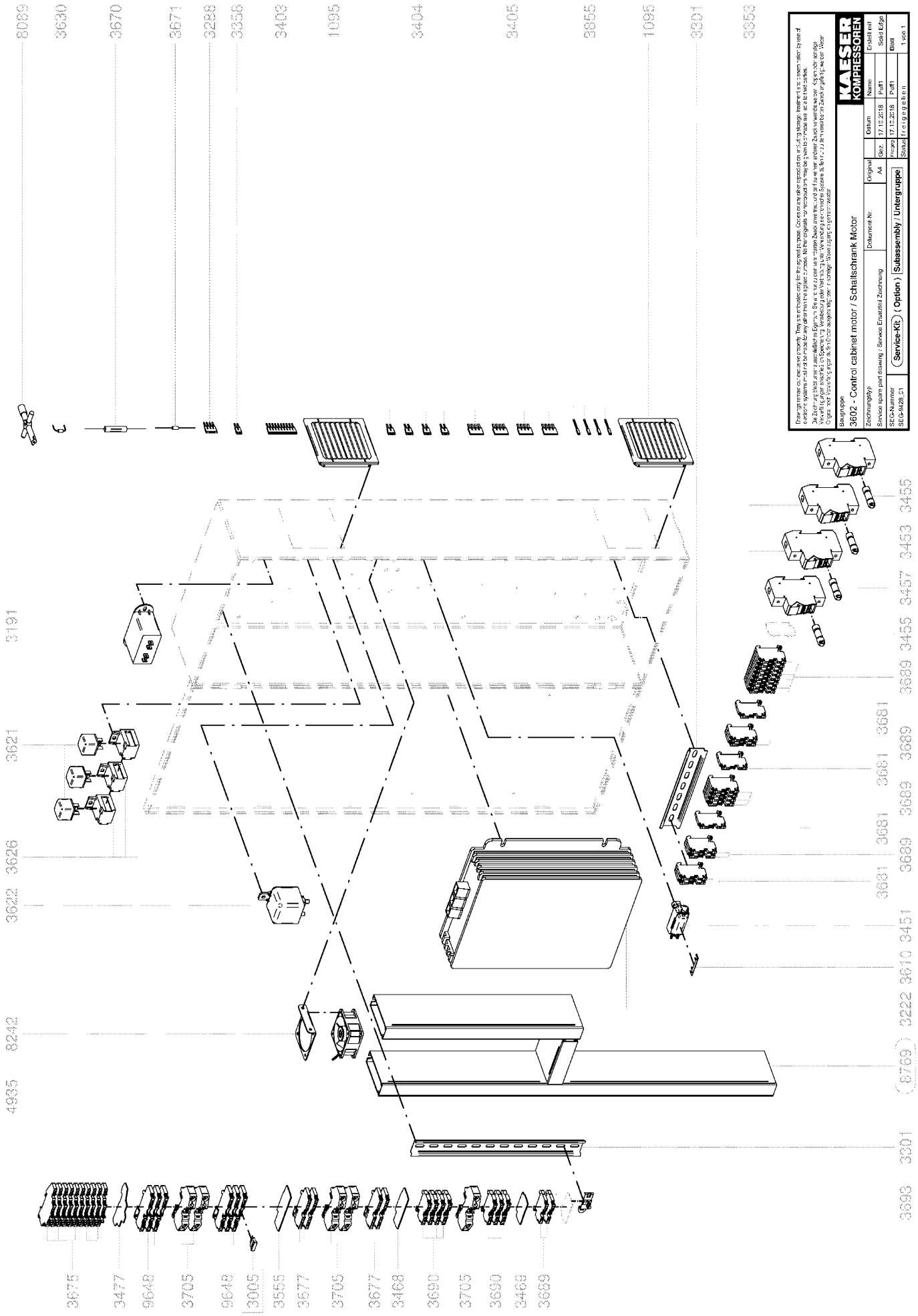

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Service spare part drawing / Service Ersatzteil Zeichnung
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Name
Erstellt mit:
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3037 - Input Output Module / Input Output Module
Zeichnungstyp
Service spare part drawing / Service Ersatzteil Zeichnung
Dokument-Nr.
Original
A4
Datum
Name:
Gez. 29.12.2015 Puff1
Kriggr. 29.12.2015 Puff1
Status freigegeben
Erstellt mit: Solid Edge
Blatt 1 von 1
SEG-Nummer
SEG-0903.01
Service-Kit (Option) Subassembly / Untergruppe


8089
3262
3286
3287
3670
3302
3812
3625
8242
4935
9706
8241
3893
3892
8580
3655
3485
9706
3351
3895
3694
3620
2285
3817
8765
3303
3692
3359
3683
3473
9647
3691
9647
3005
3479
3692
3691
3692
3359
3683
3473
3612
KAESER KOMPRESSOREN
Baugruppe
3600 - Control cabinet / Schaltschrank
Zeichnungstyp
Service spare part drawing / Service Ersatzteil Zeichnung
Dokument Nr.
Original
A4
Datum
Name
Erstellt mit
Solid Edge
Gez.
28.12.2018
Prüft
Freigeg.
28.12.2018
Prüft
Blatt
1 von 1
Status
freigegeben
SEG-Nummer
SEG-8365_01
Service-Kit
(Option)
Subassembly / Untergruppe


8089
3630
3670
3671
3283
3358
3403
1095
3404
3405
3855
1095
3301
3191
3621
3626
3622
8242
4935
3244
3242
3480
3689
3681
3451
3610
3222
8769
3301
3693
3675
3477
9648
3705
9648
3005
3555
3677
3705
3677
3468
3690
3469
3689
3460
KAESER KOMPRESSOREN
Baugruppe
3602 - Control cabinet motor / Schaltschrank Motor
Zeichnungstyp
Service spare part drawing / Service Ersatzteil Zeichnung
Dokument-Nr.
Original
A4
Datum
Name:
Erstellt mit
Gez.
19.12.2018
Pulfl
Solid Edge
Freigab.
29.12.2018
Pulfl
Blatt
Status
Freigegeben
1 von 1
SEG-Nummer
SEG-03054_01
Service-Kit
(Option)
Subassembly / Untergruppe


8089
3630
3670
3671
3288
3358
3403
1095
3404
3405
3850
1095
3301
3191
3621
3626
3622
8242
4935
3244
3242
3245
3242
3480
3689
3681
3451
3510
3222
(8769)
3301
3633
3675
3477
9648
3705
9648
3005
3555
3677
3705
3677
3468
3690
3469
3689
3460
Ersatzteilzeichnung
Service spare part drawing
Baugruppe
3602 - Control cabinet motor / Schaltschrank Motor
Service-Kit
(Option)
Subassembly / Untergruppe
KAESER KOMPRESSOREN



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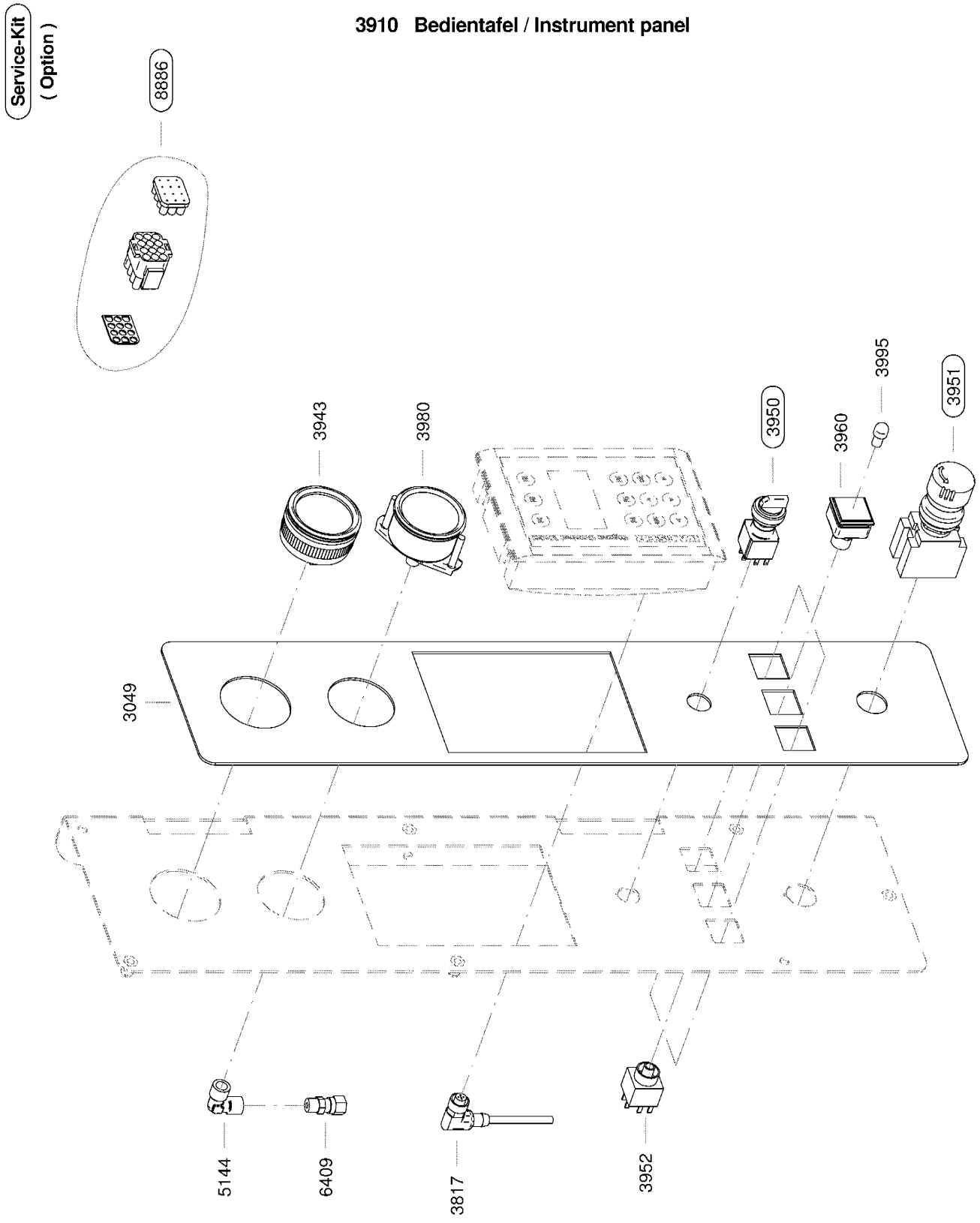
Baugruppe
3602 - Control cabinet motor / Schaltschrank Motor

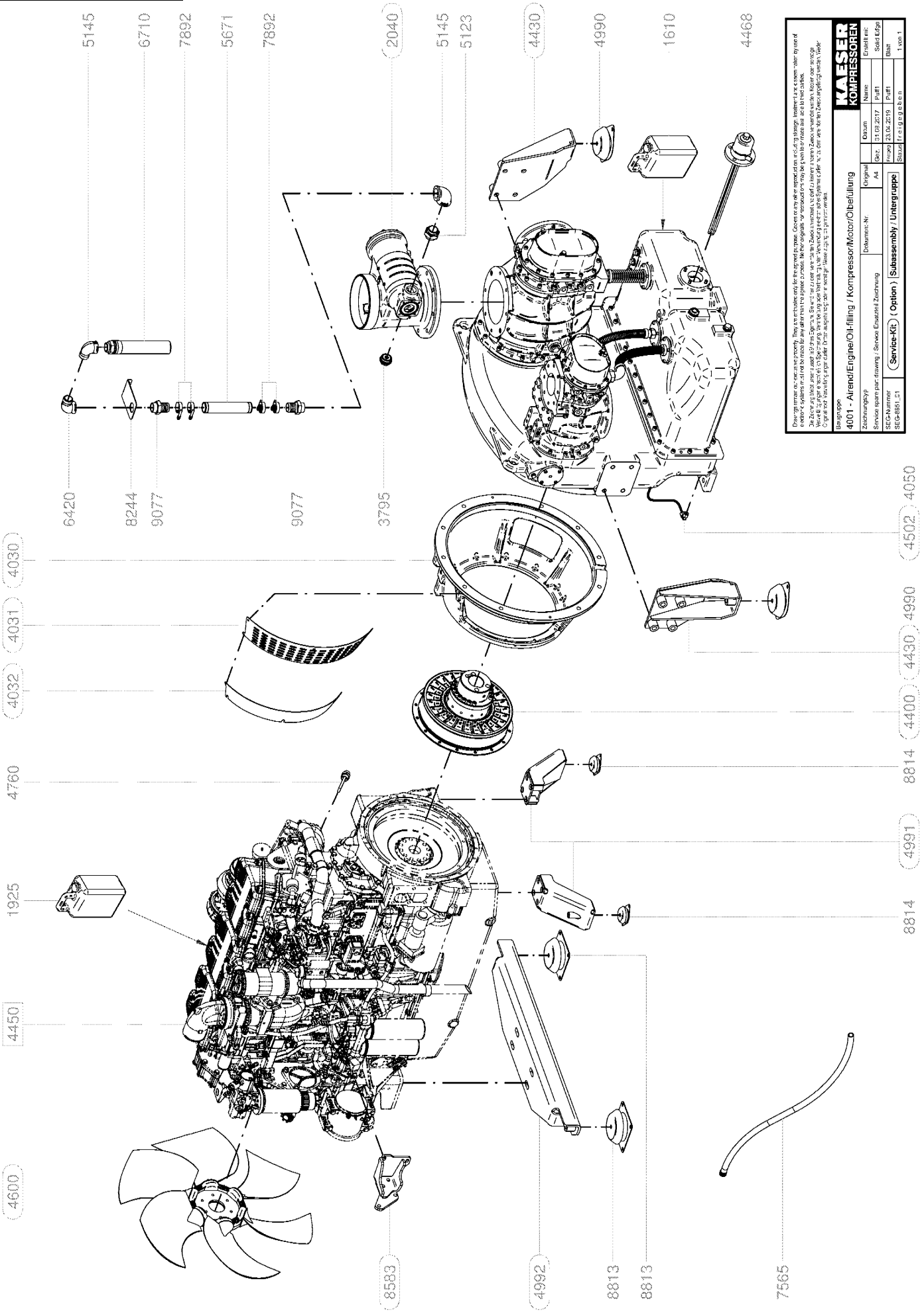
Zeichnungstyp: Service spare part drawing / Service Ersatzteil Zeichnung
Dokument-Nr.:
Original: A4
Datum: Gez. 17.12.2018; Freigab 17.12.2018; Status Freigegeben
Name: Pufft; Pufft
Erstellt mit: Solid Edge
Blatt: 1 von 1

SEG-Nummer: SEG-0426.01
(Service-Kit) (Option) Subassembly / Untergruppe

3910 Bedientafel / Instrument panel

SEG-4235_01

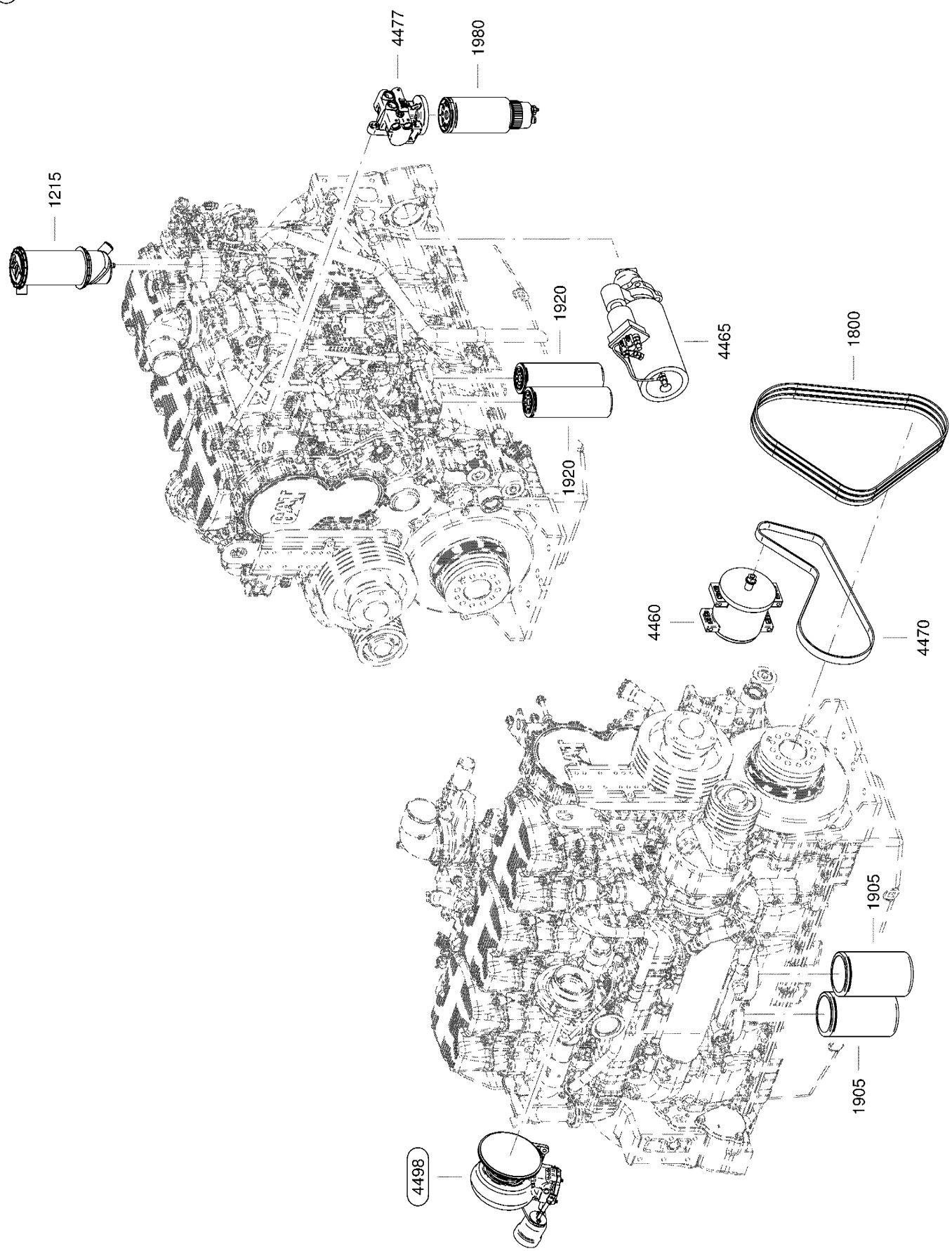



5145
6710
7892
5671
7892
2040
5145
5123
4430
4990
1610
4468
6420
8244
9077
9077
3795
4030
4031
4032
4760
1925
4450
4600
4050
4502
4990
4430
4400
8814
4991
8814
8583
4992
8813
8813
7565
KAESER KOMPRESSOREN
4001 - Airend/Engine/Oil-filling / Kompressor/Motor/Ölbefüllung
Zeichnungstyp
Service spare part drawing / Service Ersatzteil Zeichnung
Dokument-Nr.
Original
A4
Datum
Name:
Erstellt mit:
Solid Edge
SEG-Nummer
SEG-8851.01
Service-Kit (Option) Subassembly / Untergruppe
Blatt
1 von 1

Service-Kit
(Option)

4450 Motor / Engine

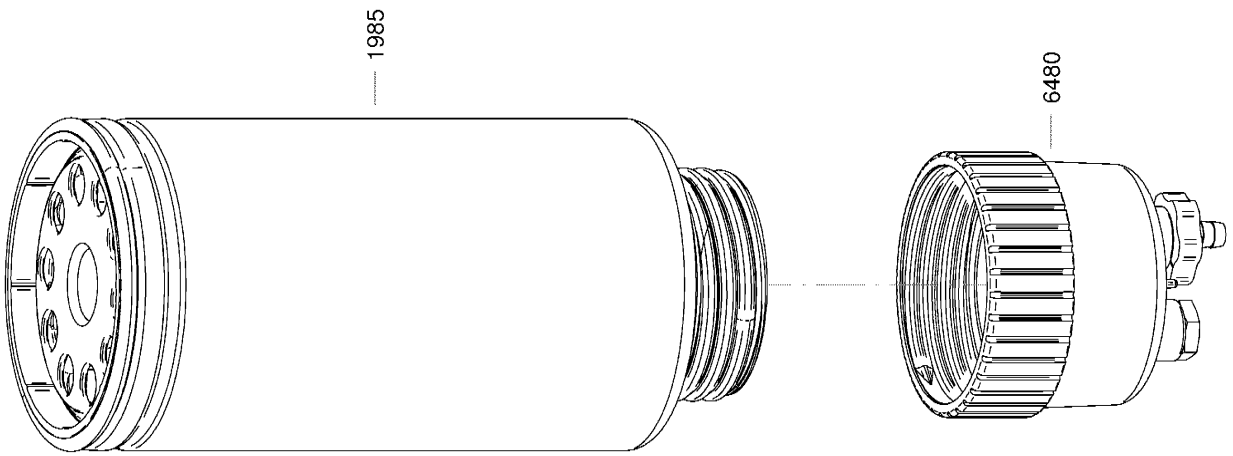
SEG-4880_01

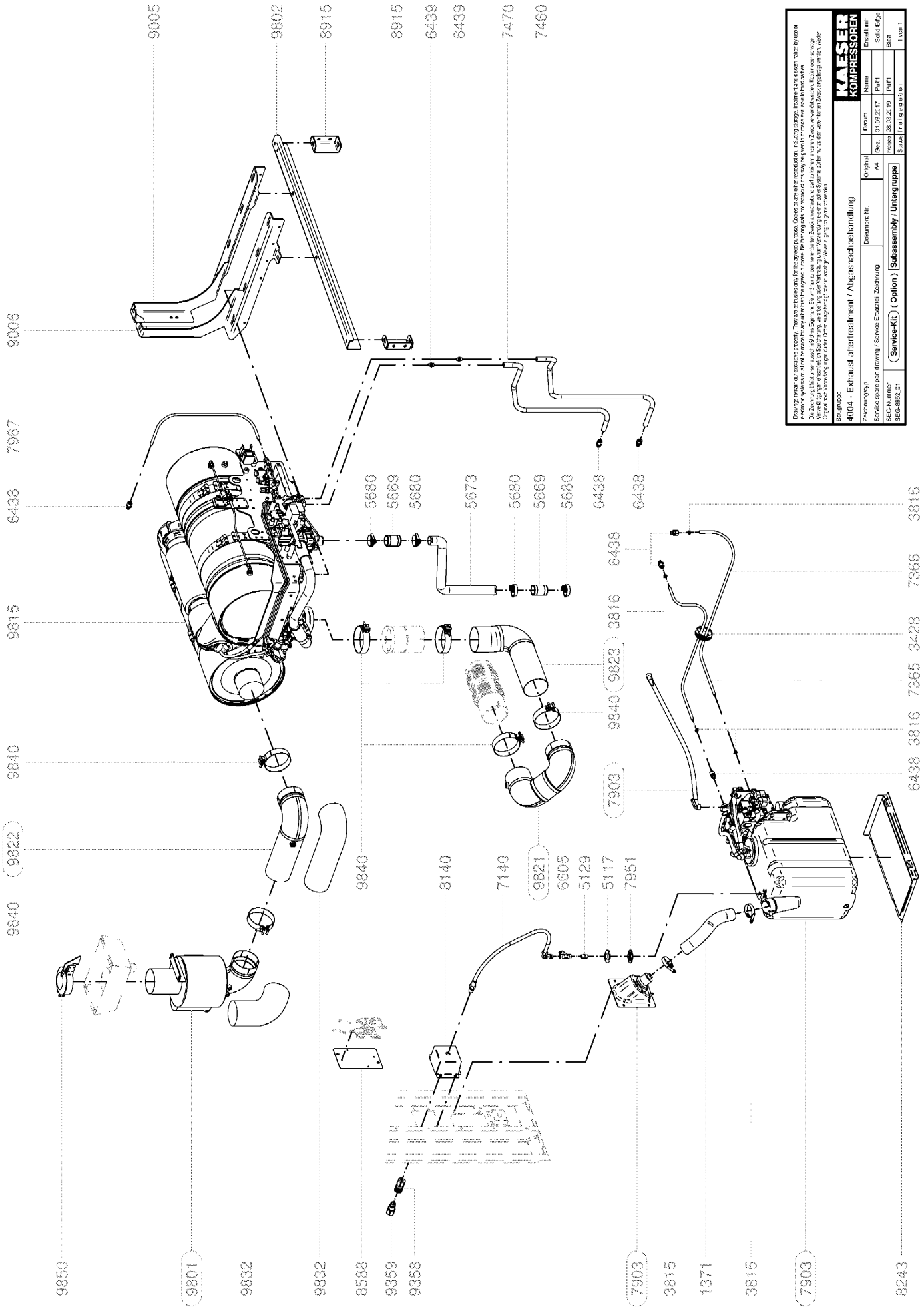


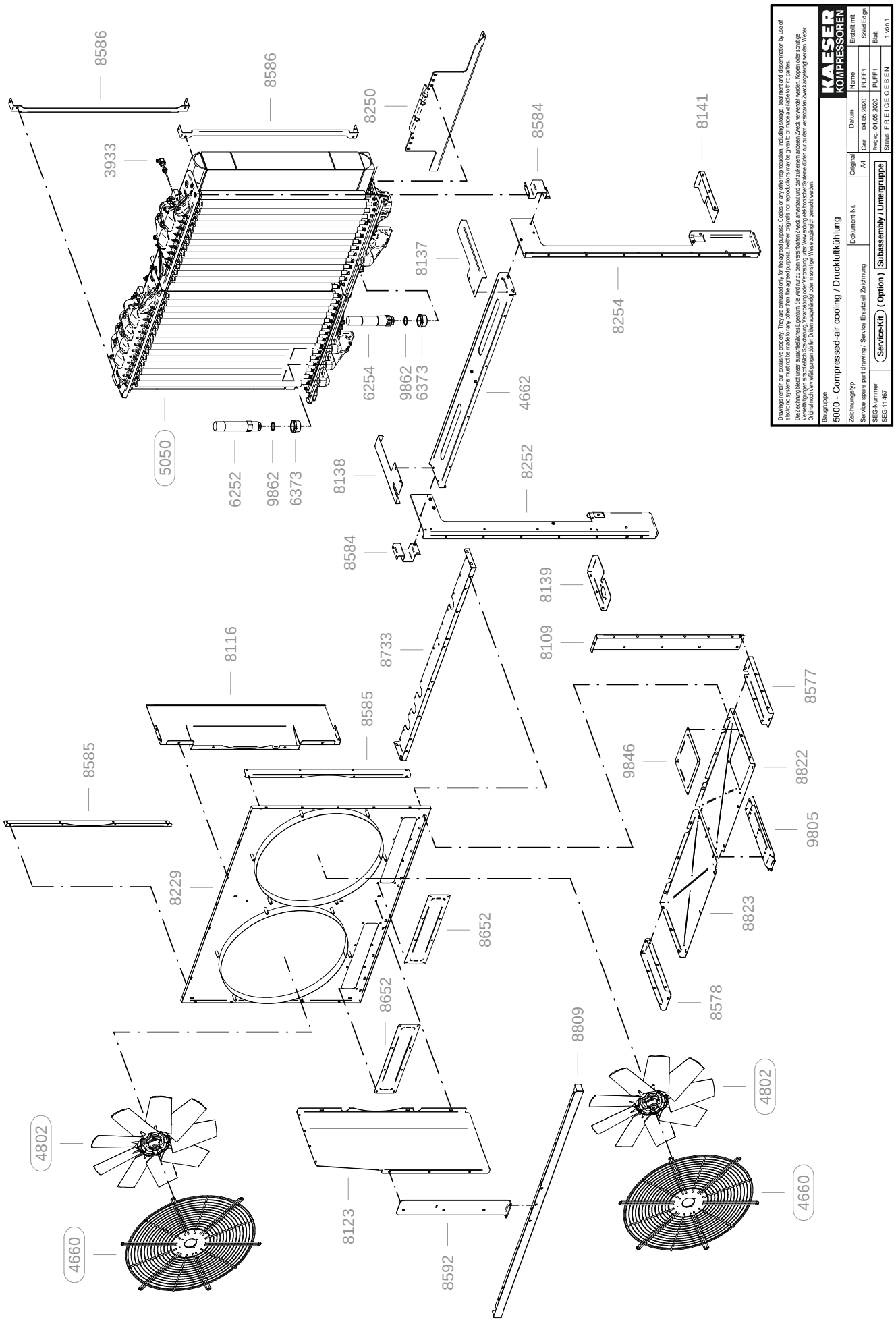
Service-Kit (Option)

1980 Kraftstoff-Wasserabscheider / Fuel water trap

SEG-5115_01



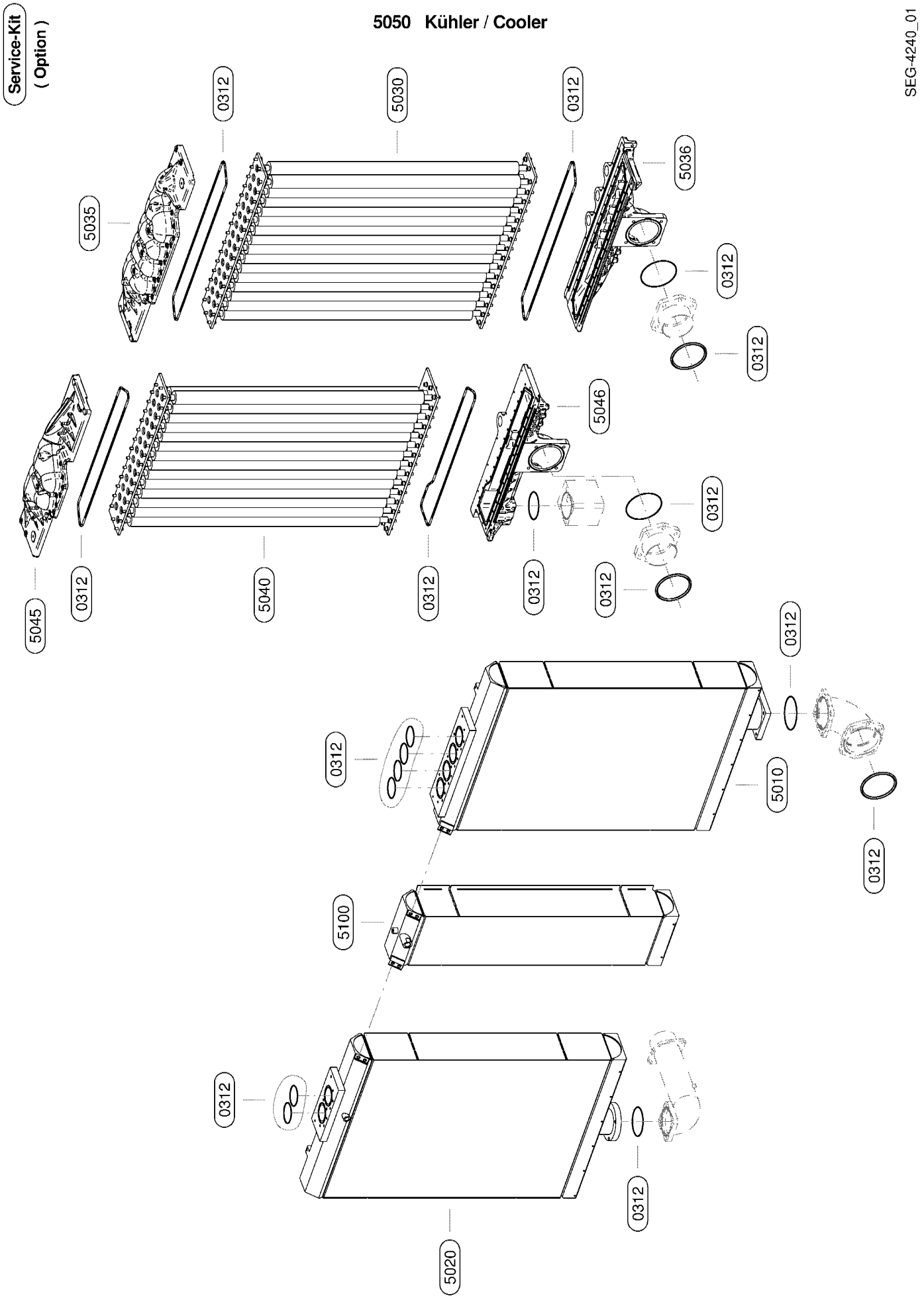

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9802
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8915
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7951
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3428
7365
3816
6438
9850
9801
9832
9832
8588
9359
9358
7903
3815
1371
3815
7903
8243
Service-Kit
(Option)
Subassembly / Untergruppe
4004 - Exhaust aftertreatment / Abgasnachbehandlung
KAESER KOMPRESSOREN

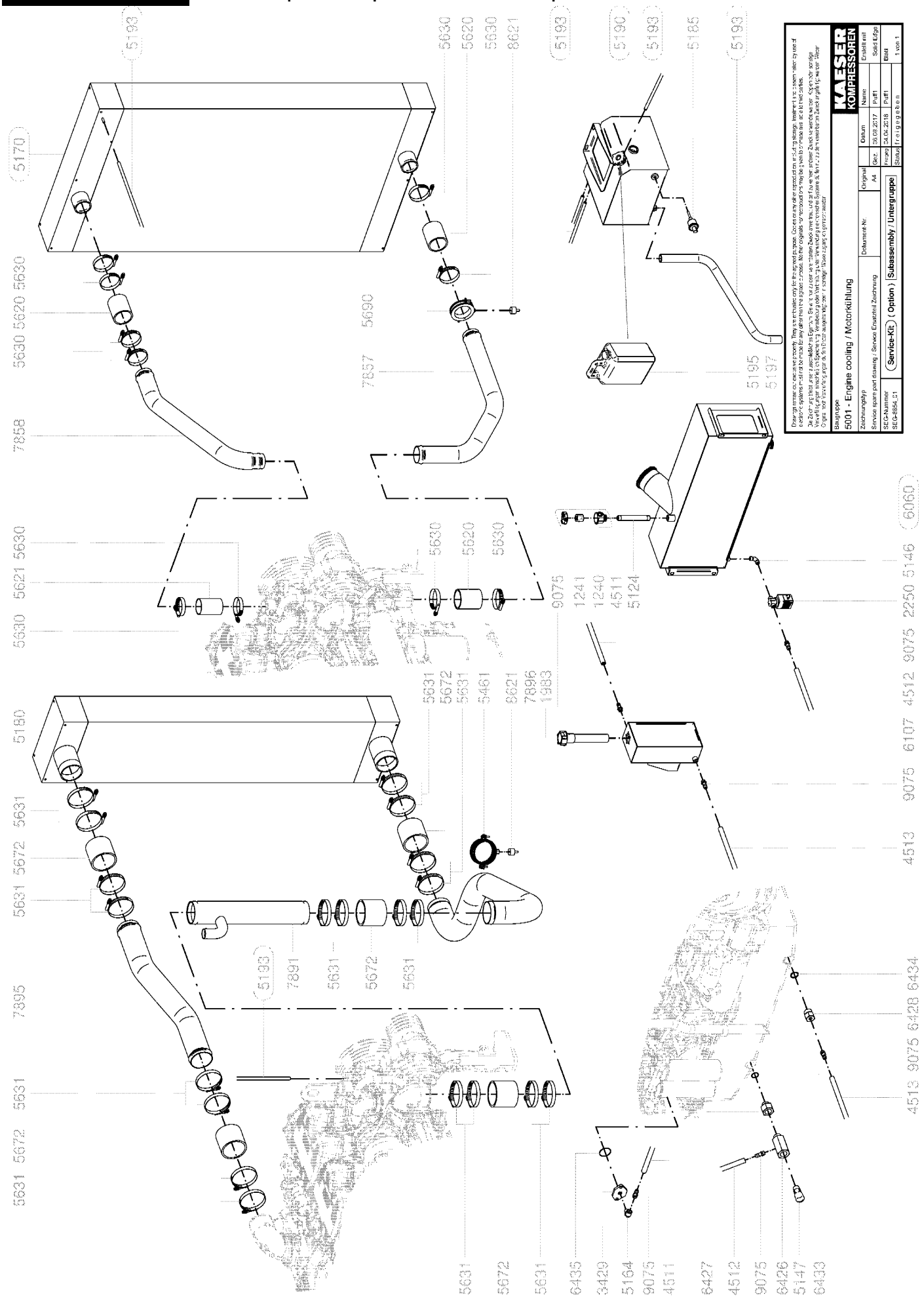


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Baugruppe					
5000 - Compressed-air cooling / Druckluftkühlung					
Zeichnungstyp		Dokument-Nr.	Original	Datum	Name
Service spare part drawing / Service Ersatzteil Zeichnung			A4	Gez. 04.05.2020	PUFF1
SEG-Nummer	Service-Kit (Option)	Subassembly / Untergruppe		Freigab 04.05.2020	PUFF1
SEG-11467				Status F R E I G E G E B E N	

Erstellt mit	
Solid Edge	
Blatt	1 von 1

5050 Kühler / Cooler





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KAESER KOMPRESSOREN

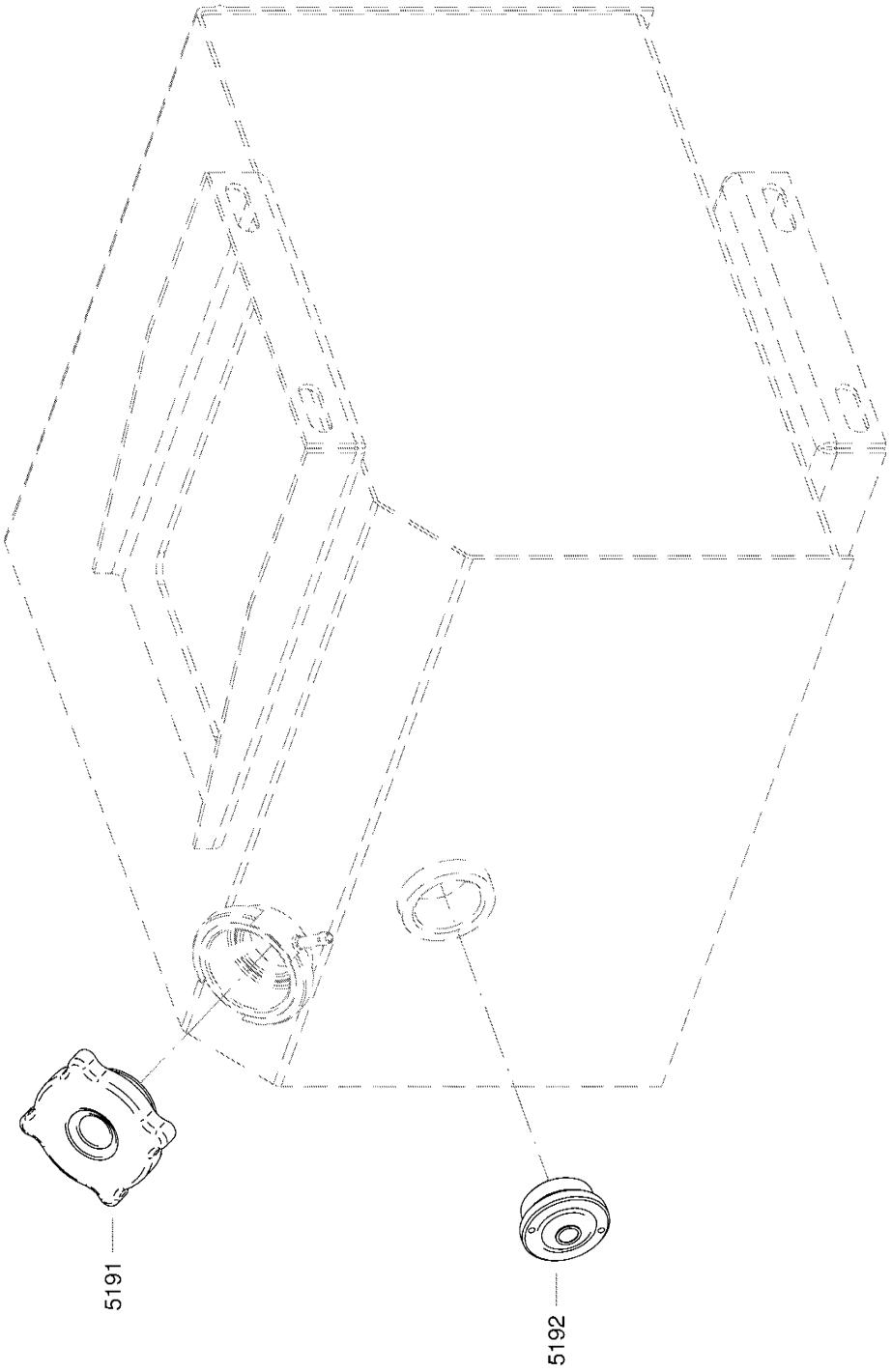
Baugruppe
5001 - Engine cooling / Motorkühlung

Zeichnungstyp	Dokument-Nr.	Original	Datum	Name	Erstellt mit
Service spare part drawing / Service Ersatzteil Zeichnung		A4	Gez. 06.08.2017	Pufft	Solid Edge
SEG-Nummer			Freigabe 24.04.2018	Pufft	Blatt
SEG-8654.01	Service-Kit (Option)	Subassembly / Untergruppe	Status freigegeben		1 von 1

Service-Kit (Option)

5190 Ausgleichsbehälter / Expansion tank

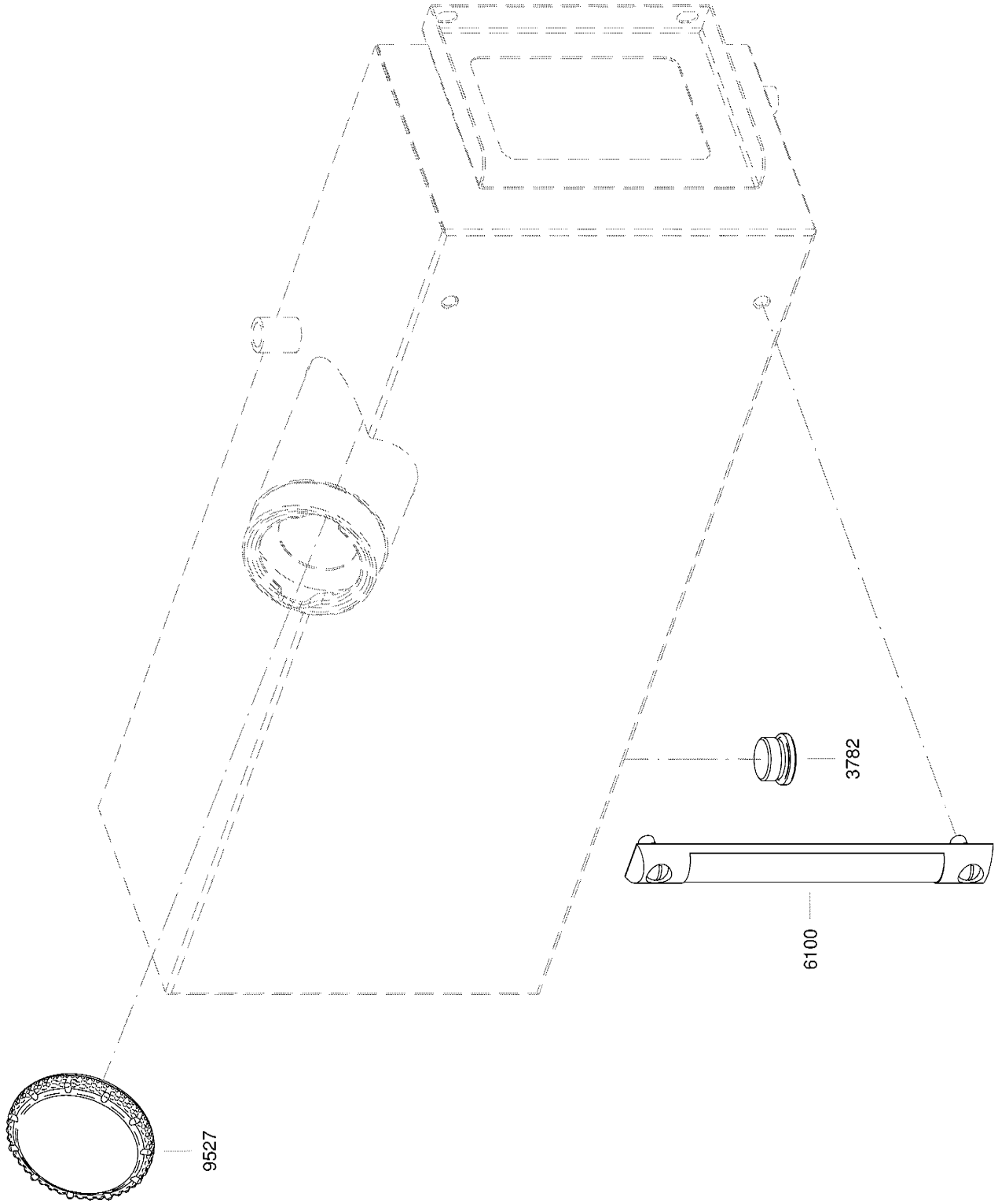
SEG-4271_01



Service-Kit (Option)

6060 Ölzusatztank / Oil tank

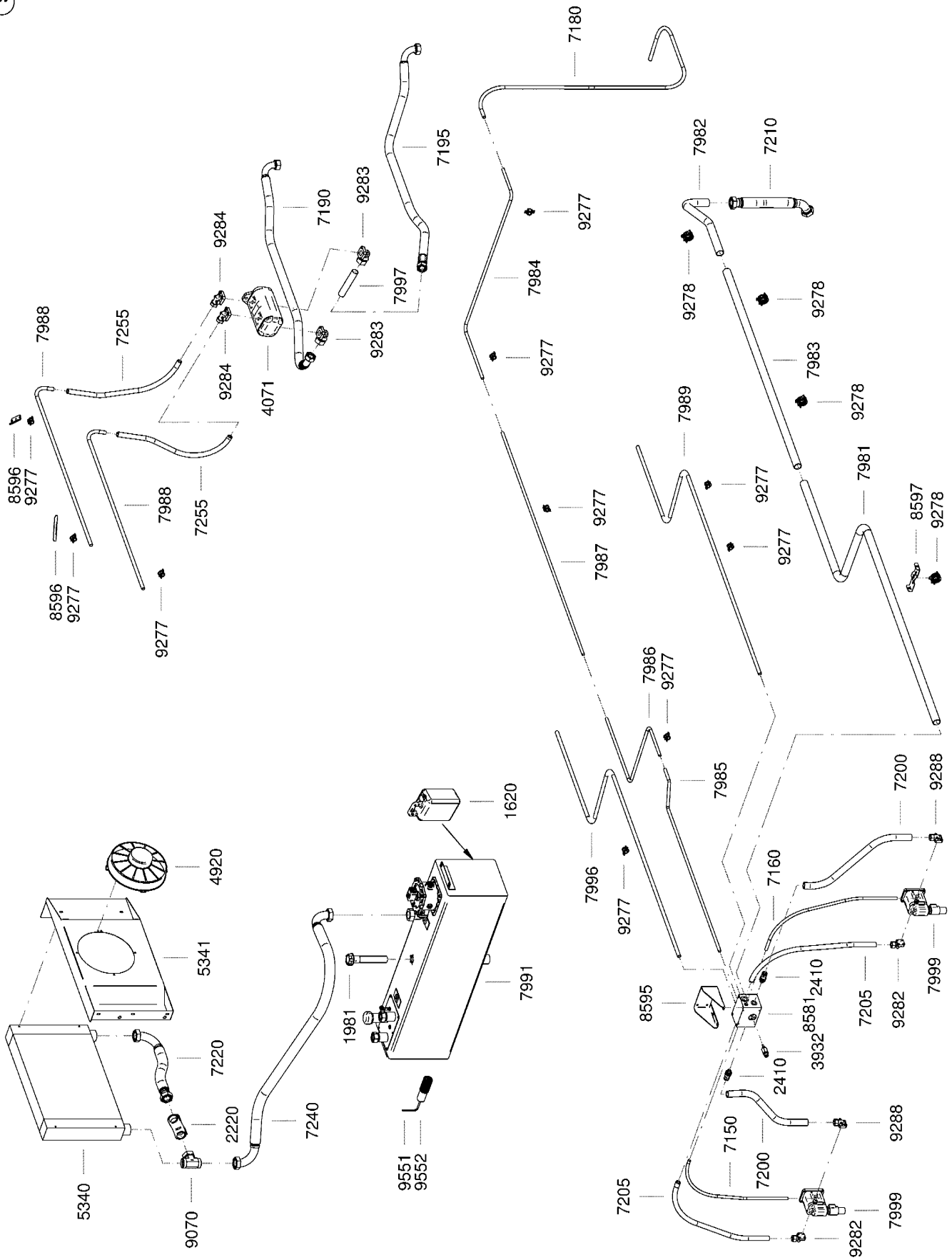
SEG-4272_01



Service-Kit (Option)

5800 Hydrauliksystem / Hydraulic system

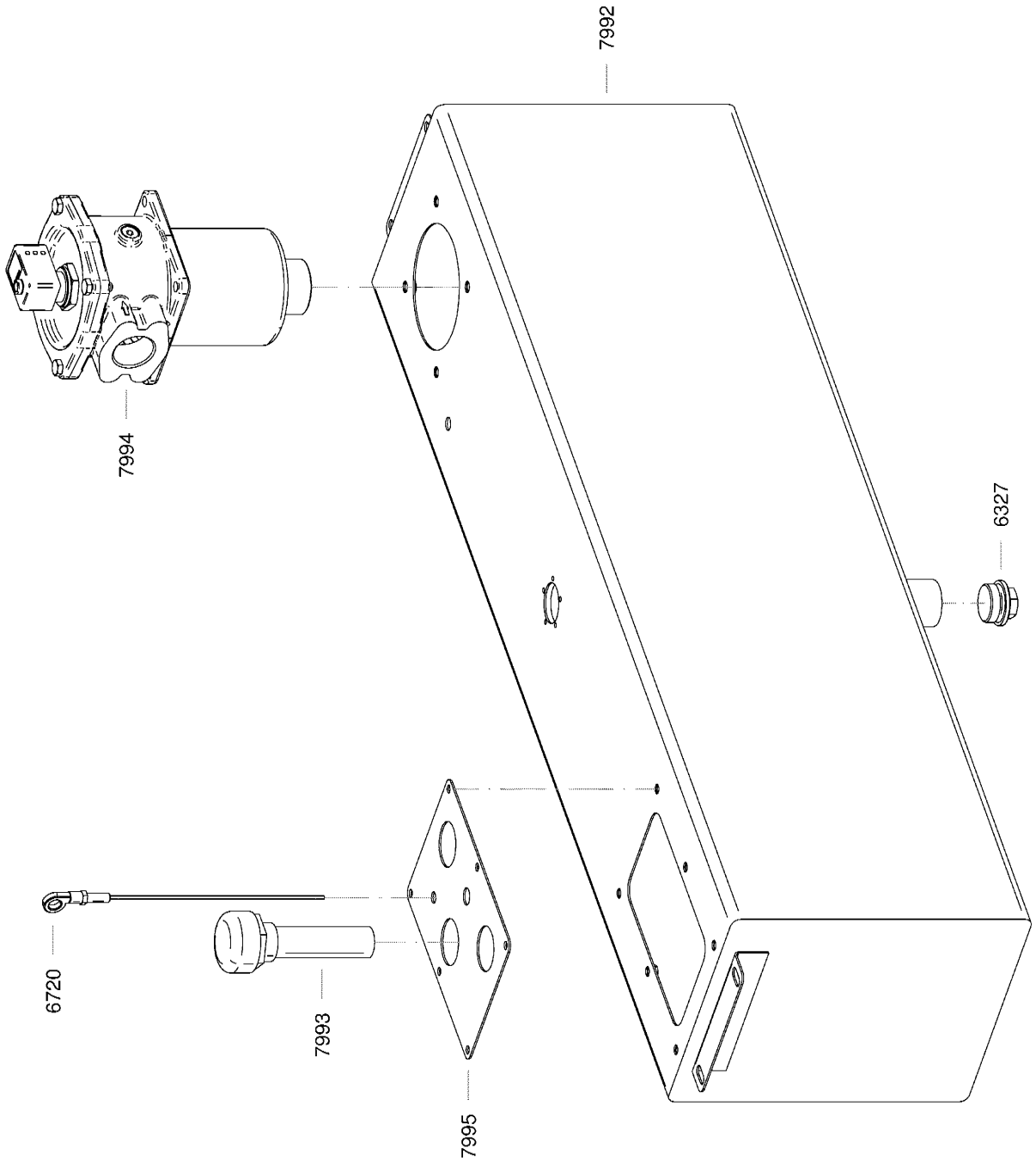
SEG-4242_01



Service-Kit (Option)

7991 Hydraulikaggregat / Hydraulic power unit

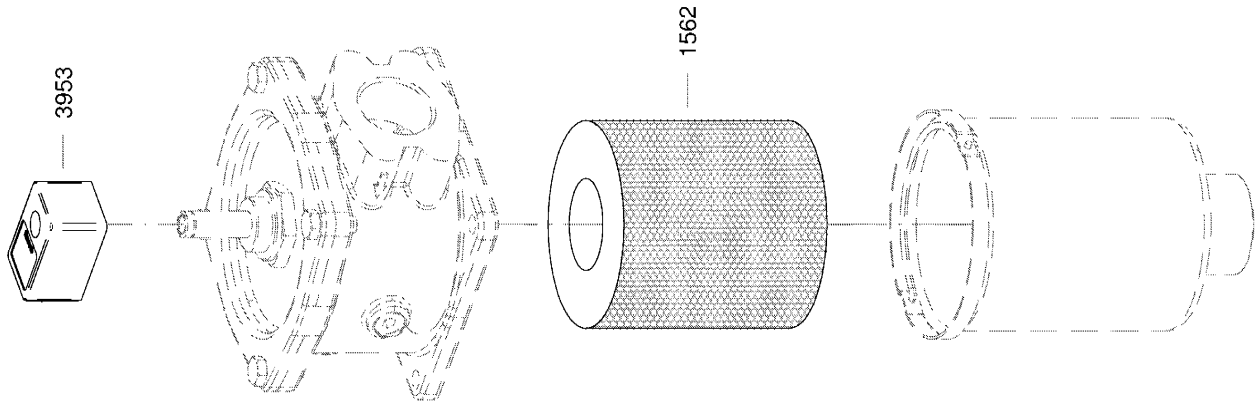
SEG-4243_01

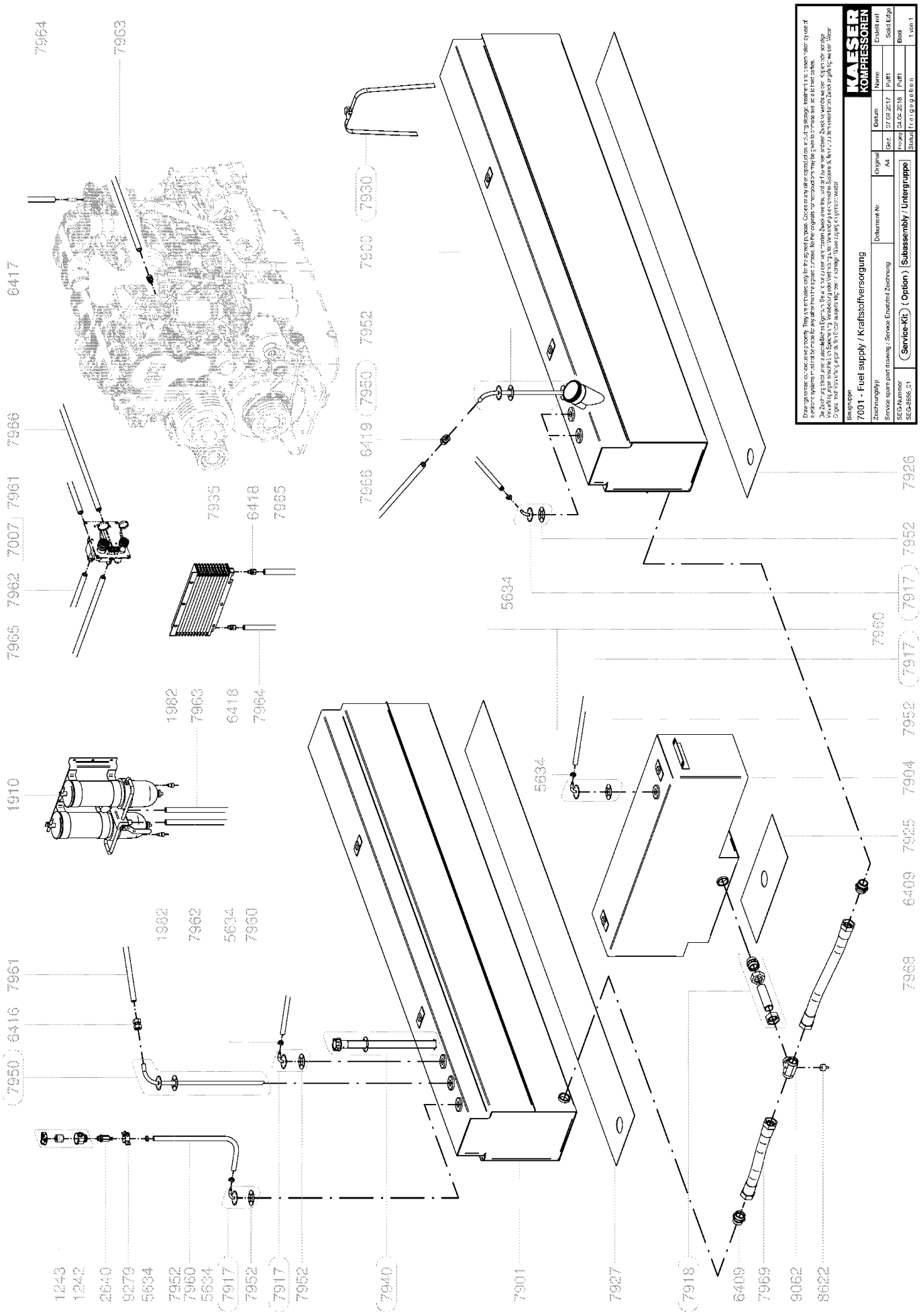


Service-Kit (Option)

7994 Rücklauffilter / Return filter

SEG-4263_01

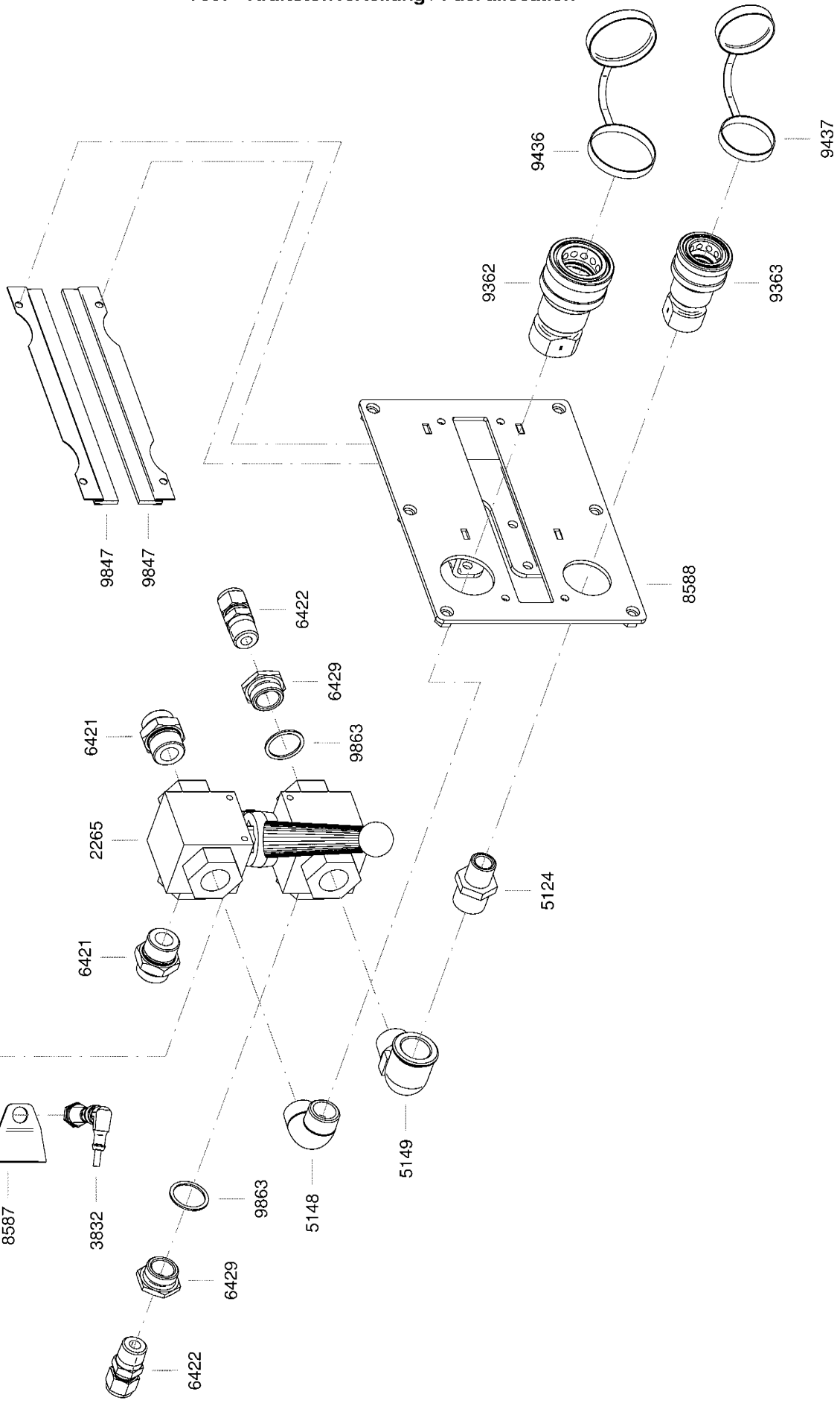


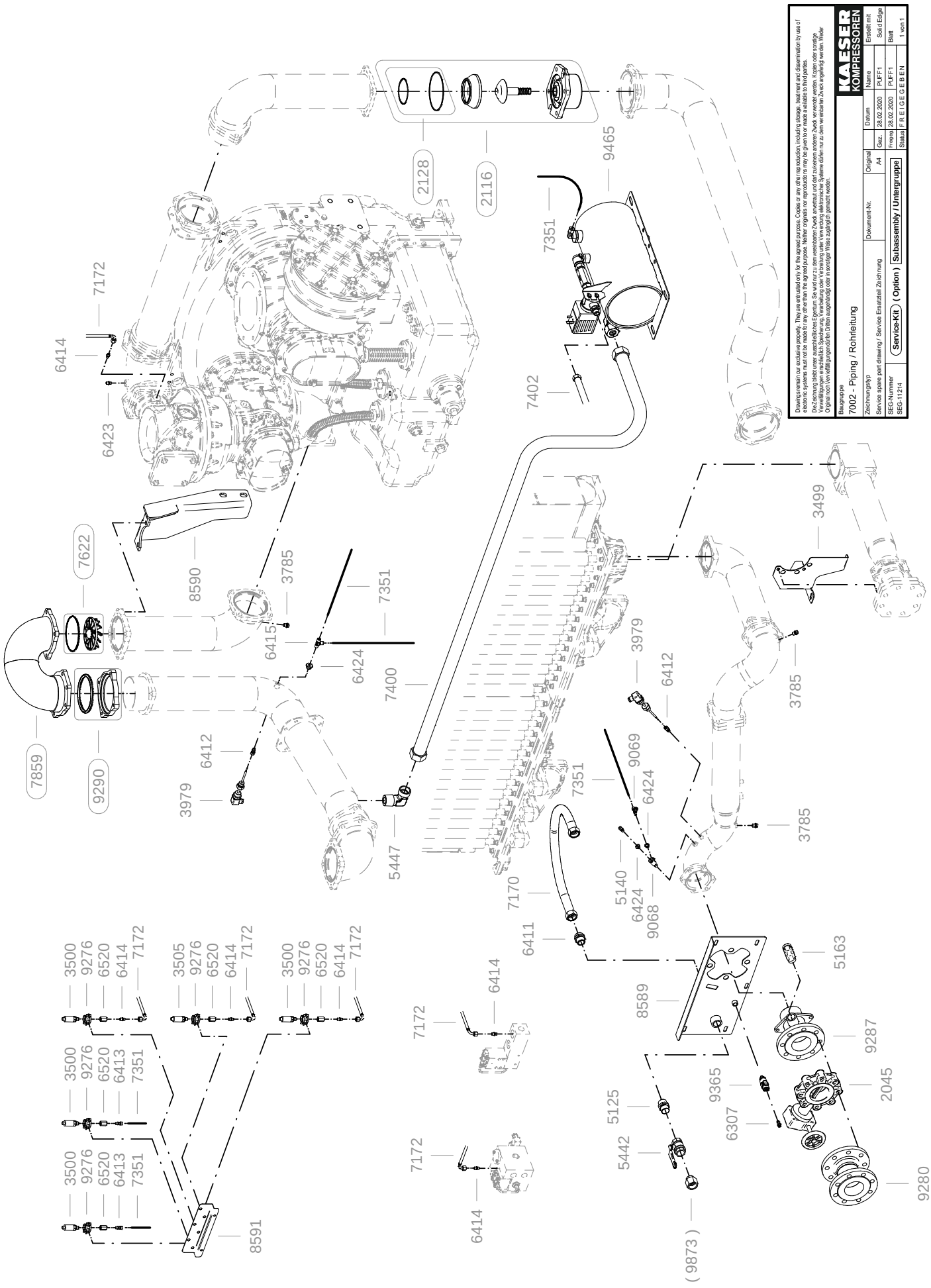

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7962
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7935
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7930
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7963
6418
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5634
7952
7960
5634
7917
7952
7917
7952
7940
7901
7927
7918
6409
7969
9062
8622
7001 - Fuel supply / Kraftstoffversorgung
Service spare part drawing / Service Ersatzteil Zeichnung
Service-Kit (Option) Subassembly / Untergruppe
KAESER KOMPRESSOREN

Service-Kit (Option)

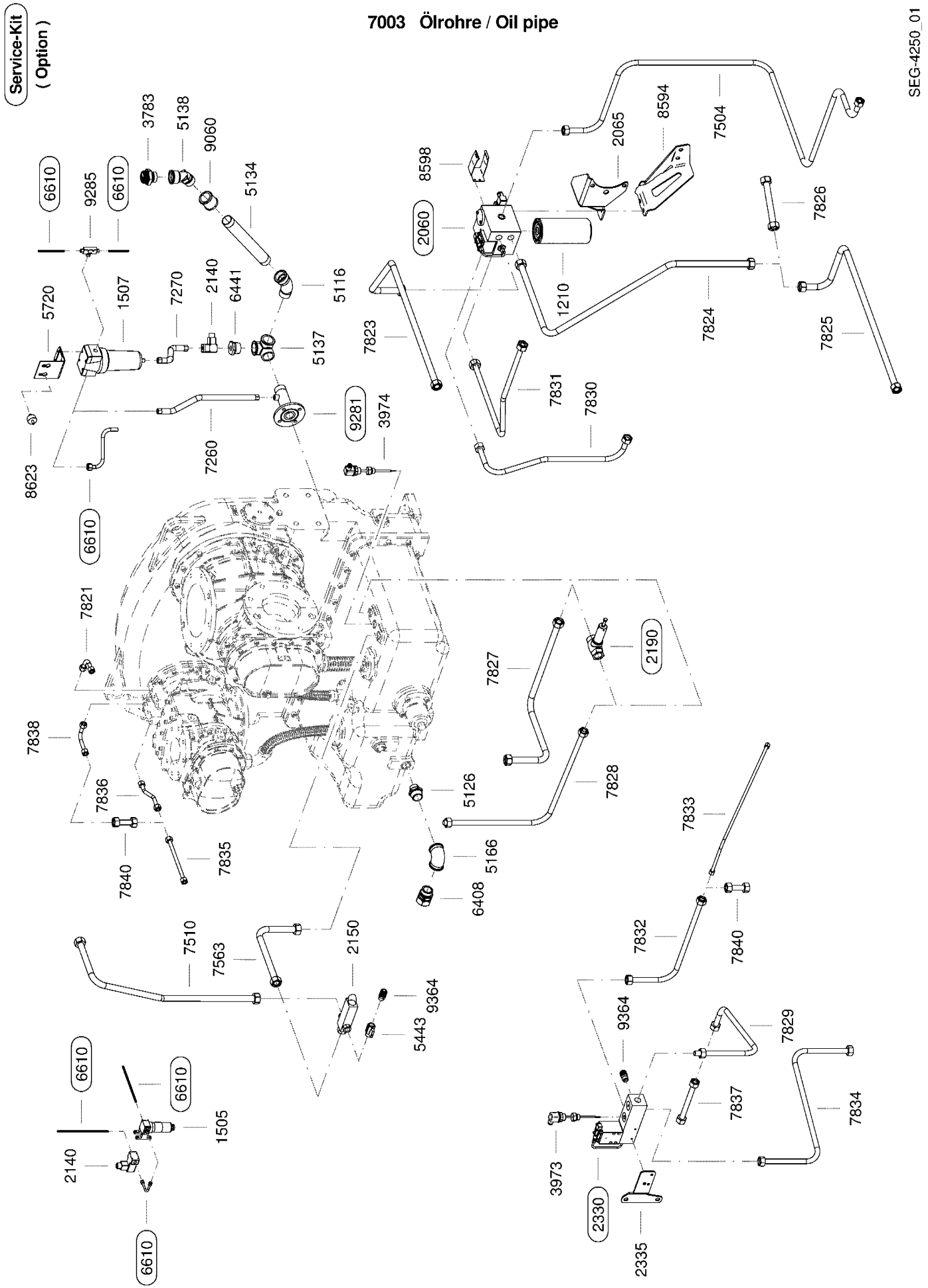
7007 Kraftstoffverteilung / Fuel allocation

SEG-4245_01

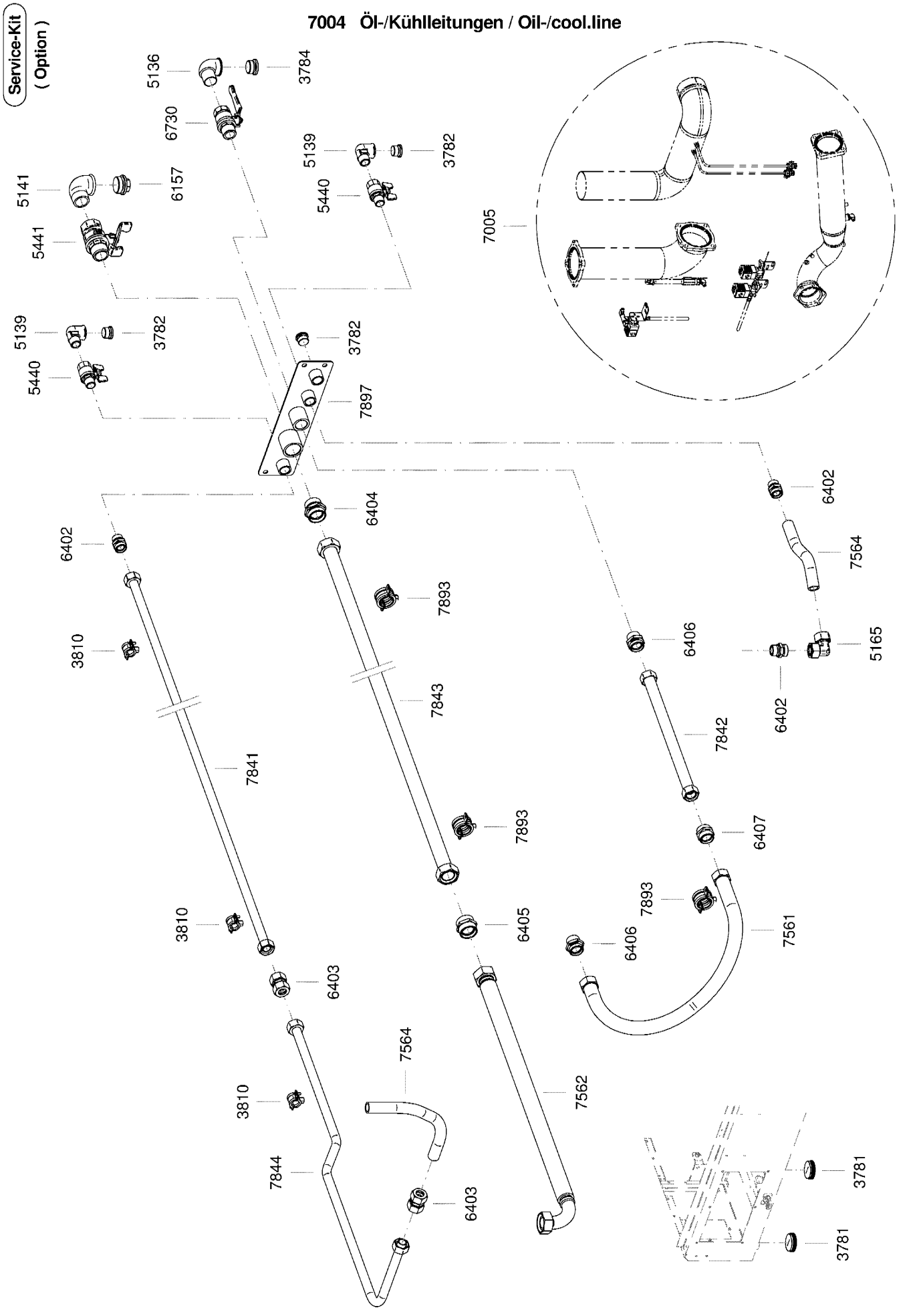



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7351
7172
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6423
7402
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8590
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3499
7351
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9290
6412
9069
6424
3979
7351
3785
5447
5140
6424
9068
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5163
8589
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5442
(9873)
9280
3500 9276 6520 6414 7172
3505 9276 6520 6414 7172
3500 9276 6520 6414 7172
3500 9276 6520 6413 7351
3500 9276 6520 6413 7351
8591
7172
6414
7172
6414
Baugruppe
7002 - Piping / Rohrleitung
Zeichnungstyp
Service spare part drawing / Service Ersatzteil Zeichnung
SEG-Nummer
SEG-11214
Service-Kit (Option)
Subassembly / Untergruppe
Dokument-Nr.
Original
A4
Datum
Name
Gez.
28.02.2020
PUFF1
Freigab
28.02.2020
PUFF1
Status
F R E I G E G E B E N
Erstellt mit
Solid Edge
Blatt
1 von 1
KAESER KOMPRESSOREN

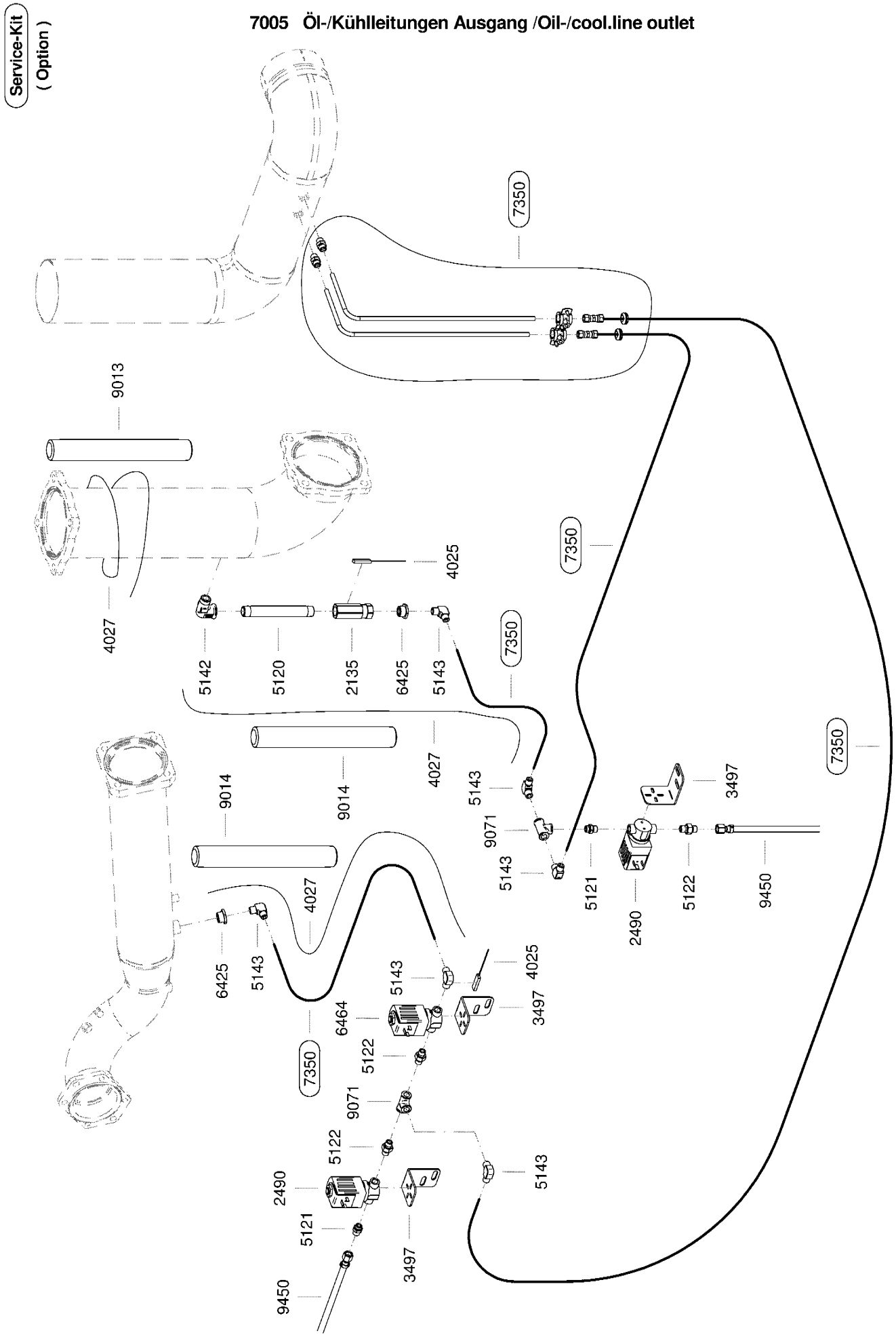
7003 Ölrohre / Oil pipe

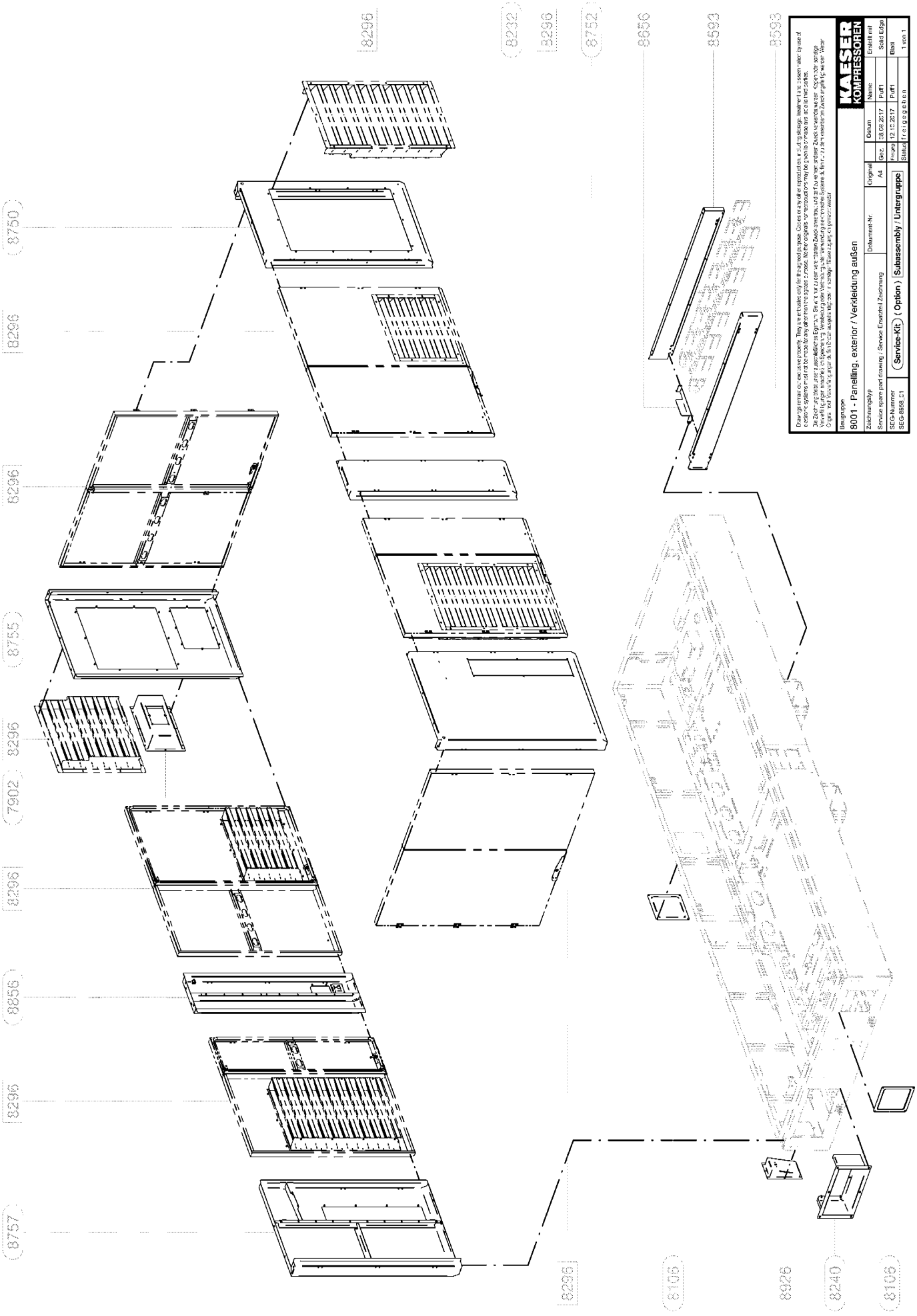


7004 Öl-/Kühlleitungen / Oil-/cool.line

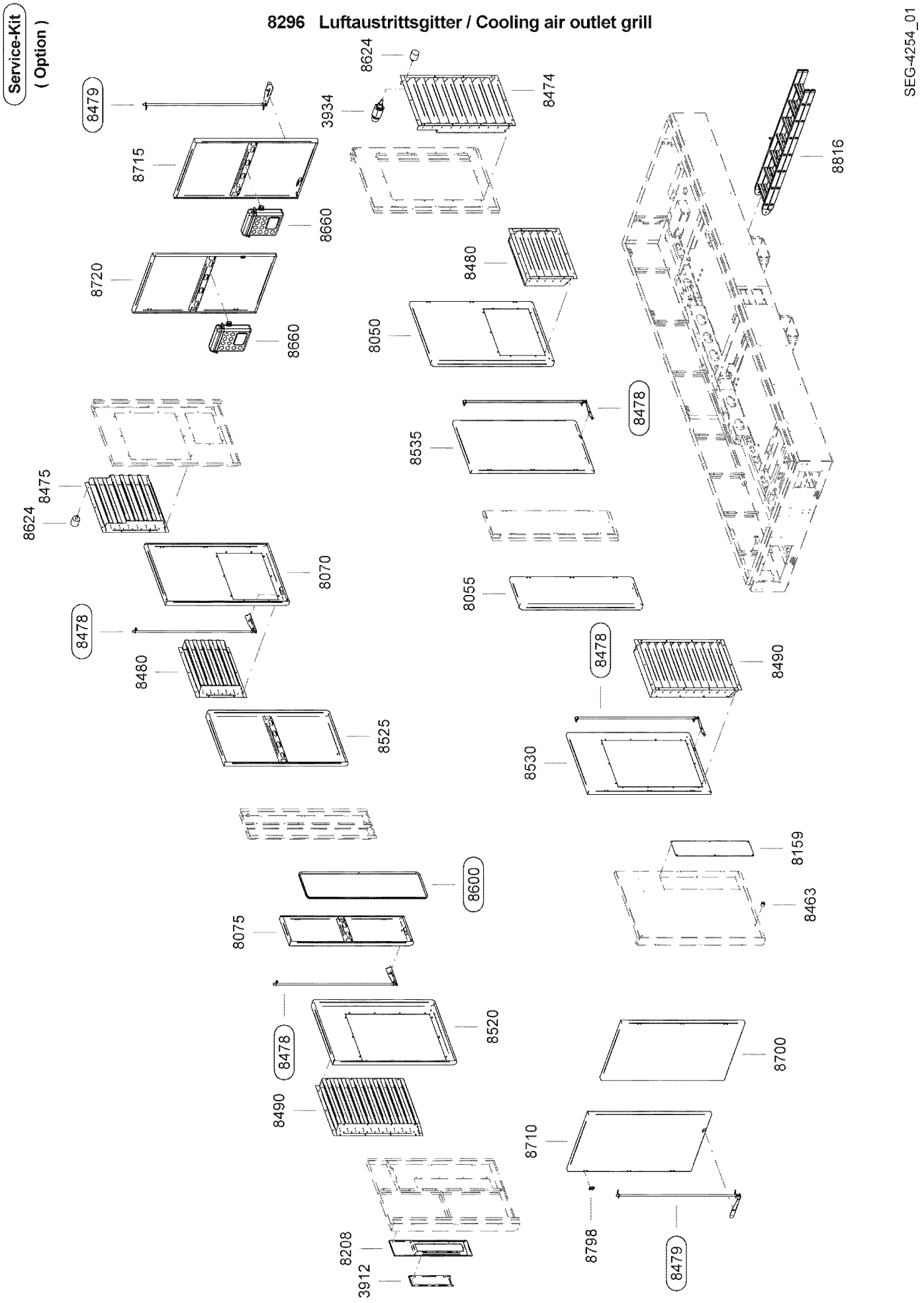


7005 Öl-/Kühlleitungen Ausgang /Oil-/cool.line outlet




8296
8232
8296
8752
8656
8593
8593
8750
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8755
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7902
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8856
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8757
8296
8106
8926
8240
8106
KAESER KOMPRESSOREN
Baugruppe
8001 - Panelling, exterior / Verkleidung außen
Zeichnungstyp
Service spare part drawing / Service Ersatzteil Zeichnung
SEG-Nummer
SEG-8656_01
Service-Kit
Option
Subassembly / Untergruppe
Original
A4
Datum
08.03.2017
12.12.2017
Name
Erstellt mit
Solid Edge
Pulfl
Pulfl
Blatt
1 von 1

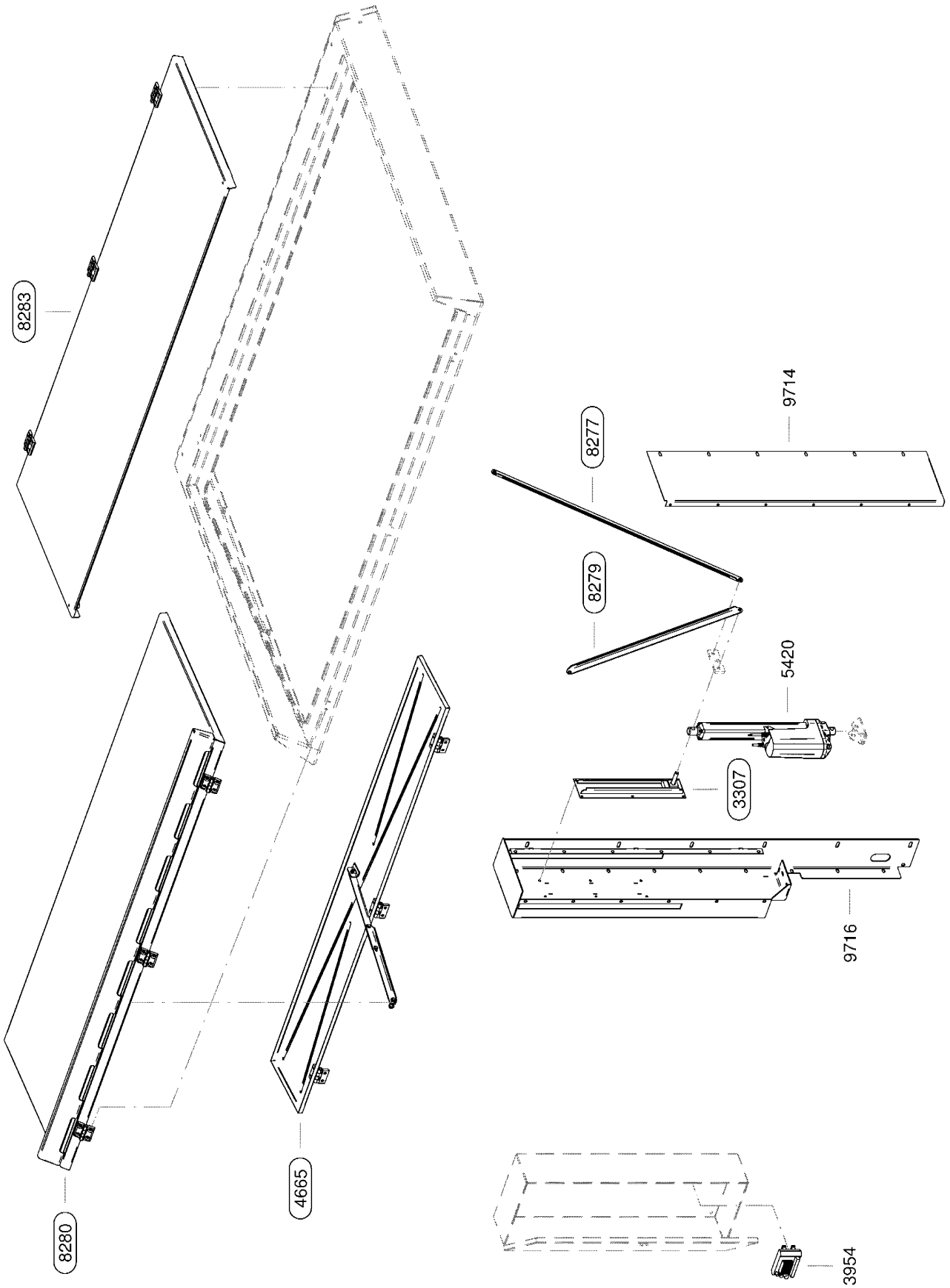
8296 Luftaustrittsgitter / Cooling air outlet grill



Service-Kit (Option)

8007 Verkleidung Dachklappen / Panelling, roof flaps

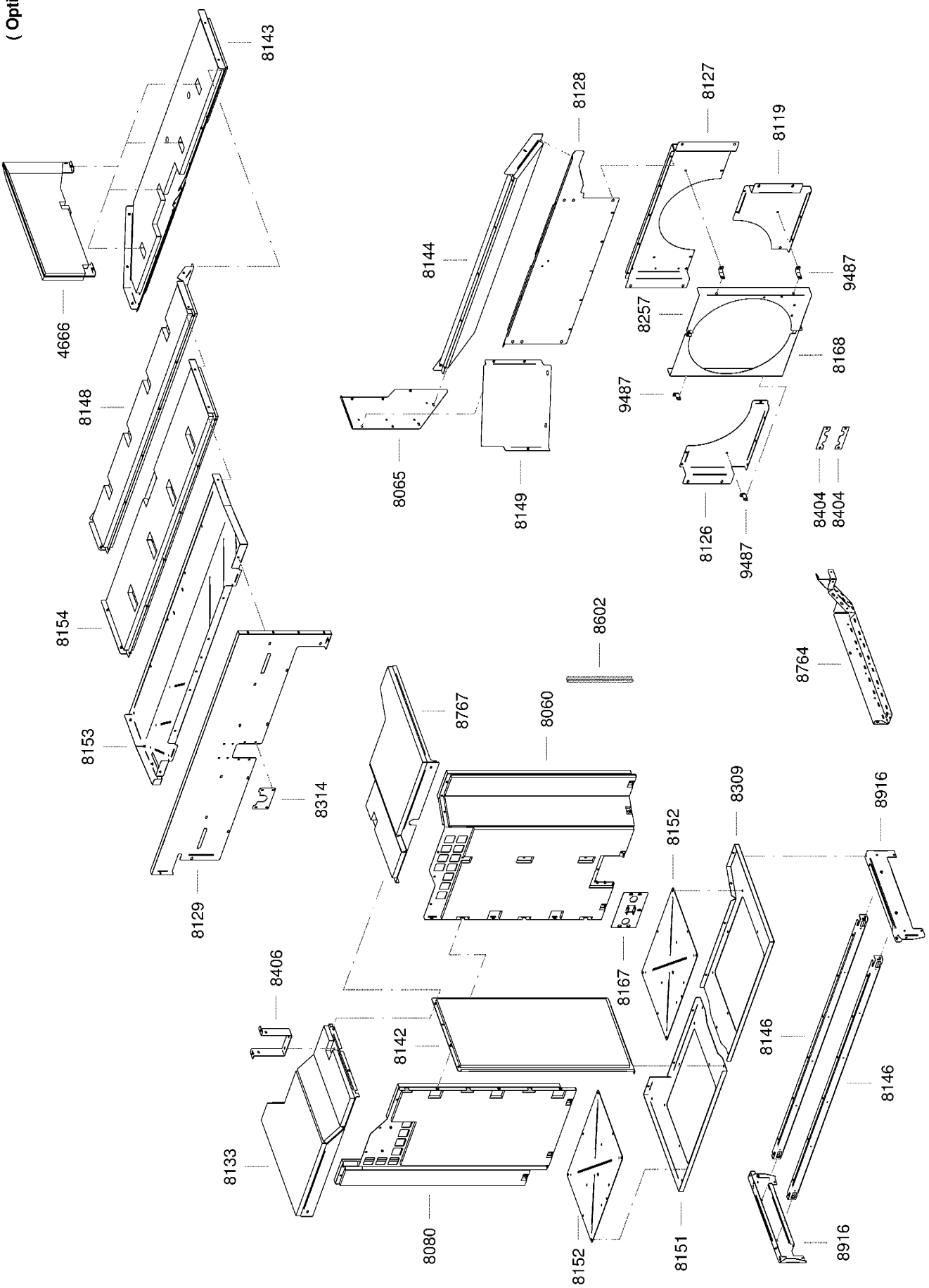
SEG-4255_01

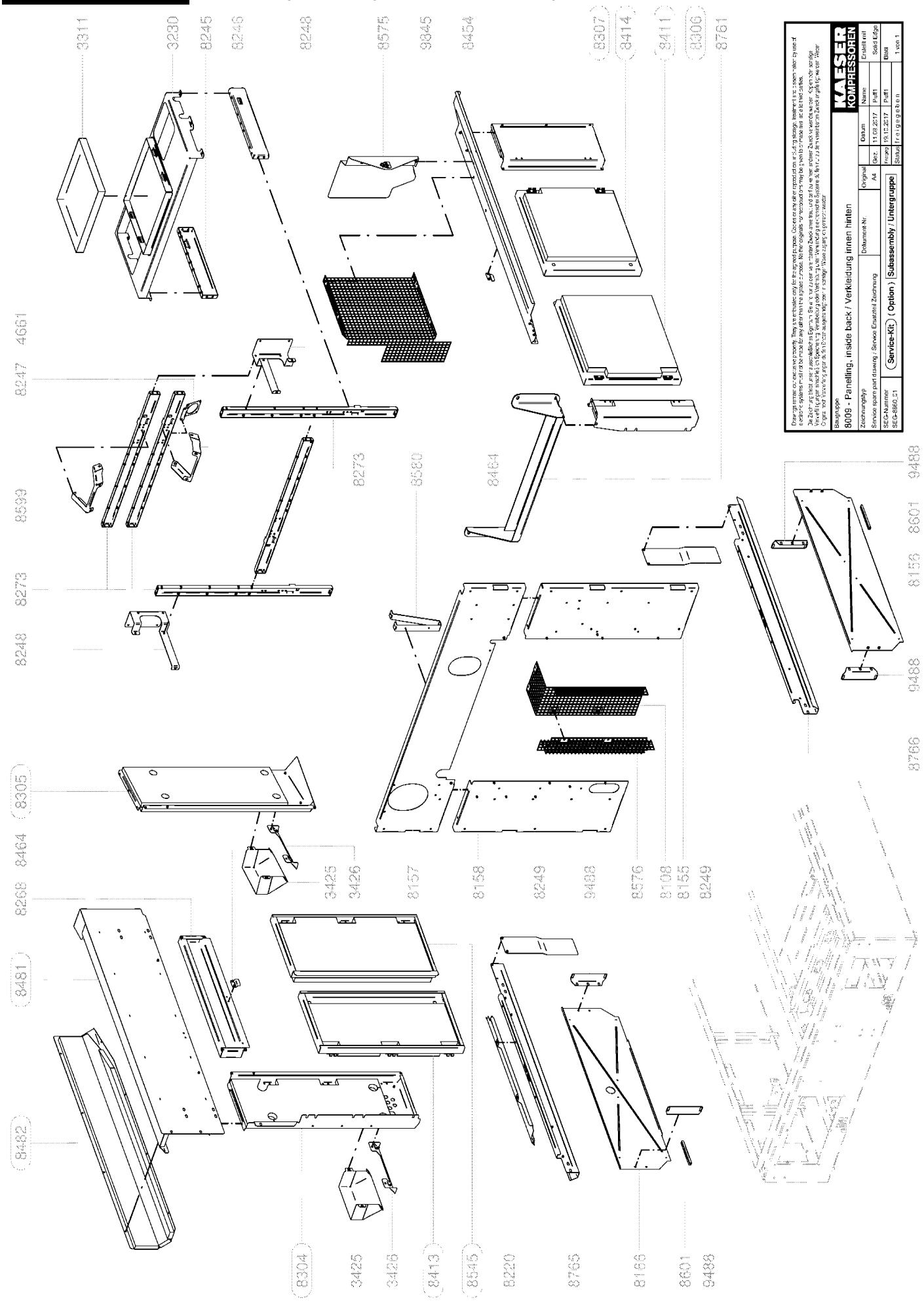


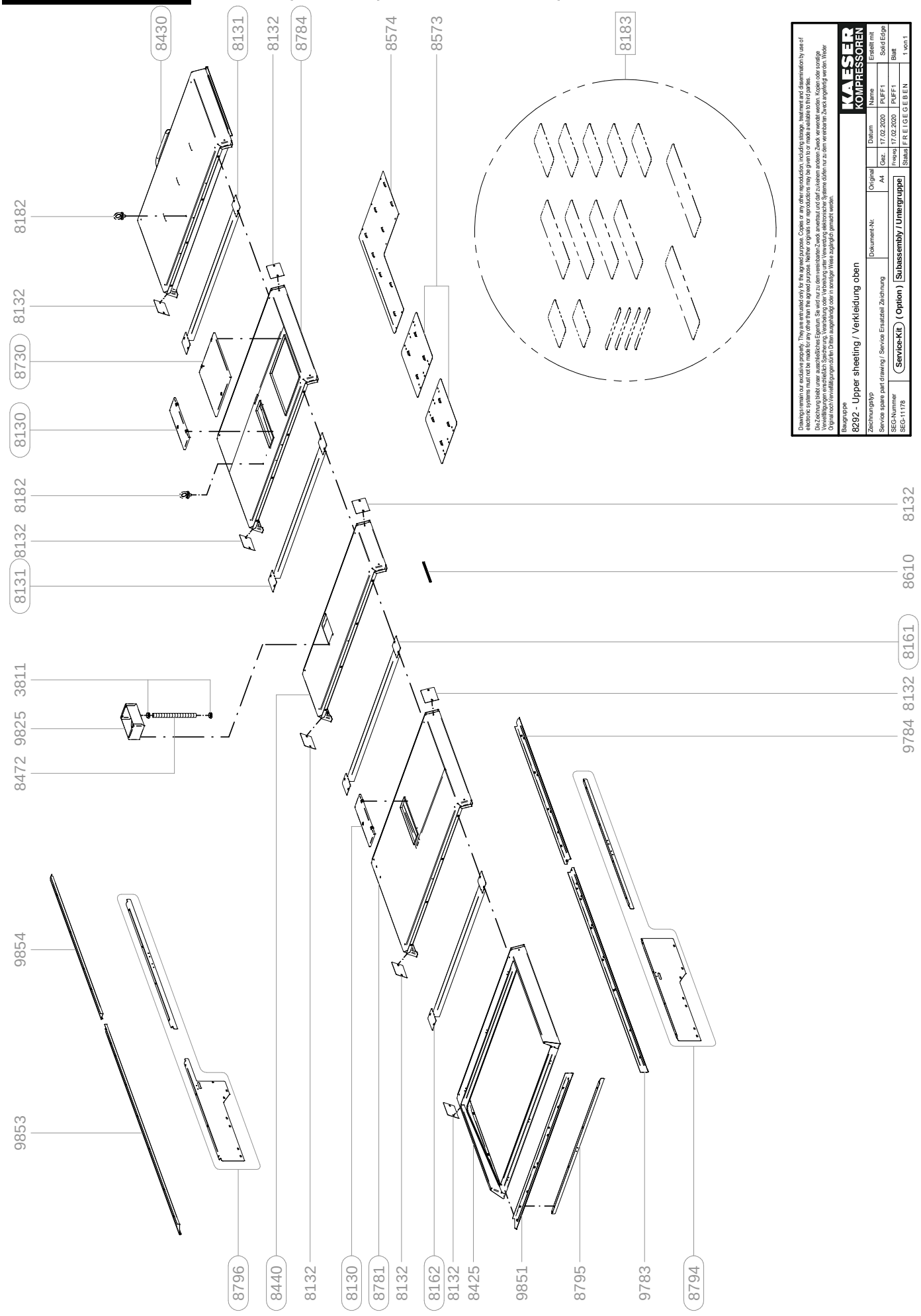
8008 Verkleidung innen vorne / Panelling, inside front

Service-Kit (Option)

SEG-4256_01




3311
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8245
8246
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8575
9845
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8307
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8157
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8249
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8304
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8601
9488
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Baugruppe
8009 - Panelling, inside back / Verkleidung innen hinten
Zeichnungstyp
Service spare part drawing / Service Ersatzteil Zeichnung
Dokument-Nr.
Original
A4
Datum
Name
Erstellt mit
Gez. 11.08.2017 Pulfl Solid Edge
Freigg. 19.12.2017 Pulfl Blatt
Status Freigegeben 1 von 1
SEG-Nummer
SEG-8860.01
Service-Kit (Option) Subassembly / Untergruppe



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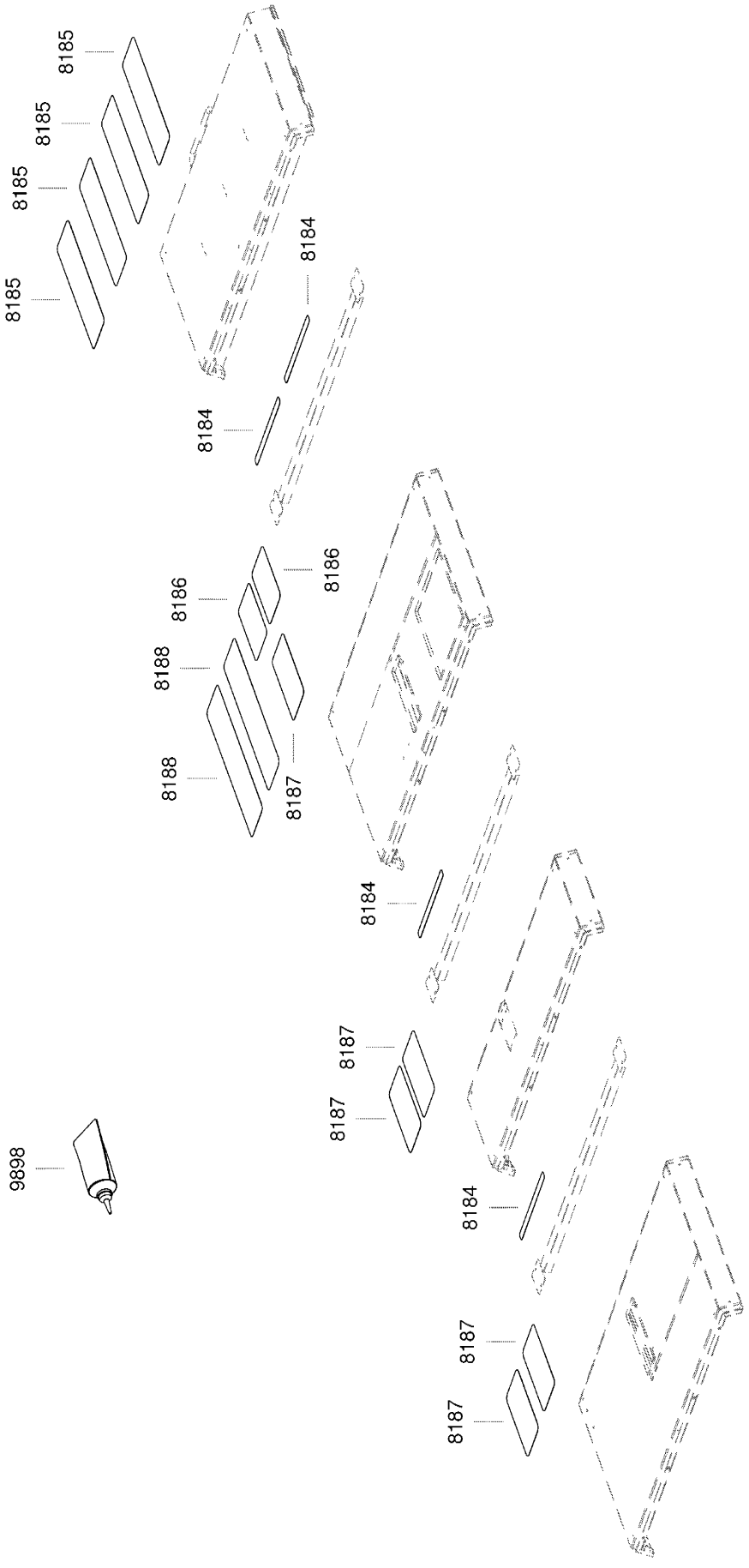
KAESER KOMPRESSOREN

Baugruppe				Name	Erstellt mit
8292 - Upper sheeting / Verkleidung oben		Original	Datum		
Zeichnungstyp	Dokument-Nr.	A4	Gez.	17.02.2020	PLIFF1
Service spare part drawing / Service Ersatzteil Zeichnung			Freig.	17.02.2020	PLIFF1
SEG-Nummer	Service-Kit	(Option)	Subassembly / Untergruppe	Status	F R E I G E G E B E N
SEG-111178					1 von 1

Service-Kit (Option)

8183 Beklebung / Set of labels

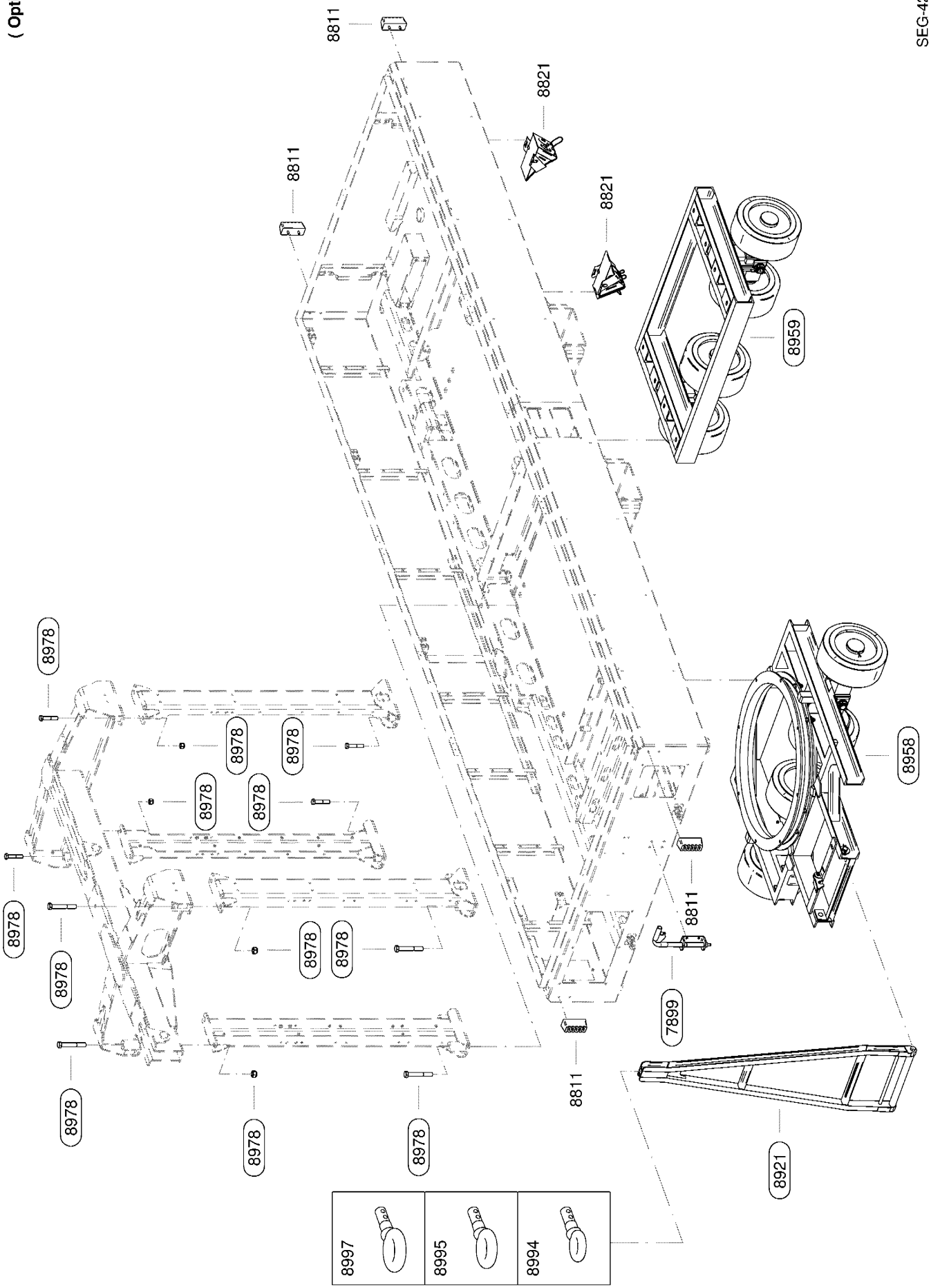
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Service-Kit (Option)

8800 Unterbau/Beleuchtung / Sub-frame/Lighting

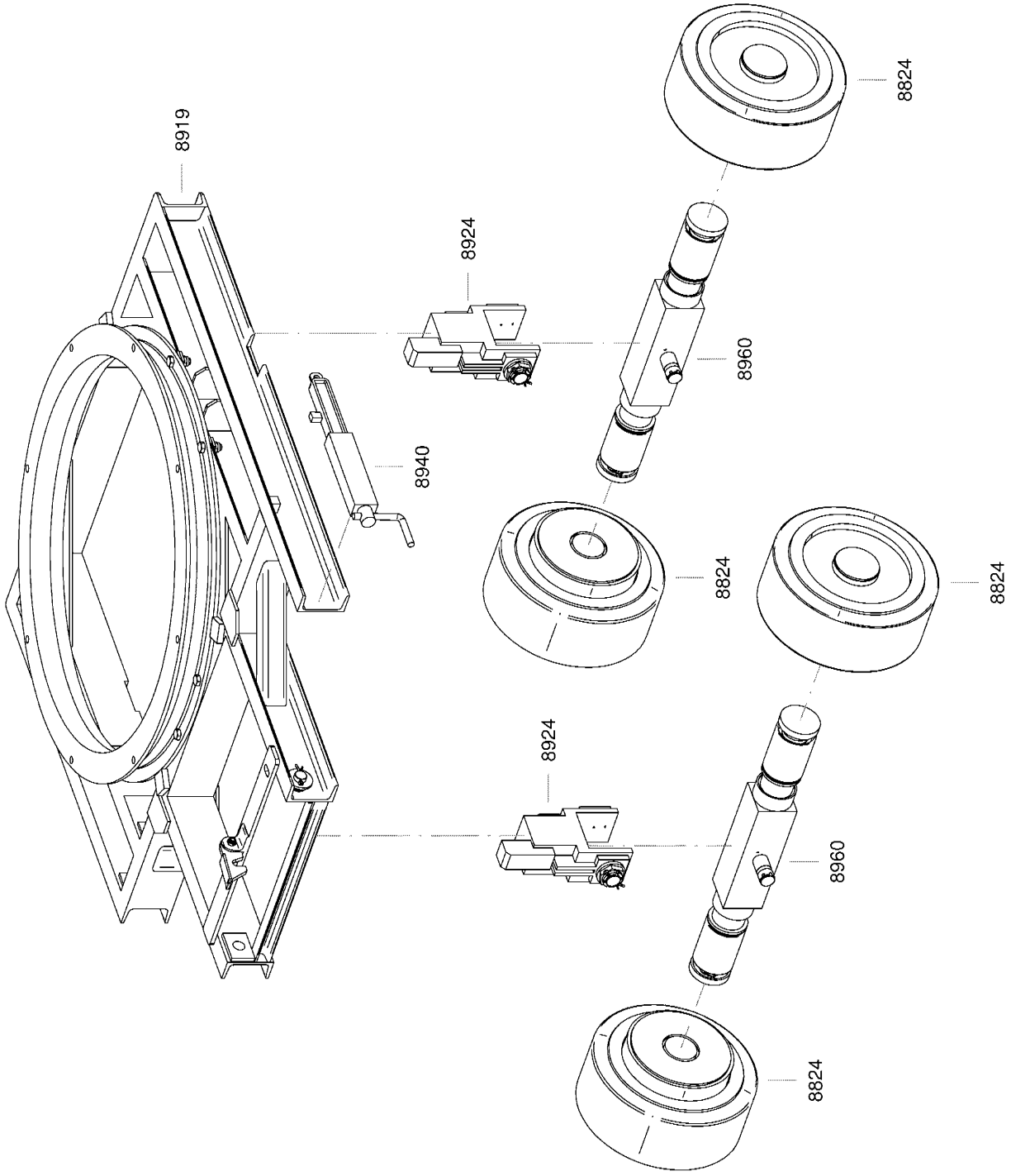
SEG-4259_01



Service-Kit (Option)

8958 Vorderachse / Leading axle

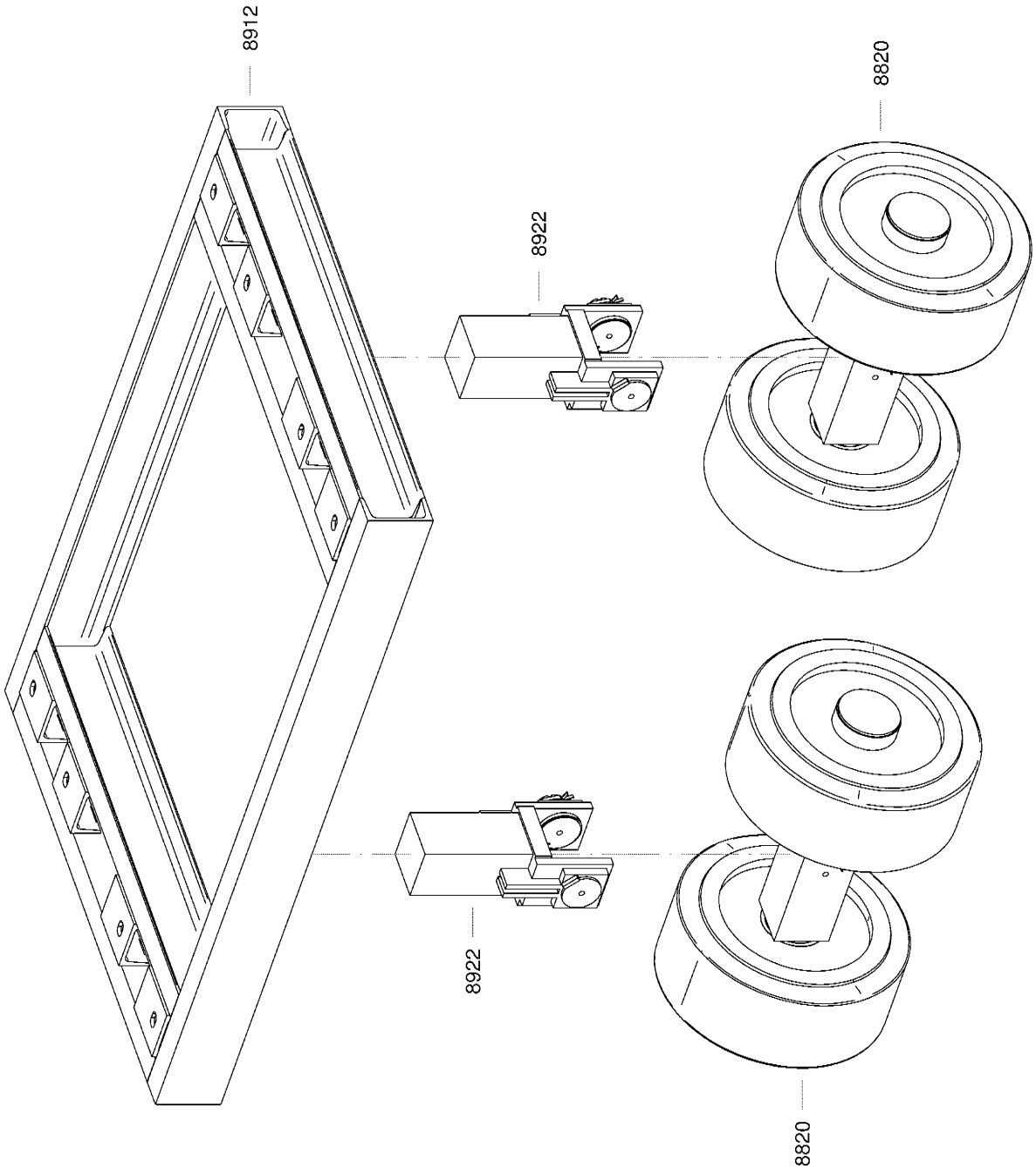
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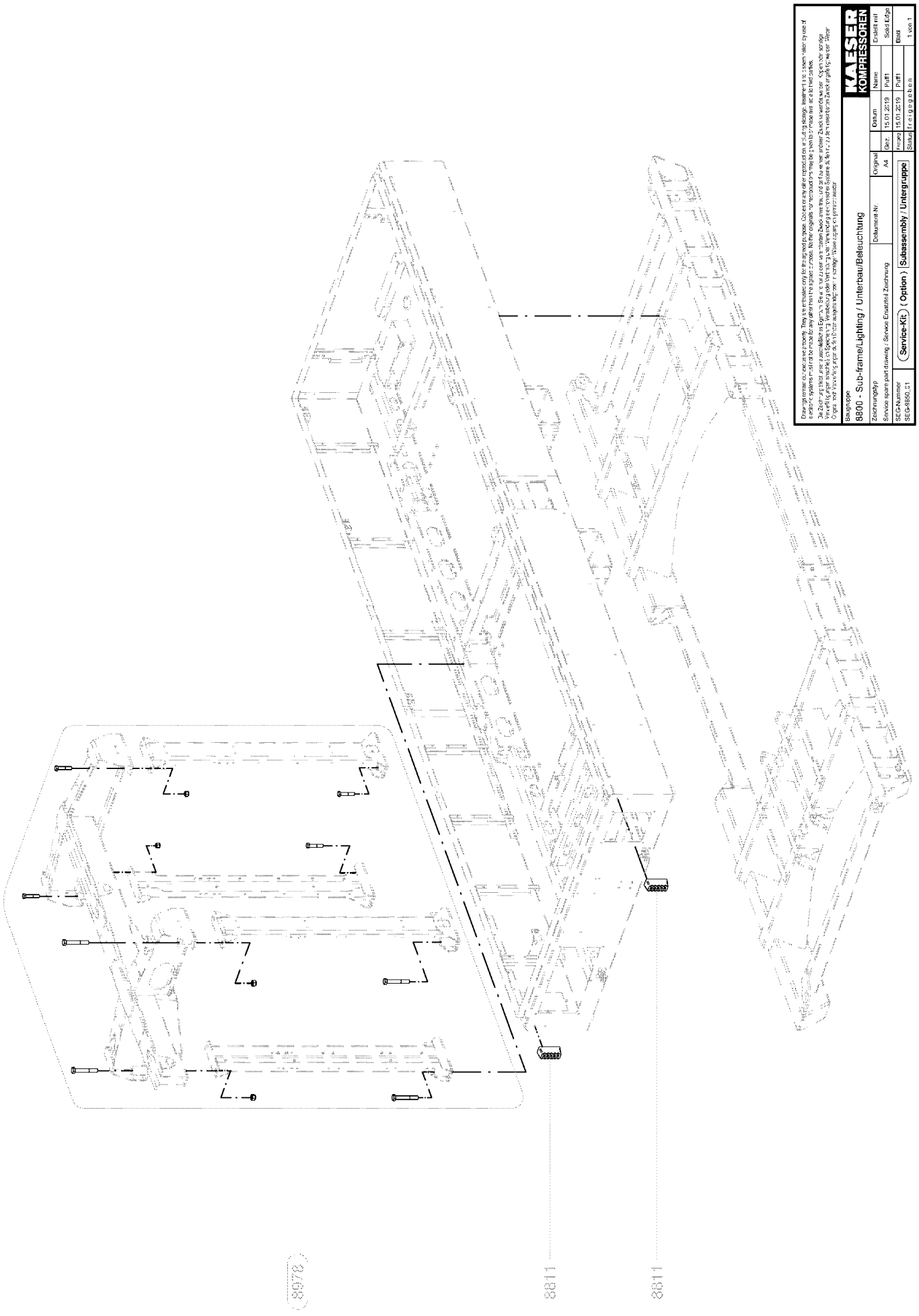


Service-Kit (Option)

8959 Hinterachse / Rear axle

SEG-4261_01

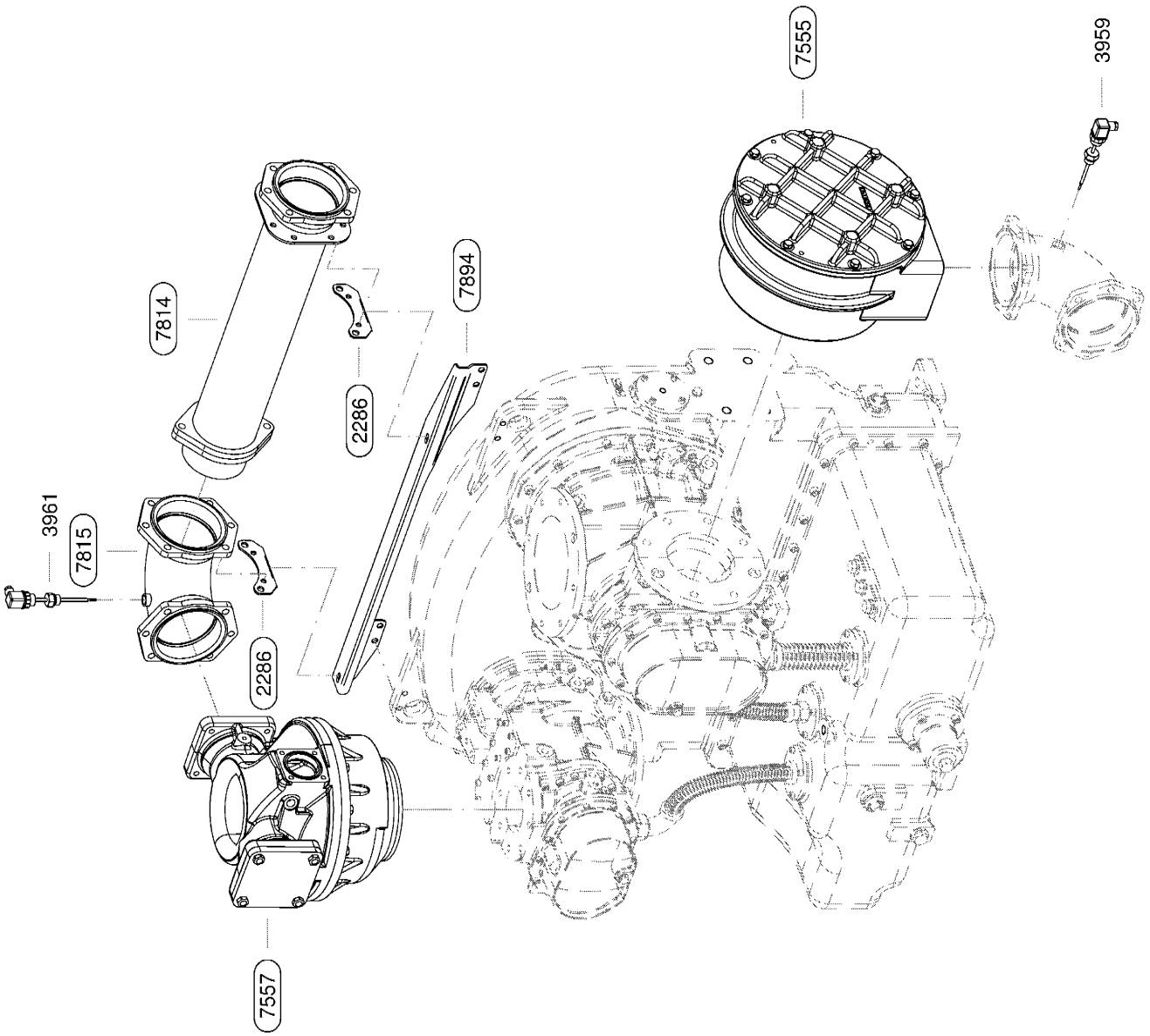



8800 - Sub-frame/Lighting / Unterbau/Beleuchtung
Service spare part drawing / Service Ersatzteil Zeichnung
Service-Kit (Option) Subassembly / Untergruppe
8878
8811
8811

Service-Kit (Option)

9400 Druckluftaufbereitung / Compressed air treatment

SEG-4262_01



12 Decommissioning, Storage and Transport

12.1 De-commissioning

De-commissioning is necessary, for example, under the following circumstances:

- The machine is temporarily not needed
- The machine will not be needed for a considerable time.
- The machine is to be scrapped.

Precondition The machine is shut down.
Machine dry and cool.

1. Carry out the following de-commissioning procedures.
2. Place a notice on the instrument panel describing the de-commissioning procedures carried out.

12.1.1 Temporary de-commissioning

Decommissioning for about 4 months.

Material Plastic sheeting
Moisture-resistant adhesive tape

1. Disconnect the battery (the minus terminal first and then the plus terminal).
2. Close off the following openings with plastic foil and moisture-resistant adhesive tape.
   - Engine air filter intake
   - Compressor air filter intake
3. Attach the following notice on the instrument panel showing the de-commissioning measures taken.

Attention!

1. The machine is temporarily decommissioned.
2. The following machine openings have been covered:

- Engine air filter intake
- Compressor air filter intake

3. Recommission according to service manual.

Date / signature

Tab. 83 "Temporarily decommissioned" information notice

Decommissioning of the compressor for several weeks during severe frost



1. *NOTICE!*
   Danger of battery freezing!
   Discharged batteries are subject to frost damage and can freeze at -10 °C.
   ➢ Store batteries in a frost-free place.
   ➢ Store batteries preferably fully charged.

2. Remove the battery (batteries) and store in a frost-free room.
3. Make sure batteries are fully charged.

12.1.2 Long-term de-commissioning and storage

De-commissioning the machine for 5 months or longer.



De-commissioning is to be performed by authorised KAESER SERVICE.

Material
Receptacle
Preserving oil
Preservative
Desiccant
Plastic sheeting
Moisture-resistant adhesive tape

➢ The following measures must be taken for long-term decommissioning and storage:

Long-term decommissioning and storage tasks	Note	Confirmed?
➢ Check engine coolant.	See chapter 10.4.1	
➢ Drain the engine oil.	KS	
➢ Fill the engine with preserving oil.	KS	
➢ Run the machine for about 10 minutes to coat all parts with a protective oil film.	–	
➢ Disconnect the battery, the minus terminal first and then the plus terminal, and store in a frost-free room.	–	
➢ Check the battery liquid level.	See chapter 10.7.4	
➢ Check the battery charge monthly and recharge if necessary to prevent the battery fluid freezing.	–	
➢ Clean the battery terminals and coat with acid-resistant grease.	–	
➢ Close the compressed air outlet valves.	–	
➢ Cover the following openings with plastic foil and moisture-proof duct tape: ■ Inlet air engine air filter ■ Compressor air filter intake	–	
➢ Clean the bodywork and treat with preservative.	–	
➢ Attach a notice on the instrument panel informing of the decommissioning measurements taken.	–	
KS = call KAESER SERVICE		

Tab. 84 "Long-term decommissioning and storage" checklist

➢ Attach the following notice on the instrument panel showing the de-commissioning measures taken.

Attention!

1. The machine is de-commissioned.
2. Preserving oil has been filled in the engine.
3. For re-commissioning:

- Perform actions provided for re-commissioning after a long period of storage.
- Re-commission according to service manual.

Date / signature

Tab. 85 Notice text: "Long-term decommissioned and storage"

➢ Store in a dry place with even temperature.

12.2 Transport

Precondition Machine switched off and locked off
(«battery isolating switch »off)
The machine is fully vented, the pressure gauge reads 0 bar.
Machine is cooled down.
All compressed air consumers are disconnected.
All connecting lines and hoses disconnected and removed.
Any loose or movable parts that may fall when transporting are removed or secured.

12.2.1 Safety



Allow transportation only by personnel trained in safely dealing with motor vehicles and the transporting of goods.



1. **WARNING!**
   There is danger of being run over or crushed by an overturning vehicle.
   Death or serious injury can result from being crushed or run-over by a machine under tow.
   ➢ Riding on the machine while it is under tow is strictly forbidden.
2. Make sure the danger area is clear of personnel.

12.2.2 Machine transport

- The portable machine is not approved for being towed on public roads.
- The auxiliary chassis installed beneath is only intended for a short-time moving on construction sites.
- As a rule, the machine is transported on the load bed of a lorry or a rail car.

➢ Observe the safety instructions in chapter 3.5.3 "Safe machine operation".

Additional precautions for a very dirty machine:

The machine can become very dirty after prolonged use on a construction site. The machine must not be transported in such a state.

➢ Clean the machine, particularly the running gear.

Additional precautions for conditions of snow and ice:

Considerable snow or ice may build up on the machine under low temperature conditions.



1. **CAUTION!**
   Accident hazard due to snow or ice falling off the machine!
   Falling snow and ice endanger persons or vehicles in the machine's vicinity.
   The maximum permissible axle load could be exceeded.
   ➢ Do not transport the machine if it is covered by snow or ice.
2. Remove any snow or ice prior to transport.

Perform the following tasks prior to transporting the machine:

1. Ensure that the machine is shut down and secured against accidental restarting.
2. Detach all connecting lines and hoses.
3. Ensure there are no objects such as unsecured tools lying on or in the machine.
4. Close and lock the access doors.
5. Secure and lock the service ladder.

12.2.2.1 Transporting the machine as trailer

Due to its design, the machine is intended for a transport as trailer only up to 6 km/h.

Check before the transport:

1. The tow bar is in transport position.
2. Make sure the towing hitch is compatible with the towing height or eye coupling on the tow bar of the towed machine.
3. Check the tow-bar and chassis for deformation and cracks.
   Damage and/or deformation visible: Immediately request from KAESER SERVICE or a garage that damaged and/or deformed chassis components are replaced.
4. Check that the wheels are securely fitted and the tyres are in good condition.
5. Check that the transport locks are deactivated and/or immobilising devices are removed.

Coupling or preparing the machine for transport:

1. Slowly and carefully approach the machine with the towing vehicle.
2. Position and park the towing vehicle with towing hitch in front of the machine's towing eye.
3. Open the towing coupling of the towing vehicle.
4. Slowly and carefully approach the machine with the towing vehicle until the trailer coupling audibly latches.



5. **WARNING!**
   Danger of accident from an incorrectly attached coupling!
   If the coupling is not fully closed, the trailer can become uncoupled from the towing vehicle and cause an accident.
   ➢ Check correct coupling.
6. Check the locking mechanism of the trailer coupling and re-couple if required.
7. Loosen the parking brake (turn the crank).
8. Remove the chocks.



Secure the chocks in the corresponding transport securing devices before towing. Replace any missing chocks immediately!

12.2.2.2 Parking the machine

The machine is generally only moved by being coupled to a towing vehicle.

Prior to detaching from the towing vehicle, secure the machine against moving.

1. Use a coupled towing vehicle to move the machine into position.
2. Make sure the parking brake is fully engaged.
3. Place chocks under the wheels.
4. Open the towing coupling of the towing vehicle.
5. Slowly forward the towing vehicle to separate from the machine.

Further information — See chapter 5.2 for notes regard the installation conditions.

12.2.3 Transporting the machine as load

The transporting method will determine the type of packing and load securing.
Packing and securing methods must be such that, assuming proper handling, the goods arrive in perfect condition at the destination.

Additional measures must be taken for the transport of machines by sea or air. Please contact an authorised KAESER SERVICE technician for more information.

Material — End-to-end wooden frame structure as wheel receivers
(Install anti-slip mats at the bottom)

Wooden blocks

Straps

12.2.3.1 Notes to load security

- National directives and regulations for securing loads should be followed.
- Load securing is taken to mean that, by full braking or sudden turning, the load will not slide, fall, roll or cause unnecessary noise. Generally accepted technical regulations should be observed (e.g., in Germany: the VDI Directive 2700 ff).
- Responsibility for properly secured loads falls on the driver, the vehicle keeper and the carrier.



1. *NOTICE!*
   Straps can damage the bodywork!
   Movement during transportation can damage the bodywork.
   ➢ Do not use straps over the bodywork.
   ➢ Attach straps only at anchoring points welded to the base frame of the machine.

2. Always observe valid accident and safety regulations when transporting.
3. The loads must be secured against rolling, tipping, slipping and falling.

Contact KAESER SERVICE with any questions regarding transporting or load securing.

KAESER accepts no liability and provides no guarantee for damage arising from incorrect transport or insufficient or incorrect load securing provisions.

For hire, rental and trade show machines, any transport safety devices used for the delivery must also be used for the return transport.

Wagons loaded with the machine are subject to *fly shunting and hump prohibitions* during rail transport.

12.2.3.2 Option rf/rm/rr
Ensuring load security

The following instruction provides only an example for securing the machine as load.

Responsibility for properly secured loads falls on the driver, the vehicle keeper and the carrier.

Load securing example according to CTU/VDI 2700 Guidelines for the transport on road, sea, and rail (without hump).

Adhesive stickers on the machine indicate the position and the permissible strapping angles.

Comply with the specified maximum strapping force and the recommended strapping angles.

The following strapping points (eyes) are provided on the machine:

- 2 strapping points at the front of the machine
- strapping points at the rear axle
- 4 lateral strapping points between the forklift brackets

The maximum permissible strapping force LC of the strapping points is: 3,000 daN.

The following straps are also used:

- 2 straps passed through the forklift brackets and attached to the load bed of the lorry or semi-trailer.

The maximum permissible strapping force LC of these strapping points is: 2,000 daN (lightly hand-tighten the lashing strip!).

The wooden frame structures for receiving the wheels are designed for multiple use. Subsequently to the transport, they are to be stored securely and reused.

Prior to use, inspect the components for damage and properly repair, if required.

The wheel receiver for the front and rear axles have different dimensions.

Chapter 13.9 provides the design dimensions.

Precondition

The load bed must be suited for the transport (maximal load) and securing of the machine (strapping points or eyes at the vehicle).

The bed surface must be well-swept, clean, and dry.

The wooden frame structures as wheel receivers are undamaged and in working order.

Straps or chains must be undamaged and in working order.

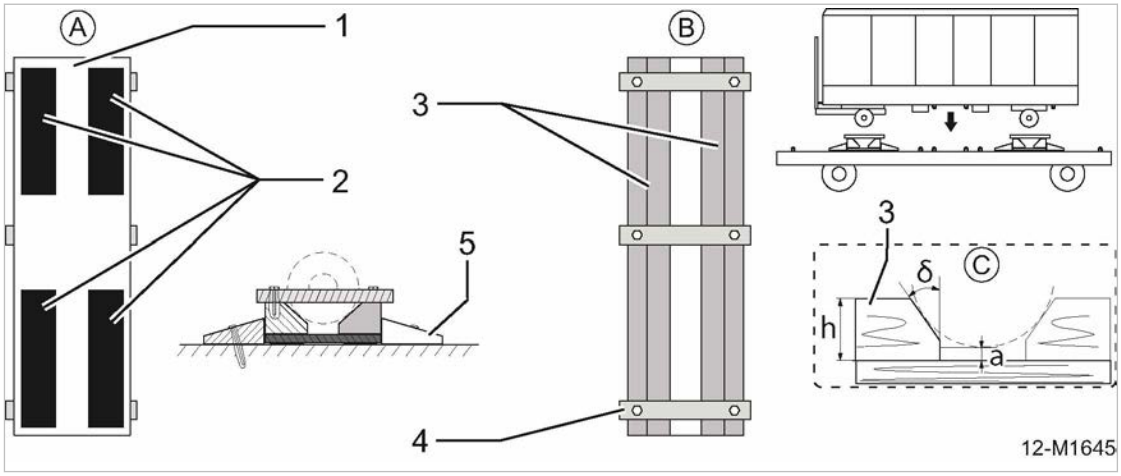


Fig. 86 Wooden frame structure as wheel receiver

- [A] View from beneath
- [B] Top view
- [1] Base plate
- [2] Anti-slip plate (friction value ≥0.6μ*)
  * relative to the load bed of the transport vehicle
- [3] Squared timer, wedge-shaped
- [4] Squared timber (crossbar)
- [5] Fixing wedge
- [C] Detail: squared timber (cross-section)
- [δ] Wedge angle to the wheels: 35°
- [a] Wheel clearance to the ground: 20 mm
- [h] Minimum support height: 75 mm

1. Provide appropriate wooden frame structure as wheel receivers.
2. Use a crane or forklift to place the machine in the centre of the load bed.
3. Slightly lift the machine again and position the wooden frame structures as wheel receivers beneath the wheel axles of the machine.
4. Lower the machine with its wheels being placed in the wooden frame structures.
5. Secure the wooden frame structures before and behind each wheel with a wooden wedge (join the wedge to the load bed).

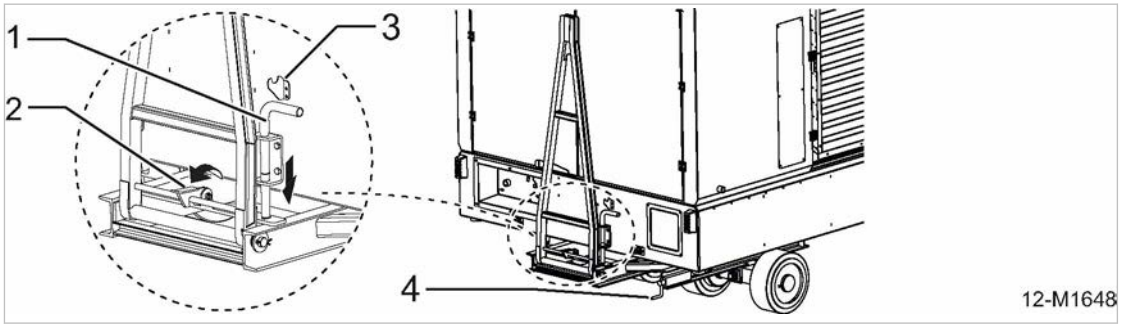


Fig. 87 Secure the machine in parking position.

- [1] Locking, bogie
- [2] Safety lever, drawbar
- [3] Suspension bracket, lock
- [4] Parking brake

6. Secure the machine in parking position.
   - Crank up the parking brake.
   - Lock the bogie with the locking mechanism.
   - Swivel the drawbar upward, latch the safety lever.

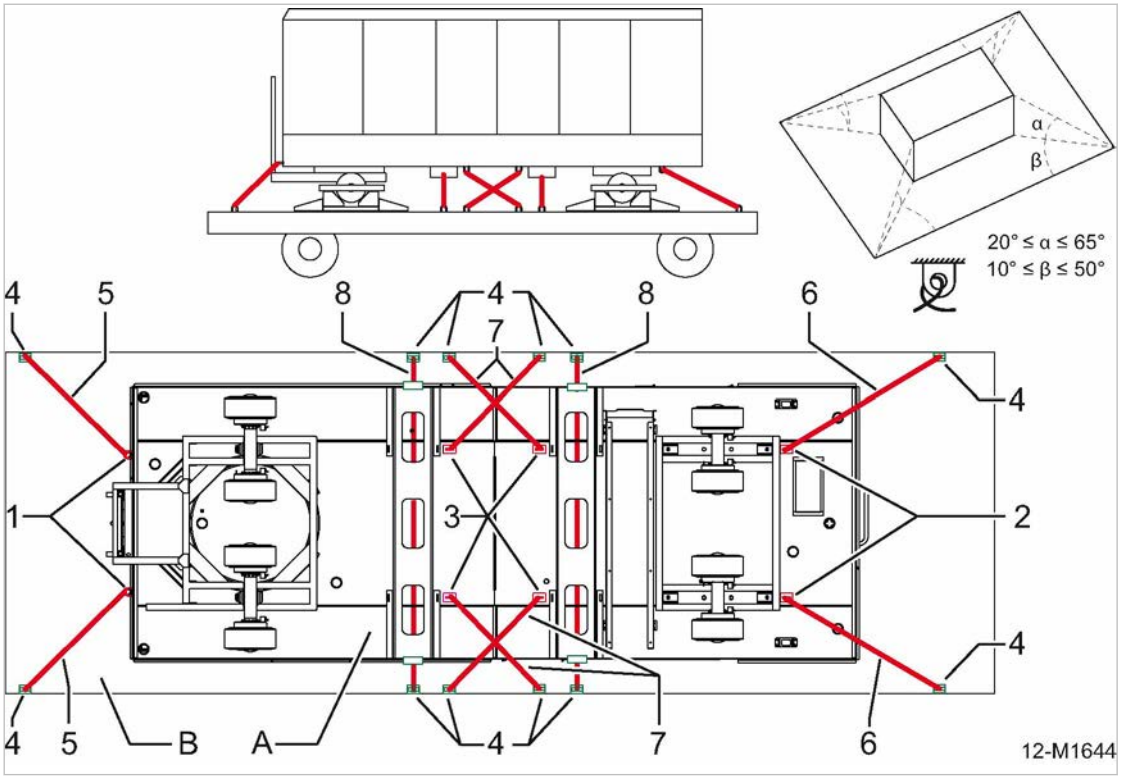


Fig. 88 Anchoring points, transport security

- [A] Machine (view from beneath)
- [B] Load bed of the lorry or semi-trailer
- [1] Strapping points, machine front side
- [2] Strapping points, machine rear axle
- [3] Centre strapping points, between machine forklift brackets
- [4] Strapping points on the bed surface of the lorry or semi-trailer
- [5] Straps in driving direction (diagonally strapped)
- [6] Straps against driving direction (diagonally strapped)
- [7] Straps attached crosswise
- [8] Straps fed through the forklift brackets (low strapping)
  (strapped across edge protection profiles)

7. Fasten the machine with straps or chains to the load bed of the vehicle:
   (see figure 88)
   - Securing in driving direction (diagonal strapping, 2 strapping points)
   - Securing against driving direction (diagonal strapping, 2 strapping points)
   - Lateral securing (diagonal strapping, 4 strapping points)
   - Lateral securing (2 straps through forklift brackets)
8. Tension the straps.

The tension of the straps must be checked during the transport, and re-tightened, if necessary.

Check the hazardous goods labels:

➢ Check whether the hazardous goods label is attached to the machine. (See chapter 3.4.6) Renew if necessary.

Before shipment as air freight:

The machine is designated as hazardous goods for air freight purposes; any disregard can result in a heavy fine!



1. **WARNING!**
   Danger of fire or explosion from operating fluids/materials!
   The machine is equipped with a combustion engine.
   ➢ Any dangerous fluids/materials contained within the machine must be removed before transport by air.
2. Remove all dangerous fluids/materials.
   These include:
   - Residues of fuel or fuel vapours.
   - Lubricating and hydraulic oils in engine, compressor, and hydraulic systems.
   - Battery electrolyte in rechargeable batteries.

12.2.3.3 Option rw
Perform load securing on the stationary machine

The machine does not have a chassis. It is fitted with a frame mounted on a skid.

Material Squared timber

Straps

Ensuring load security



The following instruction provides only an example for securing the machine as load.

Responsibility for properly secured loads falls on the driver, the vehicle keeper and the carrier.

Load securing example according to CTU/VDI 2700 Guidelines for the transport on road, sea, and rail (without hump).

Adhesive stickers on the machine indicate the position and the permissible strapping angles.

Comply with the specified maximum strapping force and the recommended strapping angles.

The following strapping points (eyes) are provided on the machine:

- 2 strapping points at the front of the machine
- 2 strapping points at the rear of the machine
- 4 lateral strapping points between the forklift brackets

The maximum permissible strapping force LC of the strapping points is: 3,000 daN.

The following straps are also used:

- 2 straps passed through the forklift brackets and attached to the load bed of the lorry or semi-trailer.

The maximum permissible strapping force LC of these strapping points is: 2,000 daN (lightly hand-tighten the lashing strip!).

Precondition The load bed must be suited for the transport (maximal load) and securing of the machine (strapping points or eyes at the vehicle).

The bed surface must be well-swept, clean, and dry.

Straps or chains must be undamaged and in working order.

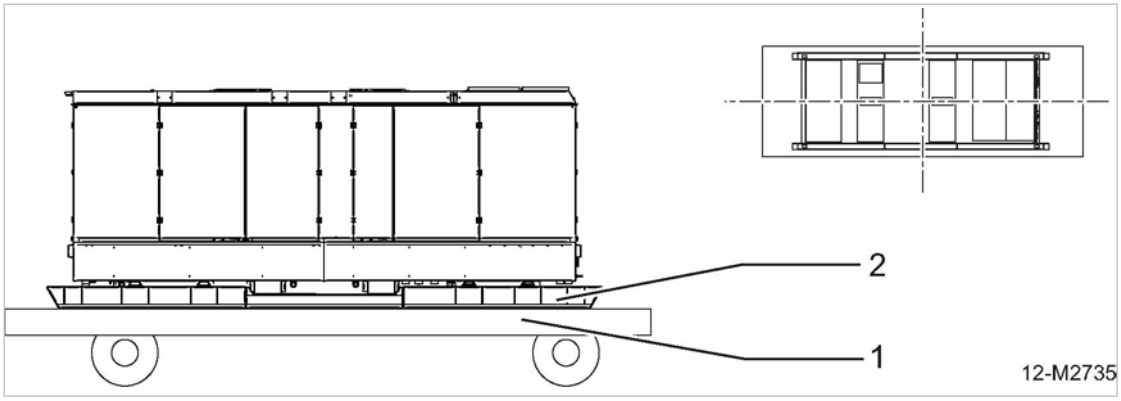


Fig. 89 Place the machine on the load bed centre.

[1] Load bed
[2] Frame skids

1. Use a crane or forklift to place the machine in the centre of the load bed.
   The machine must be centred and with both skids fully on the load bed.

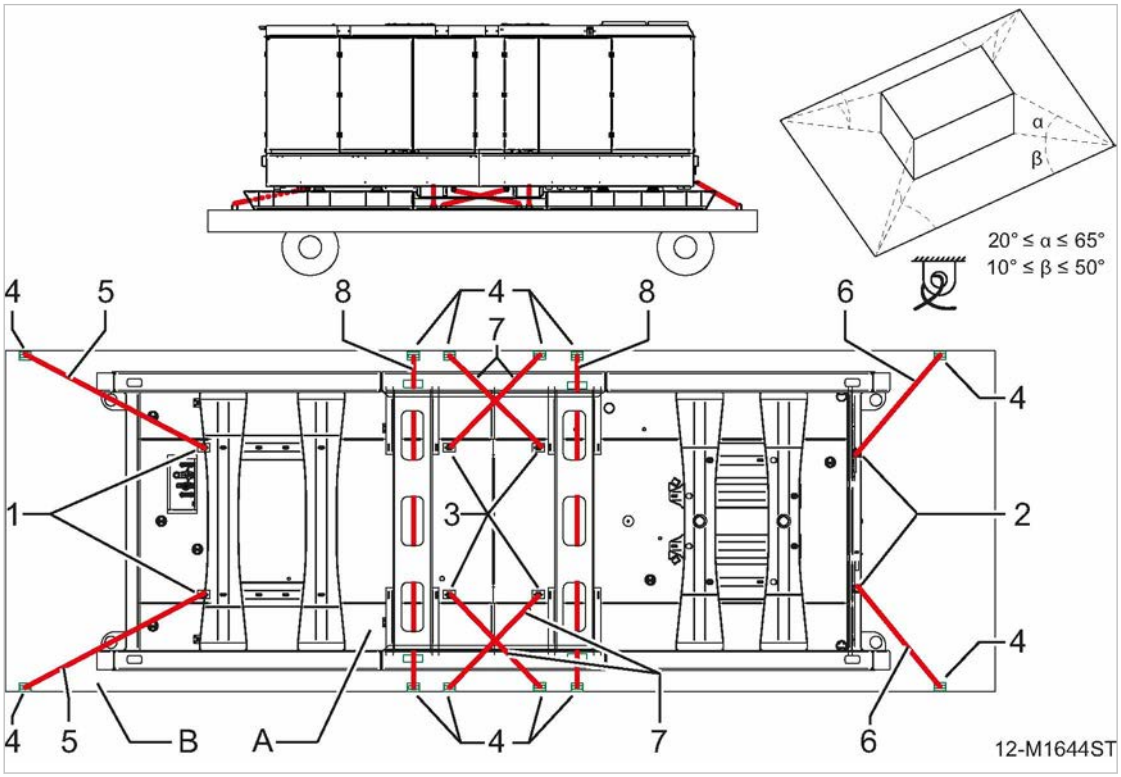


Fig. 90 Anchoring points, transport security

[A] Machine (view from beneath)
[B] Load bed of the lorry or semi-trailer
[1] Strapping points, machine rear side
[2] Strapping points, machine front side
[3] Centre strapping points, between machine forklift brackets
[4] Strapping points on the bed surface of the lorry or semi-trailer
[5] Straps to the rear (diagonally strapped)
[6] Straps to the front (diagonally strapped)
[7] Straps attached crosswise
[8] Straps fed through the forklift brackets (low strapping)
(strapped across edge protection profiles)

2. Fasten the machine with straps or chains to the load bed of the vehicle:
   (see figure 90)
   - Securing to front (diagonal strapping, 2 strapping points)
   - Securing to rear (diagonal strapping, 2 strapping points)
   - Lateral securing (diagonal strapping, 4 strapping points)
   - Lateral securing (2 straps through forklift brackets)
3. Tension the straps.

The tension of the straps must be checked during the transport, and re-tightened, if necessary.

12.2.4 Transport by crane

The crane lifting eye is designed for up to 20,000 load changes.

Permissible temperature range for transport by crane: −20° C to 100° C.

After operation, let the machine cool down before placing the crane suspension device into the lifting accessories or moving the machine by crane.

Additional precautions for conditions of snow and ice:

Considerable snow or ice may build up on the machine under low temperature conditions.
This may adversely effect the machine's centre of gravity (tilting).
It is possible that the permissible load on the crane or lifting eye is exceeded.

➢ Perform the following tasks in snow and ice conditions:
- Remove any snow and ice from the machine before lifting by a crane.
- Make sure the lifting eye cover plate is freely accessible and can be opened.

Perform the following tasks prior to moving the machine by crane:

For the transport by crane, a crane suspension traverse with two fixing points for crane lifting eyes is provided for. Access the eyes by lifting two covers on the machine roof. The covers of the crane lifting eyes are each marked with an adhesive label indicating "Double-strand lifting" (see Fig. 91).

Lifting is permitted only when a two-stranded anchoring device is used.
(see Fig. 92)

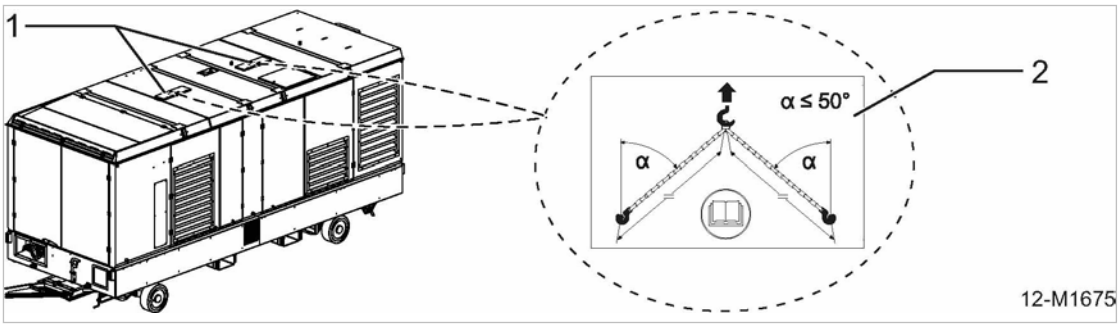


Fig. 91 Position of lifting eye cover

[1] Lifting eye cover
[2] “Double-strand lifting" label

Option rf/rm/rr

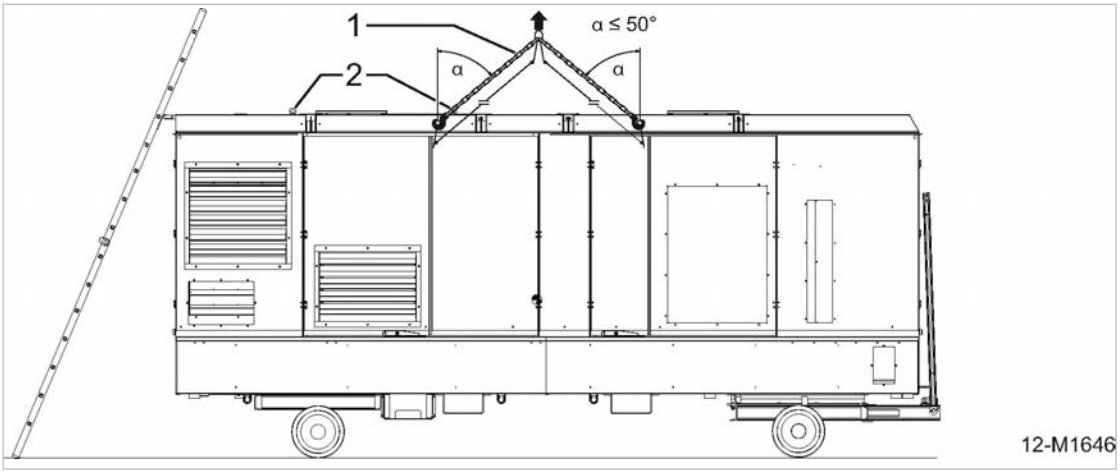


Fig. 92 Two-strand lifting by crane

[1] Two-strand anchoring device
[2] Anchoring ring for attaching the personal protective equipment

Option rw

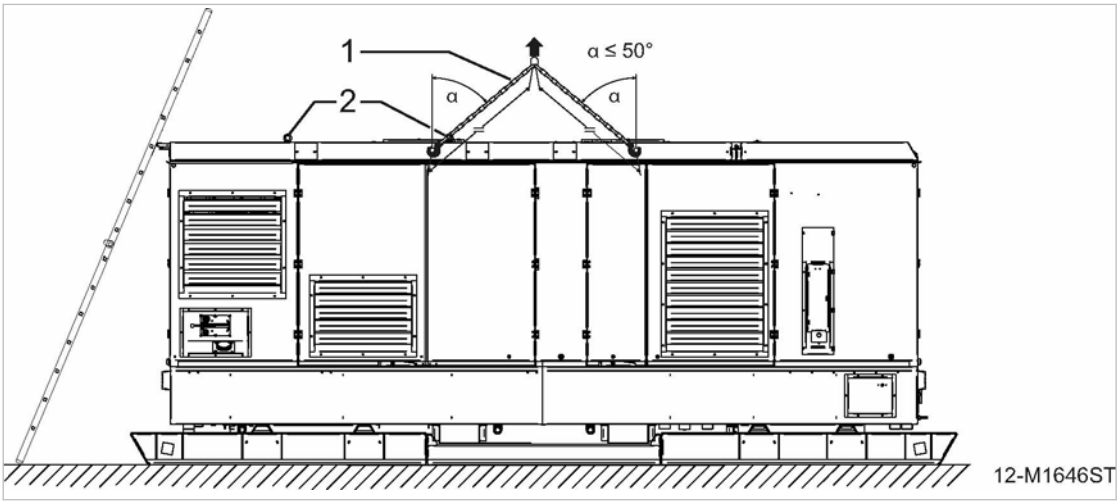


Fig. 93 Machine on skid - two-strand lifting

[1] Two-strand anchoring device
[2] Anchoring ring for attaching the personal protective equipment

1. **WARNING!**
   Stepping on the machine roof.
   Dangerous fall from the machine roof.
   - ➢ Wear clean safety boots.
   - ➢ Use only the service ladder to access the roof.
   - ➢ Wear personal protective equipment.
   - ➢ Attach the safety rope to the anchoring ring.
   - ➢ Step only on marked areas of the roof (anti-slip coating).
   - ➢ Only one person may step on the machine roof at any time.
2. Ensure that the machine is shut down and secured against accidental restarting.
3. Detach all connecting lines and hoses.

4. Detach the service ladder from its bracket and pull it out.
   - Mobile machine (option rf/rm/rr):
     - Service ladder fastened underneath the machine
   - Stationary machine on skid (option rw):
     - Service ladder fastened to the machine's rear
5. Open the service ladder fully. Check that the service ladder is latched.
6. Hang the service ladder in the bracket provided at the rear of the machine.
7. Wear personnel protective equipment (fall protection) and use the ladder to step on the roof.
8. Attach the protective equipment's line to the anchoring ring.
9. Unlatch the covers of the two crane lifting eyes using the control cabinet key and fold them up.
10. Position the two-strand anchoring device centred above the open hatches.
11. Engage both hooks in the eye.
12. Ensure that there are no objects such as unsecured tools lying on or in the machine.
13. Detach the protective equipment's line from the anchoring ring and leave the roof.
14. Remove the service ladder.
15. Close and lock the access doors.



16. **WARNING!**
    Danger of falling!
    Death or severe injury from falling off the machine.
    ➢ Riding on the machine while it is transported is strictly forbidden.
17. Make sure the danger area is clear of personnel.
18. Lift the machine carefully.

Keep in mind when setting down the machine:



1. *NOTICE!*
   Incorrect setting down can damage the machine!
   Machine components, particularly the chassis, can be damaged by incorrectly setting down.
   ➢ Set the machine down carefully.
   ➢ Do not set down unevenly.
2. Set the machine down slowly and carefully.

12.2.5 Transport machine with a forklift truck



CAUTION
Damage to the machine by incorrect lifting with a fork truck.
The machine may fall or be damaged by the forks.
➢ Pick up the machine only from the side with the forks through the lifting lugs.

Option rf/rm/rr

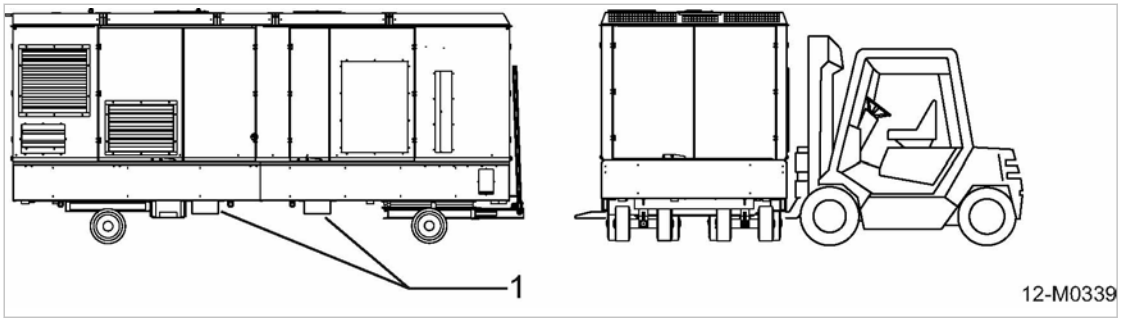


Fig. 94 Transporting the mobile machine with a forklift truck

[1] Lifting lugs

Option rw

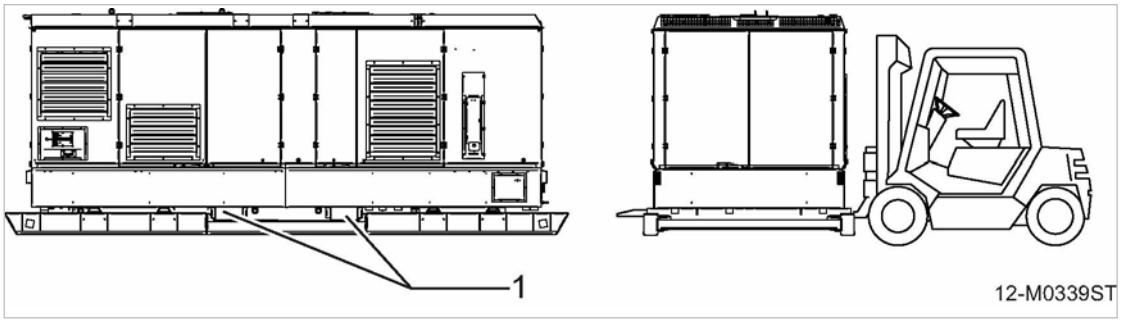


Fig. 95 Transporting the stationary machine with a forklift truck

[1] Lifting lugs

1. Close and lock the access doors.
2. Position the fork truck to the side of the machine with the forks lined up with the lifting lugs.
3. Drive the forks fully through the lifting lugs as far as possible.
   The forks are fully under the machine.
4. Lift the machine carefully.

12.3 Storage

Moisture can lead to corrosion, particularly in the engine and airend.

Frozen moisture can damage components, valve diaphragms and gaskets.

The following measures also apply to machines not yet commissioned.

Please consult with KAESER if you have questions to the appropriate storage and commissioning.

NOTICE

Moisture and frost can damage the machine!

- ➢ Prevent ingress of moisture and formation of condensation.
- ➢ Maintain a storage temperature of >0 °C.

➢ Store the machine in a dry place, free from frost if possible.

12.4 Disposal

When disposing of a machine, drain out all liquids and remove old filters.

Precondition The machine is decommissioned.

1. Completely drain the fuel from the machine.
2. Completely drain the cooling oil (gear), hydraulic oil and engine oil from the machine.
3. Remove all conterminated filters.
4. Drain the coolant from water-cooled engines and systems.
5. Remove batteries.
6. Hand the machine over to an authorized disposal expert.



- ➢ Operating materials and components contaminated with fuel, cooling oil or engine oil must be disposed of in accordance with local environment protection regulations.
- ➢ Old batteries are hazardous waste and must be disposed of correctly in accordance with local environment protection regulations

13 Annex

13.1 Marking

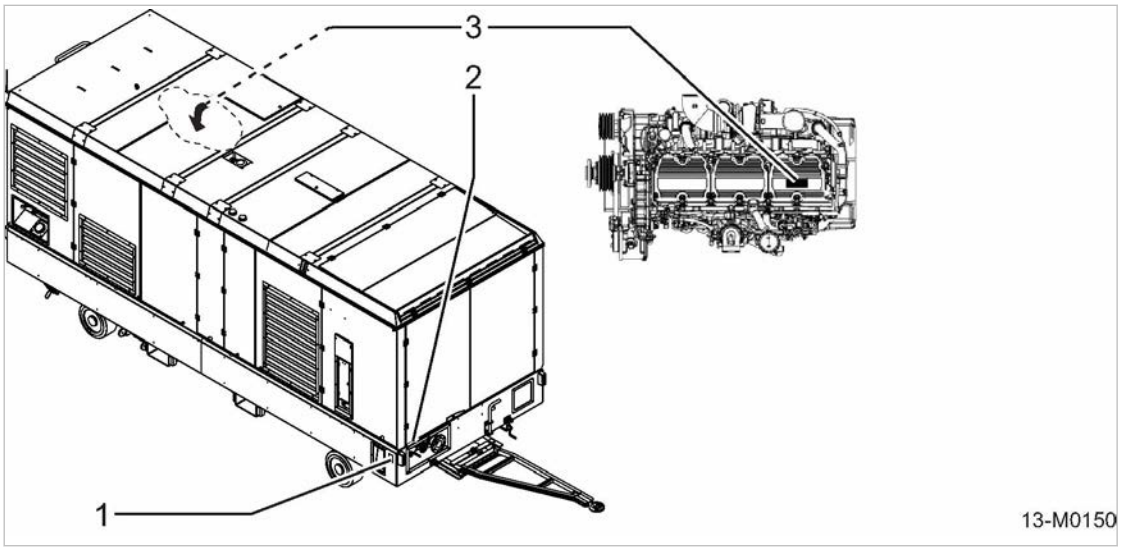
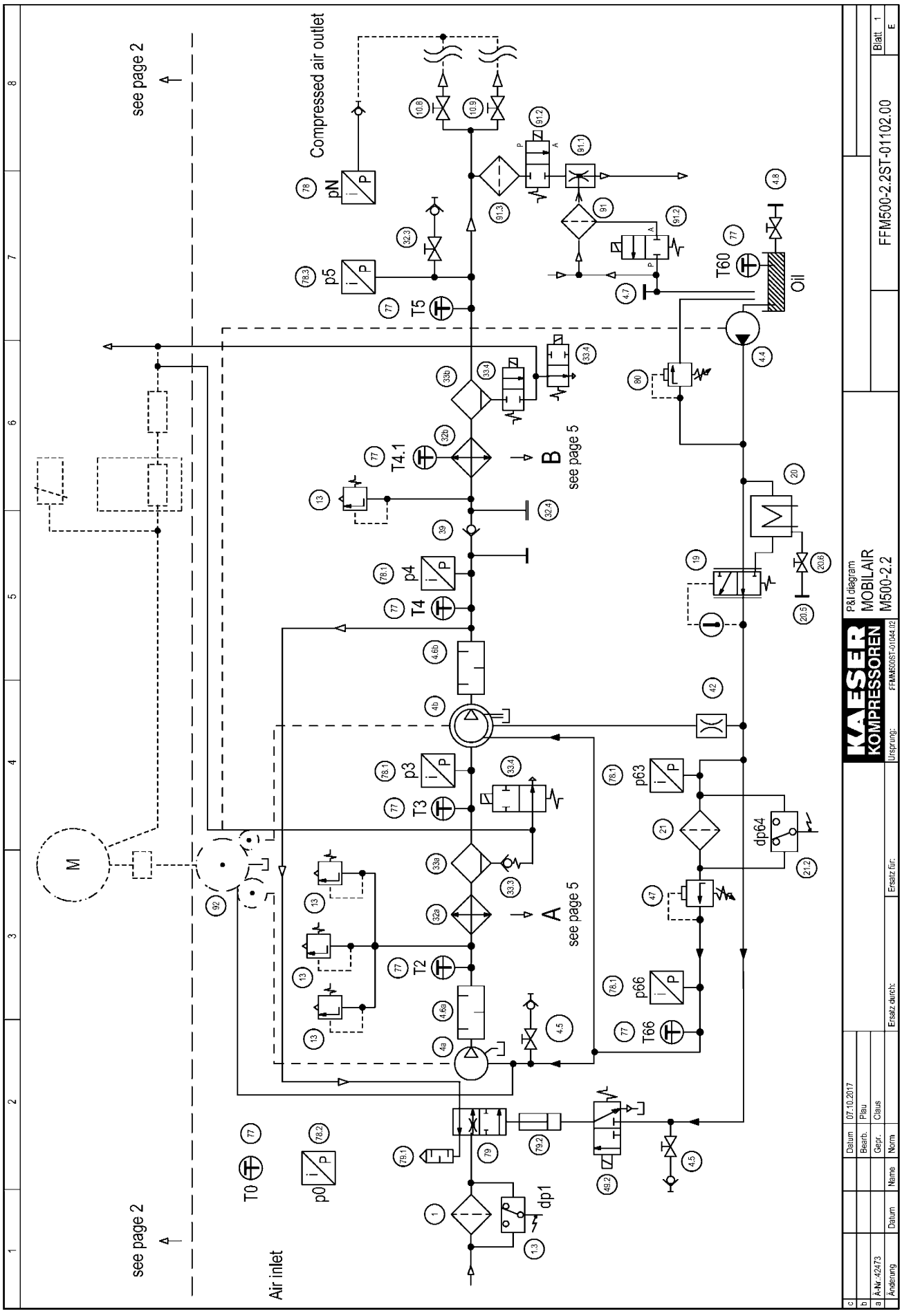
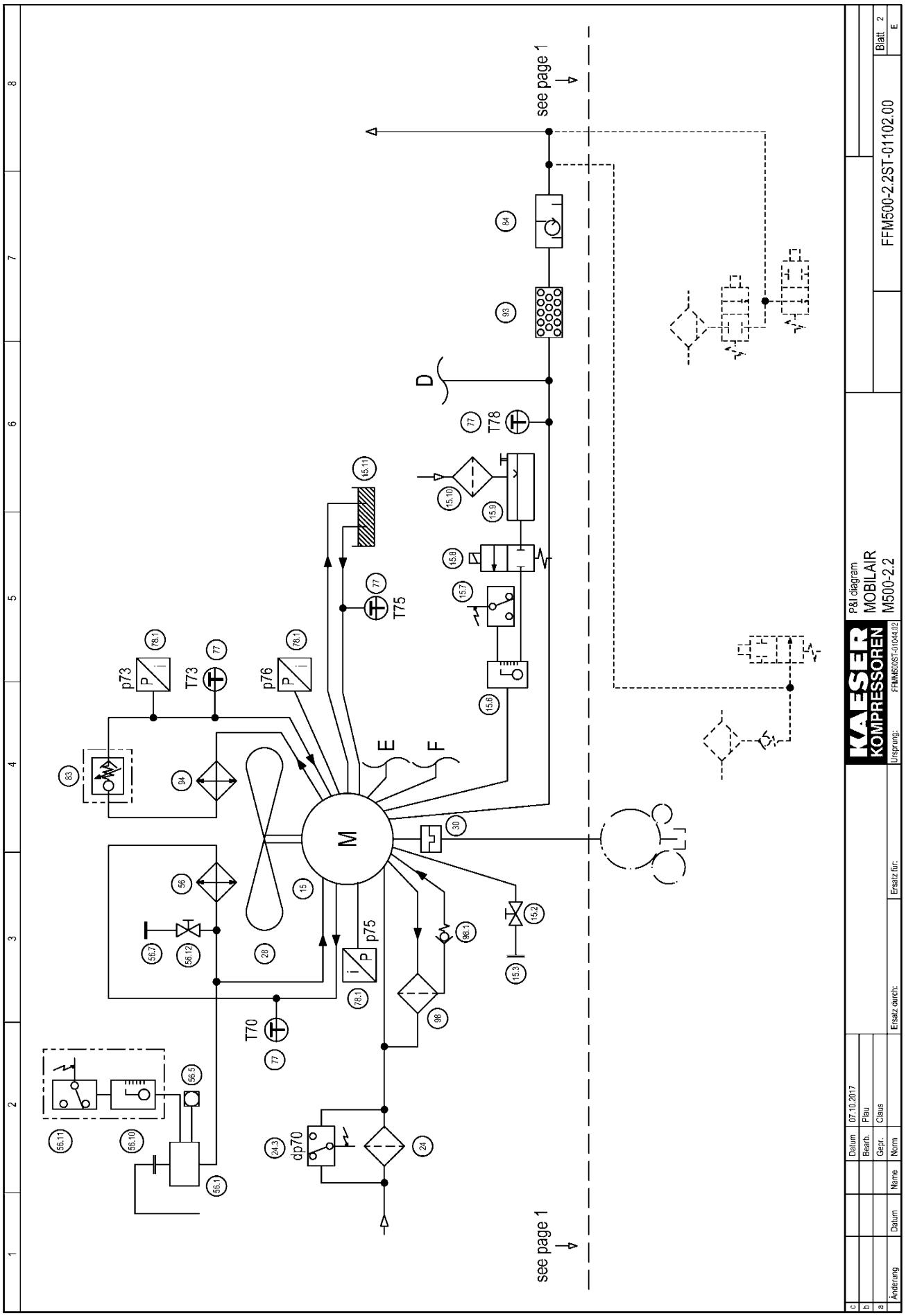


Fig. 96 Marking

1 Machine nameplate with system serial number and options
2 VIN *) (stamped in the bodywork)
*Vehicle identity number
3 Engine nameplate with engine serial number
(engine top, rear of valve plate)

13.2 Pipeline and instrument flow diagram (P&I diagram)


see page 2
Compressed air outlet
pN
p5
T5
T60
Oil
see page 5
B
T4.1
p4
T4
p3
T3
M
A
see page 5
T2
p63
dp64
p66
T66
T0
p0
dp1
Air inlet
see page 2
P&I diagram
MOBILAIR
M500-2.2
FFM500-2.2ST-01102.00
KAESER KOMPRESSOREN

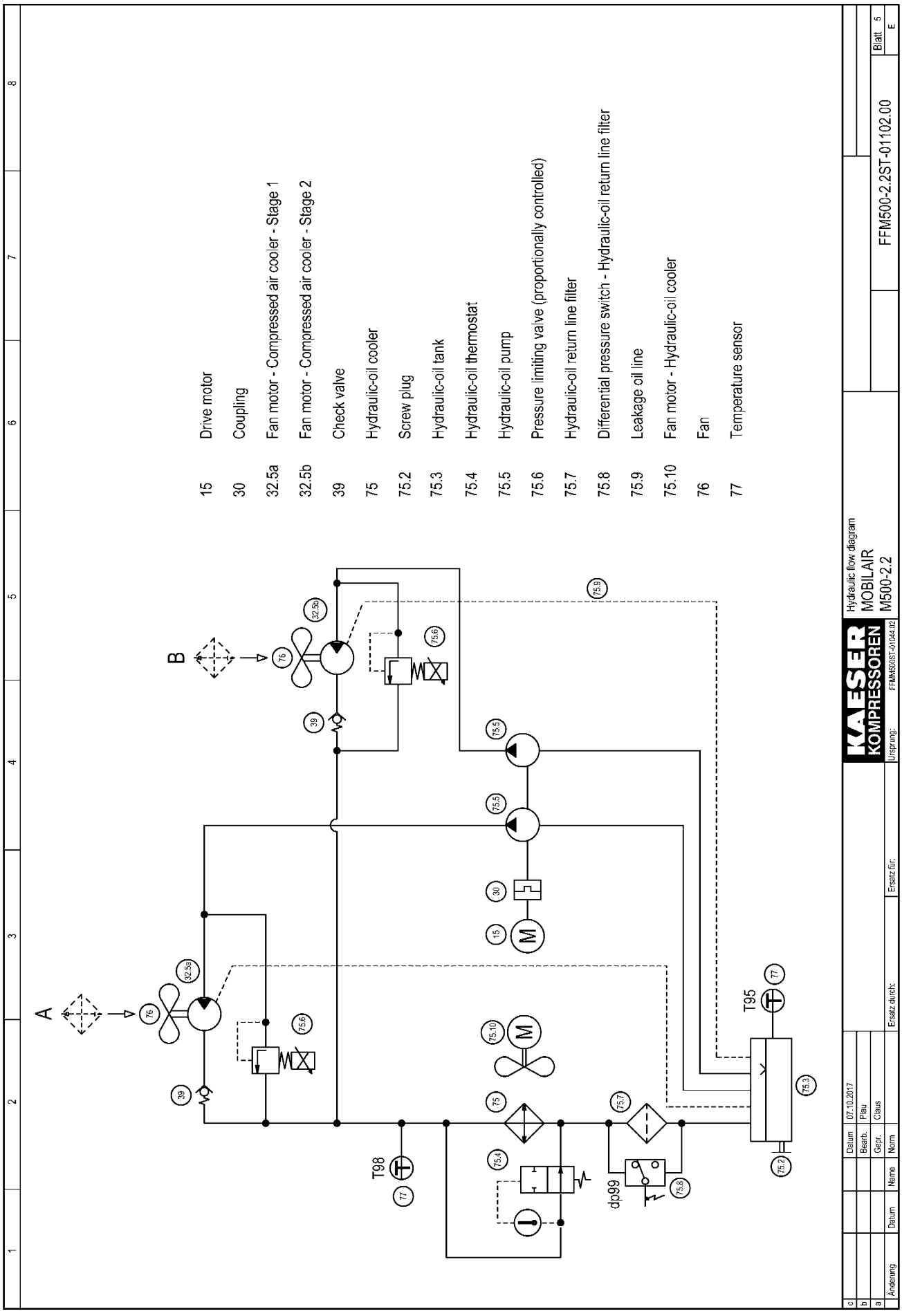

see page 1
see page 1
D
E
F
M
T78
T75
T73
T70
p73
p76
p75
dp70
P&I diagram
MOBILAIR M500-2.2
FFM500-2.2ST-01102.00
KAESER KOMPRESSOREN
Blatt 2
Datum 07.10.2017
Bearb. Plau
Gepr. Claus
Norm
Name
Datum
Änderung
Ersatz durch:
Ersatz für:
Ursprung:

1	Compressor-Air filter
1.3	Differential pressure switch - Air filter
4a	Rotary screw airend - Stage 1
4b	Rotary screw airend - Stage 2
4.4	Oil circulation pump
4.5	Measuring point connection - Oil pressure
4.6a	Pulse damper - Stage 1
4.6b	Pulse damper - Stage 2
4.7	Oil filler port with plug
4.8	Shut-off valve with flange - Oil drain device
10.8	Compressed air outlet - Shut-off valve DN 80
10.9	Compressed air outlet - Shut-off valve G1
13	Safety relief valve
15	Drive motor
15.2	Shut-off valve - Oil drain device
15.3	Screw plug -Oil drain device
15.6	Oil level monitor
15.7	Pressure switch
15.8	2/2-Directional control valve (closed when de-energised)
15.9	Oil reservoir
15.10	Vent filter
15.11	Fuel tank
19	Thermostatic valve
20	Oil cooler
20.5	Screw plug - Oil drain device
20.6	Shut-off valve
21	Oil filter
21.2	Differential pressure switch - Oil filter
24	Motor-Air filter
24.3	Differential pressure switch - Motor-Air filter
28	Fan
30	Coupling
32a	Compressed air cooler - Stage 1
32b	Compressed air cooler - Stage 2
32.3	Shut-off valve with venting hose coupling
32.4	Hot air connection
33a	Centrifugal separator - Stage 1
33b	Centrifugal separator - Stage 2
33.3	Check valve
33.4	2/2-Directional control valve
39	Check valve
42	Nozzle
47	Pressure regulating valve
49	3/2-Directional control valve
49.2	3/2-way solenoid valve for inlet valve control

c				Datum	07.10.2017		KAESER KOMPRESSOREN	P&I diagram legend MOBILAIR M500-2.2	
b				Bearb.	Plau				
a				Gepr.	Claus				
	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: FFMM500ST-01044.02	FFM500-2.2ST-01102.00 Blatt 3 E

49.2	3/2-way solenoid valve for inlet valve control
56	Water cooler
56.1	Cooling water expansion tank
56.5	Cooling water sight glass
56.7	Screw plug -Water drain device
56.10	Water filling port with plug and pressure relief valve
56.11	Cooling water status indicator (switching)
56.12	Shut-off valve - Water drain device
77	Temperature sensor
78	Pressure transducer - Network pressure
78.1	Pressure transducer - Internal pressure
78.2	Pressure transducer - Ambient pressure
78.3	Pressure transducer - Air pressure at the machine outlet
79	Combined inlet/venting valve
79.1	Silencer
79.2	Actuating cylinder
80	Overflow valve
83	Engine air intake shut-off valve (automatic shut-off)
84	Spark arrestor
91	Micro-filter
91.1	Vacuum suction nozzle
91.2	2/2-Directional control valve (closed when de-energised)
91.3	Prefilter
92	Gear
93	Particulate filter
94	Intercooler
98	Filter - Crankcase venting
98.1	Check valve
D	Reducing agent injection; See Exhaust gas after-treatment
E	Cooling water inlet; See Exhaust gas after-treatment
F	Cooling water outlet; See Exhaust gas after-treatment

c				Datum	07.10.2017		KAESER KOMPRESSOREN	P&I diagram legend MOBILAIR M500-2.2	
b				Bearb.	Plau				
a				Gepr.	Claus				
	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: FFMM500ST-01044.02		FFM500-2.2ST-01102.00 Blatt 4 E


15 Drive motor
30 Coupling
32.5a Fan motor - Compressed air cooler - Stage 1
32.5b Fan motor - Compressed air cooler - Stage 2
39 Check valve
75 Hydraulic-oil cooler
75.2 Screw plug
75.3 Hydraulic-oil tank
75.4 Hydraulic-oil thermostat
75.5 Hydraulic-oil pump
75.6 Pressure limiting valve (proportionally controlled)
75.7 Hydraulic-oil return line filter
75.8 Differential pressure switch - Hydraulic-oil return line filter
75.9 Leakage oil line
75.10 Fan motor - Hydraulic-oil cooler
76 Fan
77 Temperature sensor
A
B
T98
T95
dp99
Hydraulic flow diagram
MOBILAIR
M500-2.2
FFM500-2.2ST-01102.00
KAESER KOMPRESSOREN

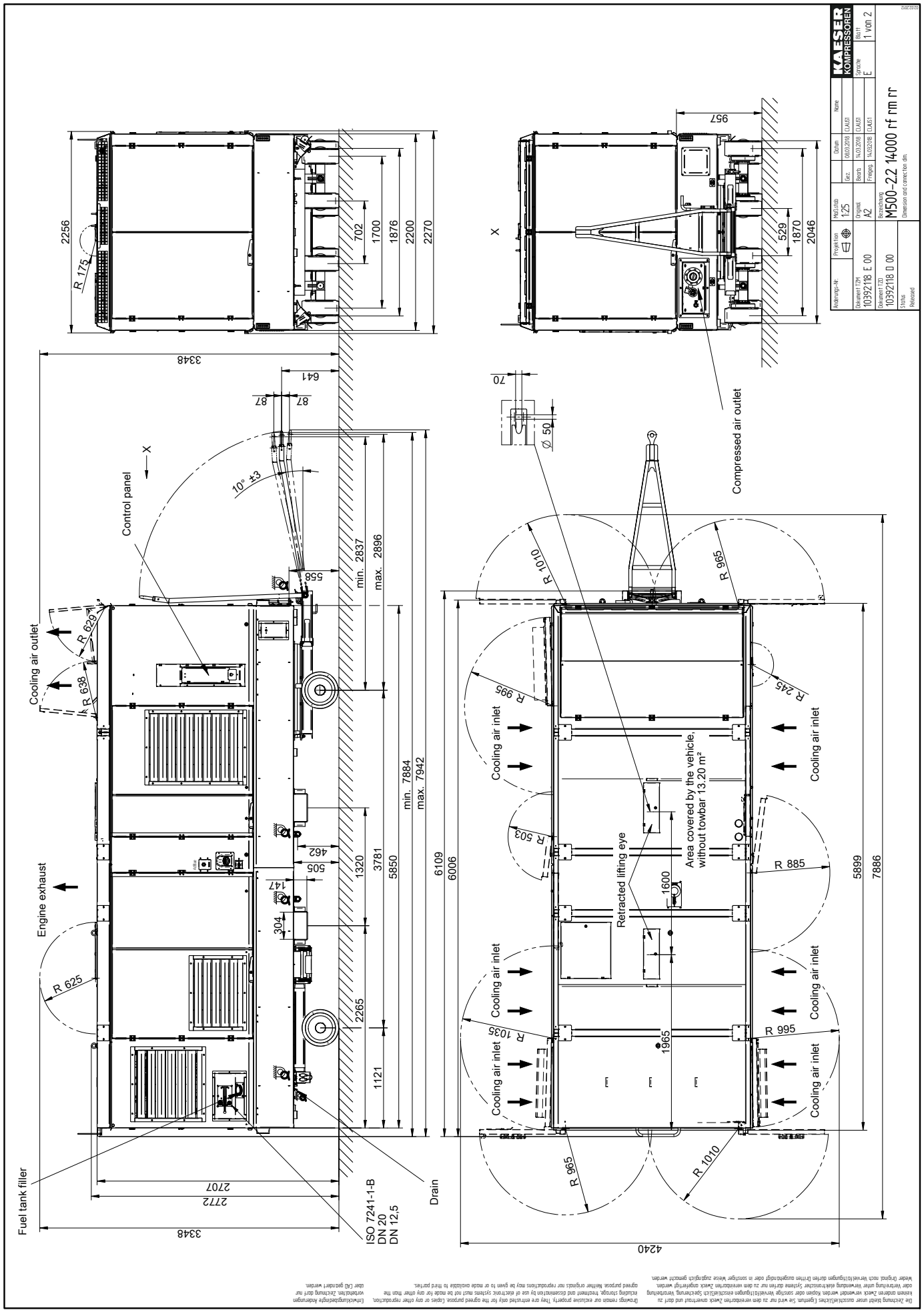
T0	Ambient air
p0	Ambient air pressure
dp1	Differential pressure, compressor air filter
T2	Stage 1: air temperature at the outlet
T3	Stage 2: air temperature at the inlet
p3	Stage 2:air pressure at the inlet
T4	Stage 2: air temperature at the outlet
p4	Stage 2: air pressure at the outlet
T4.1	Heat exchanger stage 2: air intermediate temperature
T5	Air temperature at the machine outlet
p5	Air pressure at the machine outlet
pN	Compressed air in the network (network pressure)
T60	Compressor oil temperature, oil sump
p63	Oil system: oil pressure for inlet valve
dp64	Oil system: differential pressure oil filter
T66	Oil system: oil temperature, inlet lubrication
p66	Oil system: oil pressure, inlet lubrication
T70	Diesel engine: cooling water outlet temperature from engine
dp70	Diesel engine: differential pressure, engine air filter
T73	Diesel engine: charge air inlet temperature, in engine
p73	Diesel engine charge air inlet pressure, in engine
T75	Diesel engine fuel temperature in engine
p75	Diesel engine: fuel pressure in engine
p76	Diesel engine: engine oil pressure
T78	Diesel engine: exhaust air temperature in diesel particulate filter
T95	Hydraulic oil temperature in tank
T98	Hydraulic oil temperature, downstream from engine
dp99	Differential pressure, hydraulic oil return filter

c				Datum	07.10.2017		KAESER KOMPRESSOREN	P&I diagram legend	
b				Bearb.	Plau			MOBILAIR M500-2.2	
a				Gepr.	Claus			Measurement point identifiers	
	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: FFMM500ST-01044.02	FFM500-2.2ST-01102.00 Blatt 6 E

13.3 Dimensional drawings

13.3.1 Option rf/rm/rr Drawing chassis

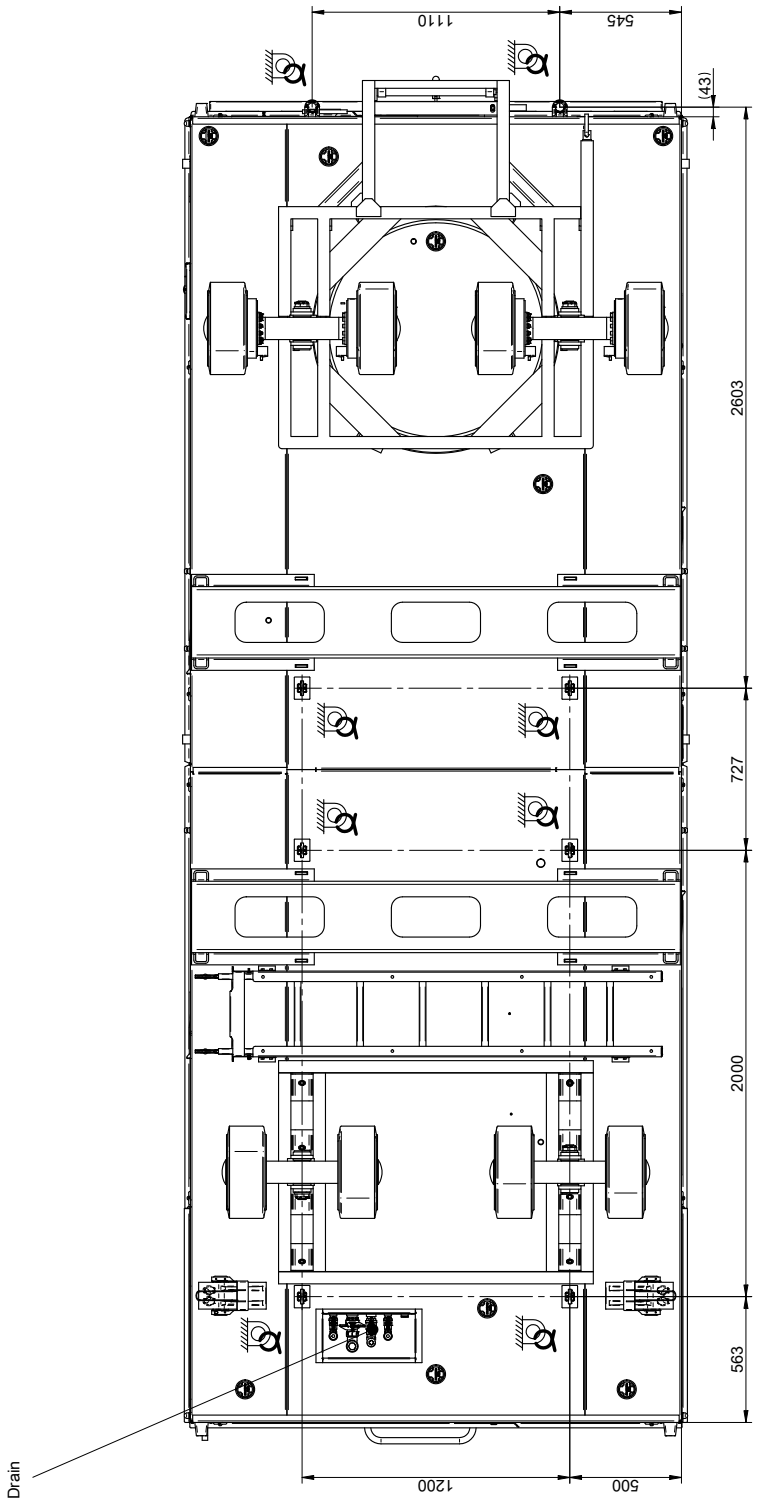
- Option rf - Chassis with steerable axle
- Option rm - chassis with height-adjustable tow bar
- Option rr - chassis without service brake



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Änderungs-Nr.	Projektion	Maßstab 1:25			Datum	Name	KAESER KOMPRESSOREN		
		Original A2	Bearb.	14.03.2018	CLAUS1	Sprache E	Blatt 2 von 2		
Dokument TZM 10392118 E 00		Bezeichnung M500-22 14000 rf rm rr	Gez.	08.03.2018	CLAUS1				
Dokument TZG 10392118 D 00		Dimension and connection dim.	Freigab.	14.03.2018	CLAUS1				
Status Released									

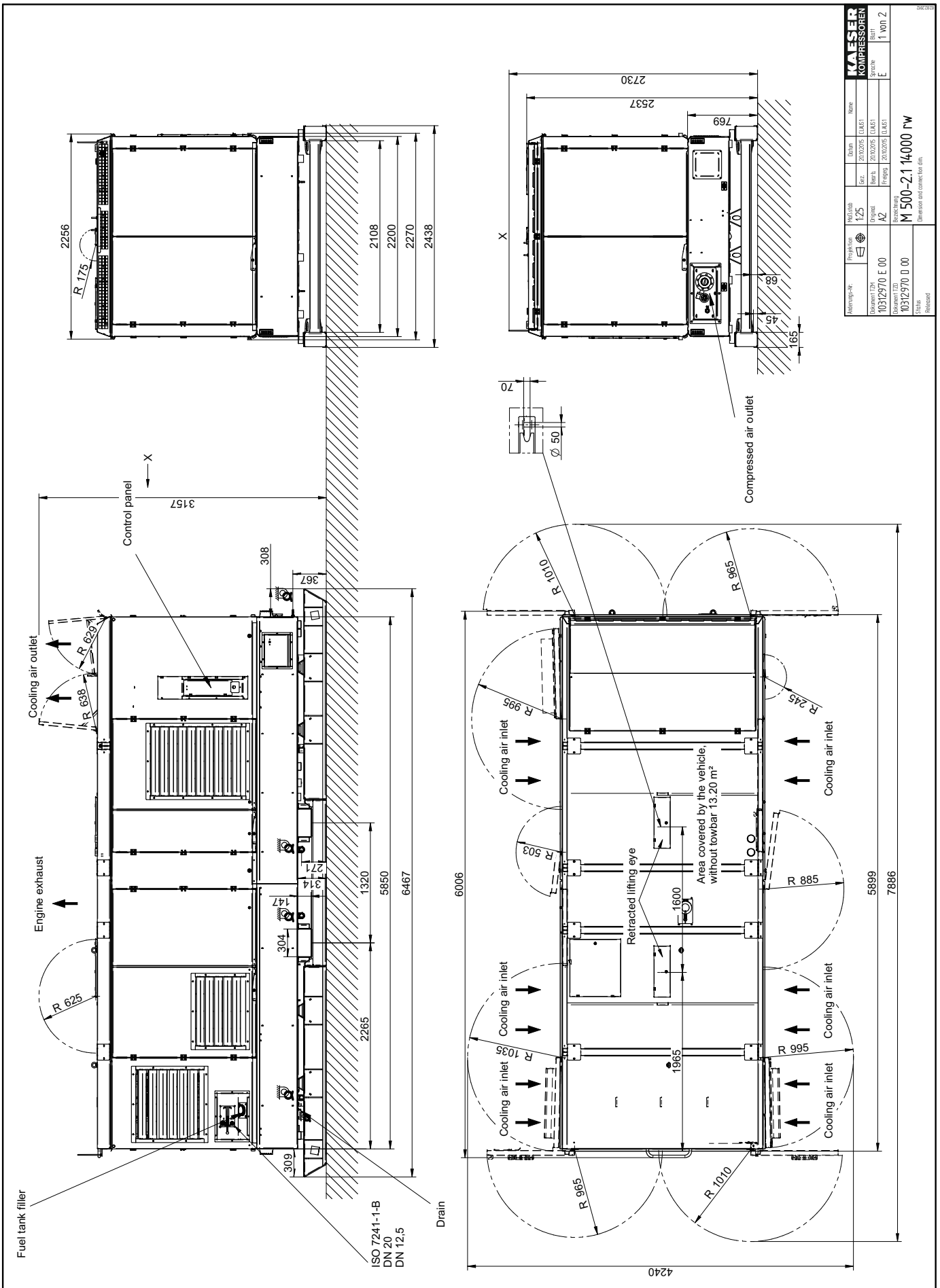
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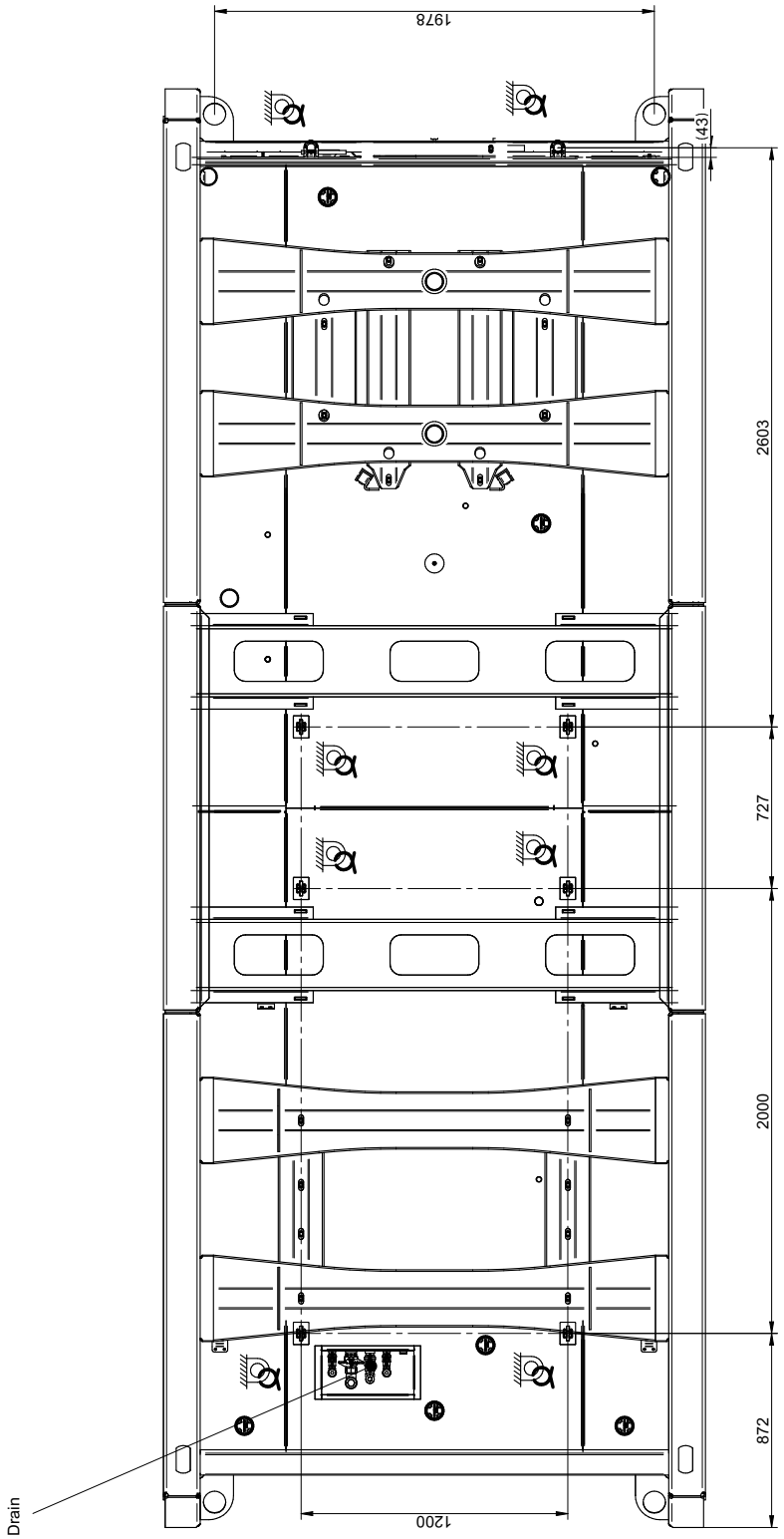
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13.3.2 Option rw
Dimensional drawing, stationary version

- Option rw - Skid frame on runners



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Änderungs-Nr:	Projektion	Maßstab		Datum	Name	KAESER KOMPRESSOREN	
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Dokument TZM		Original	Bearb.	20.10.2015	CJA51	Sprache	Blatt
10312970 E 00		A2	Freigeg.	20.10.2015	CJA51	E	2 von 2
Dokument TZD		Benennung	M 500-2.1 14000 rw				
10312970 D 00		Dimension unit connection dim.					
Status							
Released							

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13.4 Electrical Diagram

Electrical diagrams

MOBILAIR M500-2.2

SIGMA CONTROL MOBIL DRY

Engine CAT C18 - Tier 4F / stage V

Manufacturer: KAESER KOMPRESSOREN SE
Postfach 2143
96410 Coburg

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c				Date	24.10.2019 E		Cover page	=	
b				Drawn	Sitter		MOBILAIR M500-2.2	+	
a				Released	Fischer C.				
A	Change	Date	Name					DFA5002-03024.02	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			DFA5002-03024.02	1	
2	List of contents			ZFA5002-03024.02	1	
3	List of contents			ZFA5002-03024.02	2	
4	general instructions			UFA5002-03024.02	1	
5	electrical equipment identification			UFA5002-03024.02	2	
6	electrical equipment identification			UFA5002-03024.02	3	
7	Circuit diagram	connection Engine		SFA5002.SKM-03024.02	1	=SKM
8	Circuit diagram	engine control unit		SFA5002.SKM-03024.02	2	=SKM
9	Circuit diagram	engine control unit		SFA5002.SKM-03024.02	3	=SKM
10	Circuit diagram	Power supply		SFA5002.SKM-03024.02	4	=SKM
11	Circuit diagram	Heating/Battery charger		SFA5002.SKM-03024.02	5	=SKM
12	Circuit diagram	Heating/Battery charger		SFA5002.SKM-03024.02	6	=SKM
13	Circuit diagram	Heating/Battery charger		SFA5002.SKM-03024.02	7	=SKM
14	Circuit diagram	Control panel		SFA5002.BT-03024.02	1	=BT
15	Circuit diagram	Control panel		SFA5002.BT-03024.02	2	=BT
16	Circuit diagram	Power supply		SFA5002.SK-03024.02	1	=SK
17	Circuit diagram	SCM DRY Power supply unit		SFA5002.SK-03024.02	2	=SK
18	Circuit diagram	SCM DRY Power supply unit		SFA5002.SK-03024.02	3	=SK
19	Circuit diagram	SCM DRY inputs		SFA5002.SK-03024.02	4	=SK
20	Circuit diagram	SCM DRY inputs		SFA5002.SK-03024.02	5	=SK
21	Circuit diagram	SCM DRY inputs		SFA5002.SK-03024.02	6	=SK
22	Circuit diagram	SCM DRY inputs		SFA5002.SK-03024.02	7	=SK
23	Circuit diagram	SCM DRY outputs		SFA5002.SK-03024.02	8	=SK
24	Circuit diagram	SCM DRY outputs		SFA5002.SK-03024.02	9	=SK
25	Circuit diagram	SCM DRY outputs		SFA5002.SK-03024.02	10	=SK
26	Circuit diagram	SCM DRY outputs		SFA5002.SK-03024.02	11	=SK
27	Circuit diagram	SCM DRY Power supply unit		SFA5002.SK-03024.02	12	=SK
28	Circuit diagram	SCM DRY inputs		SFA5002.SK-03024.02	13	=SK
29	Circuit diagram	SCM DRY inputs		SFA5002.SK-03024.02	14	=SK
30	Circuit diagram	SCM DRY inputs		SFA5002.SK-03024.02	15	=SK
31	Circuit diagram	SCM DRY inputs		SFA5002.SK-03024.02	16	=SK
32	Circuit diagram	SCM DRY outputs		SFA5002.SK-03024.02	17	=SK
33	Circuit diagram	SCM DRY outputs		SFA5002.SK-03024.02	18	=SK
34	Circuit diagram	SCM DRY outputs		SFA5002.SK-03024.02	19	=SK
35	Circuit diagram	Radio remote control		SFA5002.SK-03024.02	20	=SK
36	Circuit diagram	Volt-free contacts		SFA5002.SK-03024.02	21	=SK
37	Circuit diagram	System illumination		SFA5002.SK-03024.02	22	=SK
38	Circuit diagram	IO extension		SFA5002.IO-03024.02	1	=IO
39	Circuit diagram	IO extension		SFA5002.IO-03024.02	2	=IO
40	Circuit diagram	IO analog signals		SFA5002.IO-03024.02	3	=IO
41	Circuit diagram	IO digital inputs		SFA5002.IO-03024.02	4	=IO
42	Circuit diagram	IO digital inputs		SFA5002.IO-03024.02	5	=IO
43	Circuit diagram	IO digital outputs		SFA5002.IO-03024.02	6	=IO
44	Circuit diagram	IO digital outputs		SFA5002.IO-03024.02	7	=IO
45	Equipment parts list	Control cabinet		GFA5002-03024.02	1	

c				Date	24.10.2019	KAESER KOMPRESSOREN	List of contents	=	
b				Drawn	Sitter		MOBILAIR M500-2.2	+	
a				Released	Fischer C.				
B	Change	Date	Name					ZFA5002-03024.02	page 1 2 Sht.

Lfd. Nr. No.	Benennung Name		Zeichnungsnummer (Kunde) Drawing No. (customer)	Zeichnungsnummer (Hersteller) Drawing No. (manufacturer)	Blatt Page	Anlagenkennzeichen Unit designation
46	Equipment parts list	Control cabinet Engine		GFA5002-03024.02	2	
47	Equipment parts list	Heating/Battery charger		GFA5002-03024.02	3	
48	Equipment parts list	Control panel		GFA5002-03024.02	4	
49	Equipment parts list	IO extension		GFA5002-03024.02	5	
50	Terminal schedule	Terminal strip -X1		KFA5002-03024.02	1	=SK
51	Terminal schedule	Terminal strip -X1		KFA5002-03024.02	2	=SK
52	Terminal schedule	Terminal strip -X2		KFA5002-03024.02	3	=SKM
53	Terminal schedule	Terminal strip -X10		KFA5002-03024.02	4	=SKM
54	Terminal schedule	Terminal strip -X10		KFA5002-03024.02	5	=SKM
55	Terminal schedule	Terminal strip -X50,-X51		KFA5002-03024.02	6	=SK
56	Terminal schedule	Plug connection -X24		KFA5002-03024.02	24	
57	Terminal schedule	Plug connection -X25		KFA5002-03024.02	25	
58	Terminal schedule	Plug connection -X31		KFA5002-03024.02	31	=SK
59	Terminal schedule	Plug connection -X32		KFA5002-03024.02	32	=SK
60	Terminal schedule	Plug connection -X33		KFA5002-03024.02	33	=SK
61	Terminal schedule	Plug connection -X34		KFA5002-03024.02	34	=SK
62	Terminal schedule	Plug connection -X35		KFA5002-03024.02	35	=SK
63	Terminal schedule	Plug connection -X36		KFA5002-03024.02	36	=SK
64	Component layout	Control panel		AFA5002-03024.02	1	=BT
65	Component layout	Control cabinet Engine		AFA5002-03024.02	2	=SKM
66	Component layout	Control cabinet unit		AFA5002-03024.02	3	=SK
67	Component layout	IO extension		AFA5002-03024.02	4	=BT

c				Date	24.10.2019		List of contents	=	
b				Drawn	Sitter		MOBILAIR M500-2.2	+	
a				Released	Fischer C.			ZFA5002-03024.02	page 2
B	Change	Date	Name						2 Sht.

1	2	3	4	5	6	7	8

general instructions

Control voltage: 24VDC

control cabinet wiring for non-designated conductors:
external voltage: 1,5 mm² H07V2-K/UL/CSA orange
measuring circuits: 1,0 mm² H05V2-K/UL/CSA violet

All control lines marked a) are 1,5 mm² FLRY white
All control lines marked b) are 2,5 mm² FLRY white
All control lines marked c) are 4 mm² FLRY white
All control lines marked d) are 1,5mm² H07V-K black

potentials:

15	switched plus + (unit ON)
30	+ terminal (Battery)
31	- terminal (Battery), earth
50	Starter-Control

wiring colors:

BU	= blue	OG	
BN	= brown	PK	= orange
YE	= yellow	RD	= pink
GN	= green	BK	= red
GNYE	= green-yellow	VT	= black
GY	= grey	WH	= violet
			= white

c				Date	24.10.2019		KAESER KOMPRESSOREN	general instructions	=
b				Drawn	Sitter			MOBILAIR M500-2.2	+
a				Released	Fischer C.				
C	Change	Date	Name					UFA5002-03024.02	page 1 / 3 Sht.

1	2	3	4	5	6	7	8

general components

-E21	Heating Hydraulic oil
-E22	Heating Oil circuit flow compressor
-E23,-E24,-E25,	
-E26.1,-E26.2	Heating Centrifugal separator
-E27.1,-E27.2	Heating Fuel filter
-F20,-F21,-F22	Cut-out Heating
-F23,-F24	Cut-out Battery charger
-F5,-F7,-F9,	
-F11...-F13,-F15,	
-F26,-F27,-F29,	
-F40,-F45...-F49,	
-F59,-F61,-F100	
-F30,-F39	Fuse
-K20	Control board SIGMA CONTROL MOBIL DRY
-K21	Operating unit SIGMA CONTROL MOBIL DRY
-K25	Control IO-extension
-K29	Relay Control Exhaust flap
-K30	Relay Starter
-K32	Relay fuel pump
-K39	Relay ECU ON
-K48	Relay enable LSR
-K49	Relay enable HSR
-K51	Relay Fan Coupling
-K52	Relay Fan Hydraulic oil
-K55	Relay AdBlue fuelling external
-K57.1,-K57.2	Relay Heating Fuel filter
-K58	Relay Heating Centrifugal separator
-K59	Relay Inlet control valve Engine air IN
-K61...-K66	Coupling relay
-K90	Radio remote control

general components

-M7,-M8	Control cabinet ventilator
-M29	Drive motor Exhaust flap
-M38	Fan Coupling
-M39	Fan Hydraulic oil
-P9	Display fuel level
-P37	Changeover switch fuel internal/external
-P40	buzzer
-P41...-P44	buzzer
-P45...-P48	Work lights
-Q10	Battery isolating switch
-R1	Load Dump module
-R11...-R16	Resistor
-S1,-S2	EMERGENCY STOP pushbutton
-S10	Control voltage ON/OFF switch
-S30,-S31	Interlock switch (door), Exhaust flap open/closed
-S45...-S48	Interlock switch (door)
-S59	Interlock switch (door) Inlet control valve Engine closed
-S100	Rotary control switch
-T1	Converter Pt100 - 4...20mA
-T3	Battery charger

components Diesel motor

-E20	Coolant heating Diesel motor
-G2	Alternator
-G1.1, -G1.2	Battery
-K14	Inlet control valve Engine air
-K22	engine control unit Diesel motor C18
-M2	Starter
-P22,-P23,-P24	Indicator light Diesel particulate filter
-P25	LED Run-on time
-S22,-S23	Button Diesel particulate filter
-X22	diagnostics plug CAT

terminal strips, plug connection

-X1,-X2	Terminal strip
-X3	Terminal strip
-X10	Terminal strip Heating, Battery charger
-X11,-X12	Plug Power supply
-X13	plug connection
-X20	Terminal strip Heating, Centrifugal separator
-X22	diagnostics plug CAT
-X24,-X25	plug connection
-X31...-X36	plug connection
-X40,-X41	plug connection
-X45,-X46,-X48	plug connection System illumination
-X50	Terminal strip, Volt-free contacts
-X51	Terminal strip
-X55	Socket outlet, AdBlue pump
-X100	Diagnostic socket KAESER
-XB30	plug connection

c				Date	24.10.2019		KAESER KOMPRESSOREN	electrical equipment identification	=
b				Drawn	Sitter			MOBILAIR M500-2.2	+
a				Released	Fischer C.				page 2
C	Change	Date	Name					UFA5002-03024.02	3 Sht.

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sensors

-B1	Pressure transducer, Air main pressure p5
-B5	Differential pressure switch Engine dp1
-B6	Differential pressure switch flow compressor dp70
-B7.1,-B7.2	Filter maintenance indication Hydraulic oil dp99
-B8	Oil filter differential pressure switch flow compressor dp7
-B13	Pressure transducer, Air main pressure pN
-B15	Pressure transducer, inlet stage 2 p3
-B16	Pressure transducer, outlet stage 2 p4
-B17	Pressure transducer, Oil pressure lubrication p66
-B18	Pressure transducer, Oil pressure Control p63
-B30	sensor coolant level
-B33	Filter maintenance fuel
-B36	Level sensor Floor pan
-B37	sensor fuel level
-B38	Level sensor engine oil
-B39	Level and temperature sensor Hydraulic oil
-B78,-B79	Filter maintenance indication fuel

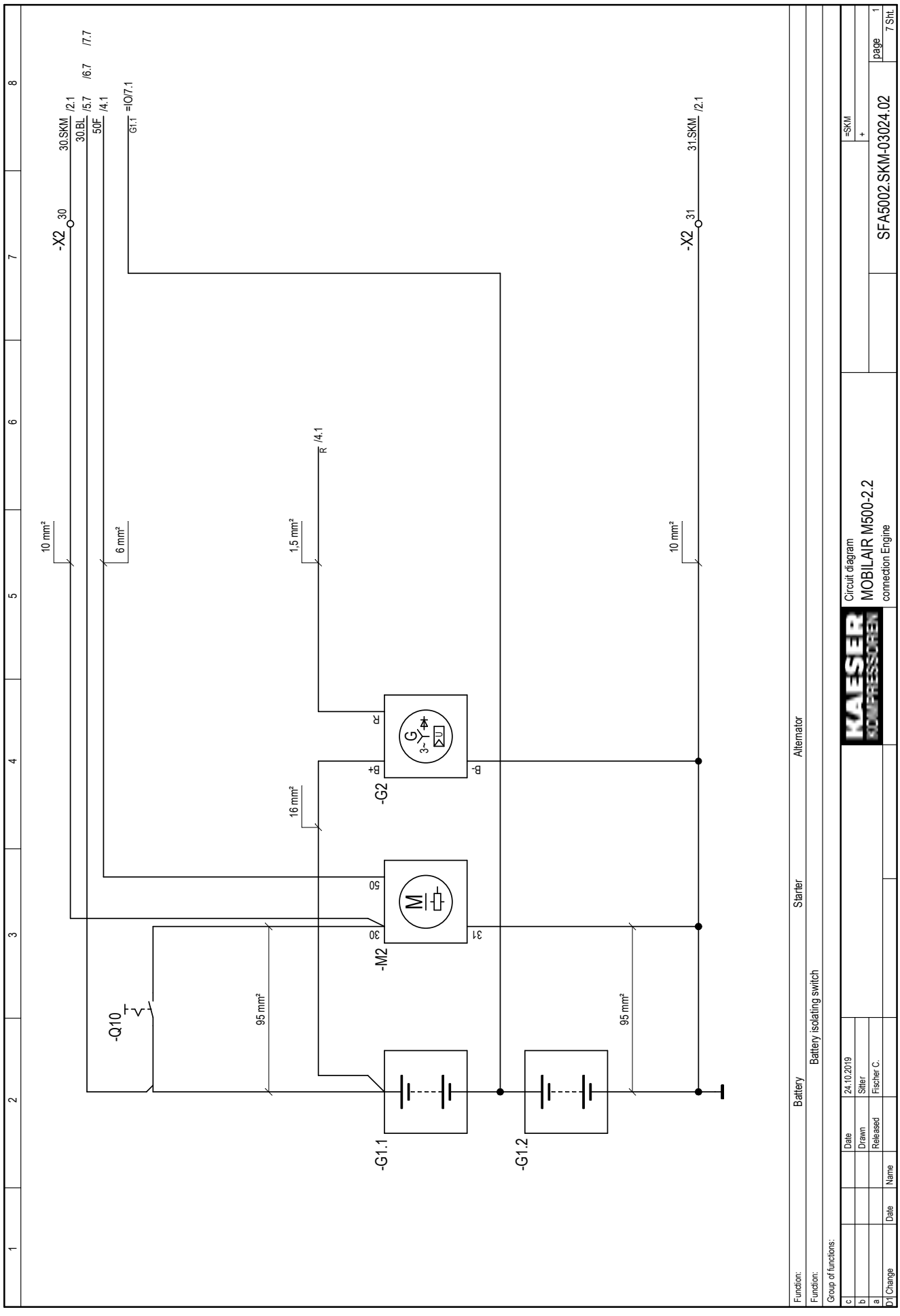
sensors

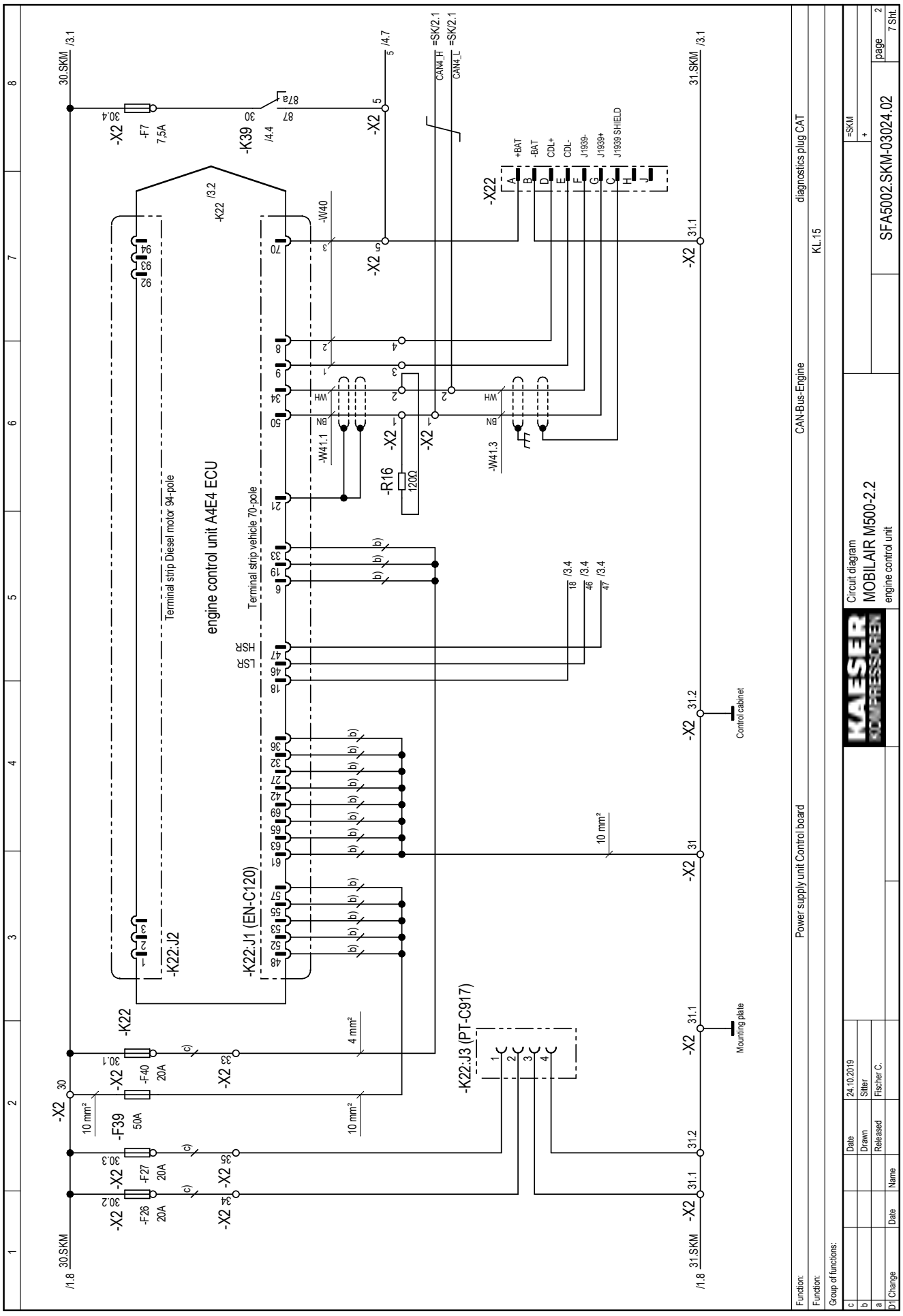
-B80	Temperature measuring transducer, Ambient temperature T0
-B82	Temperature probe, Outlet temperature stage 1 T2
-B83	Temperature probe, Inlet temperature stage 2 T3
-B84	Temperature probe, Outlet temperature stage 2 T4
-B85	Temperature probe, compressed air outlet temperature T5
-B86	Temperature probe, Oil temperature lubrication T66
-B87	Temperature probe, Oil temperature Oil sump T60
-B90	Temperature probe, Outlet temperature stage 2 T4.1
-B95	Temperature probe, Oil temperature Hydraulic oil T98
-B100	Temperature probe Ambient temperature Engine

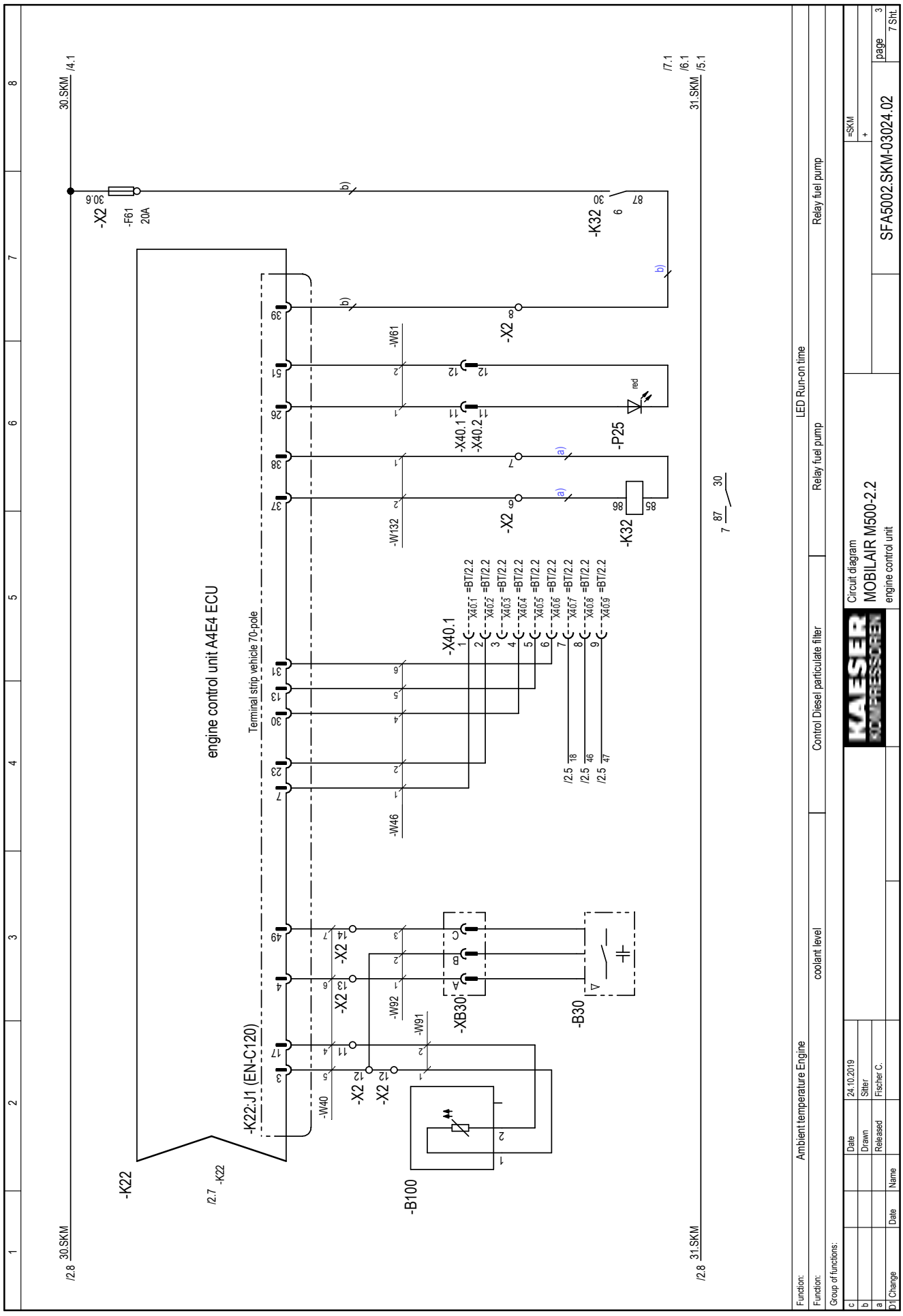
actuators

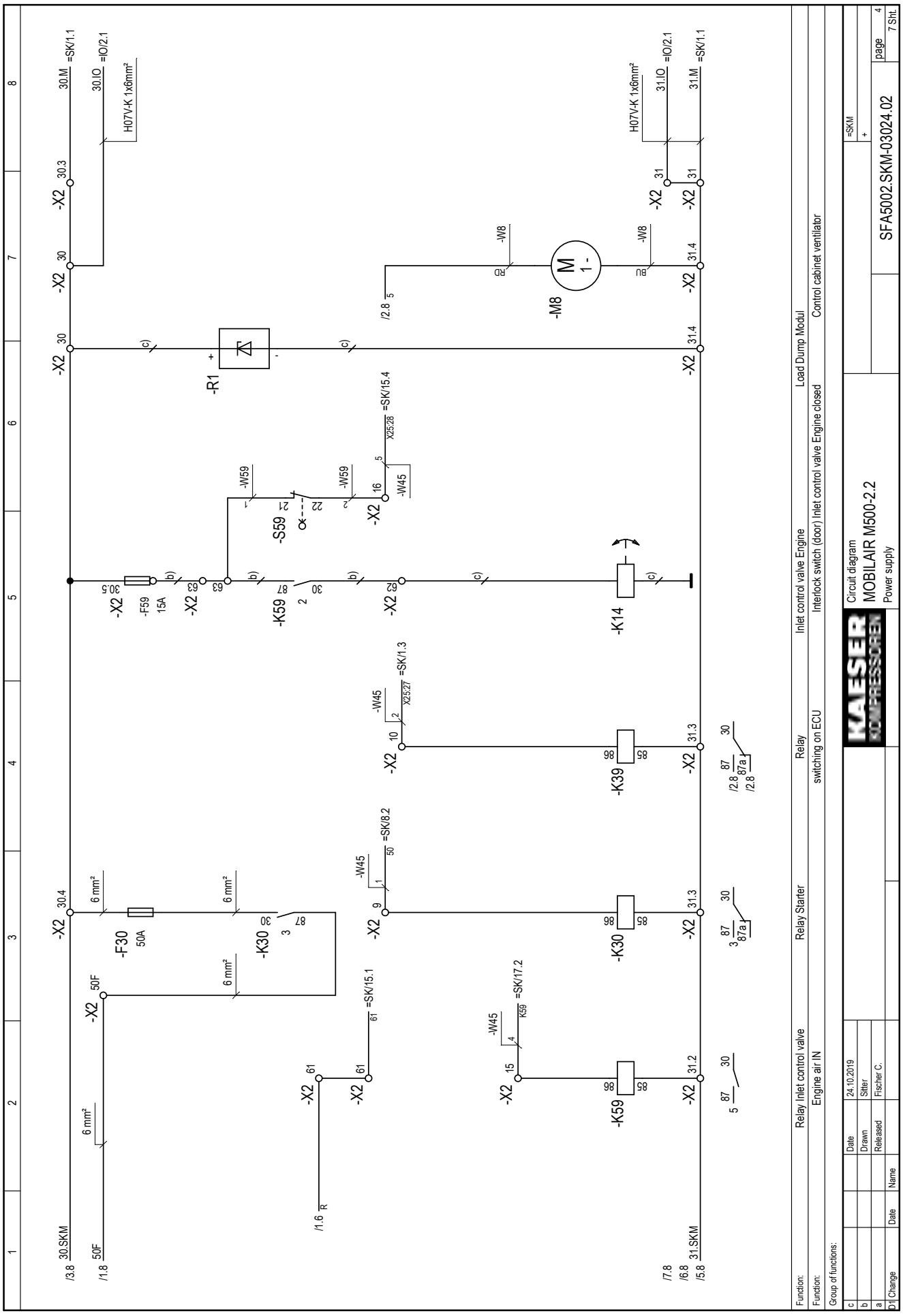
-K1	Control valve Inlet valve
-K2	Solenoid valve Scavenging
-K3	Solenoid valve Oil return
-K10.1,-K10.2,-K11	Solenoid valve Centrifugal separator
-K18,-K19	Control valve Fan
-K95	Solenoid valve condensate drain Centrifugal separator
-K96	Solenoid valve engine oil

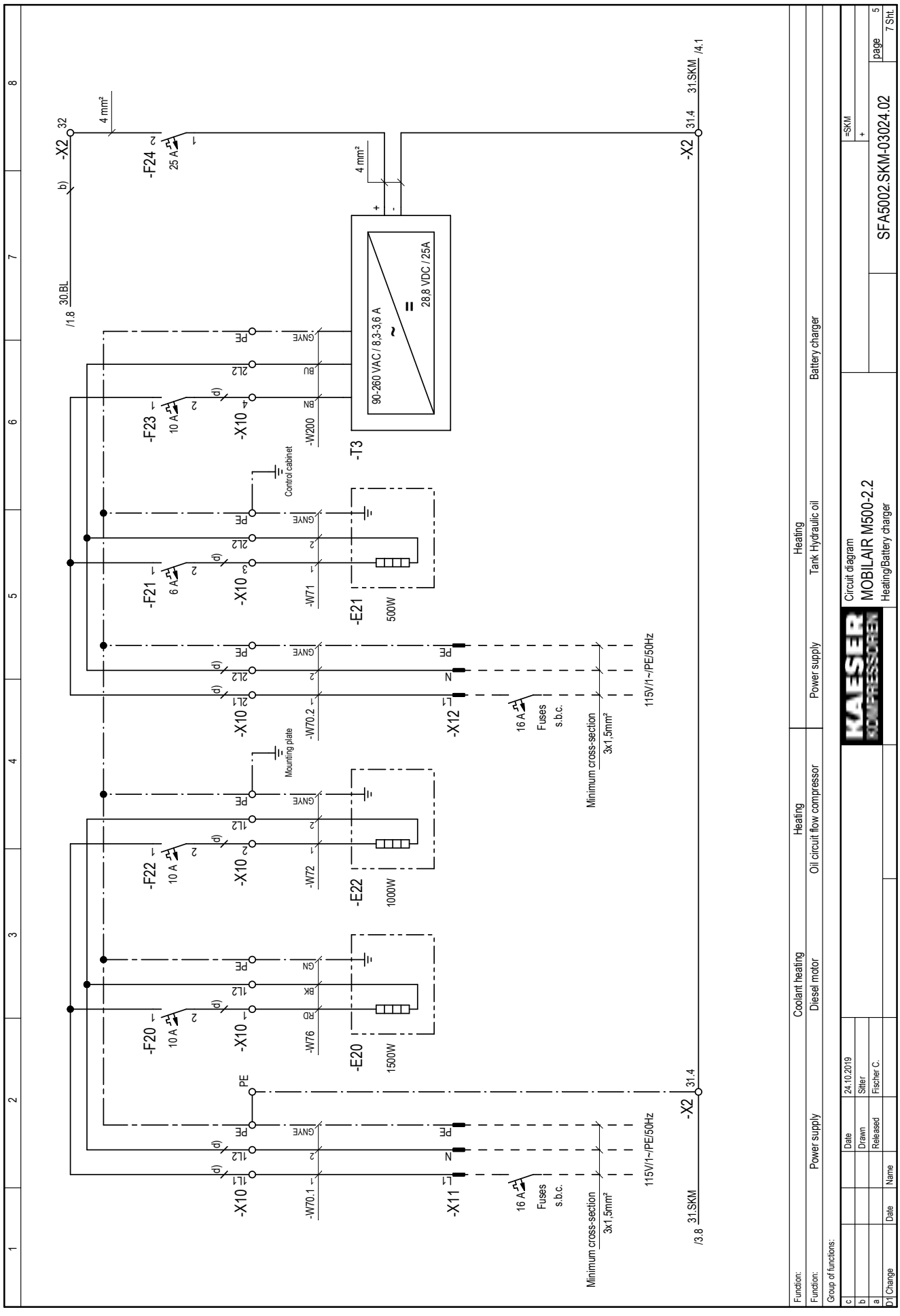
c				Date	24.10.2019		KAESER KOMPRESSOREN	electrical equipment identification	=
b				Drawn	Sitter			MOBILAIR M500-2.2	+
a				Released	Fischer C.				
C	Change	Date	Name					UFA5002-03024.02	page 3 / 3 Sht.

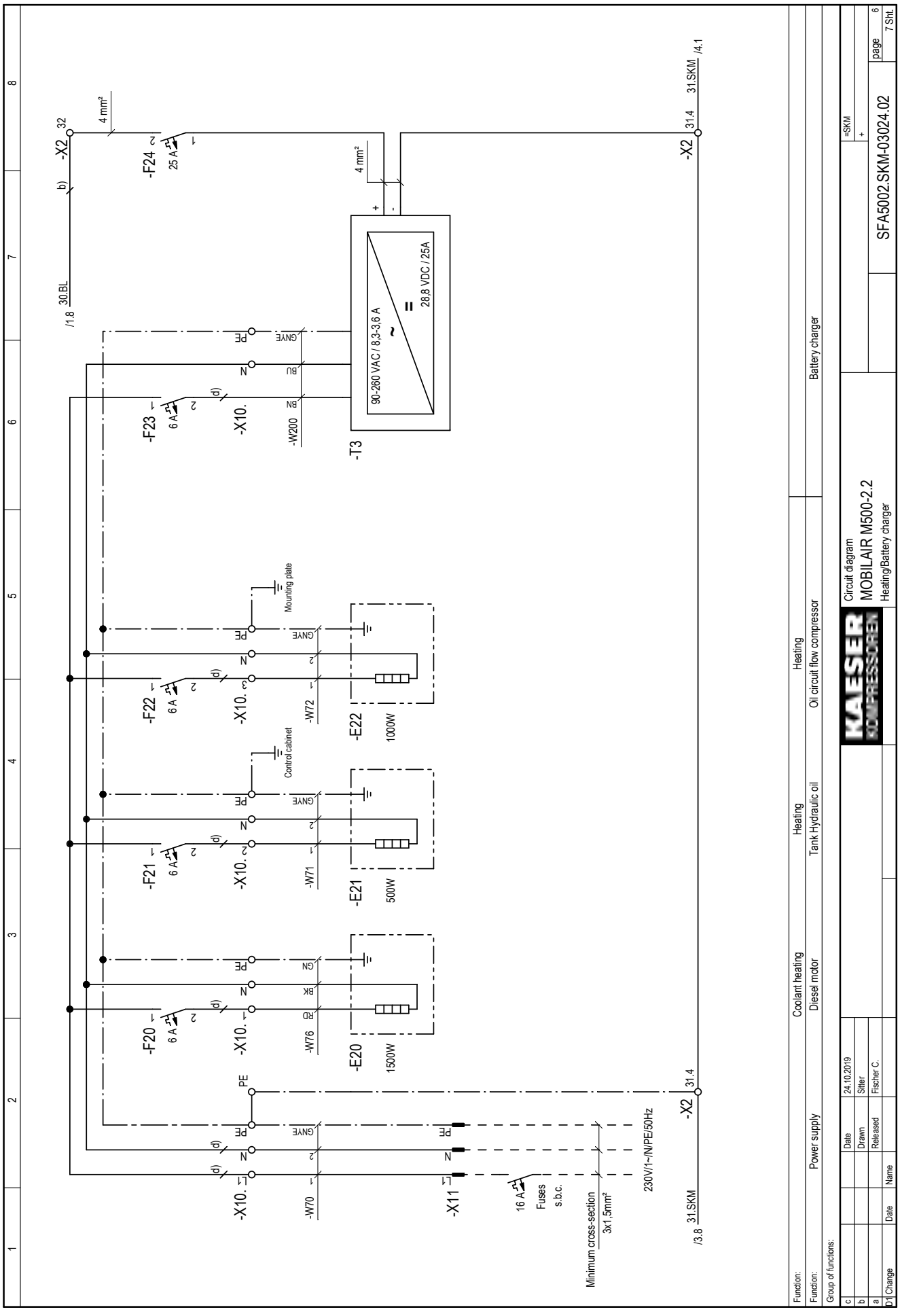

-X2 30
30.SKM /2.1
30.BL /5.7 /6.7 /7.7
50F /4.1
G1.1 =IO/7.1
-X2 31
31.SKM /2.1
10 mm²
6 mm²
1.5 mm²
16 mm²
95 mm²
95 mm²
10 mm²
R /4.1
-G2
B+
B-
-M2
50
30
31
-Q10
-G1.1
-G1.2
Function: Battery Starter Alternator
Function: Battery isolating switch
Group of functions:
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Change
Circuit diagram
MOBILAIR M500-2.2
connection Engine
=SKM
+
SFA5002.SKM-03024.02
page 1
7 Sht.

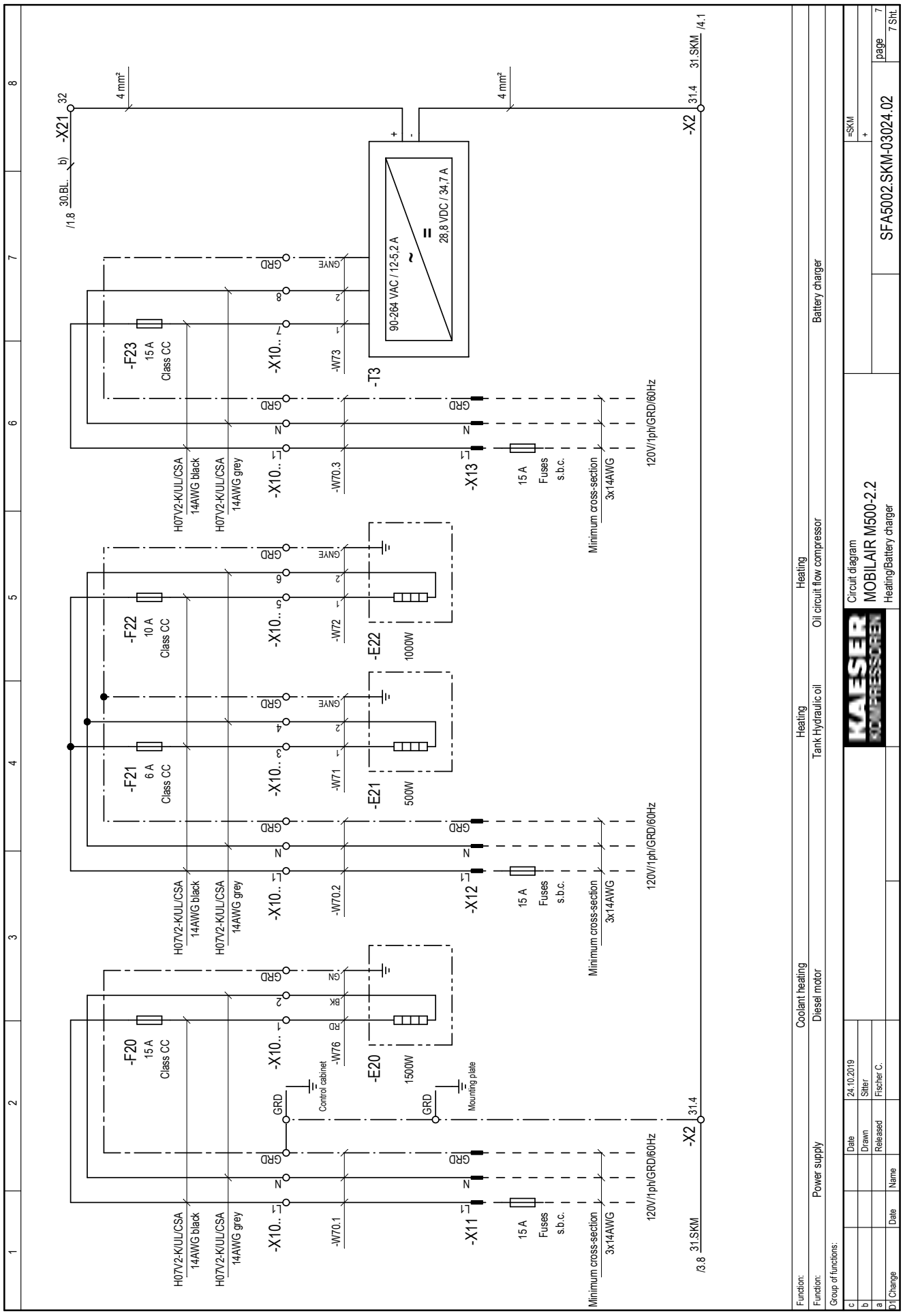

engine control unit A4E4 ECU
Terminal strip Diesel motor 94-pole
Terminal strip vehicle 70-pole
-K22:J2
-K22:J1 (EN-C120)
-K22:J3 (PT-C917)
-K22
-K39
-R16
120Ω
-W40
-W41.1
-W41.3
-X22
+BAT
-BAT
CDL+
CDL-
J1939-
J1939+
J1939 SHIELD
CAN4_H
CAN4_L
=SK/2.1
-F7 7,5A
-F40 20A
-F39 50A
-F27 20A
-F26 20A
10 mm²
4 mm²
Power supply unit Control board
CAN-Bus-Engine
diagnostics plug CAT
KL.15
Control cabinet
Mounting plate
Circuit diagram
MOBILAIR M500-2.2
engine control unit
SFA5002.SKM-03024.02
=SKM
page 2
7 Sht.
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
D1 Change

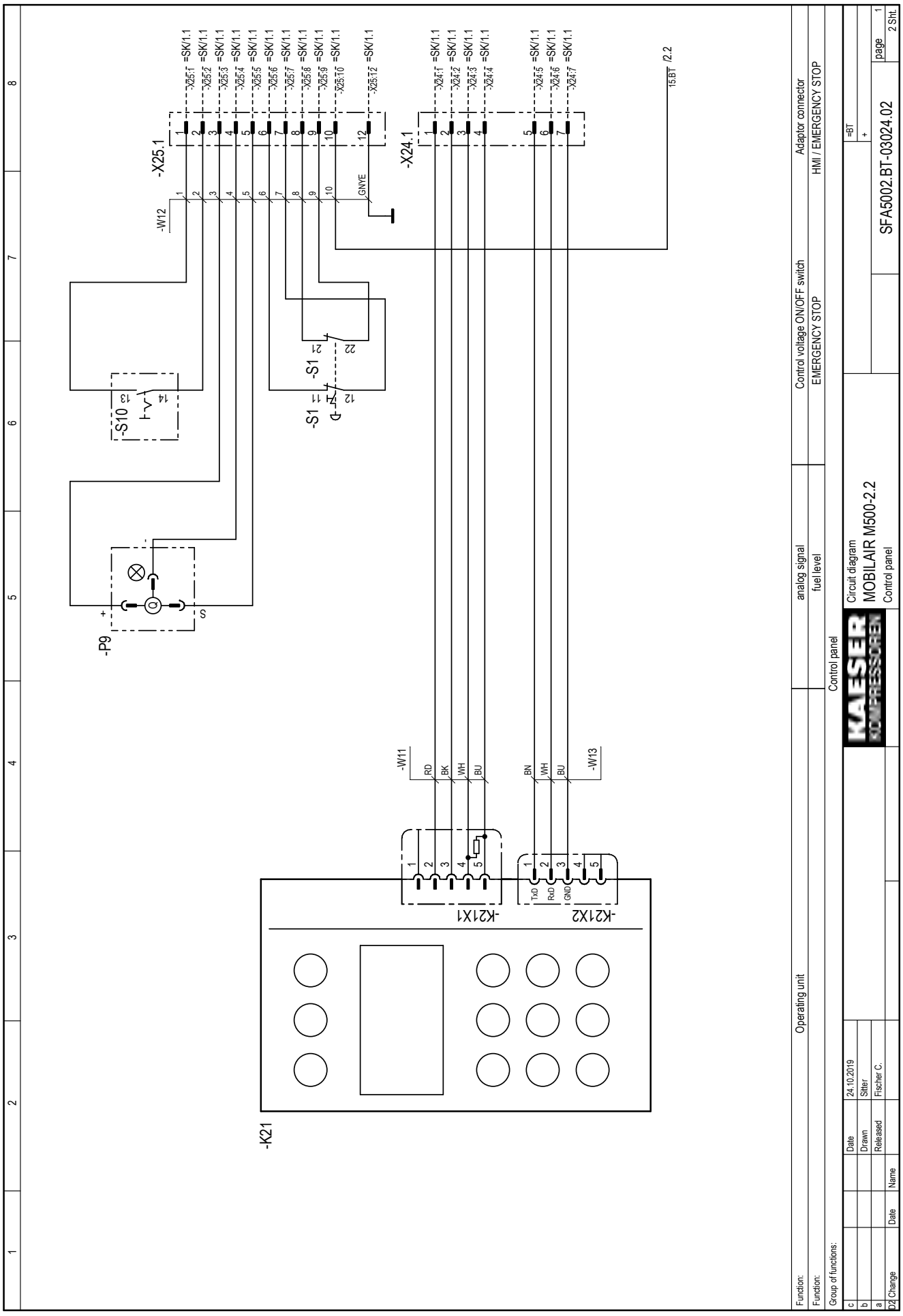

engine control unit A4E4 ECU
Terminal strip vehicle 70-pole
-K22:J1 (EN-C120)
-K22
-X40.1
-X40.2
-X2
-XB30
-B30
-B100
-K32
-P25
-W40
-W46
-W91
-W92
-W132
-W61
-F61 20A
LED Run-on time
Relay fuel pump
Control Diesel particulate filter
coolant level
Ambient temperature Engine
Circuit diagram
MOBILAIR M500-2.2
engine control unit
SFA5002.SKM-03024.02
=SKM
page 3
7 Sht.
24.10.2019
Sitter
Fischer C.

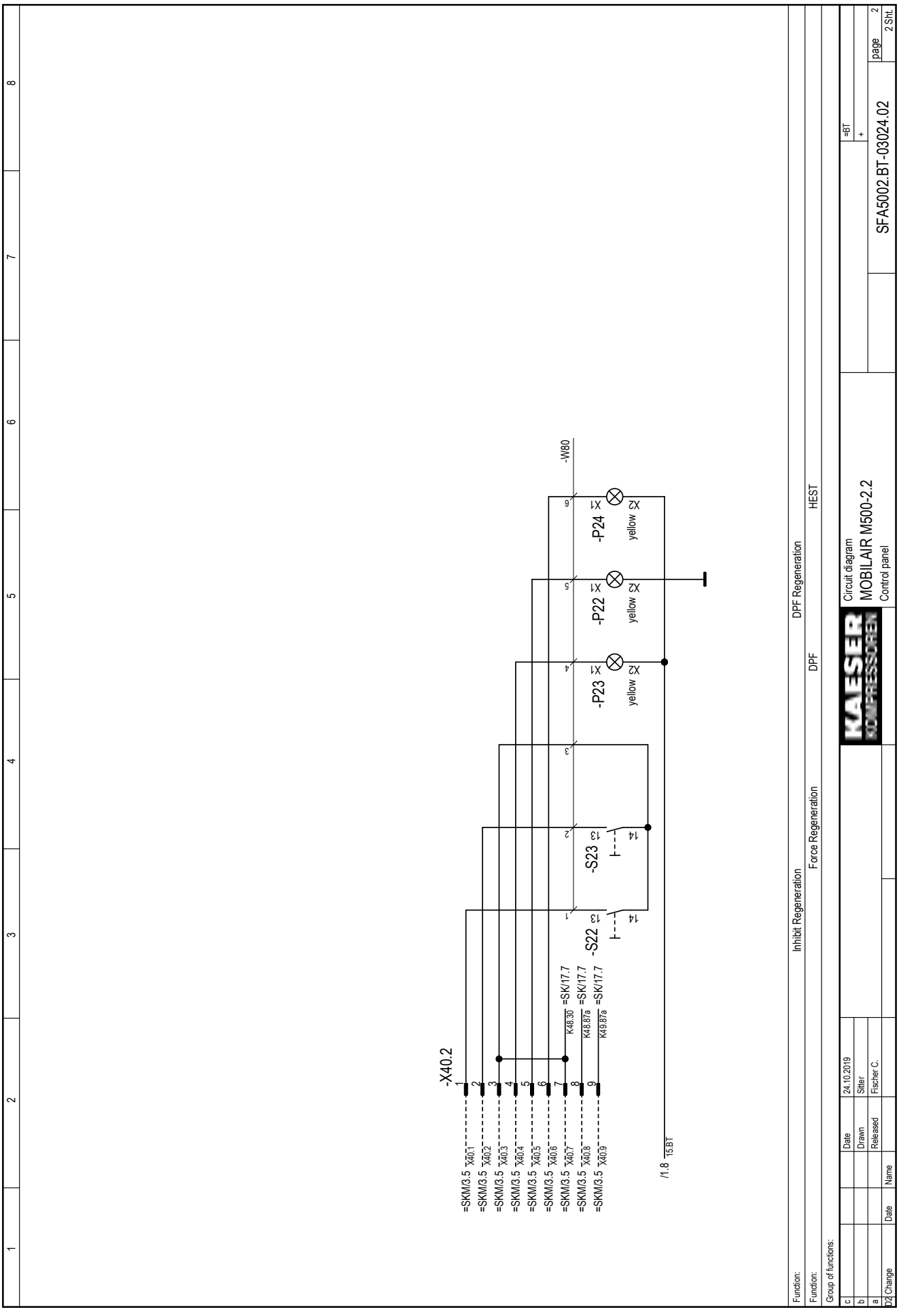

SFA5002.SKM-03024.02
Circuit diagram
MOBILAIR M500-2.2
Power supply
Relay Inlet control valve
Relay Starter
Relay
Inlet control valve Engine
Load Dump Modul
Engine air IN
switching on ECU
Interlock switch (door) Inlet control valve Engine closed
Control cabinet ventilator
-R1
-M8
-K59
-K30
-K39
-K14
-S59
-F30
-F59
-X2
-W8
-W59
-W45
H07V-K 1x6mm²
6 mm²
=SK/1.1
=IO/2.1
=SK/1.3
=SK/8.2
=SK/15.1
=SK/17.2
=SK/15.4
30.SKM
31.SKM
50F
Date
Name
Drawn
Released
Schter
Fischer C.
24.10.2019
=SKM
page 4
7 Sht.

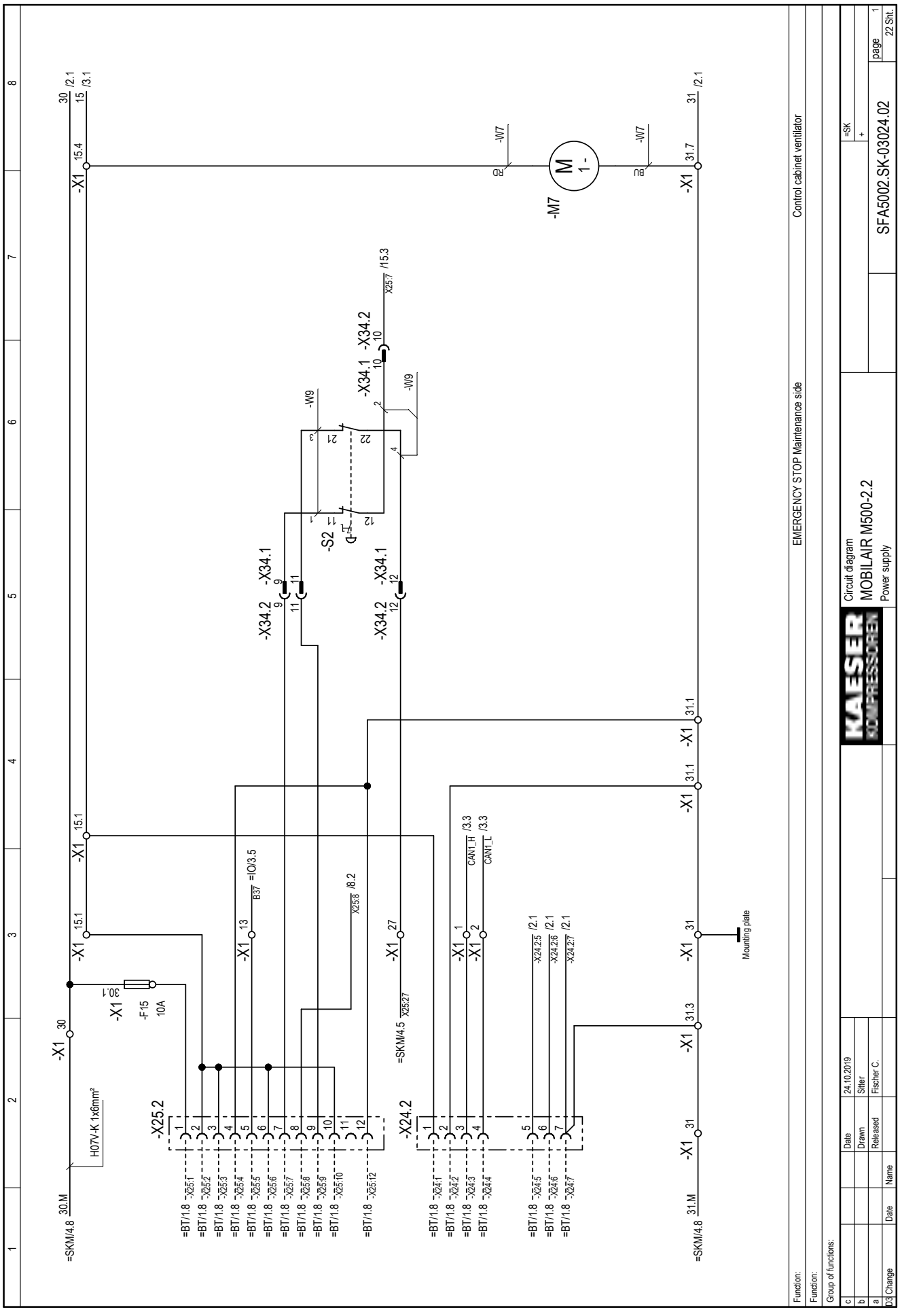

-X2 32
4 mm²
-F24 25 A
b)
/1.8 30.BL
-X2 31.SKM /4.1
-X2 31.4
4 mm²
+
-
-T3
90-260 VAC / 8,3-3,6 A
28.8 VDC / 25A
-F23 10 A
-X10
-W200
-F21 6 A
-X10
-W71
-E21
500W
Control cabinet
-F22 10 A
-X10
-W72
-E22
1000W
Mounting plate
-F20 10 A
-X10
-W76
-E20
1500W
-X10
-W70.2
-X12
16 A
Fuses
s.b.c.
Minimum cross-section
3x1,5mm²
115V/1~/PE/50Hz
-X10
-W70.1
-X11
-X2 31.4
/3.8 31.SKM
Function: Heating
Function: Coolant heating Heating
Power supply Diesel motor Oil circuit flow compressor
Power supply Tank Hydraulic oil Battery charger
Group of functions:
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Change
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR M500-2.2
Heating/Battery charger
=SKM
+
page 5
7 Sht.
SFA5002.SKM-03024.02

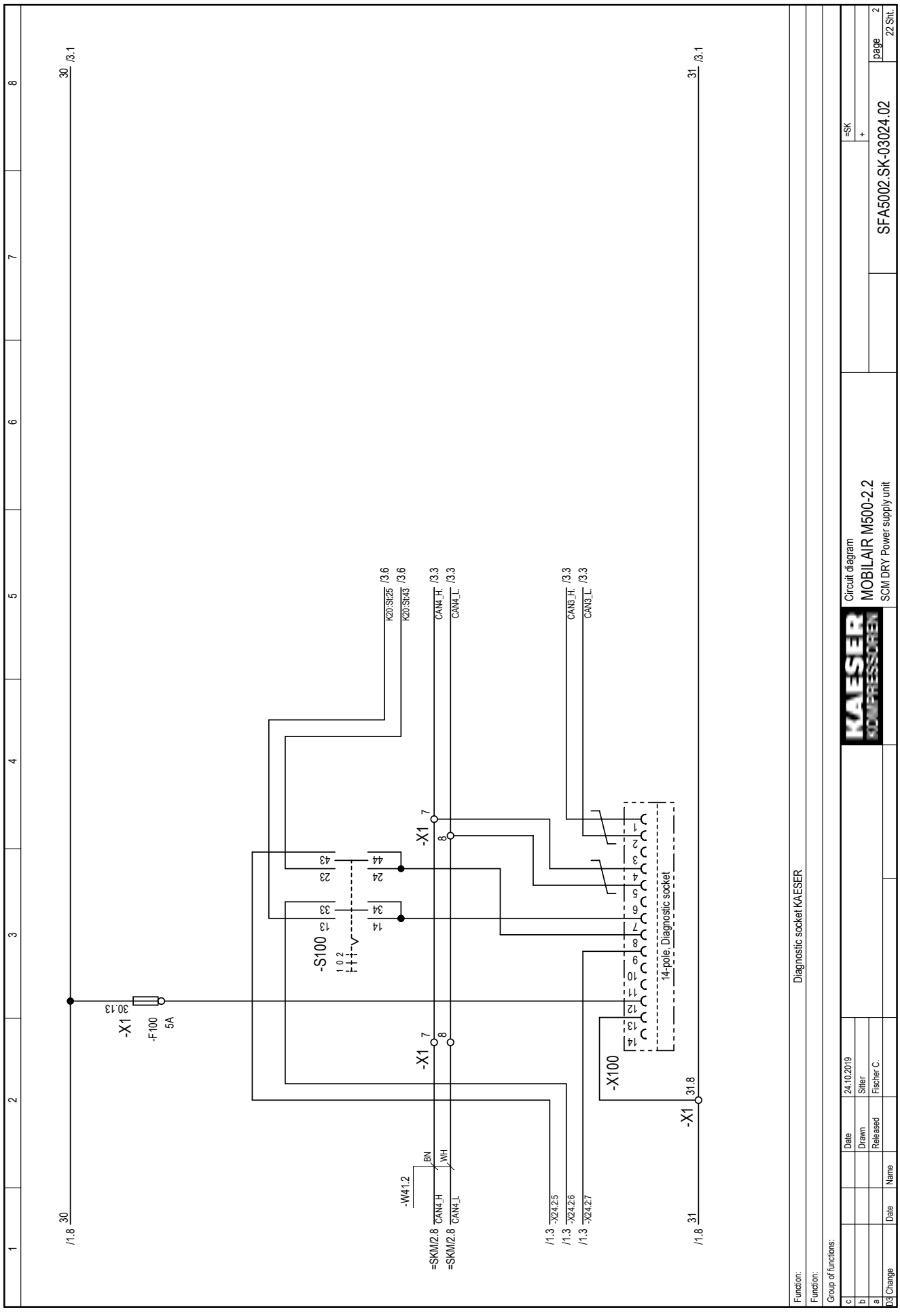

-X2 32
4 mm²
-F24 25 A
-X2 31.4 31.SKM /4.1
b) 30.BL /1.8
4 mm²
+
-
-T3
90-260 VAC / 8,3-3,6 A
28,8 VDC / 25A
-F23 6 A
-X10.
-W200
GNYE
BU
BN
PE
N
-F22 6 A
-X10.
-W72
-E22 1000W
Mounting plate
-F21 6 A
-X10.
-W71
-E21 500W
Control cabinet
-F20 6 A
-X10.
-W76
-E20 1500W
GN
BK
RD
-X2 31.4
-X10.
-W70
-X11
16 A
Fuses
s.b.c.
Minimum cross-section
3x1,5mm²
230V/1~/N/PE/50Hz
/3.8 31.SKM
Function: Coolant heating Heating Heating
Function: Power supply Diesel motor Tank Hydraulic oil Oil circuit flow compressor Battery charger
Group of functions:
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
D1 Change
Circuit diagram
MOBILAIR M500-2.2
Heating/Battery charger
=SKM
+
SFA5002.SKM-03024.02
page 6
7 Sht.

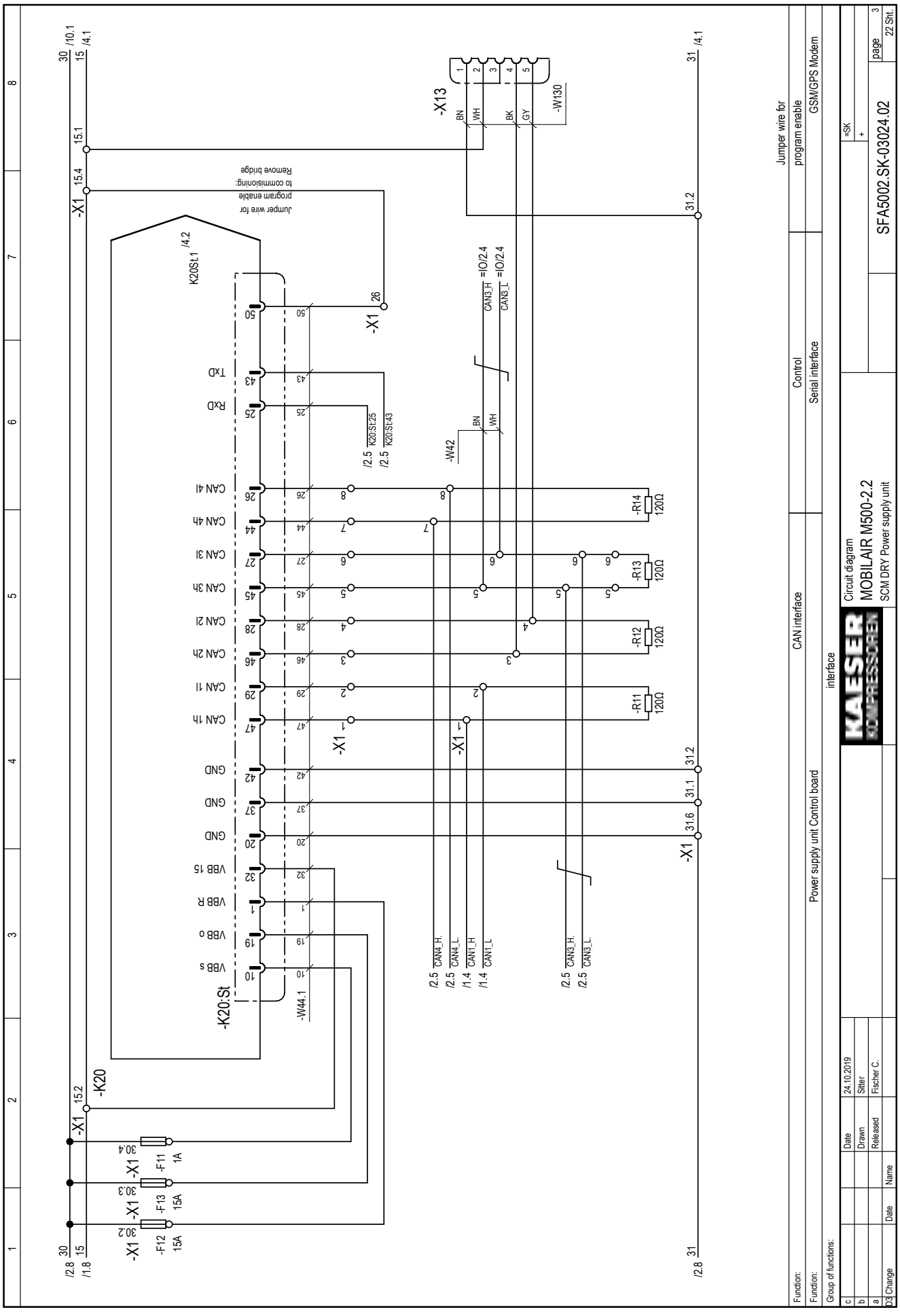

-X21
32
4 mm²
30.BL.
b)
/1.8
-X2
31.4
31.SKM
/4.1
-T3
90-264 VAC / 12-5.2 A
28.8 VDC / 34.7 A
-F23
15 A
Class CC
-F22
10 A
Class CC
-F21
6 A
Class CC
-F20
15 A
Class CC
-X10..
-W73
-W72
-W71
-W76
-W70.3
-W70.2
-W70.1
-E22
1000W
-E21
500W
-E20
1500W
-X13
-X12
-X11
H07V2-K/UL/CSA
14AWG black
14AWG grey
15 A
Fuses
s.b.c.
Minimum cross-section
3x14AWG
120V/1ph/GRD/60Hz
Control cabinet
Mounting plate
/3.8
Function:
Coolant heating
Heating
Heating
Function:
Power supply
Diesel motor
Tank Hydraulic oil
Oil circuit flow compressor
Battery charger
Group of functions:
Date
24.10.2019
Drawn
Sitter
Released
Fischer C.
Name
Change
Circuit diagram
MOBILAIR M500-2.2
Heating/Battery charger
=SKM
+
page
7
7 Sht.
SFA5002.SKM-03024.02

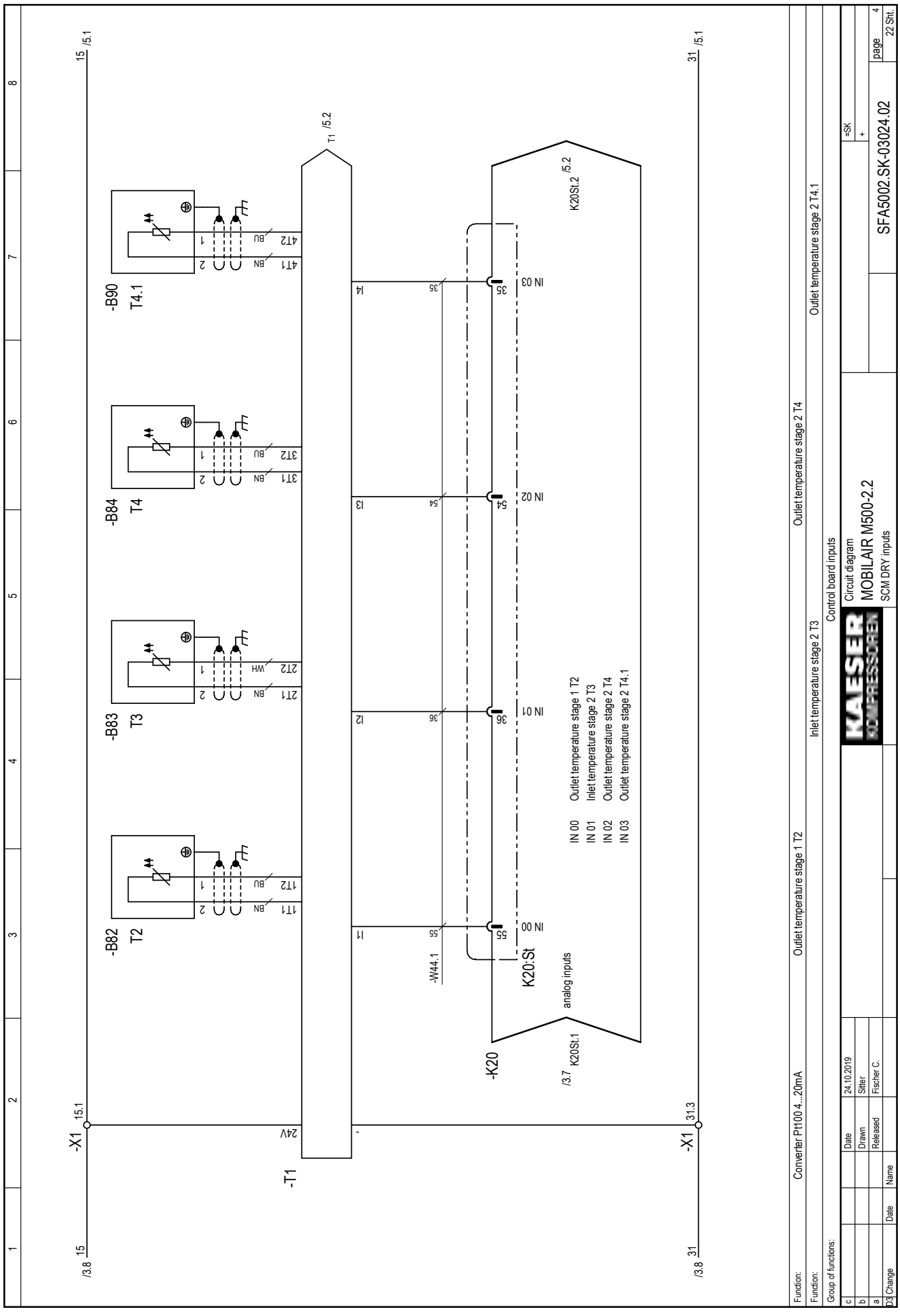

-X25.1
-X24.1
-W12
-S10
-S1
-P9
-K21
-K21X1
-K21X2
-W11
-W13
GNYE
15.BT
/2.2
RD
BK
WH
BU
BN
TxD
RxD
GND
Operating unit
Control panel
Control voltage ON/OFF switch
EMERGENCY STOP
Adaptor connector
HMI / EMERGENCY STOP
analog signal
fuel level
Circuit diagram
MOBILAIR M500-2.2
Control panel
SFA5002.BT-03024.02
Date
Drawn
Released
24.10.2019
Slitter
Fischer C.
Name
Change
page 1
2 Sht.

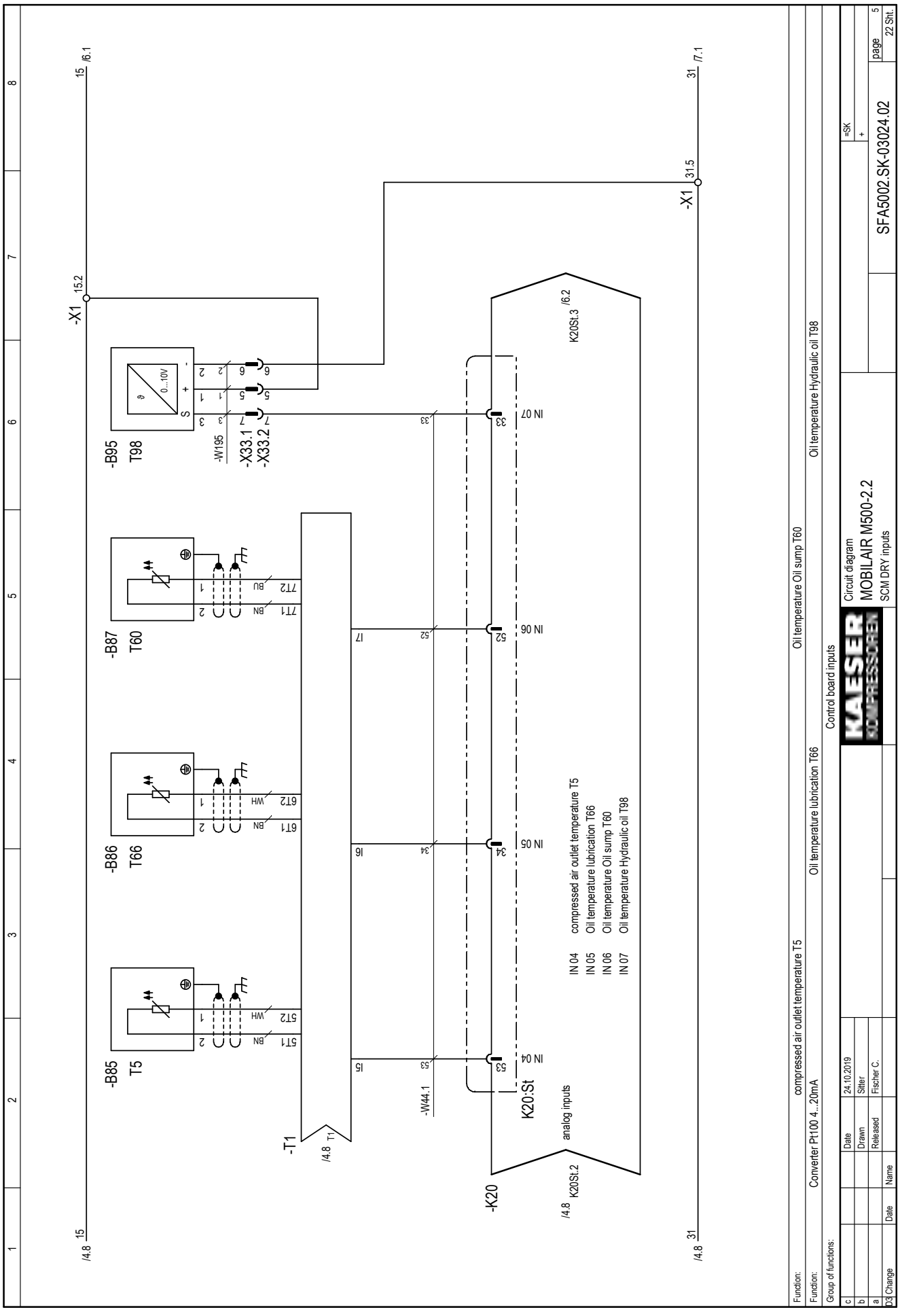

-X40.2
=SKM/3.5 X40:1
=SKM/3.5 X40:2
=SKM/3.5 X40:3
=SKM/3.5 X40:4
=SKM/3.5 X40:5
=SKM/3.5 X40:6
=SKM/3.5 X40:7
=SKM/3.5 X40:8
=SKM/3.5 X40:9
K48.30 =SK/17.7
K48.87a =SK/17.7
K49.87a =SK/17.7
-S22
-S23
-P23 yellow
-P22 yellow
-P24 yellow
-W80
/1.8 15.BT
Inhibit Regeneration
Force Regeneration
DPF Regeneration
DPF
HEST
Function:
Function:
Group of functions:
Circuit diagram
MOBILAIR M500-2.2
Control panel
SFA5002.BT-03024.02
=BT
page 2
2 Sht.
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Change

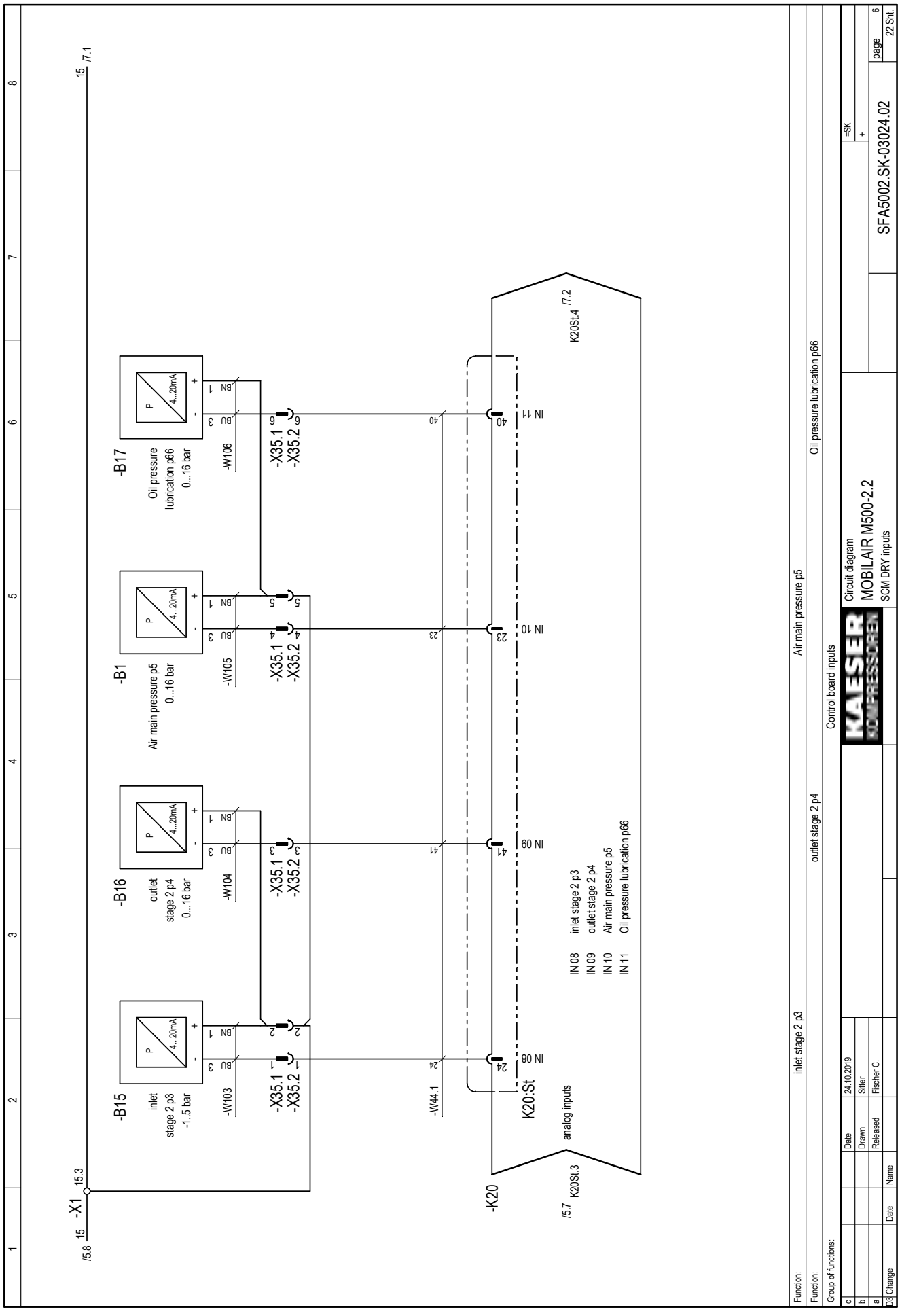

EMERGENCY STOP Maintenance side
Control cabinet ventilator
Function:
Function:
Group of functions:
Circuit diagram
MOBILAIR M500-2.2
Power supply
SFA5002.SK-03024.02
=SK
page 1
22 Sht.
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
D3 Change
-M7
-S2
-F15 10A
H07V-K 1x6mm²
Mounting plate
-X25.2
-X24.2
-X34.1
-X34.2
-W7
-W9
CAN1_H
CAN1_L
=IO/3.5
=SKM/4.5
=SKM/4.8

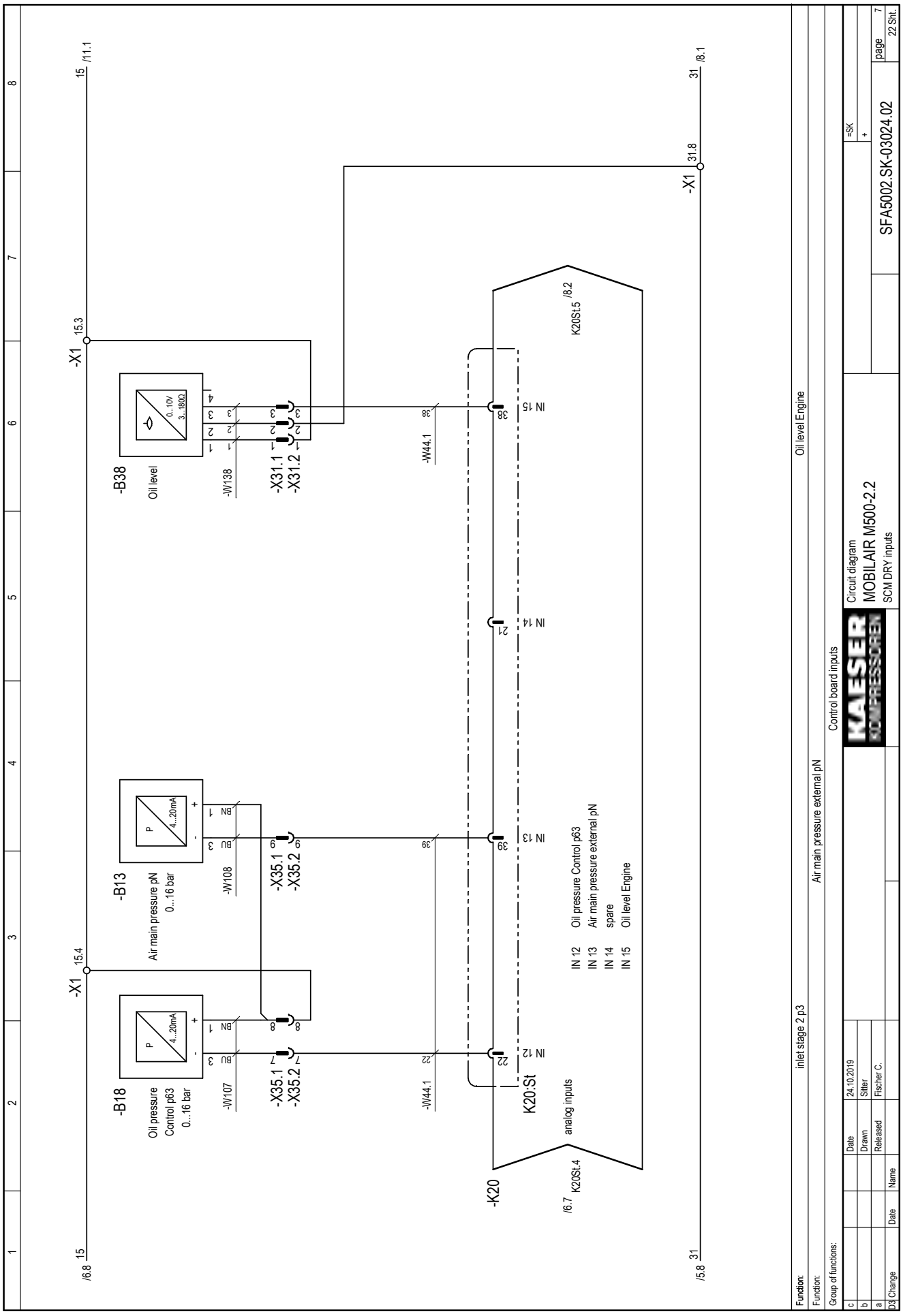

30 /3.1
31 /3.1
-X1
-F100
5A
30.13
-S100
13
14
23
24
33
34
43
44
K20:St:25
K20:St:43
/3.6
CAN4_H
CAN4_L
/3.3
CAN3_H
CAN3_L
-X1
7
8
-X100
14-pole. Diagnostic socket
-W41.2
BN
WH
=SKM/2.8 CAN4_H
=SKM/2.8 CAN4_L
/1.3 -X24.2:5
/1.3 -X24.2:6
/1.3 -X24.2:7
/1.8 30
/1.8 31
31.8
Diagnostic socket KAESER
Function:
Function:
Group of functions:
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR M500-2.2
SCM DRY Power supply unit
SFA5002.SK-03024.02
=SK
+
page 2
22 Sht.
Date
Name
Drawn
Released
24.10.2019
Sitter
Fischer C.
Change

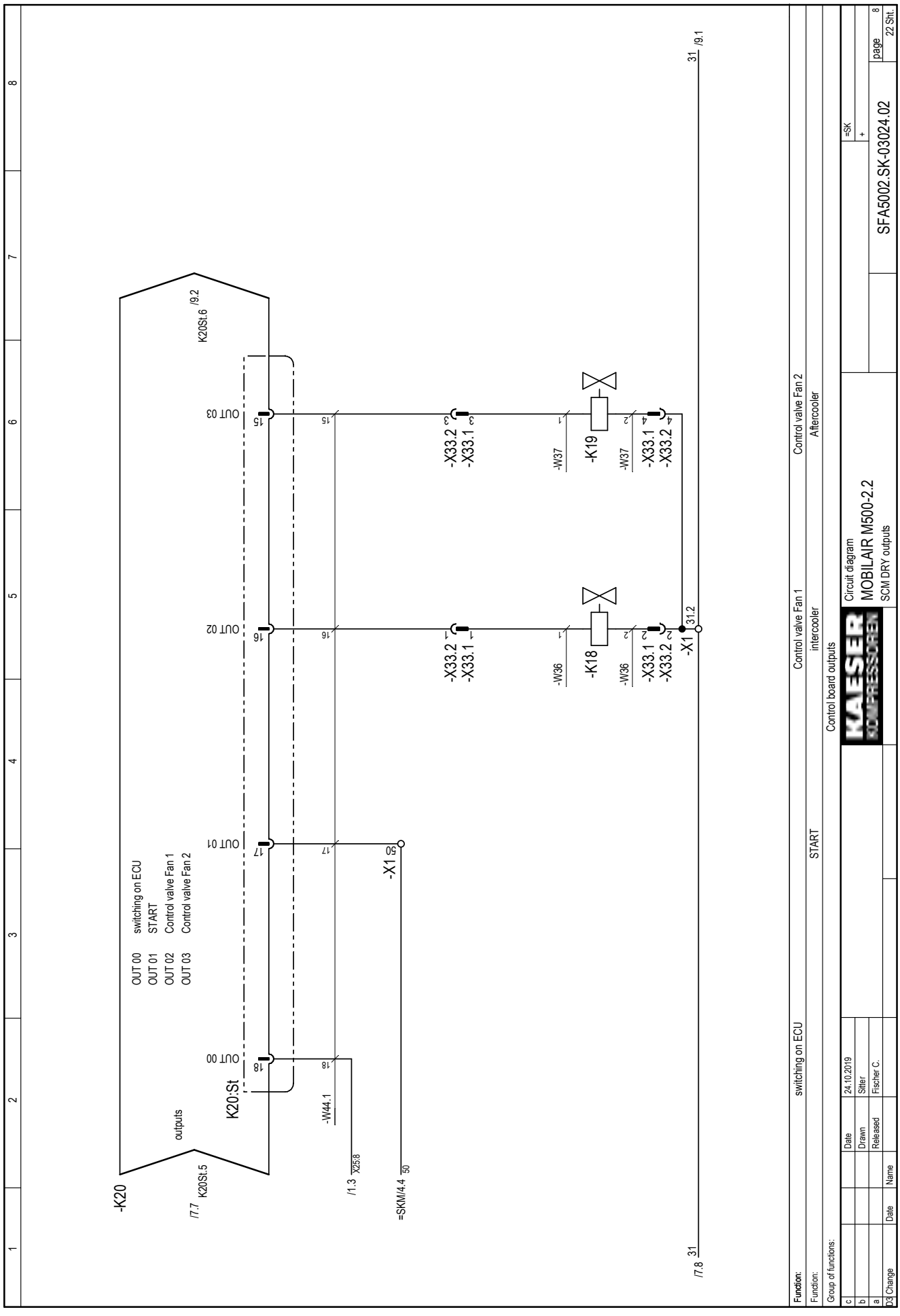

-X13
-W130
BN
WH
BK
GY
-X1
-K20
-K20:St
K20St:1
-W42
-W44.1
-R14 120Ω
-R13 120Ω
-R12 120Ω
-R11 120Ω
-F11 1A
-F13 15A
-F12 15A
Jumper wire for program enable to commissioning: Remove bridge
CAN4_H.
CAN4_L.
CAN1_H
CAN1_L
CAN3_H.
CAN3_L.
CAN3_H =IO/2.4
CAN3_L =IO/2.4
TxD
RxD
GND
VBB 15
VBB R
VBB o
VBB s
CAN 1h
CAN 1l
CAN 2h
CAN 2l
CAN 3h
CAN 3l
CAN 4h
CAN 4l
Jumper wire for program enable
Control
Serial interface
GSM/GPS Modem
CAN interface
Power supply unit Control board
interface
Function:
Group of functions:
Circuit diagram
MOBILAIR M500-2.2
SCM DRY Power supply unit
SFA5002.SK-03024.02
=SK
page 3
22 Sht.
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
D3 Change

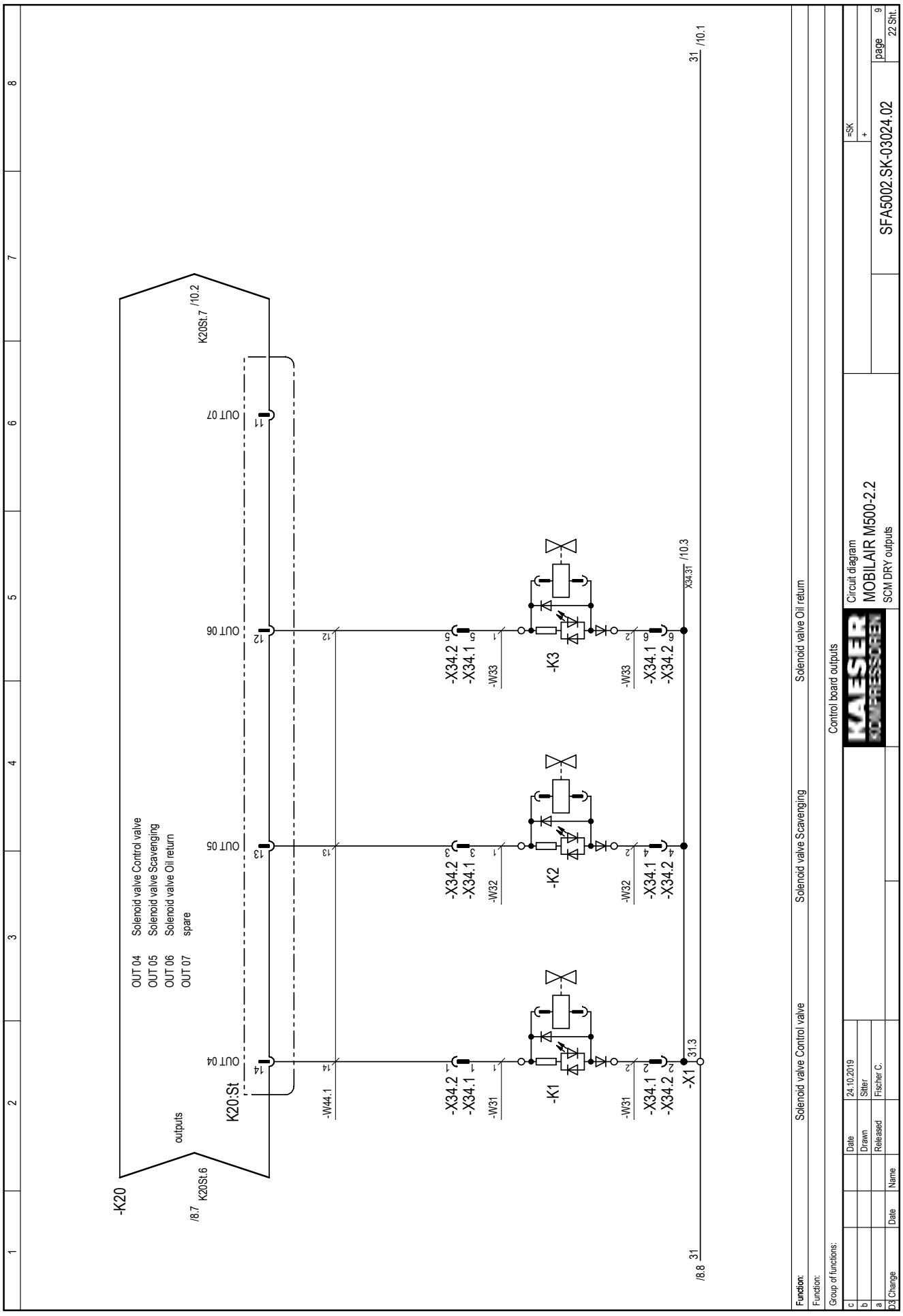

-X1
-T1
-B82 T2
-B83 T3
-B84 T4
-B90 T4.1
-K20
K20:St
K20St.1
K20St.2
-W44.1
IN 00 Outlet temperature stage 1 T2
IN 01 Inlet temperature stage 2 T3
IN 02 Outlet temperature stage 2 T4
IN 03 Outlet temperature stage 2 T4.1
analog inputs
Converter Pt100 4...20mA
Outlet temperature stage 1 T2
Outlet temperature stage 2 T4
Inlet temperature stage 2 T3
Outlet temperature stage 2 T4.1
Control board inputs
Circuit diagram
MOBILAIR M500-2.2
SCM DRY inputs
SFA5002.SK-03024.02
24.10.2019
Sitter
Fischer C.
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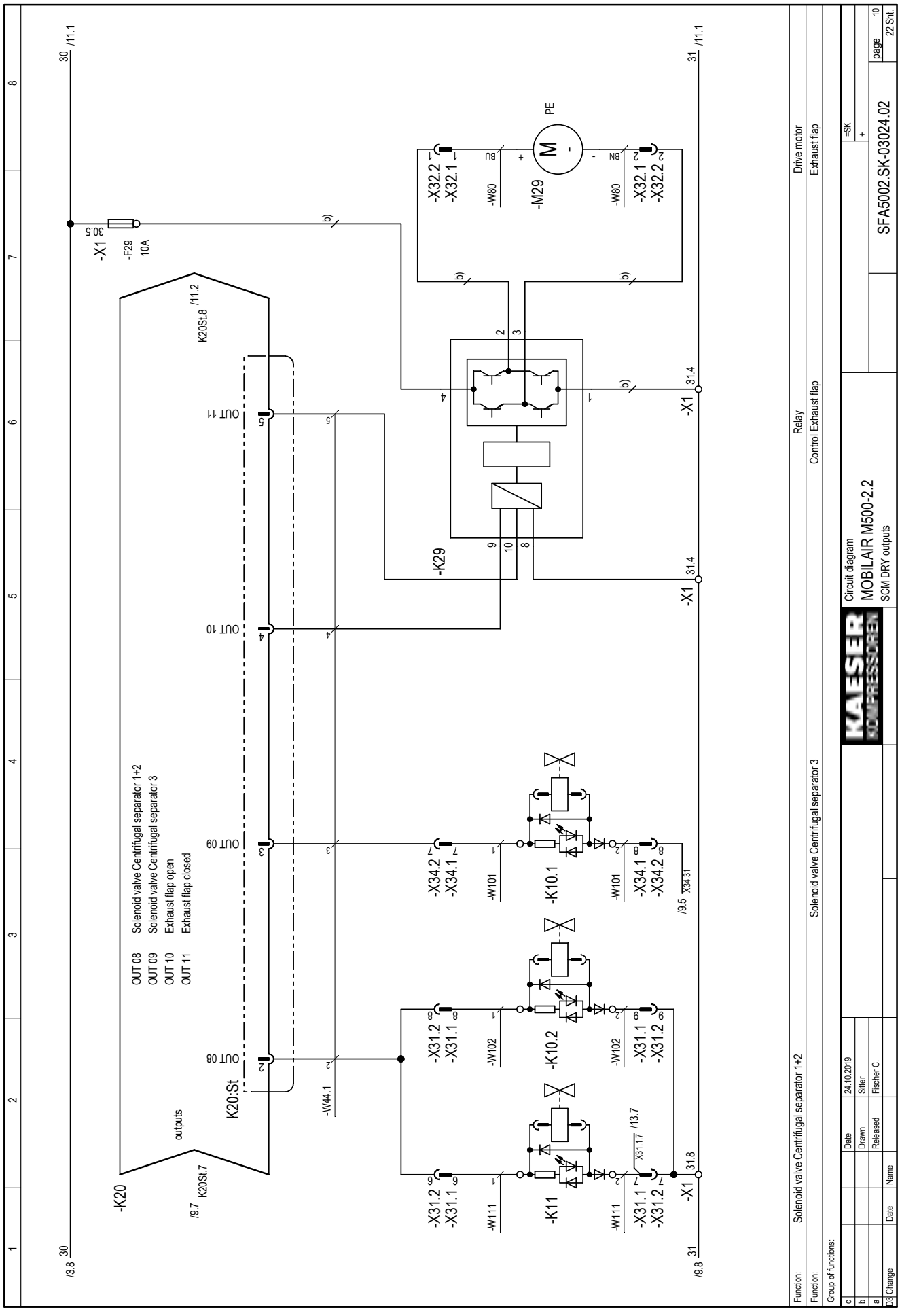

-X1 15.2
/6.1
15
-X1 31.5
/7.1
31
-B95 T98
-B87 T60
-B86 T66
-B85 T5
-W195
-X33.1
-X33.2
-T1
/4.8 T1
-W44.1
-K20
K20:St
K20St.3 /6.2
K20St.2 /4.8
analog inputs
IN 04 compressed air outlet temperature T5
IN 05 Oil temperature lubrication T66
IN 06 Oil temperature Oil sump T60
IN 07 Oil temperature Hydraulic oil T98
Function: compressed air outlet temperature T5
Oil temperature Oil sump T60
Function: Converter Pt100 4...20mA
Oil temperature lubrication T66
Oil temperature Hydraulic oil T98
Group of functions: Control board inputs
Circuit diagram
MOBILAIR M500-2.2
SCM DRY inputs
SFA5002.SK-03024.02
=SK
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Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
D3 Change

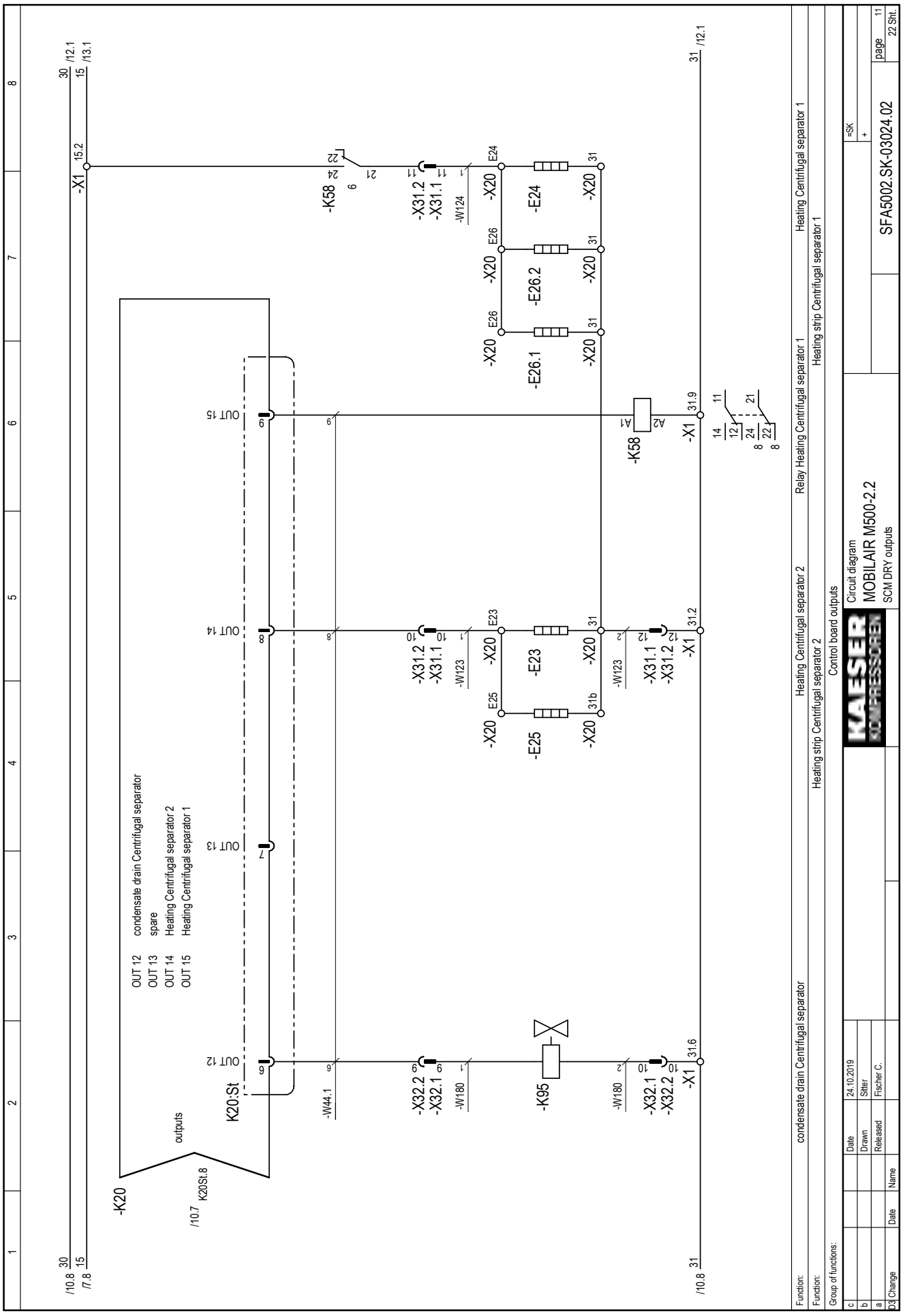

-X1
15.3
/5.8
15
/7.1
-B15
inlet
stage 2 p3
-1..5 bar
-B16
outlet
stage 2 p4
0...16 bar
-B1
Air main pressure p5
0...16 bar
-B17
Oil pressure
lubrication p66
0...16 bar
-W103
-W104
-W105
-W106
-W44.1
-X35.1
-X35.2
-K20
K20:St
analog inputs
/5.7
K20St.3
/7.2
K20St.4
IN 08 inlet stage 2 p3
IN 09 outlet stage 2 p4
IN 10 Air main pressure p5
IN 11 Oil pressure lubrication p66
Function: inlet stage 2 p3
Air main pressure p5
Function: outlet stage 2 p4
Oil pressure lubrication p66
Group of functions:
Control board inputs
Circuit diagram
MOBILAIR M500-2.2
SCM DRY inputs
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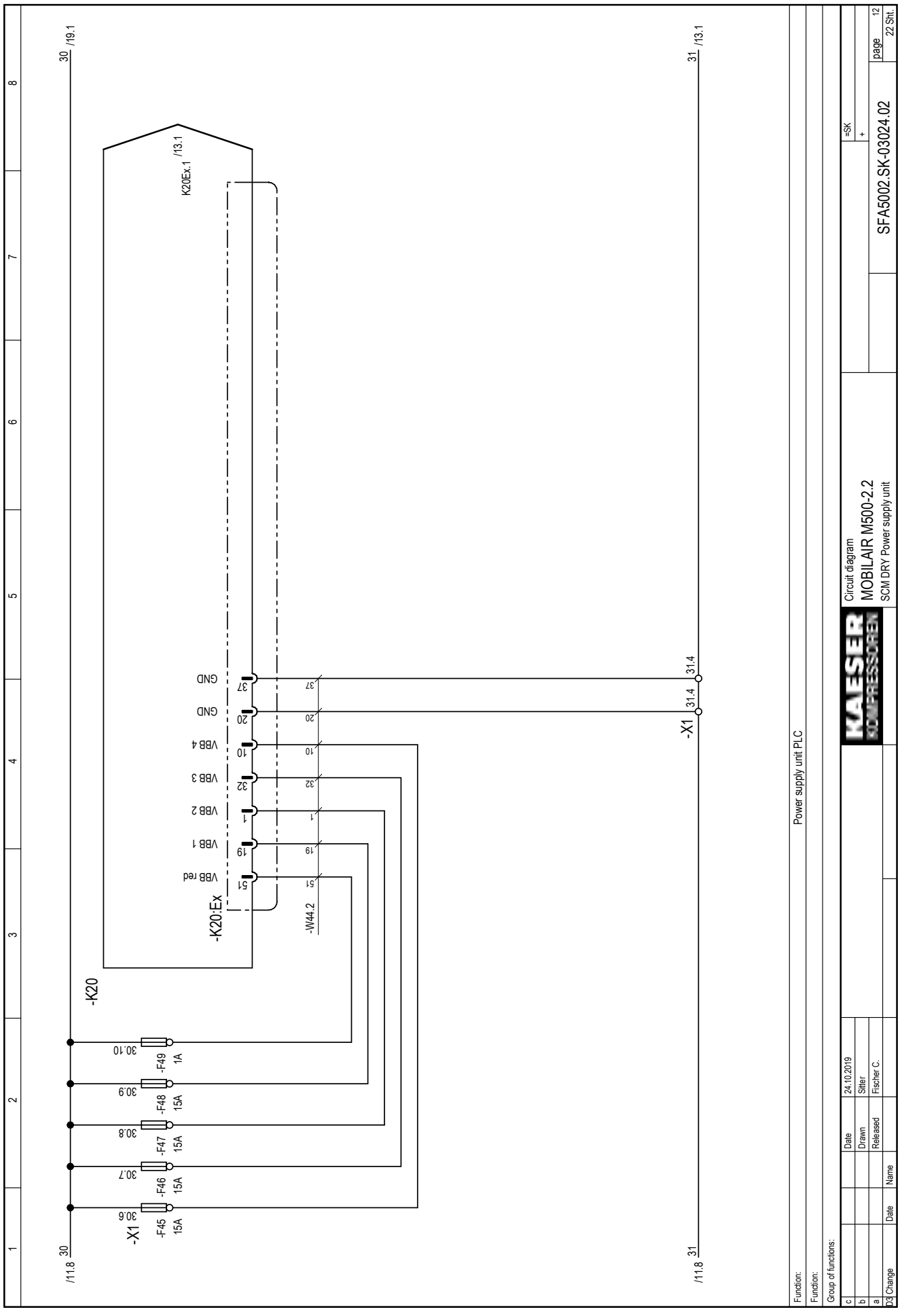

-B18
Oil pressure Control p63 0...16 bar
-B13
Air main pressure pN 0...16 bar
-B38
Oil level
-K20
K20:St
analog inputs
K20St.4
K20St.5
-X1
-X31.1
-X31.2
-X35.1
-X35.2
-W107
-W108
-W138
-W44.1
IN 12 Oil pressure Control p63
IN 13 Air main pressure external pN
IN 14 spare
IN 15 Oil level Engine
Function: inlet stage 2 p3
Oil level Engine
Function:
Air main pressure external pN
Group of functions:
Control board inputs
Circuit diagram
MOBILAIR M500-2.2
SCM DRY inputs
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24.10.2019
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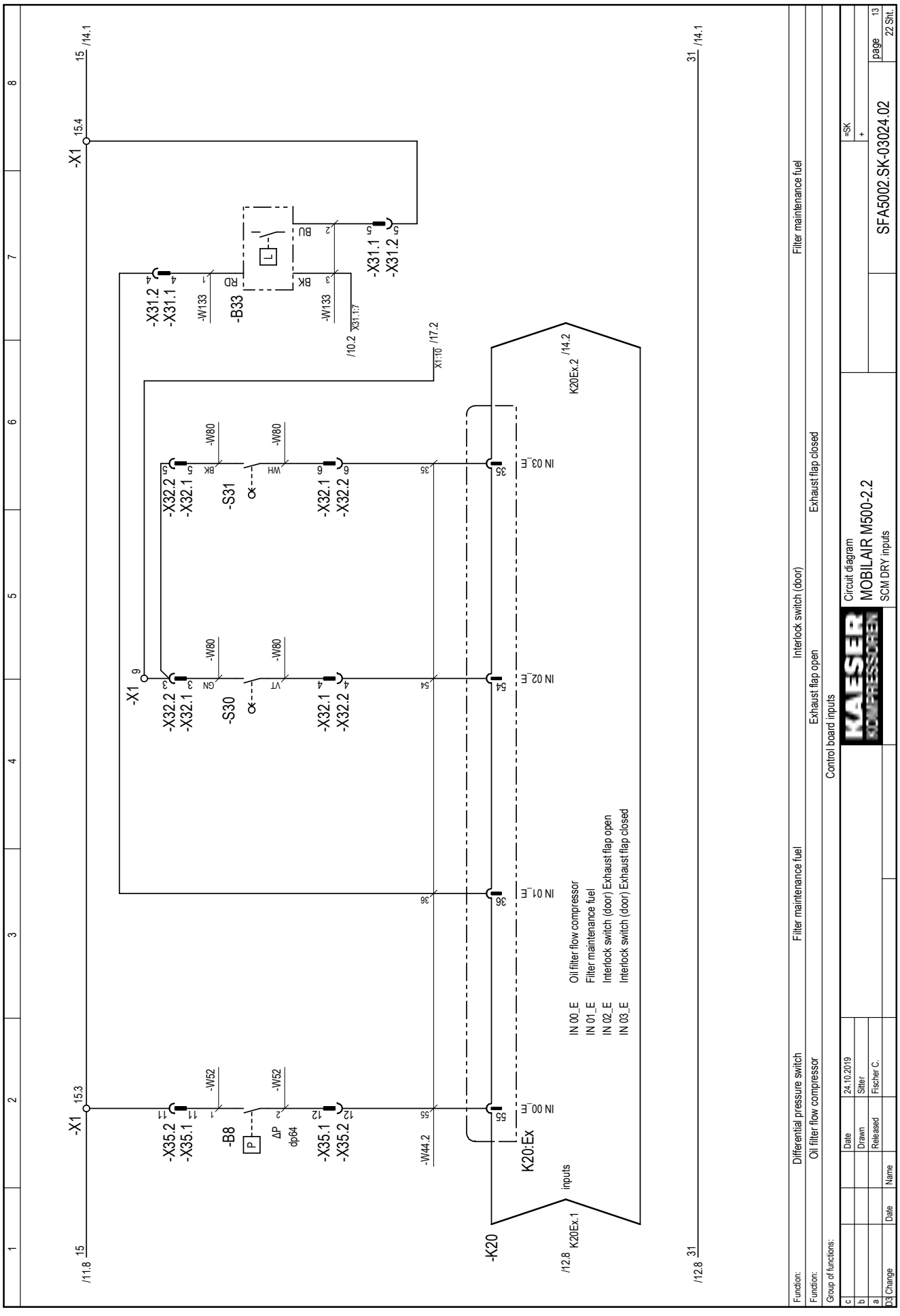

-K20
K20:St
K20St.5
K20St.6
/9.2
/7.7
/7.8
/9.1
outputs
OUT 00 switching on ECU
OUT 01 START
OUT 02 Control valve Fan 1
OUT 03 Control valve Fan 2
OUT 00
OUT 01
OUT 02
OUT 03
-W44.1
/1.3 X25:8
=SKM/4.4 50
-X1
-W36
-W37
-K18
-K19
-X33.1
-X33.2
31.2
Function: switching on ECU
Control valve Fan 1
Control valve Fan 2
Function: START
intercooler
Aftercooler
Group of functions: Control board outputs
Date 24.10.2019
Drawn Slitter
Released Fischer C.
Name
Change
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR M500-2.2
SCM DRY outputs
SFA5002.SK-03024.02
=SK
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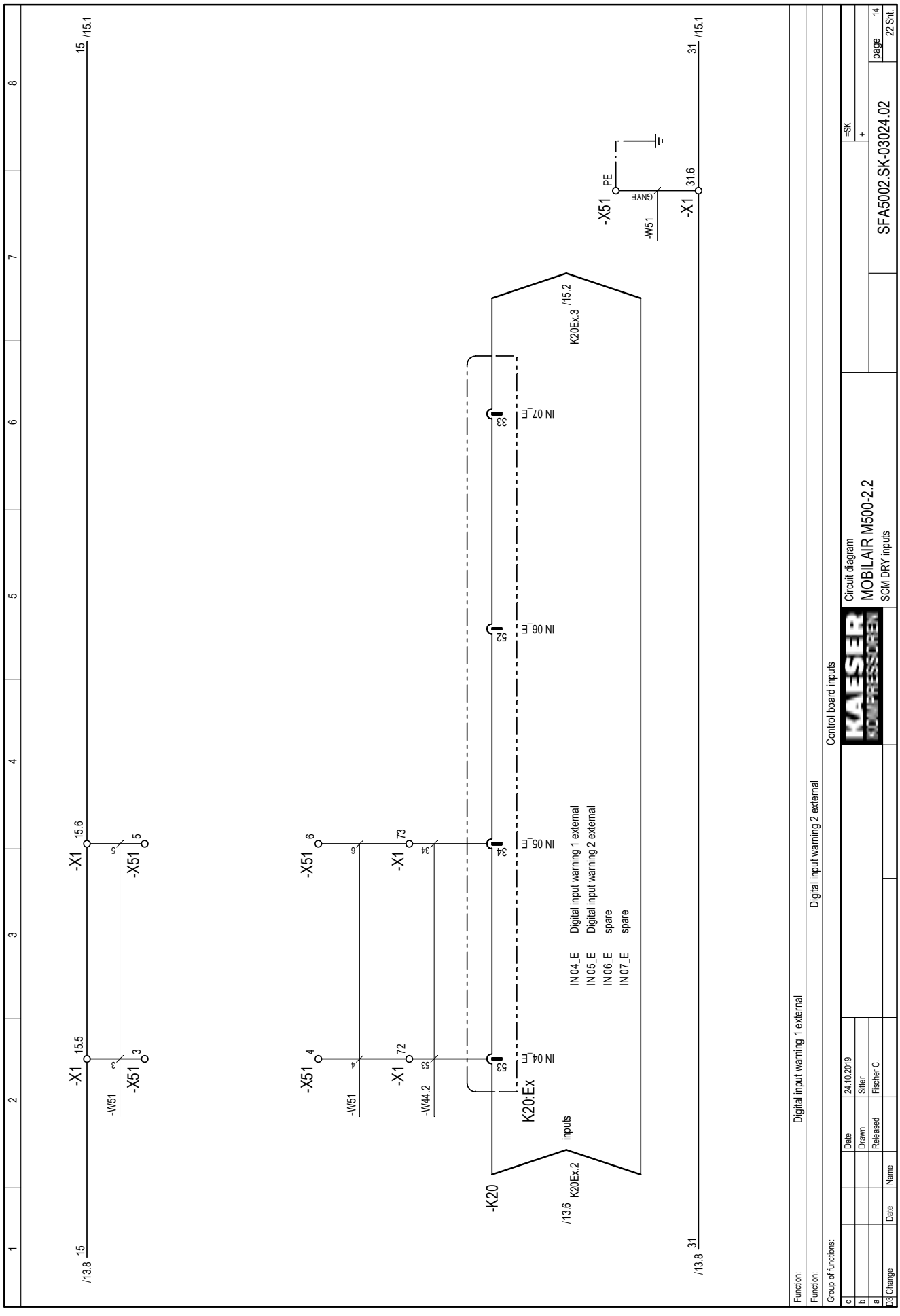

-K20
/8.7 K20St.6
outputs
K20:St
OUT 04 Solenoid valve Control valve
OUT 05 Solenoid valve Scavenging
OUT 06 Solenoid valve Oil return
OUT 07 spare
K20St.7 /10.2
OUT 07
OUT 06
OUT 05
OUT 04
-W44.1
-W31
-W32
-W33
-X34.2
-X34.1
-K1
-K2
-K3
-X34.1
-X34.2
-X1
31.3
X34.31 /10.3
31 /10.1
31 /8.8
Function: Solenoid valve Control valve
Solenoid valve Scavenging
Solenoid valve Oil return
Function:
Group of functions:
Control board outputs
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
D3 Change
Circuit diagram
MOBILAIR M500-2.2
SCM DRY outputs
SFA5002.SK-03024.02
=SK
+
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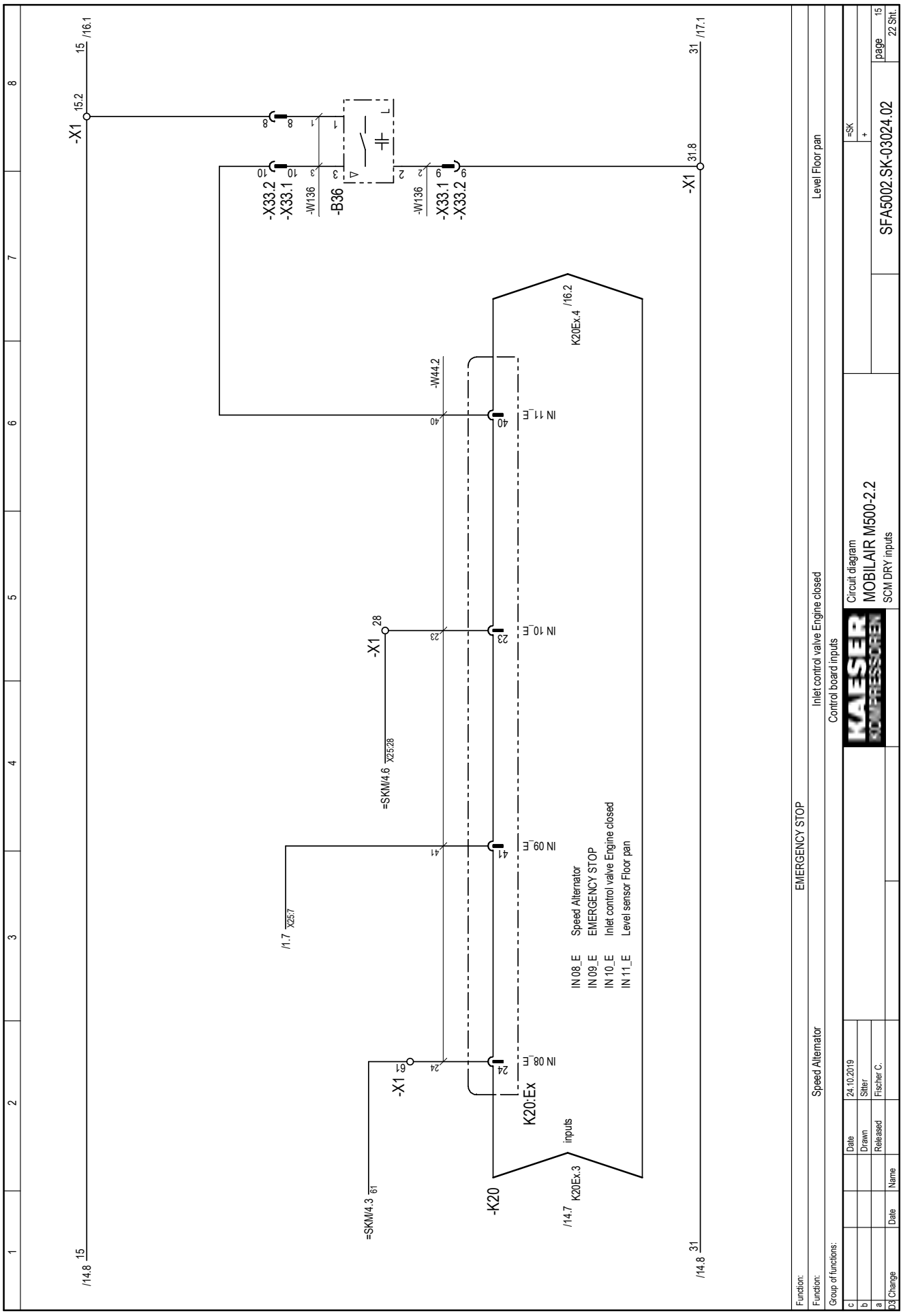

OUT 08 Solenoid valve Centrifugal separator 1+2
OUT 09 Solenoid valve Centrifugal separator 3
OUT 10 Exhaust flap open
OUT 11 Exhaust flap closed
K20:St
K20St.8
K20St.7
outputs
-K20
-K29
-K10.1
-K10.2
-K11
-M29
PE
-X1
-F29 10A
-W44.1
-W101
-W102
-W111
-W80
Drive motor
Relay
Control Exhaust flap
Exhaust flap
Solenoid valve Centrifugal separator 3
Solenoid valve Centrifugal separator 1+2
Circuit diagram
MOBILAIR M500-2.2
SCM DRY outputs
SFA5002.SK-03024.02
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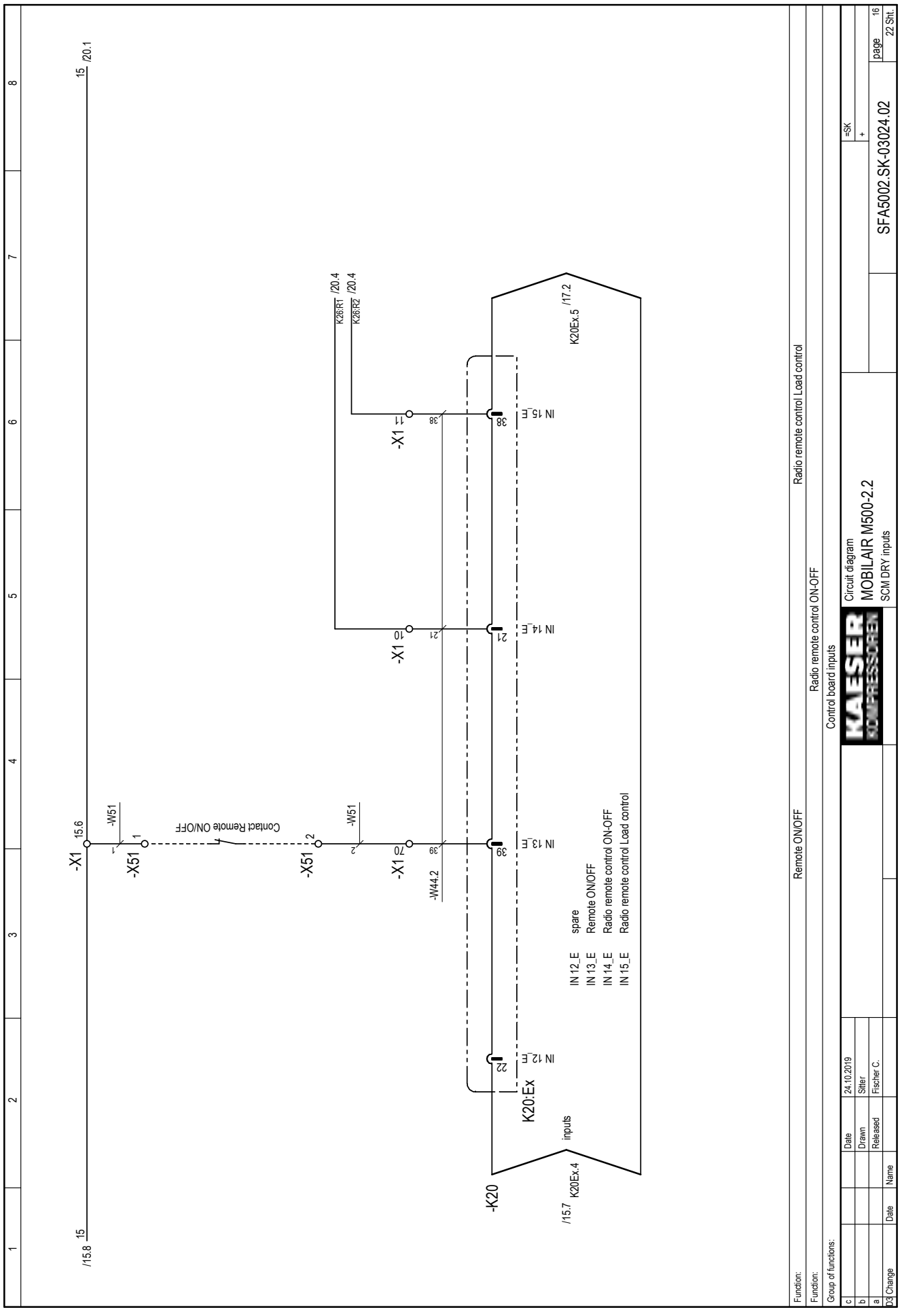

-K20
K20:St
outputs
/10.7 K20St.8
OUT 12 condensate drain Centrifugal separator
OUT 13 spare
OUT 14 Heating Centrifugal separator 2
OUT 15 Heating Centrifugal separator 1
-K58
-K95
-X1
-X20
-X31.1
-X31.2
-X32.1
-X32.2
-E23
-E24
-E25
-E26
-E26.1
-E26.2
-W44.1
-W123
-W124
-W180
Function: condensate drain Centrifugal separator
Heating Centrifugal separator 2
Relay Heating Centrifugal separator 1
Heating Centrifugal separator 1
Function:
Heating strip Centrifugal separator 2
Heating strip Centrifugal separator 1
Group of functions:
Control board outputs
Circuit diagram
MOBILAIR M500-2.2
SCM DRY outputs
SFA5002.SK-03024.02
=SK
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22 Sht.
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
D3 Change

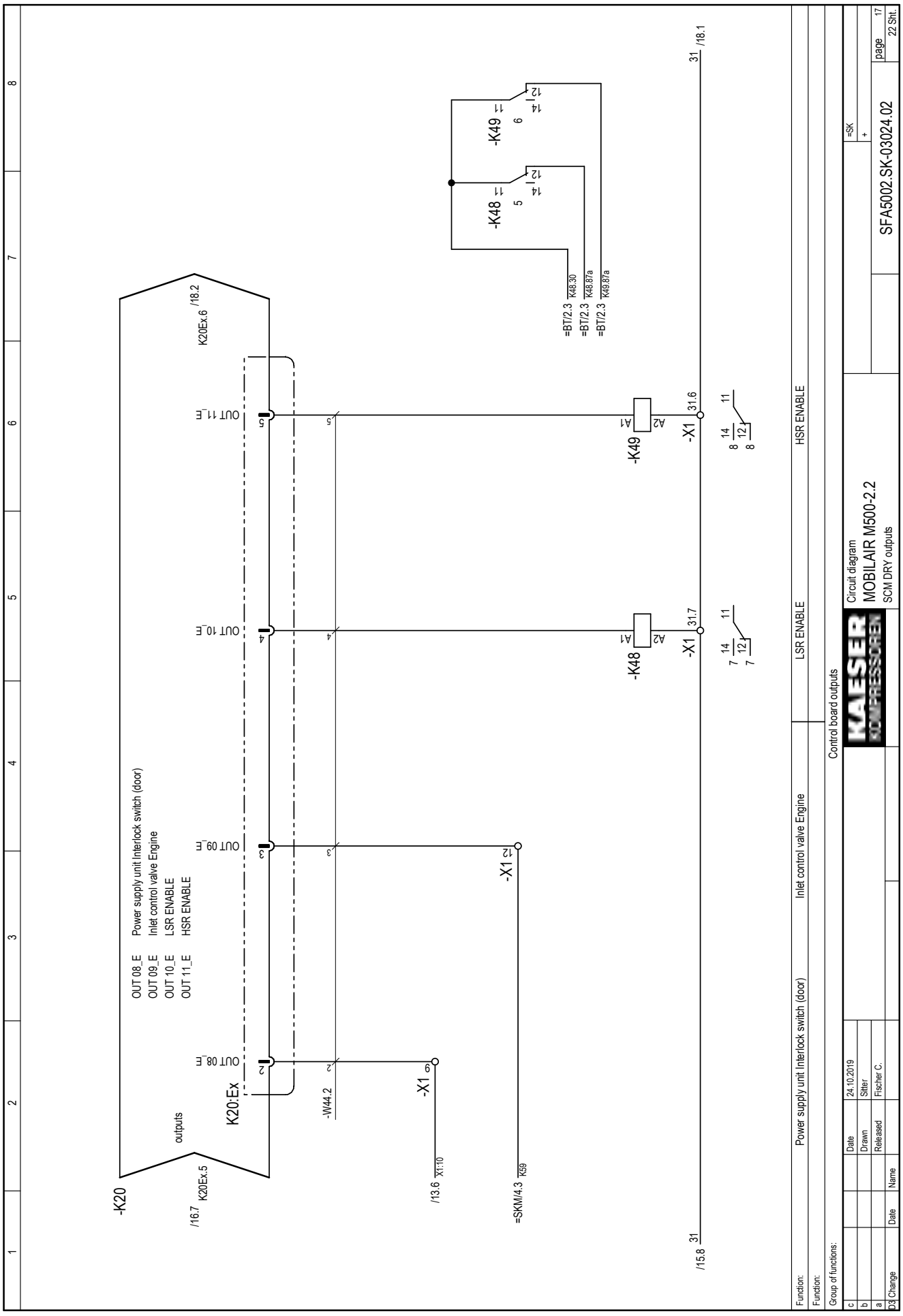

30 /19.1
31 /13.1
K20Ex.1 /13.1
GND 37
GND 20
VBB 4 10
VBB 3 32
VBB 2 1
VBB 1 19
VBB red 51
-K20:Ex
-W44.2
-K20
-X1
-F45 15A
-F46 15A
-F47 15A
-F48 15A
-F49 1A
30.6
30.7
30.8
30.9
30.10
/11.8 30
/11.8 31
31.4
Power supply unit PLC
Function:
Function:
Group of functions:
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Change
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR M500-2.2
SCM DRY Power supply unit
=SK
+
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SFA5002.SK-03024.02

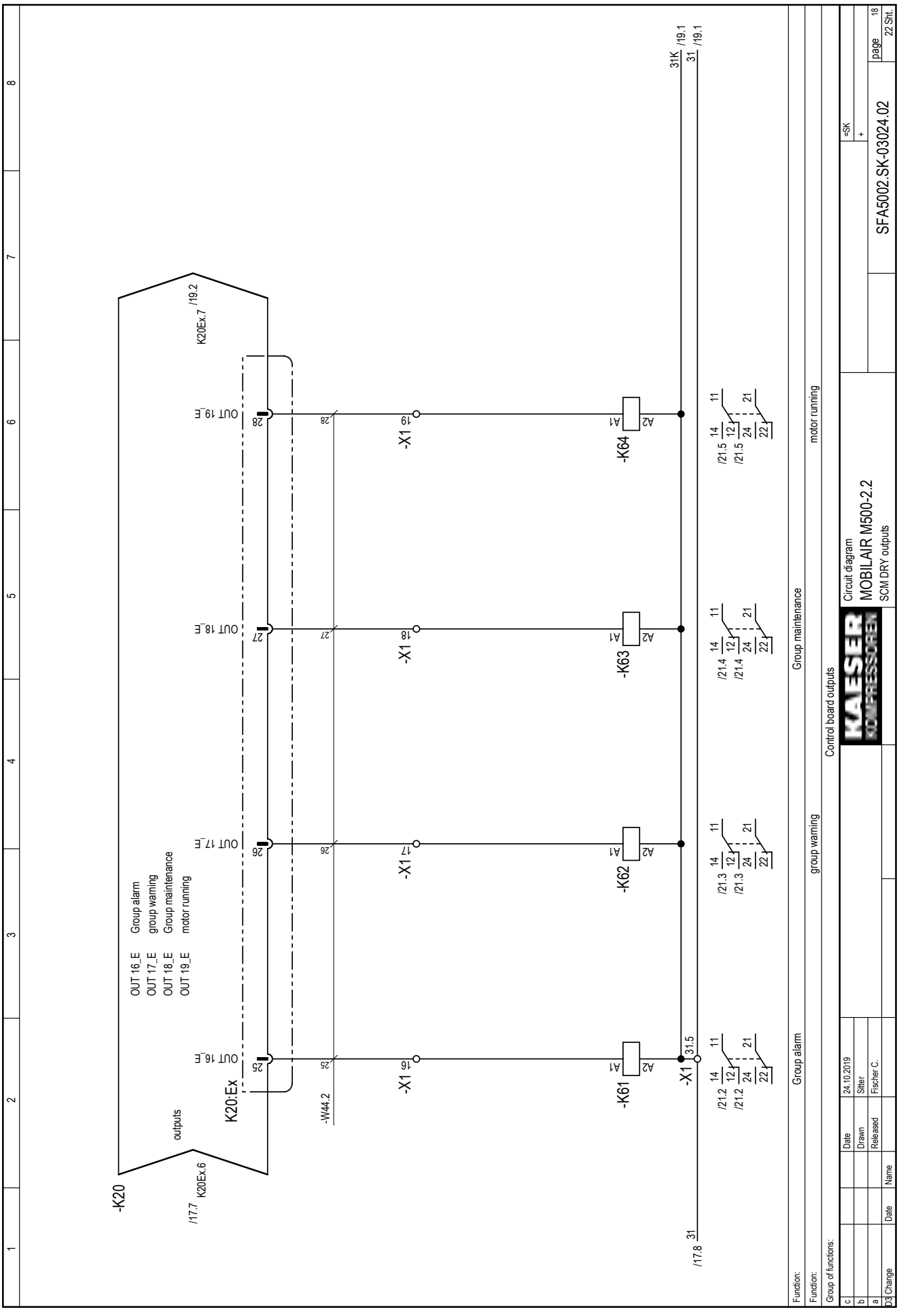

-X1
-B33
-B8
-S31
-S30
-K20
K20:Ex
-W52
-W80
-W44.2
-X31.1
-X31.2
-X32.1
-X32.2
-X35.1
-X35.2
IN 00_E Oil filter flow compressor
IN 01_E Filter maintenance fuel
IN 02_E Interlock switch (door) Exhaust flap open
IN 03_E Interlock switch (door) Exhaust flap closed
Function: Differential pressure switch Filter maintenance fuel Interlock switch (door) Filter maintenance fuel
Function: Oil filter flow compressor Exhaust flap open Exhaust flap closed
Group of functions: Control board inputs
Circuit diagram
MOBILAIR M500-2.2
SCM DRY inputs
SFA5002.SK-03024.02
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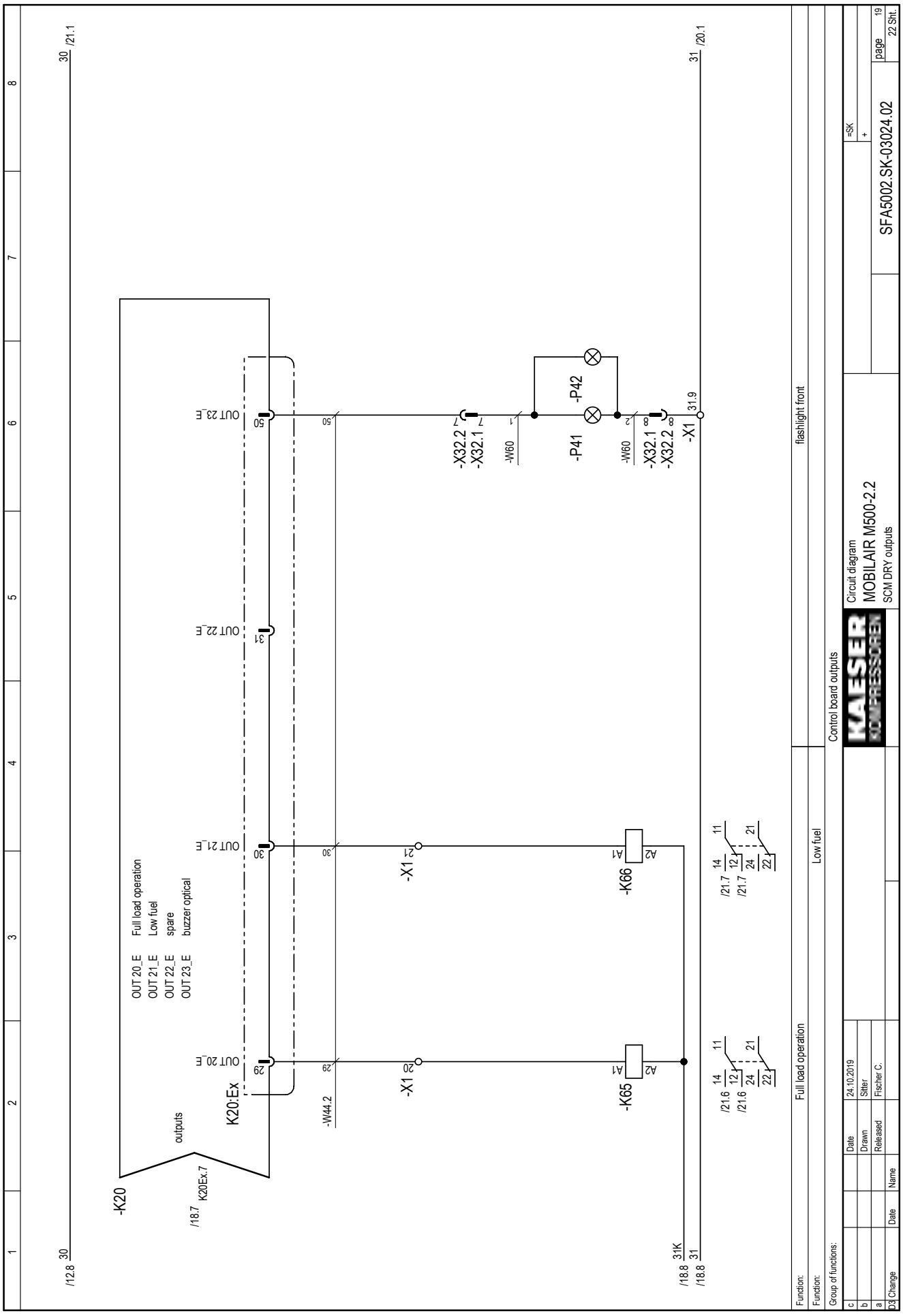

-X1 15.6
-X51 5
-X1 15.5
-X51 3
-W51
-X51 6
-X1 73
-X51 4
-X1 72
-W51
-W44.2
IN 04_E Digital input warning 1 external
IN 05_E Digital input warning 2 external
IN 06_E spare
IN 07_E spare
IN 04_E
IN 05_E
IN 06_E
IN 07_E
K20:Ex
inputs
-K20
/13.6 K20Ex.2
K20Ex.3 /15.2
-X51 PE
GNYE
-W51
-X1 31.6
/15.1
/13.8
Function: Digital input warning 1 external
Function: Digital input warning 2 external
Group of functions: Control board inputs
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Change
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR M500-2.2
SCM DRY inputs
SFA5002.SK-03024.02
=SK
+
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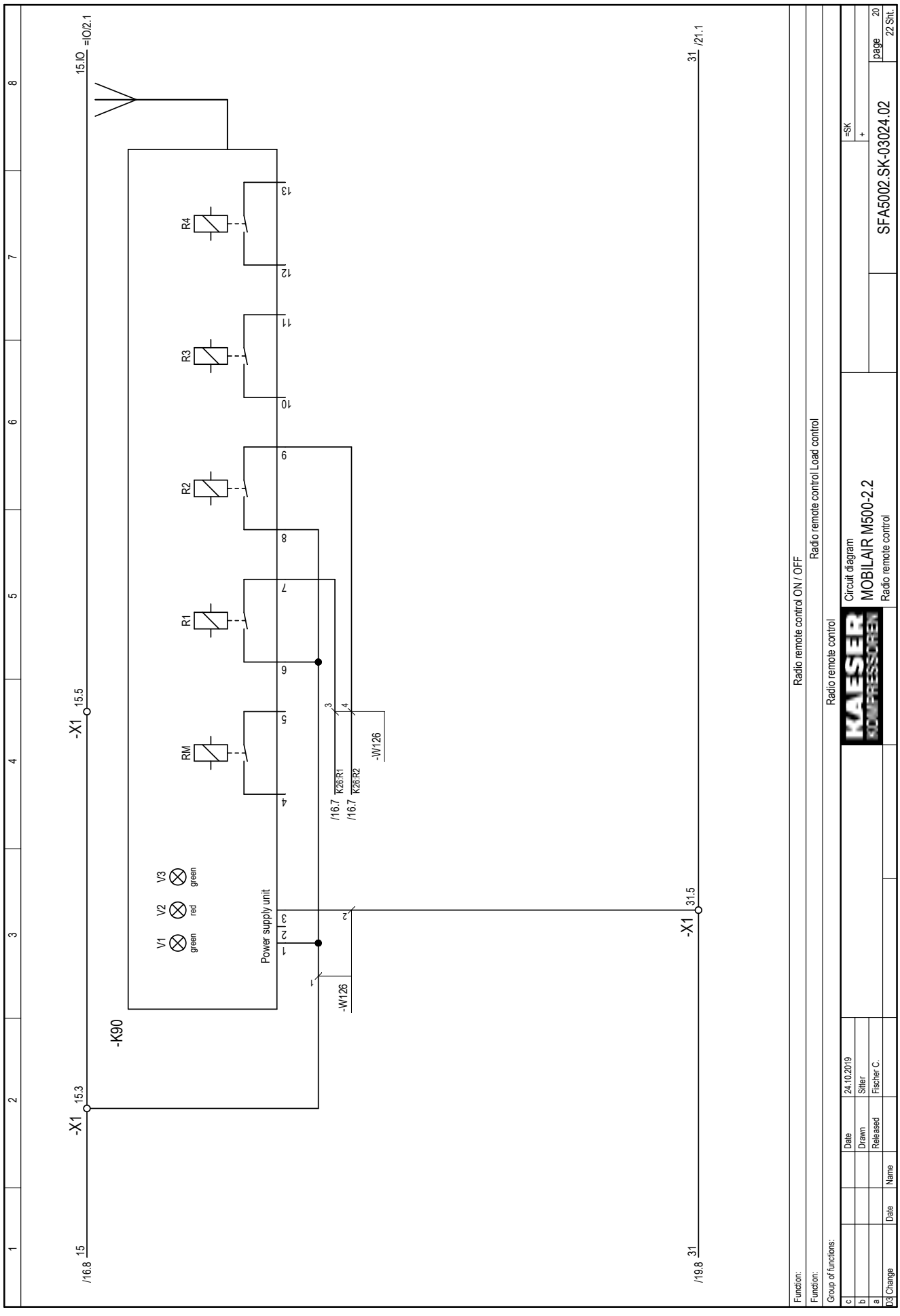

-X1
-X33.2
-X33.1
-W136
-B36
-W136
-X33.1
-X33.2
-X1
-W44.2
K20Ex.4
IN 11_E
IN 10_E
IN 09_E
IN 08_E
-X1
=SKM/4.6 X25:28
/1.7 X25:7
IN 08_E Speed Alternator
IN 09_E EMERGENCY STOP
IN 10_E Inlet control valve Engine closed
IN 11_E Level sensor Floor pan
-X1
=SKM/4.3
-K20
K20:Ex
inputs
K20Ex.3
/14.8
/14.7
/14.8
EMERGENCY STOP
Speed Alternator
Inlet control valve Engine closed
Level Floor pan
Control board inputs
Circuit diagram
MOBILAIR M500-2.2
SCM DRY inputs
SFA5002.SK-03024.02
=SK
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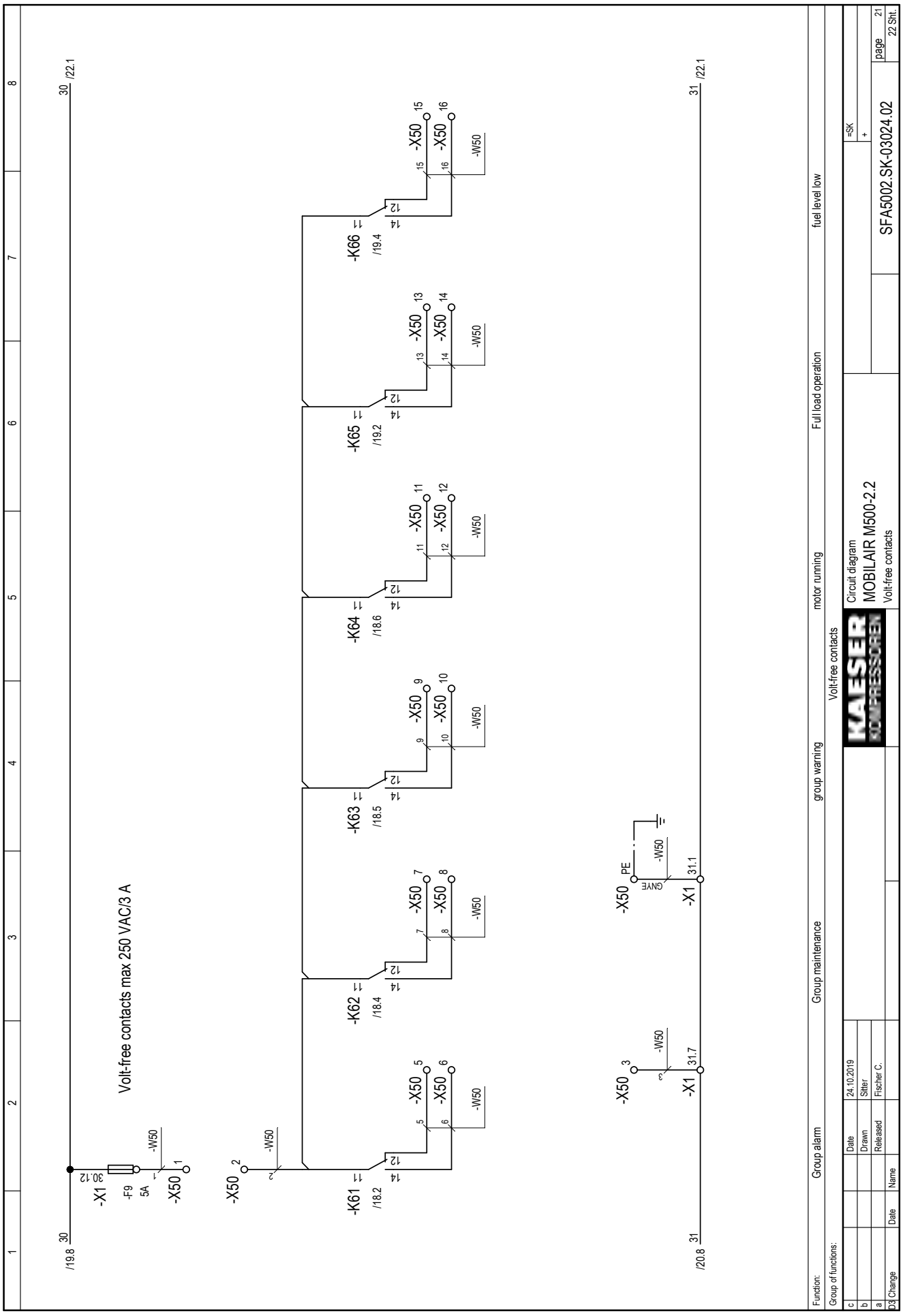

Function: Remote ON/OFF
Radio remote control Load control
Function: Radio remote control ON-OFF
Group of functions: Control board inputs
Circuit diagram
MOBILAIR M500-2.2
SCM DRY inputs
SFA5002.SK-03024.02
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=SK
Date 24.10.2019
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Name
Change
-X1 15.6
-X51
-W51
Contact Remote ON/OFF
-W44.2
-K20
K20:Ex
K20Ex.4 /15.7
K20Ex.5 /17.2
inputs
IN 12_E spare
IN 13_E Remote ON/OFF
IN 14_E Radio remote control ON-OFF
IN 15_E Radio remote control Load control
K26:R1 /20.4
K26:R2 /20.4
/20.1
/15.8

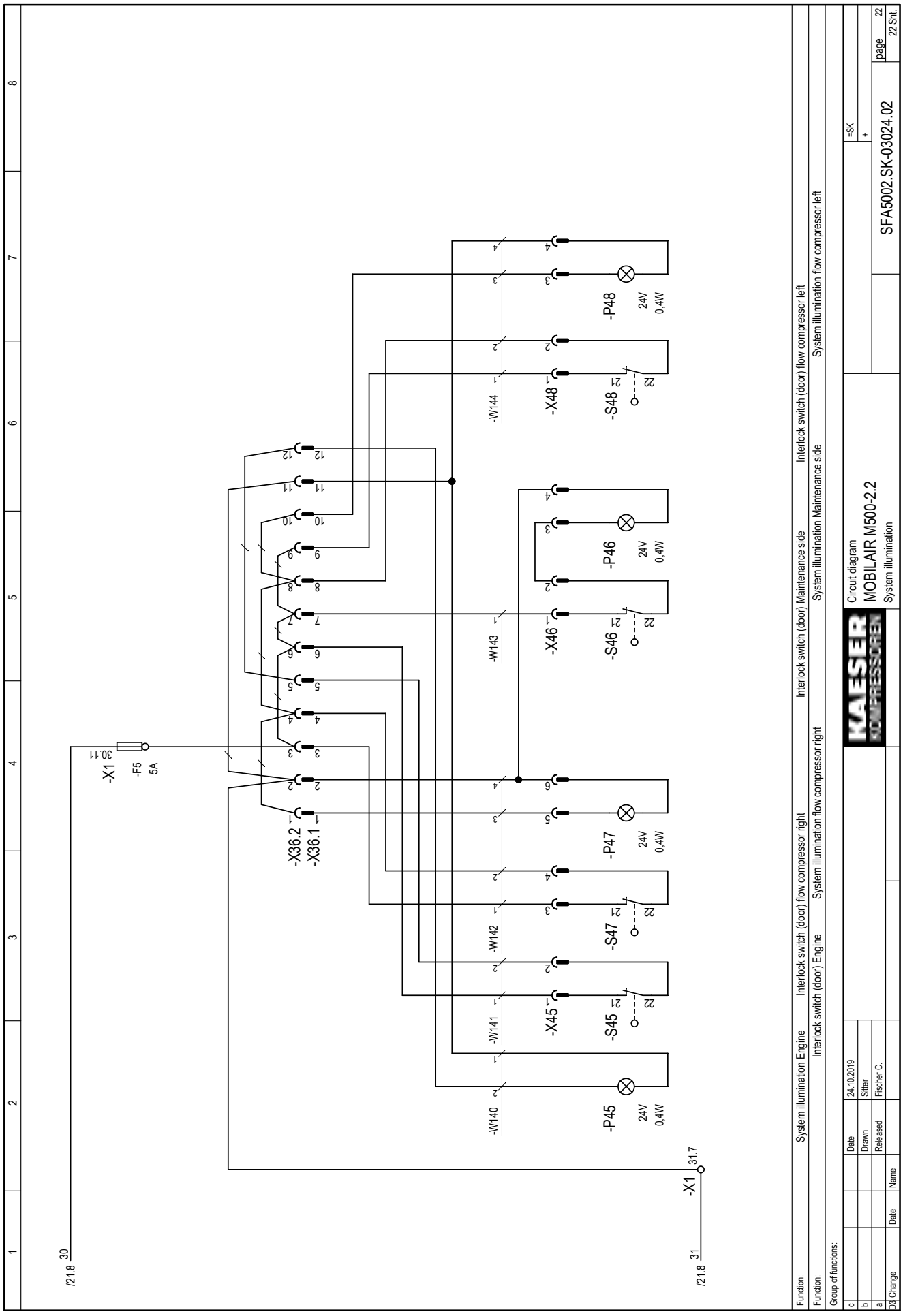

-K20
/16.7 K20Ex.5
outputs
K20:Ex
OUT 08_E
OUT 09_E
OUT 10_E
OUT 11_E
Power supply unit Interlock switch (door)
Inlet control valve Engine
LSR ENABLE
HSR ENABLE
K20Ex.6 /18.2
-W44.2
-X1 9
/13.6 X1:10
-X1 12
=SKM/4.3 K59
-K49
-K48
-X1 31.6
-X1 31.7
31 /15.8
31 /18.1
-K49 11 12 14 6
-K48 11 12 14 5
=BT/2.3 K48.30
=BT/2.3 K48.87a
=BT/2.3 K49.87a
Function: Power supply unit Interlock switch (door) Inlet control valve Engine LSR ENABLE HSR ENABLE
Function:
Group of functions: Control board outputs
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
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Circuit diagram
MOBILAIR M500-2.2
SCM DRY outputs
SFA5002.SK-03024.02
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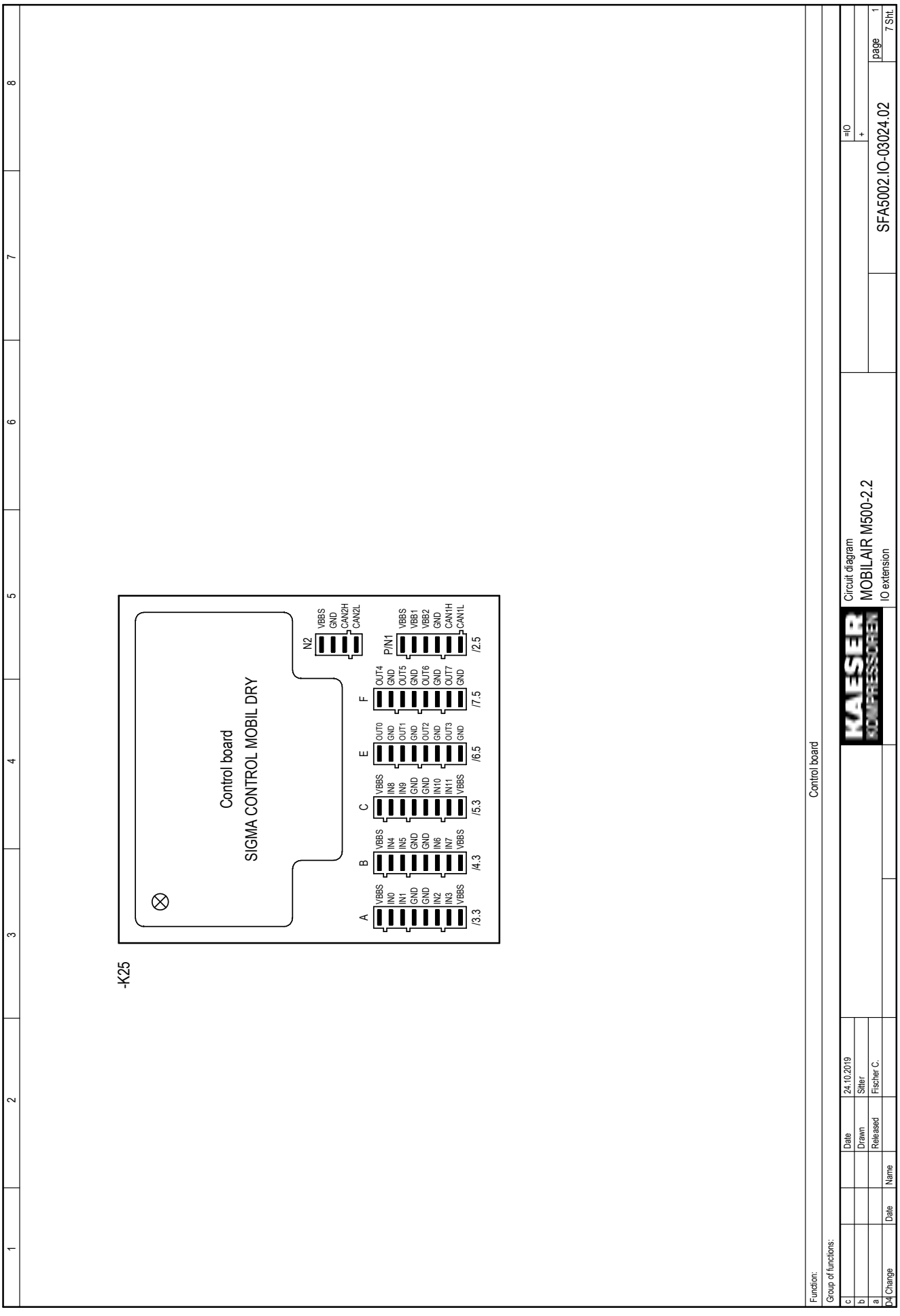

-K20
K20:Ex
outputs
K20Ex.7 /19.2
K20Ex.6 /17.7
OUT 16_E
OUT 17_E
OUT 18_E
OUT 19_E
Group alarm
group warning
Group maintenance
motor running
-W44.2
-X1
-K61
-K62
-K63
-K64
31K /19.1
31 /19.1
31.5
/17.8 31
/21.2
/21.3
/21.4
/21.5
Function: Group alarm
Function: group warning
Group maintenance
motor running
Group of functions: Control board outputs
Date 24.10.2019
Drawn Sitter
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Name
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KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR M500-2.2
SCM DRY outputs
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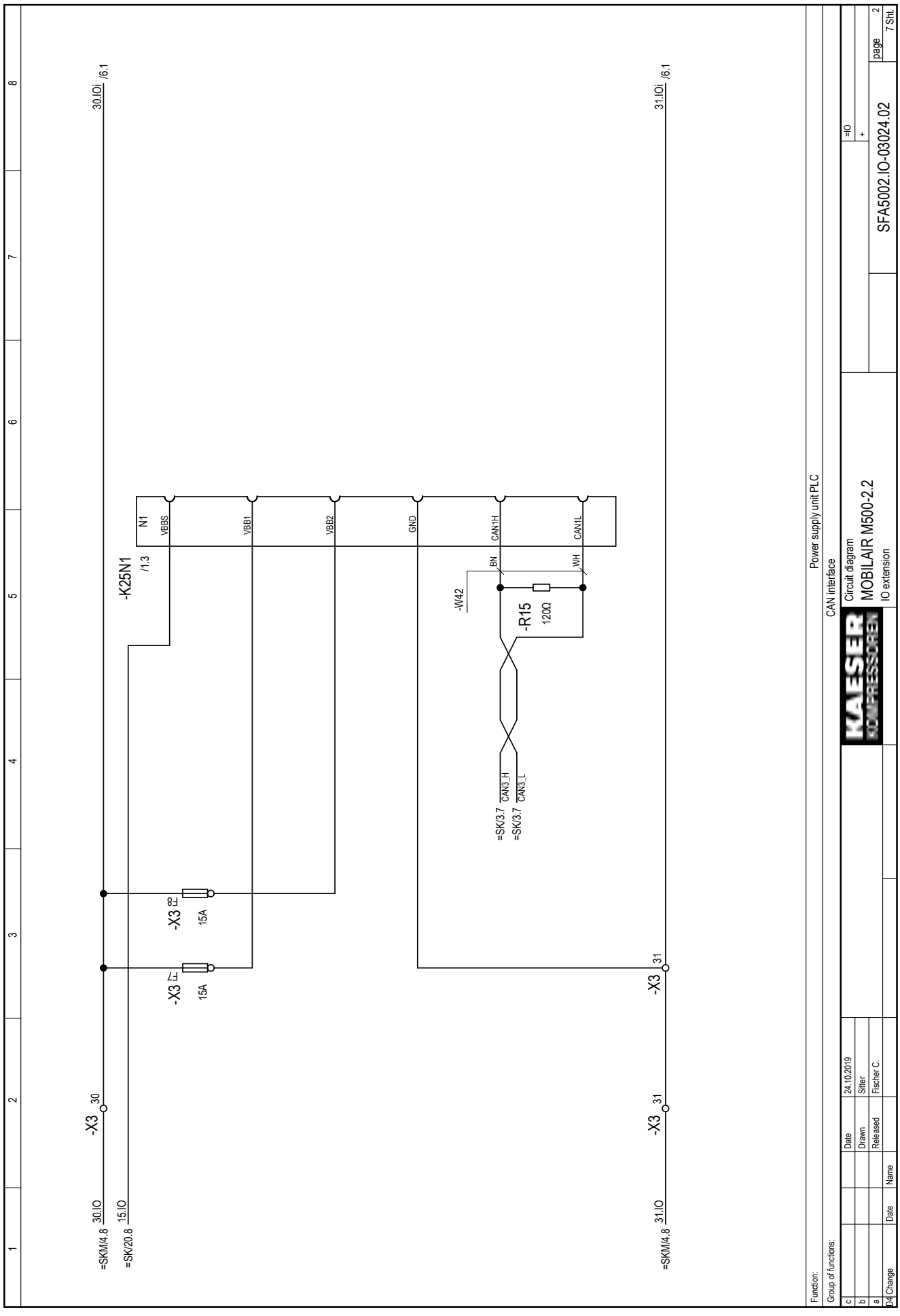

OUT 20_E Full load operation
OUT 21_E Low fuel
OUT 22_E spare
OUT 23_E buzzer optical
-K20
K20:Ex
outputs
-K65
-K66
-P41
-P42
-X1
-X32.1
-X32.2
-W60
-W44.2
Full load operation
Low fuel
Control board outputs
flashlight front
Circuit diagram
MOBILAIR M500-2.2
SCM DRY outputs
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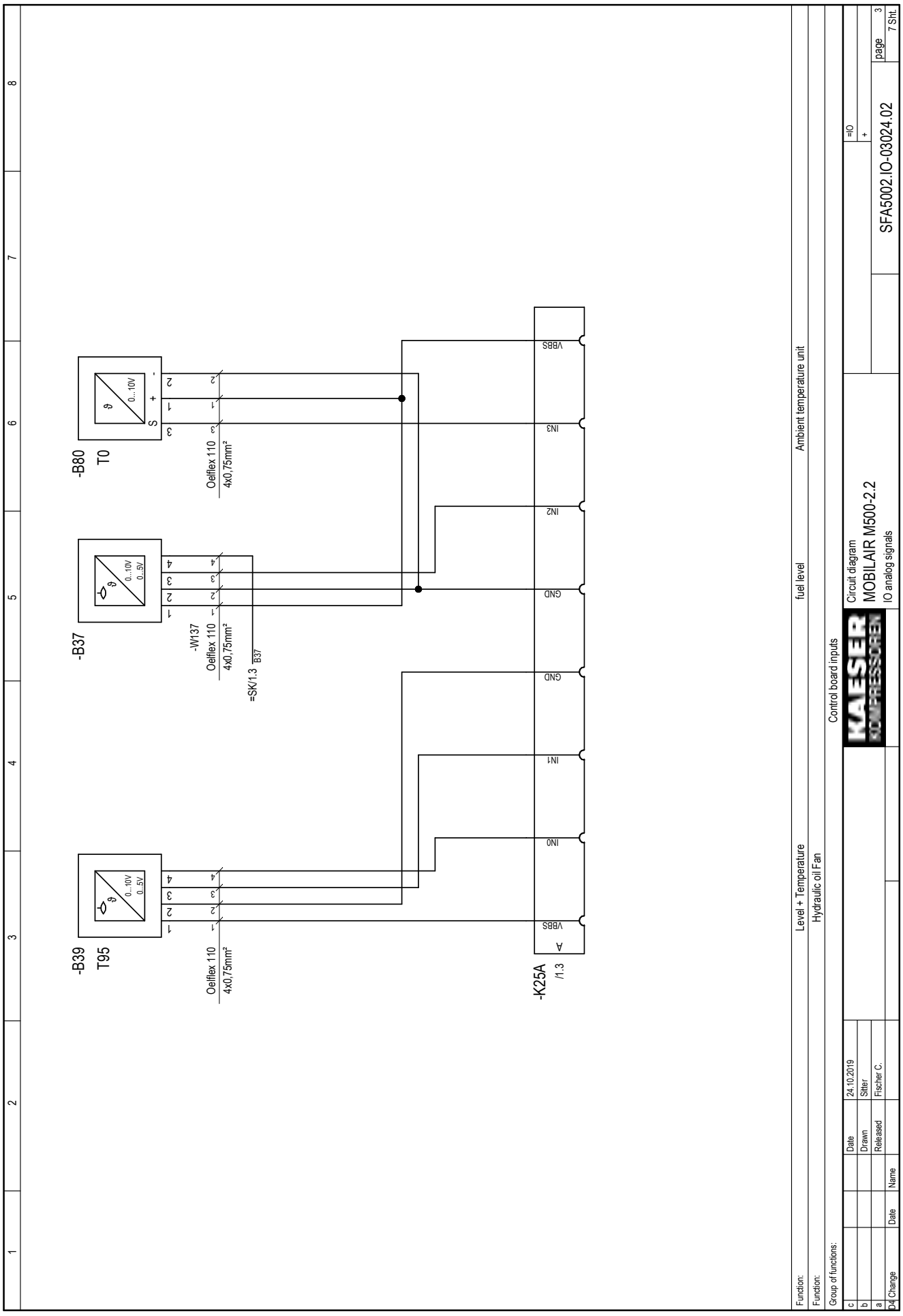

15.IO =IO/2.1
-X1 15.5
-X1 15.3
-K90
/16.8 15
/19.8 31
31 /21.1
-X1 31.5
R1
R2
R3
R4
RM
V1 green
V2 red
V3 green
Power supply unit
-W126
/16.7 K26:R1
/16.7 K26:R2
Radio remote control ON / OFF
Radio remote control Load control
Radio remote control
Circuit diagram
MOBILAIR M500-2.2
Radio remote control
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Change

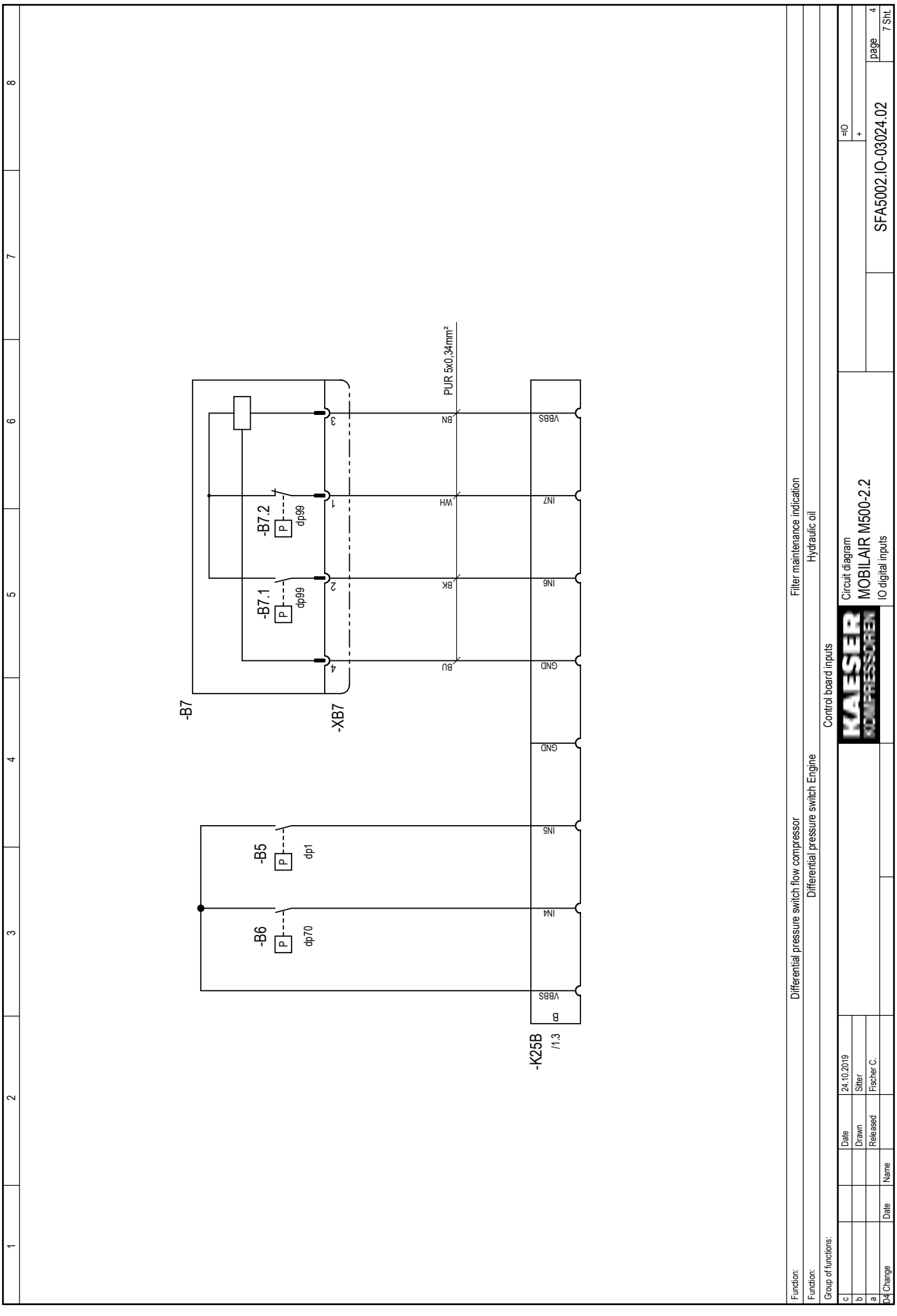

Volt-free contacts max 250 VAC/3 A
-X1
-F9
5A
-X50
-W50
-K61
-K62
-K63
-K64
-K65
-K66
-X50
-W50
-X1
PE
GNYE
Function:
Group alarm
Group maintenance
group warning
motor running
Full load operation
fuel level low
Group of functions:
Volt-free contacts
Circuit diagram
MOBILAIR M500-2.2
Volt-free contacts
SFA5002.SK-03024.02
=SK
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Date
Drawn
Released
Name
24.10.2019
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Fischer C.
D3 Change

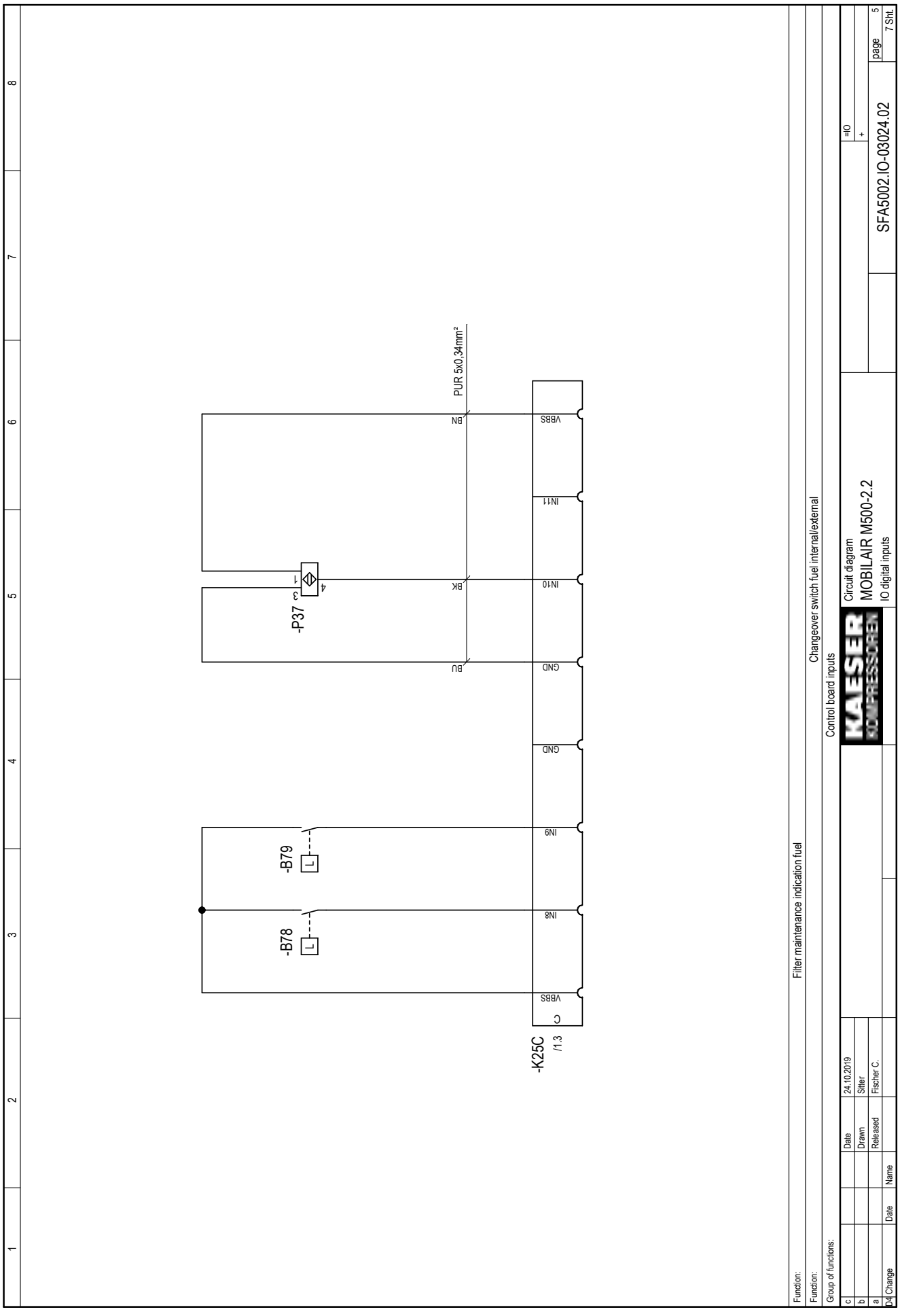

-X1
-F5
5A
-X36.2
-X36.1
-W140
-W141
-W142
-W143
-W144
-P45
-P47
-P46
-P48
-X45
-X47
-X46
-X48
-S45
-S47
-S46
-S48
24V
0,4W
/21.8
/21.8
System illumination Engine
Interlock switch (door) flow compressor right
Interlock switch (door) Engine
System illumination flow compressor right
Interlock switch (door) Maintenance side
System illumination Maintenance side
Interlock switch (door) flow compressor left
System illumination flow compressor left
Circuit diagram
MOBILAIR M500-2.2
System illumination
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Fischer C.

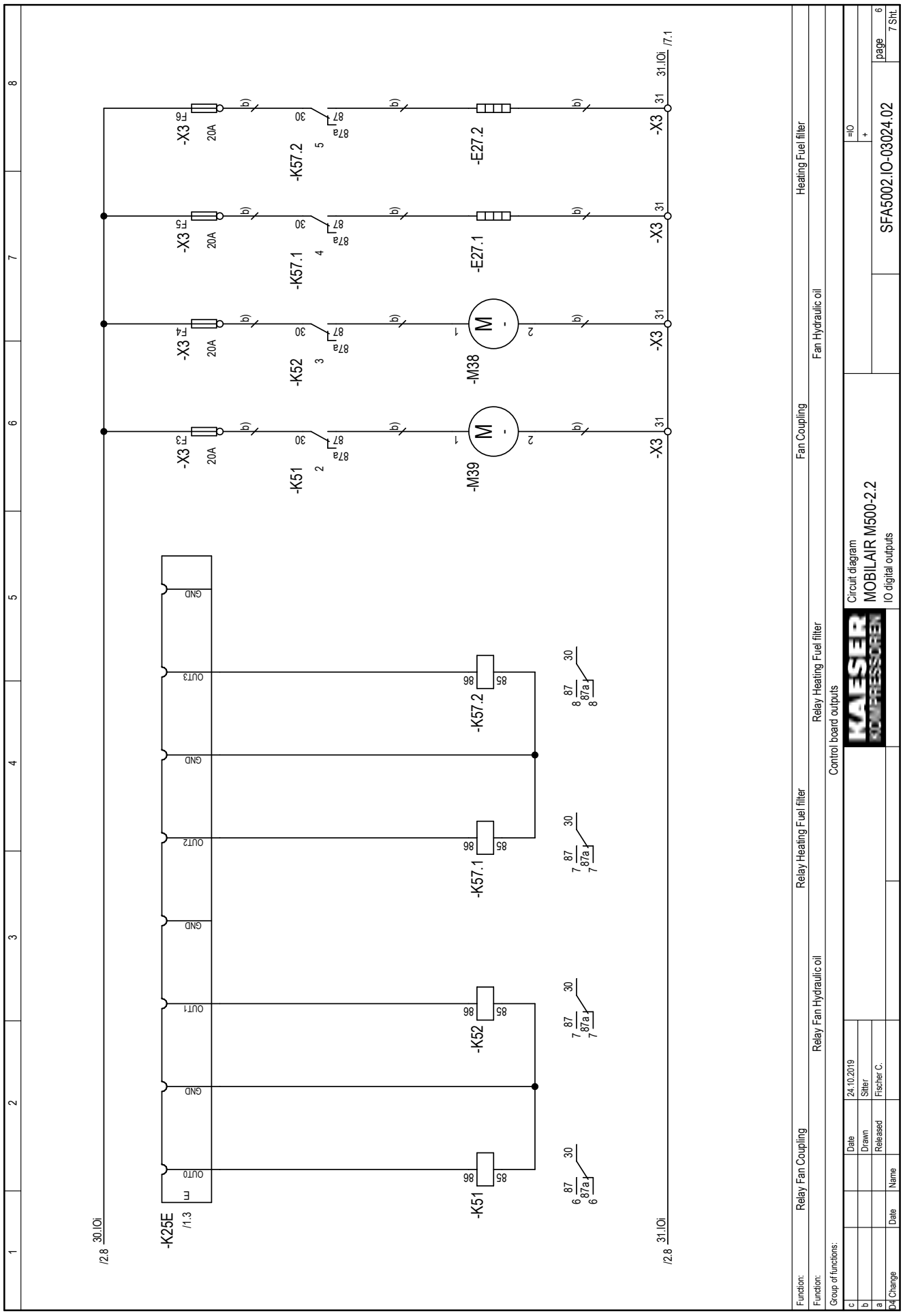

-K25
Control board
SIGMA CONTROL MOBIL DRY
N2
VBBS
GND
CAN2H
CAN2L
P/N1
VBBS
VBB1
VBB2
GND
CAN1H
CAN1L
/2.5
A
VBBS IN0 IN1 GND GND IN2 IN3 VBBS
/3.3
B
VBBS IN4 IN5 GND GND IN6 IN7 VBBS
/4.3
C
VBBS IN8 IN9 GND GND IN10 IN11 VBBS
/5.3
E
OUT0 GND OUT1 GND GND OUT2 GND OUT3 GND
/6.5
F
OUT4 GND OUT5 GND GND OUT6 GND OUT7 GND
/7.5
Function:
Control board
Group of functions:
Date
24.10.2019
Drawn
Sliter
Released
Fischer C.
Name
Date
Change
Circuit diagram
MOBILAIR M500-2.2
IO extension
=IO
+
SFA5002.IO-03024.02
page 1
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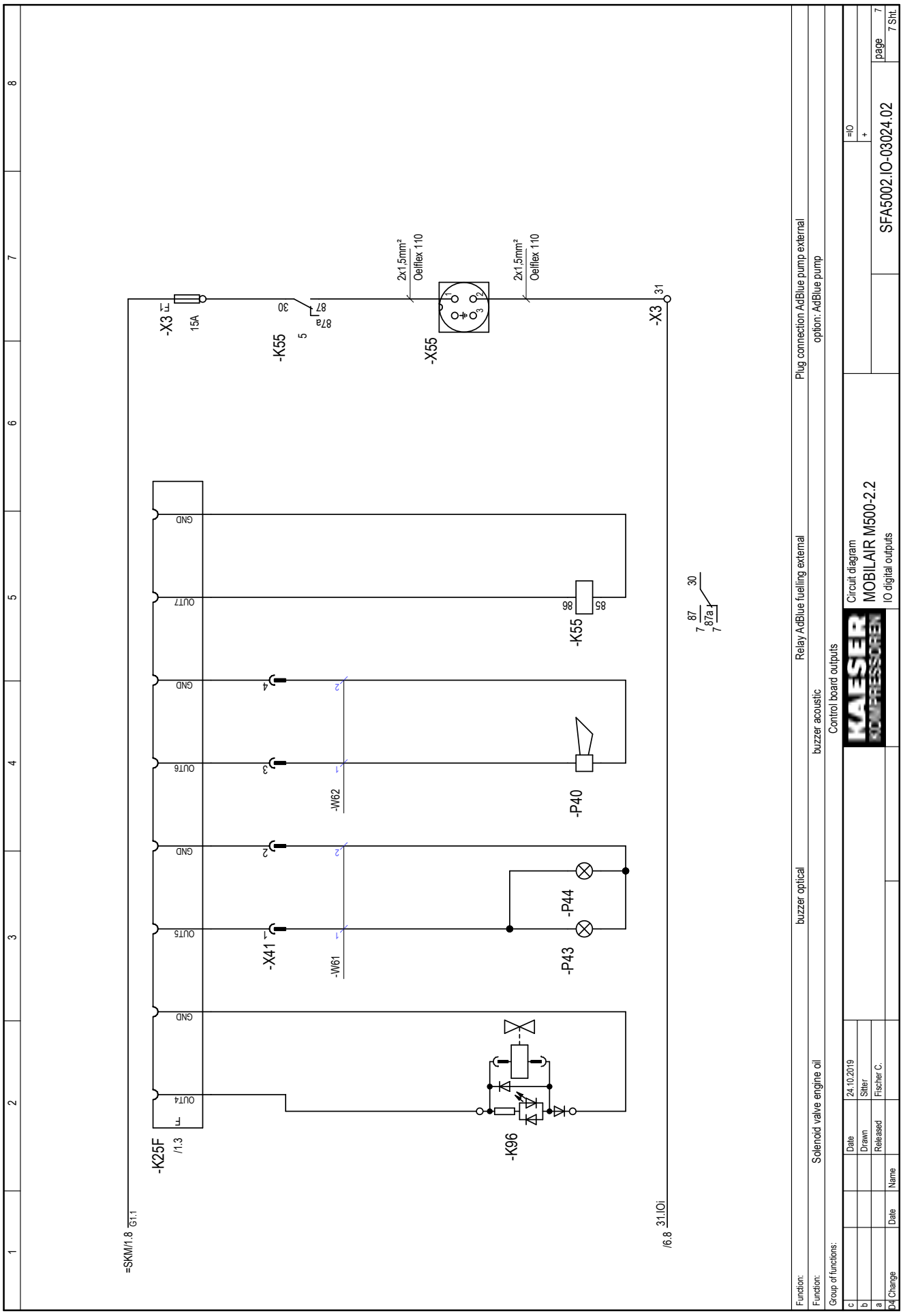

30.IOi /6.1
31.IOi /6.1
-K25N1
/1.3
N1
VBBS
VBB1
VBB2
GND
CAN1H
CAN1L
BN
WH
-W42
-R15
120Ω
=SK/3.7 CAN3_H
=SK/3.7 CAN3_L
-X3 88
-X3 87
15A
15A
-X3 30
-X3 31
-X3 31
=SKM/4.8 30.IO
=SK/20.8 15.IO
=SKM/4.8 31.IO
Power supply unit PLC
CAN interface
Function:
Group of functions:
Circuit diagram
MOBILAIR M500-2.2
IO extension
SFA5002.IO-03024.02
=IO
+
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Date
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Sitter
Fischer C.
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-B80
T0
0...10V
S
Oelflex 110
4x0,75mm²
-B37
0..10V
0..5V
-W137
Oelflex 110
4x0,75mm²
=SK/1.3
B37
-B39
T95
0..10V
0..5V
Oelflex 110
4x0,75mm²
-K25A
/1.3
VBBS
IN3
IN2
GND
GND
IN1
IN0
VBBS
A
Function:
Level + Temperature
fuel level
Ambient temperature unit
Function:
Hydraulic oil Fan
Group of functions:
Control board inputs
Date
24.10.2019
Drawn
Sitter
Released
Fischer C.
Name
Date
Change
Circuit diagram
MOBILAIR M500-2.2
IO analog signals
SFA5002.IO-03024.02
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+
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PUR 5x0,34mm²
-B7
-XB7
-B7.2
-B7.1
-B5
-B6
dp99
dp99
dp1
dp70
P
BN
WH
BK
BU
3
1
2
4
VBBS
IN7
IN6
GND
GND
IN5
IN4
VBBS
B
-K25B
/1.3
Function:
Differential pressure switch flow compressor
Filter maintenance indication
Function:
Differential pressure switch Engine
Hydraulic oil
Group of functions:
Control board inputs
Circuit diagram
MOBILAIR M500-2.2
IO digital inputs
SFA5002.IO-03024.02
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Chg
Change


PUR 5x0,34mm²
BN
BK
BU
VBBS
IN11
IN10
GND
GND
IN9
IN8
VBBS
-K25C
/1.3
-B78
-B79
-P37
Filter maintenance indication fuel
Changeover switch fuel internal/external
Control board inputs
Circuit diagram
MOBILAIR M500-2.2
IO digital inputs
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Date
Change


-X3
-K57.2
-E27.2
-K57.1
-E27.1
-K52
-M38
-K51
-M39
-K25E
-K57.2
-K57.1
-K52
-K51
Relay Fan Coupling
Relay Heating Fuel filter
Relay Fan Hydraulic oil
Relay Heating Fuel filter
Control board outputs
Fan Coupling
Heating Fuel filter
Fan Hydraulic oil
Circuit diagram
MOBILAIR M500-2.2
IO digital outputs
SFA5002.IO-03024.02
page 6
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=SKM/1.8 G1.1
-K25F /1.3
-X3 15A
-K55
-X55
2x1.5mm² Oelflex 110
-X3 31
-K96
-X41
-W61
-W62
-P40
-P43
-P44
-K55
/6.8 31.IOi
Function: buzzer optical
Relay AdBlue fuelling external
Plug connection AdBlue pump external
Function: Solenoid valve engine oil
buzzer acoustic
option: AdBlue pump
Group of functions:
Control board outputs
Circuit diagram
MOBILAIR M500-2.2
IO digital outputs
SFA5002.IO-03024.02
page 7
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Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
Chg Change

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A Stück-zahl Qty.	B Benennung und Verwendung Description and function	C Fabrikatsbezeichnung Typ; notwendige techn. Daten (z.B. Steuerspannung, Frequenz, Einstellbereich); Bestell-Nr.; Hersteller Identification data Type; basic technical data (e.g. control voltage, frequency, adjustable range); order No.; manufacturer			D Lfd. Nr. Item	E Betriebsmittel-Kennz. nach DIN 40719, Teil 2 Identifying symbol of device	F Stromlaufplan Planabschnitt Circuit diagram sheet No.; section No.	G Einbauort Location	Concerns only the manufacturer Wst.-Nr. H Schabl. Nr.	I BZ-Pos.	J VA Kz. *)	K Eingangs-vermerk
	Control cabinet:											
1	Control cabinet		300x800x155	7.3146.02500 Rittal								
1	Mounting plate			225584.0 Wagner								
1	Control board SCM	CR9047		7.9200.11010 ifm		-K20						
1	Converter	7xPt100/4-20mA - 30...350°C		7.2887.00090 Ziehl		-T1						
1	GSM/GPS Modem SCM			7.9208.01000 PROEMION		-X13						
1	Radio remote control Consignee			7.9214.00010 Welotec								
1	Radio remote control Antenna			7.9214.00030 Welotec								
1	Control Actuator drive	12-35VDC / 1-20A		8.1735.00010 Linak		-K29						
2	Coupling relay	RIF-0-RPT-24DC/21	24 VDC/1W	7.3172.00310 Phoenix		-K48,-K49						
7	Coupling relay		24 VDC/2W 5A	7.5495.00010 Omron		-K58,-K61...-K66						
7	Relay socket	P2RF-08-E		7.5496.0 Omron		-K58,-K61...-K66						
1	Control cabinet ventilator	25m3/h 24VDC		7.9660.0 Emb-Papst		-M7						
8	tiered terminals	WKF1,5E/35		7.3149.00860 Wieland		-X1						
28	Terminal	WKFN 2,5D2/2/35		7.3149.02080 Wieland		-X1						
2	Terminal	WKF 16/35 PV/WKFN		7.3149.02170 Wieland		-X1						
9	cable screening connection terminal EMV	Φ 3-6mm		7.6342.00010 icotek		-X1						
13	Fuse terminal	WKFN 4FSI		7.3149.02160 Wieland		-X1						
2	Fuse UNIVAL		1 A	7.6411.00110 FTM		-F11,-F49						
3	Fuse UNIVAL		5 A	7.6411.00040 FTM		-F5,-F9,-F100						
2	Fuse UNIVAL		10 A	7.6411.00050 FTM		-F15,-F29						
6	Fuse UNIVAL		15 A	7.6411.00060 FTM		-F12,-F13,-F45...-F48						
4	Resistor		120 Ω	7.5392.00030 Conrad		-R11,-R12,-R13,-R14						
1	Diagnostic socket		14-pole	7.6589.02000 Börsig		-X100						
1	Rotary control switch			7.9027.10080 Schlegel		-S100						
1	Switching element	4 S		7.9027.10090 Schlegel		-S100						
8	plug connection 12-pole	1604941-1		7.6589.00520 TYCO		-X24,-X25,-X31...-X36						
2	Connector cable Control board SCM			7.9200.10210 S&S								
1	Cable socket	M12x1,5 5m 5-pole, 90°		7.9200.00130 ifm								

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c			Date	24.10.2019	
b			Drawn	Sitter	
a			Released	Fischer C.	
F	Change	Date	Name		

KAESER KOMPRESSOREN

Equipment parts list
MOBILAIR M500-2.2
Control cabinet

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A Stück-zahl Qty.	B Benennung und Verwendung Description and function	C Fabrikatsbezeichnung Typ; notwendige techn. Daten (z.B. Steuerspannung, Frequenz, Einstellbereich); Bestell-Nr.; Hersteller — Identification data Type; basic technical data (e.g. control voltage, frequency, adjustable range); order No.; manufacturer				D Lfd. Nr. Item	E Betriebsmittel-Kennz. nach DIN 40719, Teil 2 — Identifying symbol of device	F Stromlaufplan Planabschnitt — Circuit diagram sheet No.; section No.	G Einbauort — Location	Concerns only the manufacturer: Wst.-Nr. H Schabl. Nr.	I BZ-Pos.	J VA Kz. *)	K Eingangs-vermerk
	Control cabinet Engine:												
1	Control cabinet		300x800x155	7.3146.01950	Rittal								
1	Mounting plate			225584.0	Wagner								
1	LOAD-DUMP-Modul	EC2016	24 VDC	7.9200.00100	ifm		-R1						
3	Relay	24 VDC/1W, 10/20A		8.6544.00010	FTM		-K32,-K39,-K59						
3	Relay socket			7.3411.00020	FTM		-K32,-K39,-K59						
1	Relay	24 VDC/1S, 100A		8.6544.00070	FTM		-K30						
2	Fuse		50 A	7.6411.00005	FTM		-F30,-F39						
2	Fuse socket			7.6410.00100	FTM		-F30,-F39						
1	Control cabinet ventilator	25m3/h 24VDC		7.9660.0	Emb-Papst		-M9						
2	Outlet filter	GV100 RAL7035		7.2752.00100	Rübsamen&Herr								
10	tiered terminals	WKF1,5E/35		7.3149.00860	Wieland		-X2						
4	Terminal	WKFN 2,5D2/2/35		7.3149.02080	Wieland		-X2						
2	Terminal	WKFN 2,5/35		7.3149.01680	Wieland		-X2						
8	Terminal	WKFN 4/35		7.3149.01810	Wieland		-X2						
4	Terminal	WKF 16/35 PV/WKFN		7.3149.02170	Wieland		-X2						
2	cable screening connection terminal EMV	Φ 3-6mm		7.6342.00010	icotek		-X2						
6	Fuse terminal	WKFN 4FSI		7.3149.02160	Wieland		-X2						
1	Fuse UNIVAL		7,5 A	7.6411.00100	FTM		-F7						
1	Fuse UNIVAL		15 A	7.6411.00060	FTM		-F59						
4	Fuse UNIVAL		20 A	7.6411.00080	FTM		-F26,-F27,-F40,-F61						
1	Resistor		120 Ω	7.5392.00030	Conrad		-R16						
1	Battery charger	24VDC/25A		7.9117.00100	Waeco		-T3						
4	Cut-out	5SY6106-7 C6A	1-pole	7.3140.02740	Siemens		-F20,-F21,-F22,-F23						
1	Cut-out	5SY6125-7 C25A	1-pole	7.3140.02760	Siemens		-F24						
9	Terminal	WKFN 2,5/35		7.3149.01680	Wieland		-X10						
5	PE earth terminal	WKFN 2,5/SL/35		7.3149.02300	Wieland		-X10						

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c				Date	24.10.2019
b				Drawn	Sitter
a				Released	Fischer C.
F	Change	Date	Name		

KAESER KOMPRESSOREN

Equipment parts list
MOBILAIR M500-2.2
Control cabinet Engine

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A Stück-zahl Qty.	B Benennung und Verwendung Description and function	C Fabrikatsbezeichnung Typ; notwendige techn. Daten (z.B. Steuerspannung, Frequenz, Einstellbereich); Bestell-Nr.; Hersteller / Identification data Type; basic technical data (e.g. control voltage, frequency, adjustable range); order No.; manufacturer				D Lfd. Nr. Item	E Betriebsmittel-Kennz. nach DIN 40719, Teil 2 / Identifying symbol of device	F Stromlaufplan Planabschnitt / Circuit diagram sheet No.; section No.	G Einbauort / Location	Concerns only the manufacturer: H Wst.-Nr. Schabl. Nr.	I BZ-Pos.	J VA Kz. *)	K Eingangs-vermerk
	-X10 EU:												
1	Battery charger	24VDC/25A		7.9117.00100	Waeco		-T3						
4	Cut-out	5SY6106-7 C6A	1-pole	7.3140.02740	Siemens		-F20,-F21,-F22,-F23						
1	Cut-out	5SY6125-7 C25A	1-pole	7.3140.02760	Siemens		-F24						
9	Terminal	WKFN 2,5/35		7.3149.01680	Wieland		-X10						
5	PE earth terminal	WKFN 2,5/SL/35		7.3149.02300	Wieland		-X10						
	-X10 GB:												
1	Battery charger	24VDC/25A		7.9117.00100	Waeco		-T3						
1	Cut-out	5SY6106-7 C6A	1-pole	7.3140.02740	Siemens		-F21						
1	Cut-out	5SY6125-7 C25A	1-pole	7.3140.02760	Siemens		-F24						
3	Cut-out	5SY6110-7 C10A	1-pole	7.3140.02740	Siemens		-F20,-F22,-F23						
9	Terminal	WKFN 2,5/35		7.3149.01680	Wieland		-X10						
5	PE earth terminal	WKFN 2,5/SL/35		7.3149.02300	Wieland		-X10						
	-X10 USA:												
1	Battery charger	24VDC/35A/UL		7.9117.00200	Waeco		-T3						
1	Fuse socket	AMBUS EASYSWITCH	1-pole	7.3320.00050	Wöhner		-F20,-F21,-F22,-F23						
1	Fuse	ATDR 6	6 A, 600V	7.3161.00340	Gould		-F21						
1	Fuse	ATDR 10	10 A, 600V	7.3161.00300	Gould		-F22						
2	Fuse	ATDR 15	15 A, 600V	7.3161.00310	Gould		-F20,-F23						
16	Terminal	WKFN 2,5/35		7.3149.01680	Wieland		-X10						
5	PE earth terminal	WKFN 2,5/SL/35		7.3149.02300	Wieland		-X10						

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KAESER KOMPRESSOREN

Equipment parts list
MOBILAIR M500-2.2
Heating/Battery charger

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A Stück-zahl Qty.	B Benennung und Verwendung Description and function	C Fabrikatsbezeichnung Typ; notwendige techn. Daten (z.B. Steuerspannung, Frequenz, Einstellbereich); Bestell-Nr.; Hersteller / Identification data Type; basic technical data (e.g. control voltage, frequency, adjustable range); order No.; manufacturer			D Lfd. Nr. Item	E Betriebsmittel-Kennz. nach DIN 40719, Teil 2 / Identifying symbol of device	F Stromlaufplan Planabschnitt / Circuit diagram sheet No.; section No.	G Einbauort / Location	Concerns only the manufacturer: Wst.-Nr. H Schabl. Nr.	I BZ-Pos.	J VA Kz. *)	K Eingangs-vermerk
	Control panel:											
1	Operating unit SCM	CR9022	7.9200.00020	ifm		-K21						
1	Display fuel level		8.6476.0	Wagner		-P9						
1	Rotary control switch	16mm/IP65/2-St.	7.9027.10050	Schlegel		-S10						
3	Illuminated pushbutton	27x27mm / yellow	7.9027.10170	Schlegel		-P22,-P23,-P24						
3	Lamp	T5,5K/24V/1,2W	7.9027.10040	Schlegel		-S22,-S23,-S24						
4	Switching element with Lamp socket block	1S, 1Ö	7.9027.10030	Schlegel		-S10,-S22,-S23,-S24						
1	EMERGENCY STOP	QRUV	7.3217.0	Schlegel		-S1						
1	Switching element	MHT00	7.3218.0	Schlegel		-S1						
3	plug connection 12-pole		7.6589.00500	Börsig		-X24,-X25,-X40						

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KAESER KOMPRESSOREN

Equipment parts list
MOBILAIR M500-2.2
Control panel

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A Stück-zahl Qty.	B Benennung und Verwendung Description and function	C Fabrikatsbezeichnung Typ; notwendige techn. Daten (z.B. Steuerspannung, Frequenz, Einstellbereich); Bestell-Nr.; Hersteller Identification data Type; basic technical data (e.g. control voltage, frequency, adjustable range); order No.; manufacturer			D Lfd. Nr. Item	E Betriebsmittel-Kennz. nach DIN 40719, Teil 2 Identifying symbol of device	F Stromlaufplan Planabschnitt Circuit diagram sheet No.; section No.	G Einbauort Location	Concerns only the manufacturer Wst.-Nr. H Schabl. Nr.	I BZ-Pos.	J VA Kz. *)	K Eingangs-vermerk
	IO extension											
1	bracket Control cabinet		224442.0	Wagner								
1	Control Smart	CR9052	7.9200.11000	ifm		-K25						
1	Connection box	6 Relay/ 10 Fuses	7.9200.01020	ifm								
1	plug connection 6-pole		7.9200.01310	Boersig		-K25N1						
3	plug connection 8-pole		7.9200.01320	Boersig		-K25A,-K25B,-K25C						
2	plug connection 8-pole		7.9200.01330	Boersig		-K25E,-K25F						
1	EMERGENCY STOP	QRUV	7.3217.0	Schlegel		-S2						
1	Switching element	MHT00	7.3218.0	Schlegel		-S2						
1	Resistor	120 Ω	7.5392.00030	Conrad		-R15						
5	Relay	24 VDC/1 W, 10/20 A	8.6544.00010	FTM		-K51,-K52,-K55,						
						-K57.1,-K57.2						
2	Differential pressure switch	55 mbar	7.5429.00030	Mann&Hummel		-B5,-B6						
1	sensor Filter maintenance indication		9.0249.00010	Bosch		-B7						
1	sensor fuel level		7.9201.00010	Bedia		-B37						
1	Level and temperature sensor Hydraulic oil	ITS-65	7.7801.0	Bedia		-B39						
2	Filter maintenance indication		8.1738.0	Parker		-B78,-B79						
1	Temperature sensor		7.9202.40010	Bedia		-B80						
2	Heating	0,4 kW/24 V	7.8750.1	Parker		-E27.1,-E27.2						
1	axial fan	Φ 305 24VDC	5.3938.0	Buhr		-M38						
1	axial fan	Φ 255 24VDC	5.3939.0	Buhr		-M39						
1	Changeover switch fuel internal/external	IFS215	7.9213.0	ifm		-P37						
1	Plug	3+PE	7.9192.0	Börsig		-X55						
1	terminal box	3+PE	7.9192.00010	Börsig		-X55						
1	Protective cap		7.9192.00020	Börsig		-X55						

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a			Released	Fischer C.	
F	Change	Date	Name		

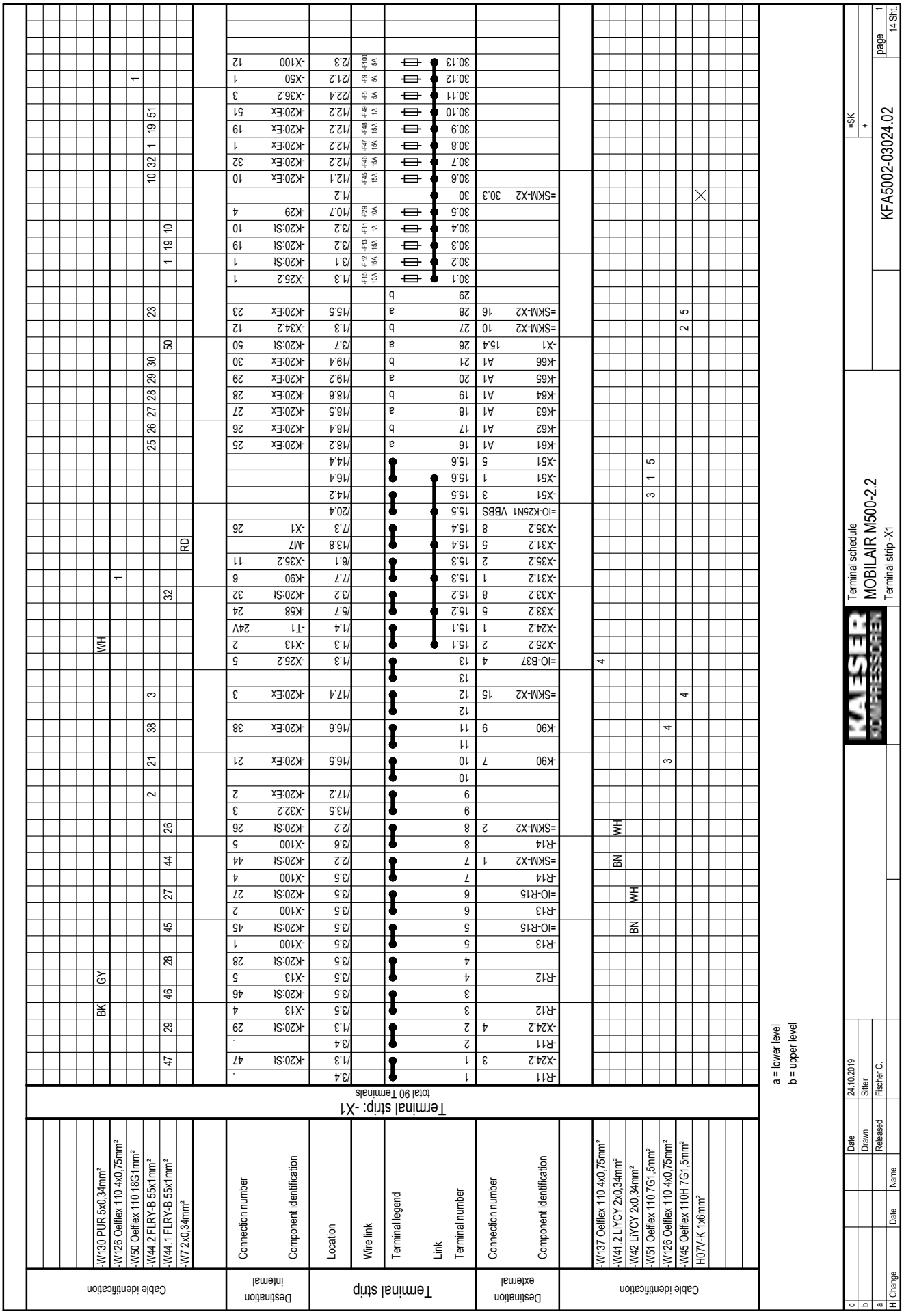
KAESER KOMPRESSOREN

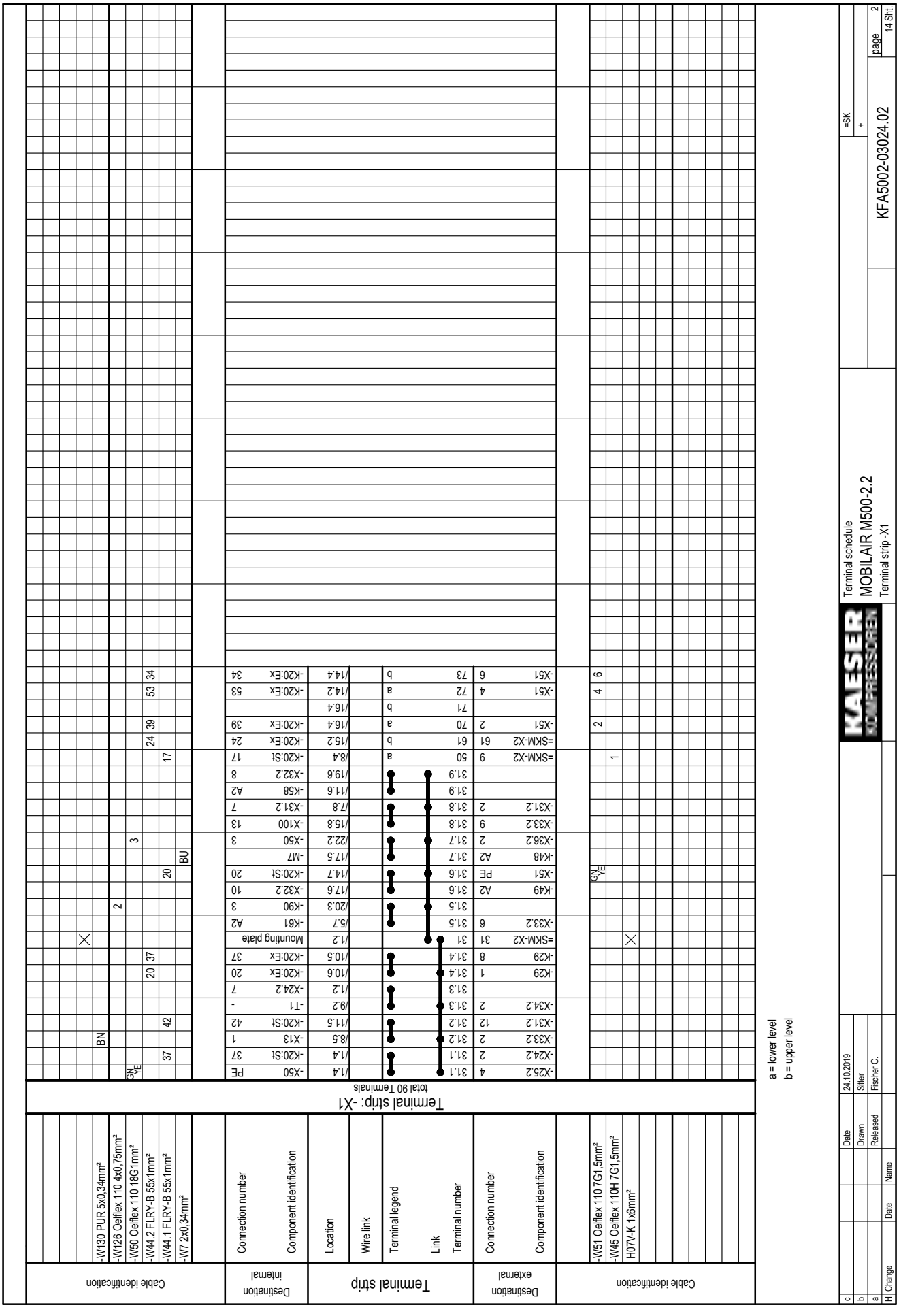
Equipment parts list
MOBILAIR M500-2.2
IO extension

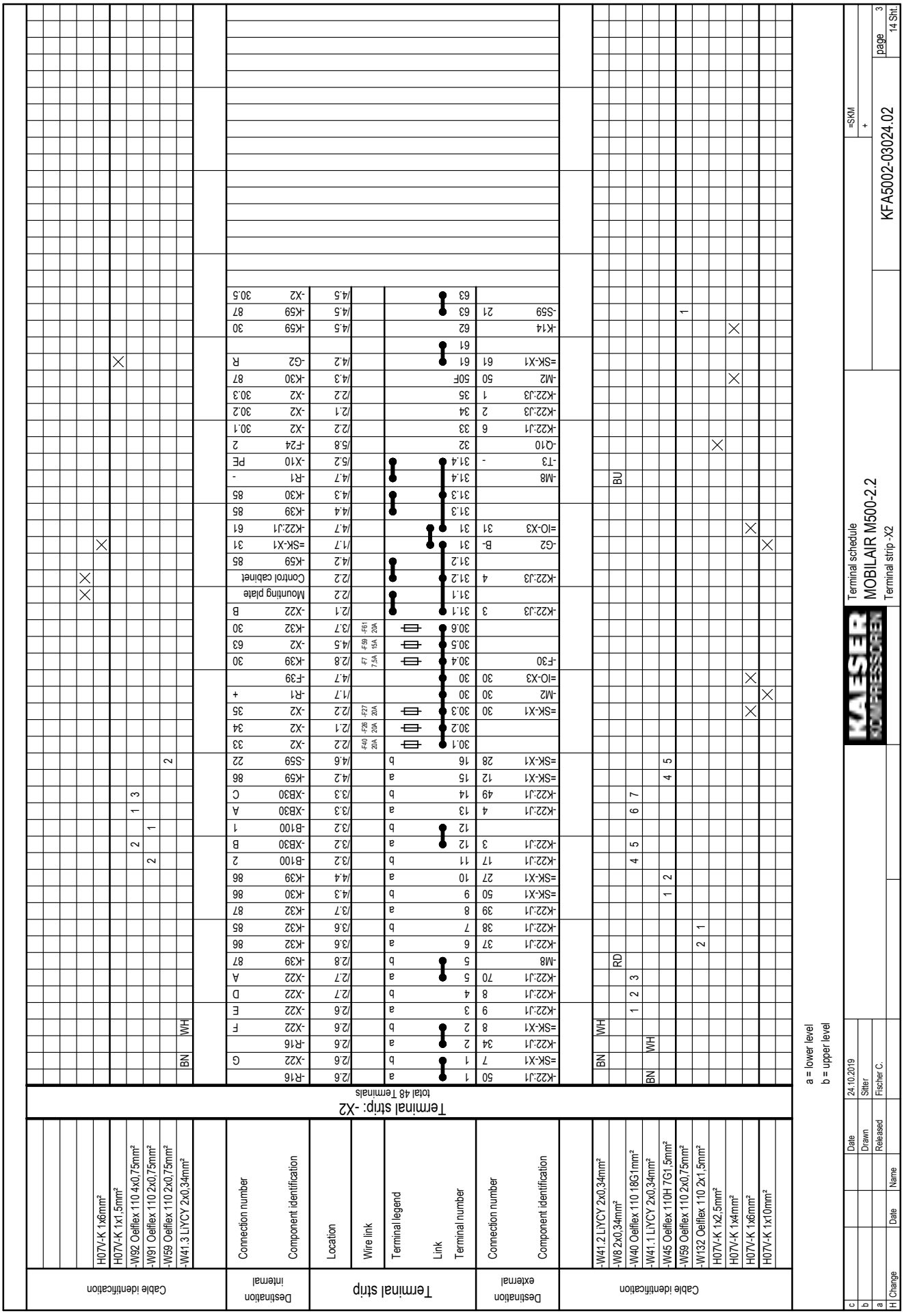
GFA5002-03024.02

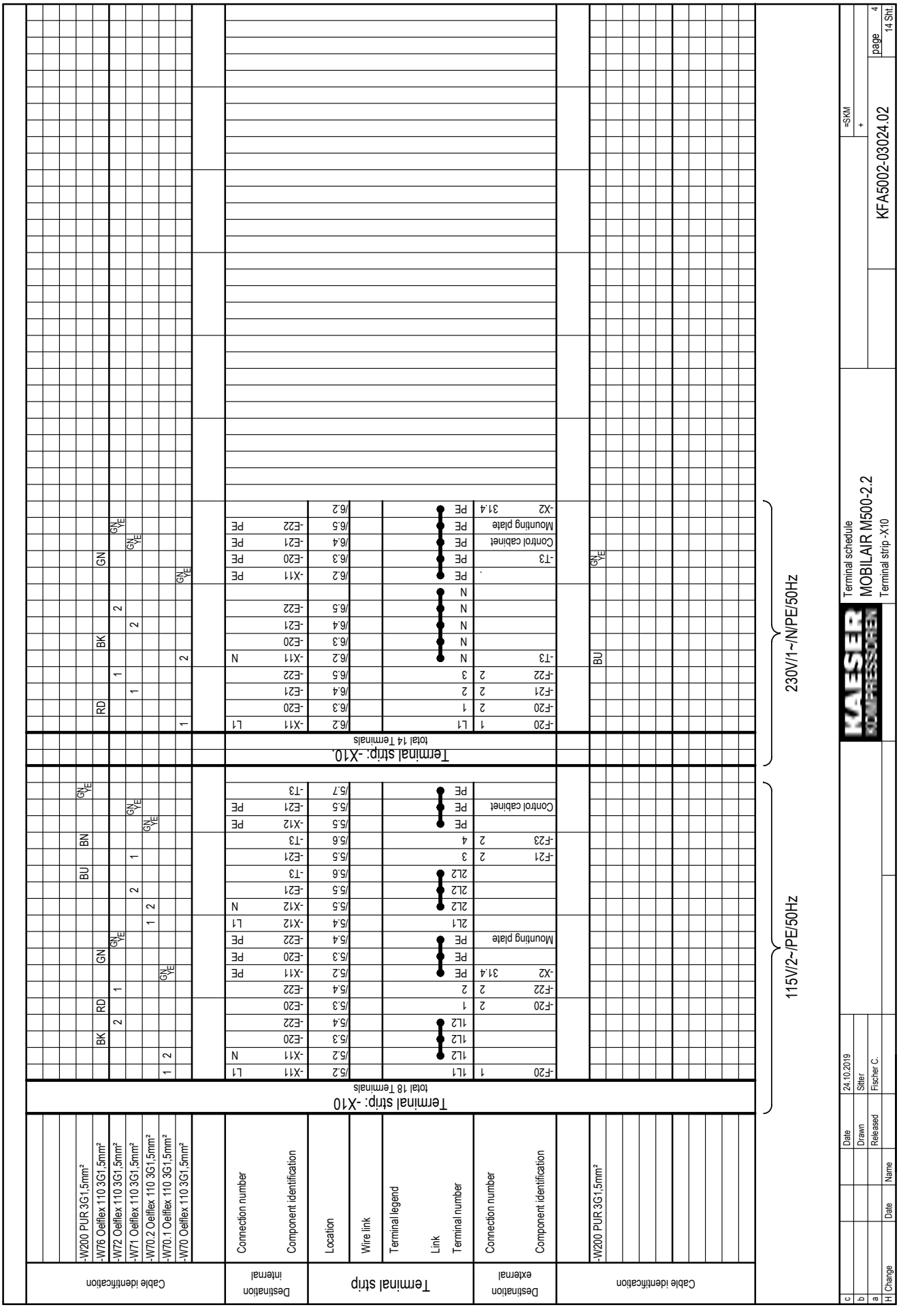
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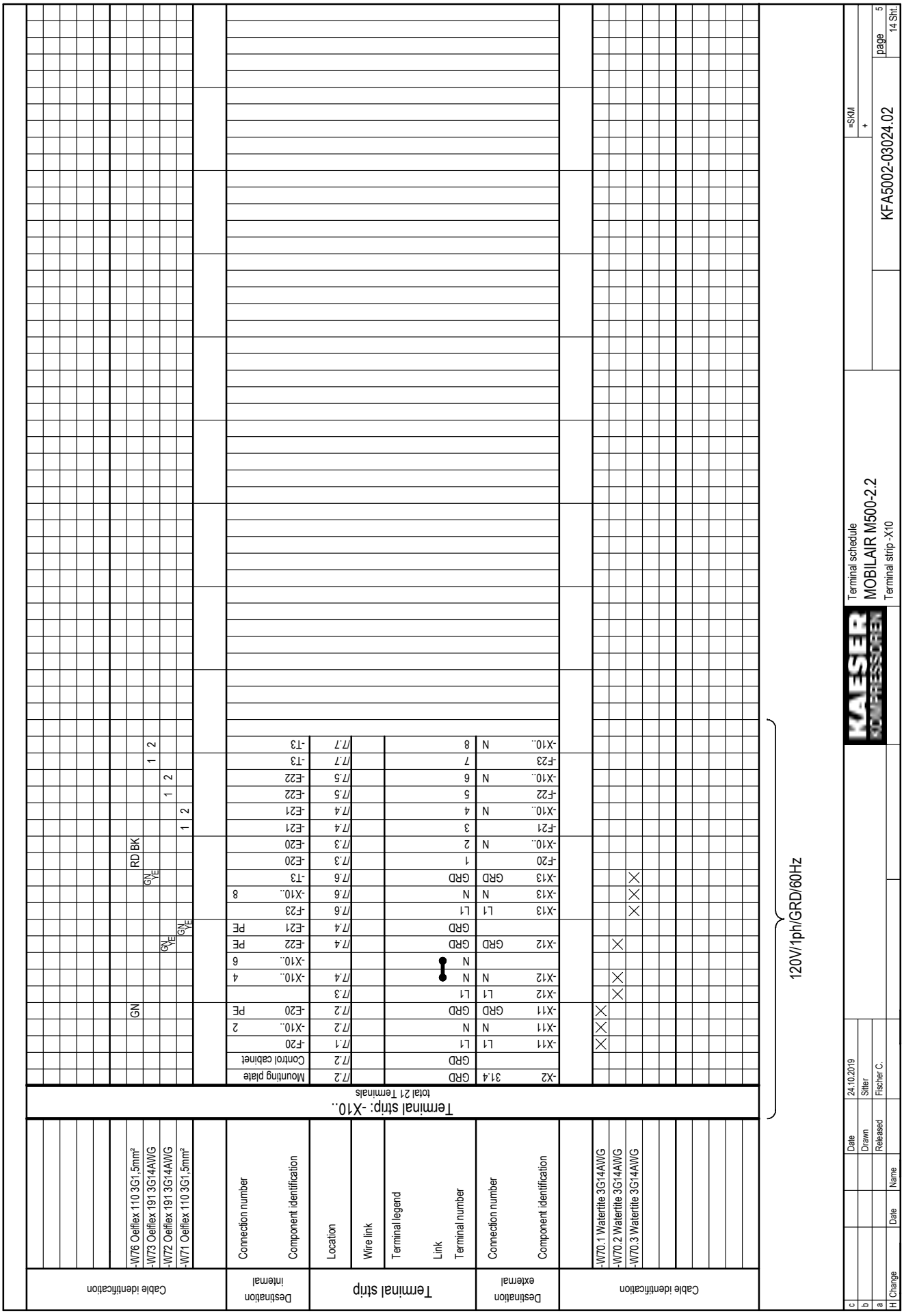
page 5
5 Sht.

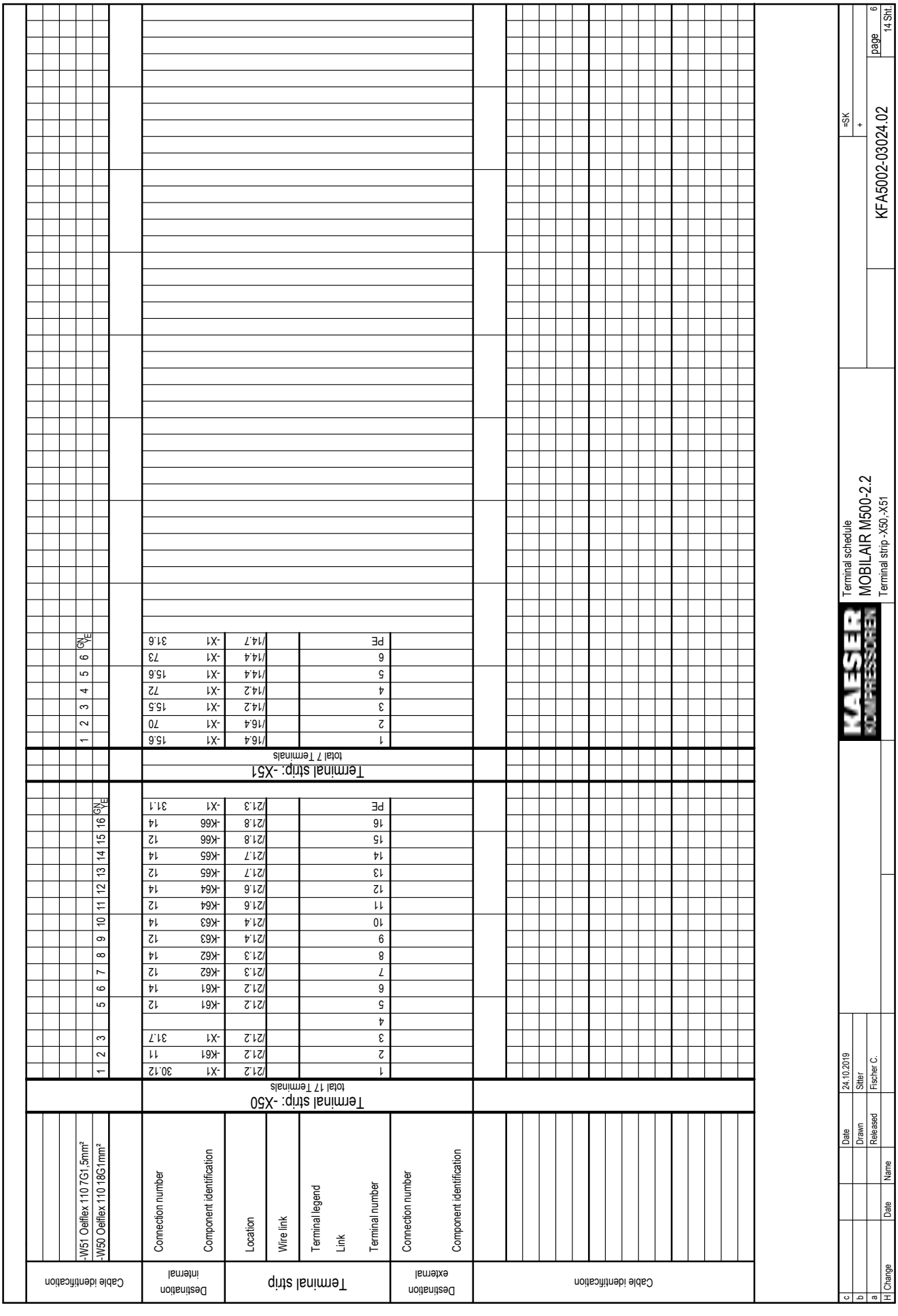

Terminal strip: -X1
total 90 Terminals
Cable identification
Destination internal
Terminal strip
Destination external
Cable identification
-W130 PUR 5x0,34mm²
-W126 Oelflex 110 4x0,75mm²
-W50 Oelflex 110 18G1mm²
-W44.2 FLRY-B 55x1mm²
-W44.1 FLRY-B 55x1mm²
-W7 2x0,34mm²
Connection number
Component identification
Location
Wire link
Terminal legend
Link
Terminal number
Connection number
Component identification
-W137 Oelflex 110 4x0,75mm²
-W41.2 LiYCY 2x0,34mm²
-W42 LiYCY 2x0,34mm²
-W51 Oelflex 110 7G1,5mm²
-W126 Oelflex 110 4x0,75mm²
-W45 Oelflex 110H 7G1,5mm²
H07V-K 1x6mm²
a = lower level
b = upper level
Terminal schedule
MOBILAIR M500-2.2
Terminal strip - X1
KFA5002-03024.02
=SK
page 1
14 Sht.
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Change

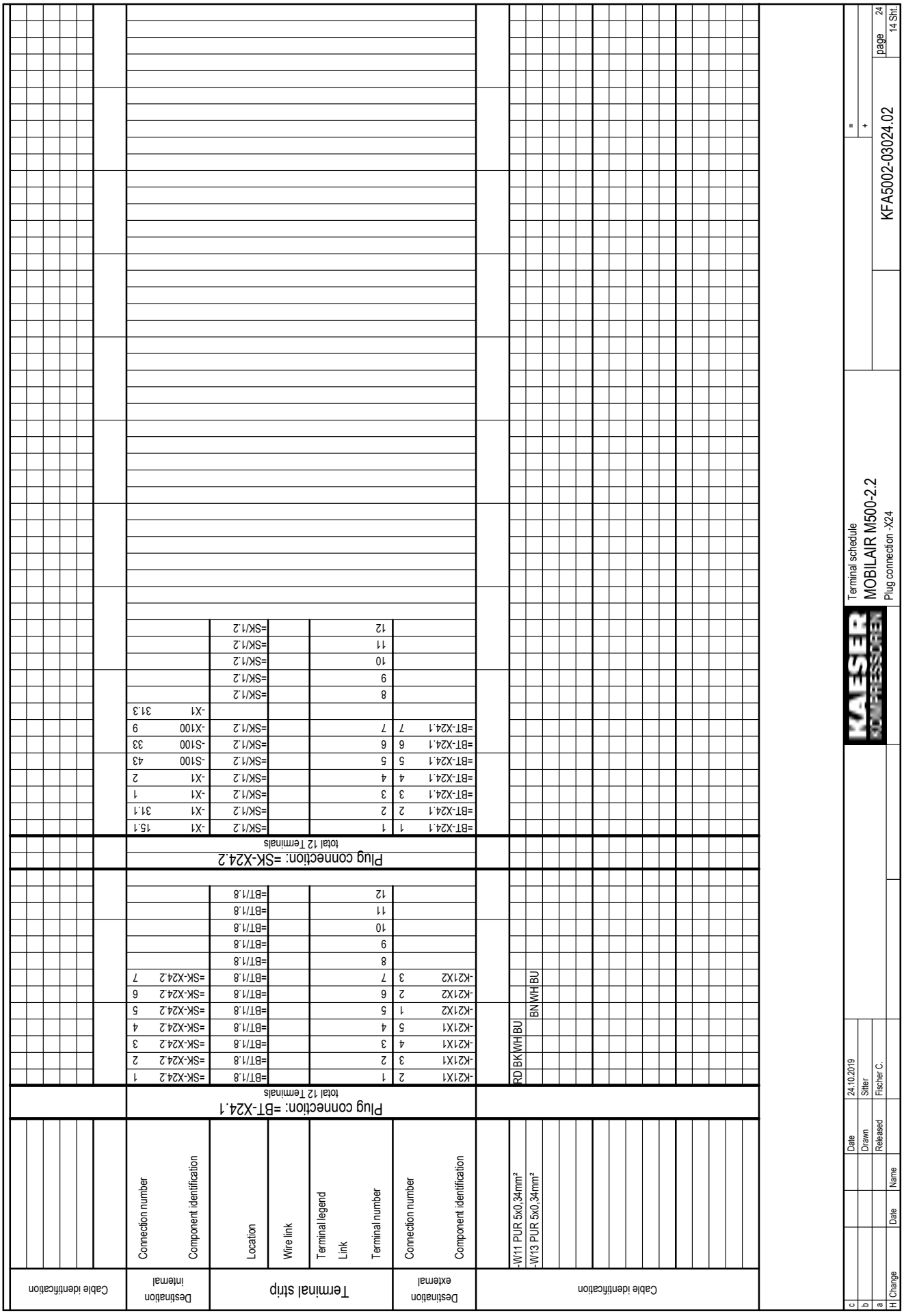

Terminal strip: -X1
total 90 Terminals
Cable identification
Destination internal
Terminal strip
Destination external
Cable identification
Connection number
Component identification
Location
Wire link
Terminal legend
Link
Terminal number
Connection number
Component identification
-W130 PUR 5x0,34mm²
-W126 Oelflex 110 4x0,75mm²
-W50 Oelflex 110 18G1mm²
-W44.2 FLRY-B 55x1mm²
-W44.1 FLRY-B 55x1mm²
-W7 2x0,34mm²
-W51 Oelflex 110 7G1,5mm²
-W45 Oelflex 110H 7G1,5mm²
H07V-K 1x6mm²
a = lower level
b = upper level
Terminal schedule
MOBILAIR M500-2.2
Terminal strip - X1
KFA5002-03024.02
=SK
page 2
14 Sht.
Date
Drawn
Released
Name
24.10.2019
Sitter
Fischer C.
Change

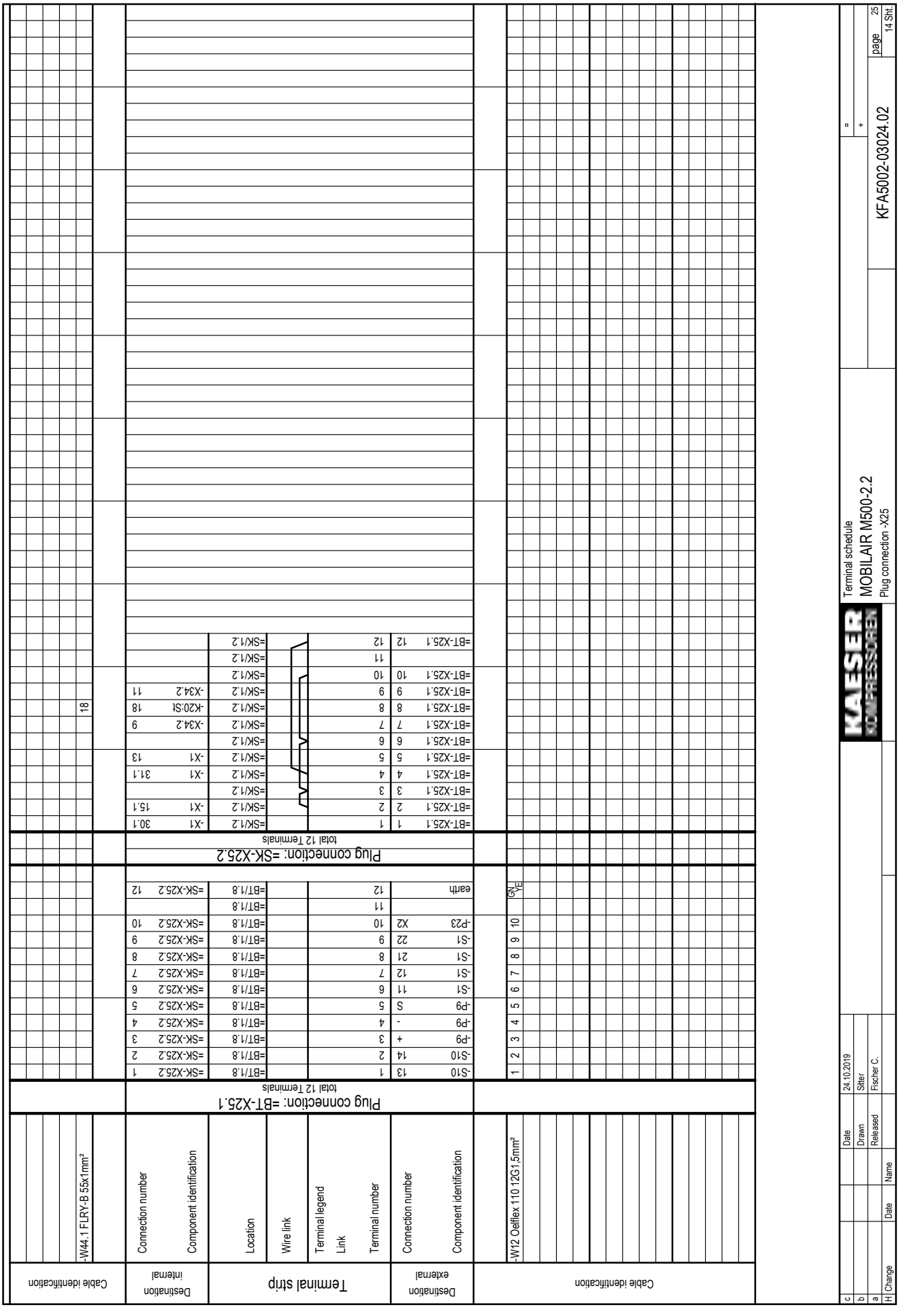

Terminal strip: -X2
total 48 Terminals
Destination external
Cable identification
Terminal strip
Destination internal
Cable identification
Connection number
Component identification
Location
Wire link
Terminal legend
Link
Terminal number
Connection number
Component identification
-W41.2 LiYCY 2x0,34mm²
-W8 2x0,34mm²
-W40 Oelflex 110 18G1mm²
-W41.1 LiYCY 2x0,34mm²
-W45 Oelflex 110H 7G1,5mm²
-W59 Oelflex 110 2x0,75mm²
-W132 Oelflex 110 2x1,5mm²
H07V-K 1x2,5mm²
H07V-K 1x4mm²
H07V-K 1x6mm²
H07V-K 1x10mm²
H07V-K 1x6mm²
H07V-K 1x1,5mm²
-W92 Oelflex 110 4x0,75mm²
-W91 Oelflex 110 2x0,75mm²
-W59 Oelflex 110 2x0,75mm²
-W41.3 LiYCY 2x0,34mm²
a = lower level
b = upper level
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
H Change
Terminal schedule
MOBILAIR M500-2.2
Terminal strip - X2
KFA5002-03024.02
=SKM
+
page 3
14 Sht.

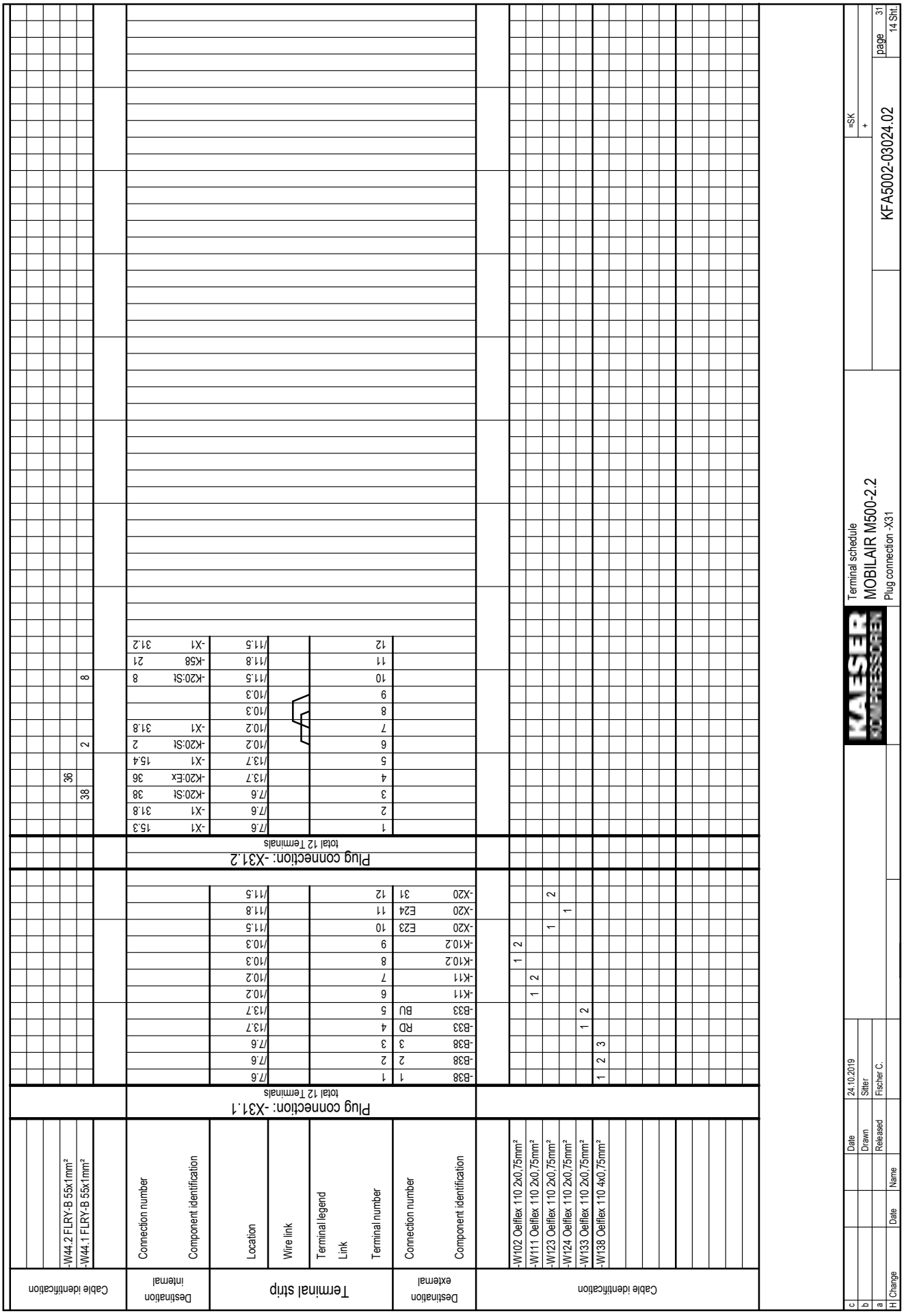

Terminal schedule
MOBILAIR M500-2.2
Terminal strip - X10
KFA5002-03024.02
page 4
14 Sht.
=SKM
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
Change
Cable identification
Destination external
Terminal strip
Destination internal
Cable identification
-W200 PUR 3G1,5mm²
-W76 Oelflex 110 3G1,5mm²
-W72 Oelflex 110 3G1,5mm²
-W71 Oelflex 110 3G1,5mm²
-W70.2 Oelflex 110 3G1,5mm²
-W70.1 Oelflex 110 3G1,5mm²
-W70 Oelflex 110 3G1,5mm²
Component identification
Connection number
Location
Wire link
Terminal legend
Link
Terminal number
Terminal strip: -X10
total 18 Terminals
Terminal strip: -X10.
total 14 Terminals
115V/2~/PE/50Hz
230V/1~/N/PE/50Hz

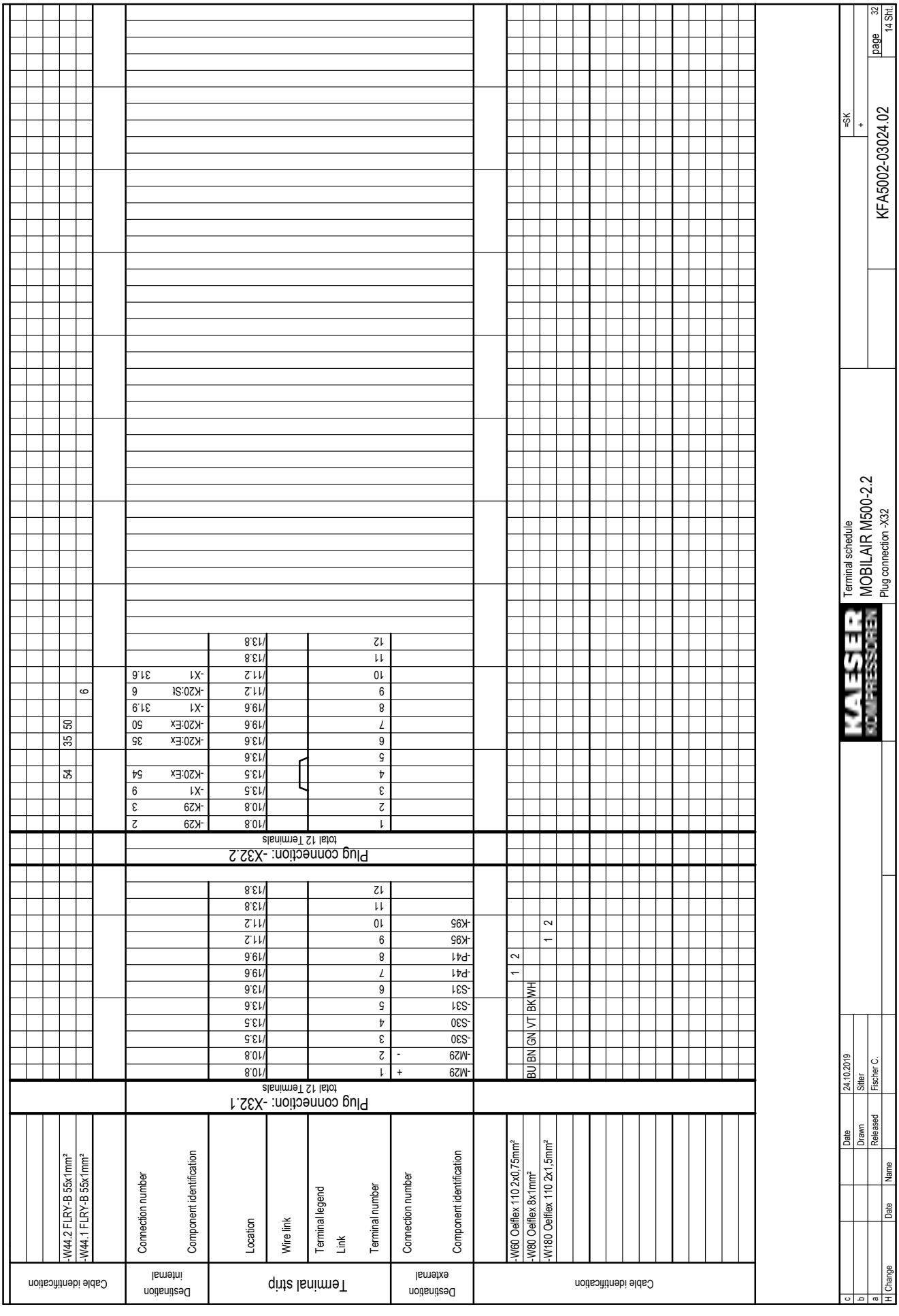

Terminal strip: -X10..
total 21 Terminals
120V/1ph/GRD/60Hz
Cable identification
Destination external
Terminal strip
Destination internal
Cable identification
-W70.1 Waterlite 3G14AWG
-W70.2 Waterlite 3G14AWG
-W70.3 Waterlite 3G14AWG
Component identification
Connection number
Terminal number
Link
Terminal legend
Wire link
Location
Component identification
Connection number
-W76 Oeflex 110 3G1,5mm²
-W73 Oeflex 191 3G14AWG
-W72 Oeflex 191 3G14AWG
-W71 Oeflex 110 3G1,5mm²
Mounting plate
Control cabinet
Date
Drawn
Released
Name
24.10.2019
Sitter
Fischer C.
H Change
Terminal schedule
MOBILAIR M500-2.2
Terminal strip - X10
=SKM
KFA5002-03024.02
page 5
14 Sht.

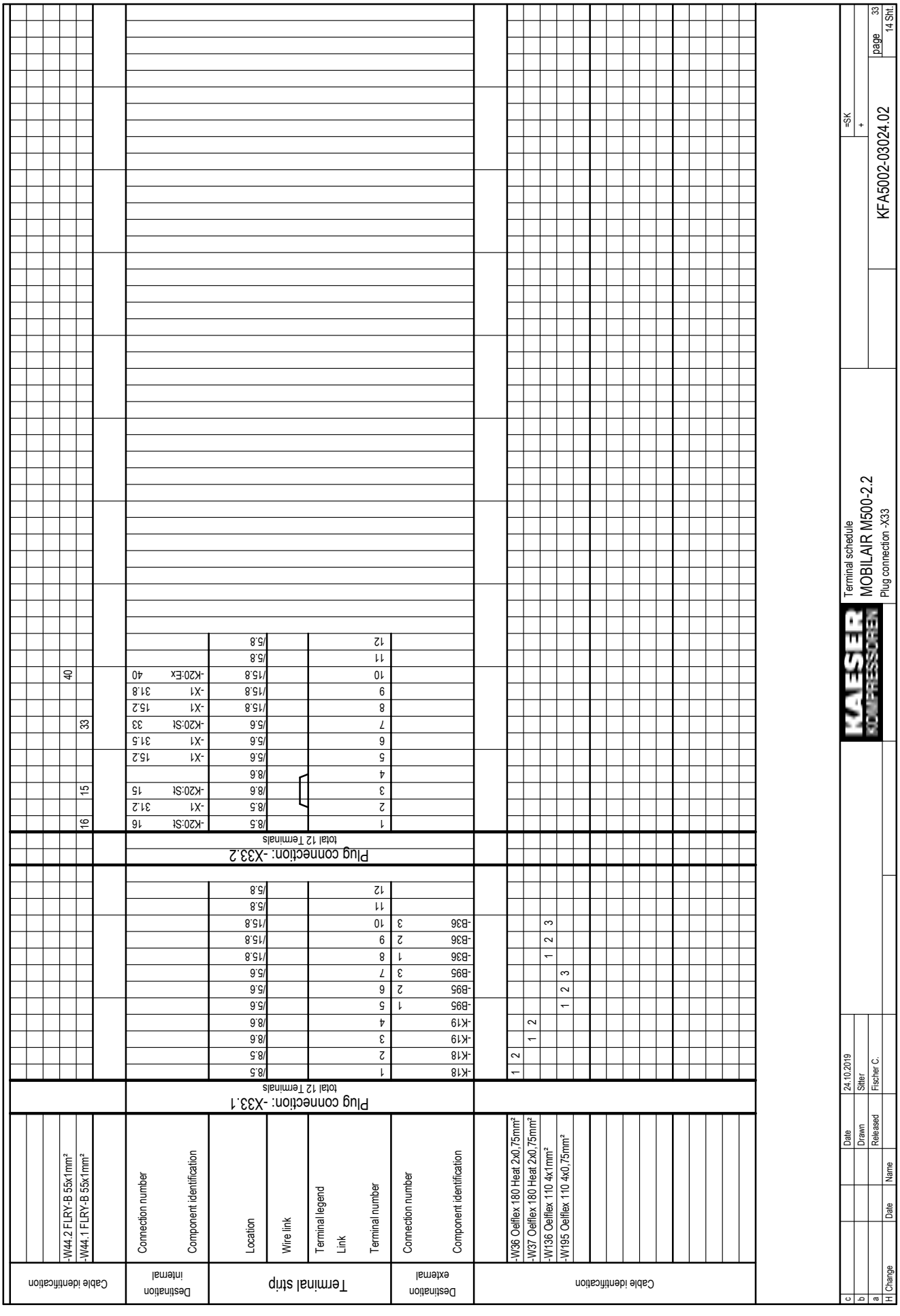

Terminal schedule
MOBILAIR M500-2.2
Terminal strip - X50, -X51
KFA5002-03024.02
page 6
14 Sht.
=SK
+
Terminal strip: -X50
total 17 Terminals
Terminal strip: -X51
total 7 Terminals
Destination external
Destination internal
Terminal strip
Cable identification
Component identification
Connection number
Terminal number
Link
Terminal legend
Wire link
Location
-W51 Oelflex 110 7G1,5mm²
-W50 Oelflex 110 18G1mm²
Drawn
Released
Sitter
Fischer C.
24.10.2019
Name
Date
Change

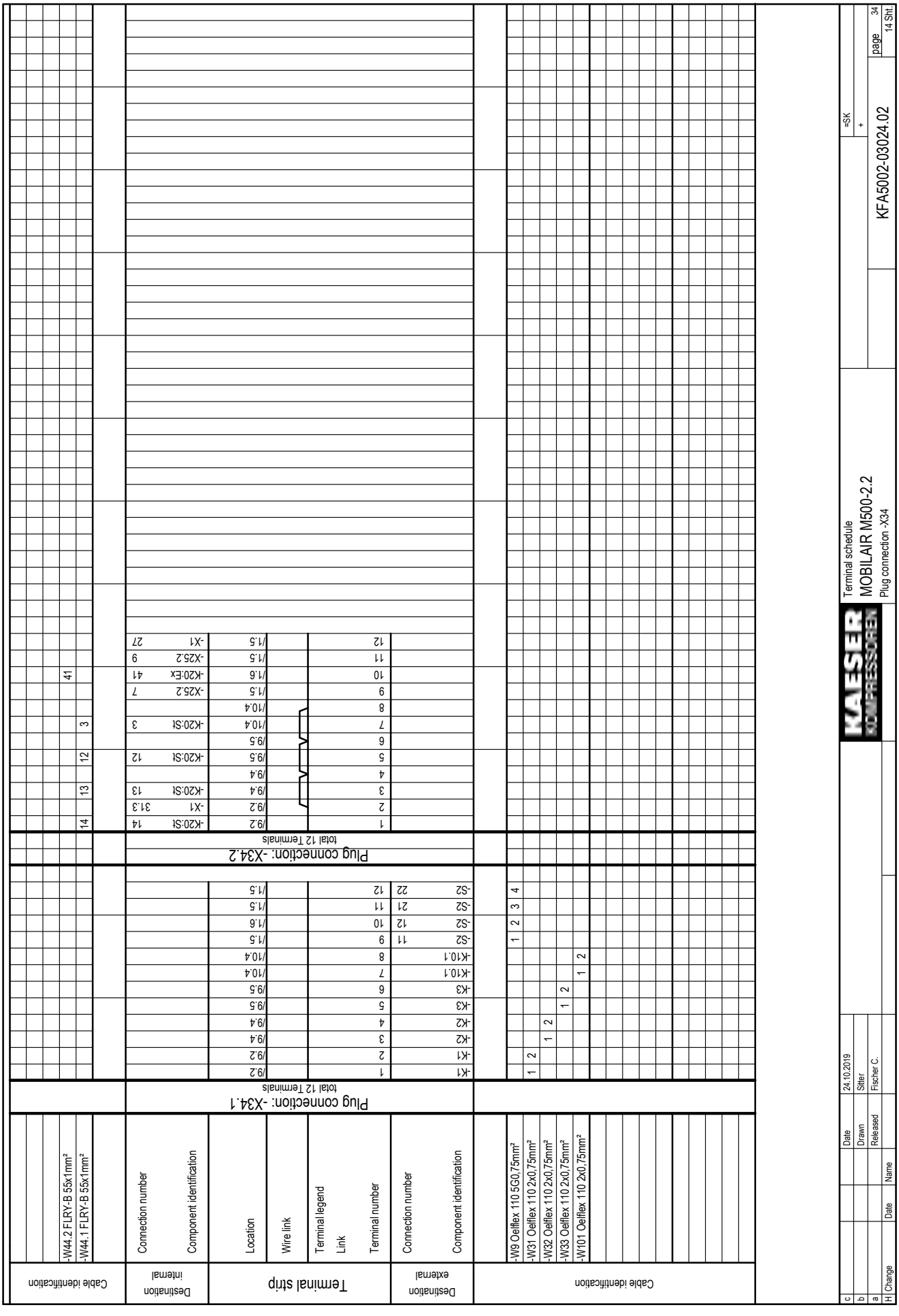

Terminal schedule
MOBILAIR M500-2.2
Plug connection -X24
KFA5002-03024.02
page 24
14 Sht.
Cable identification
Destination external
Terminal strip
Destination internal
Cable identification
Component identification
Connection number
Terminal number
Link
Terminal legend
Wire link
Location
Component identification
Connection number
Plug connection: =BT-X24.1
total 12 Terminals
Plug connection: =SK-X24.2
total 12 Terminals
-W11 PUR 5x0,34mm²
-W13 PUR 5x0,34mm²
RD BK WH BU
BN WH BU
Date
Drawn
Released
24.10.2019
Sitter
Fischer C.
Name
Date
H Change
a
b
c

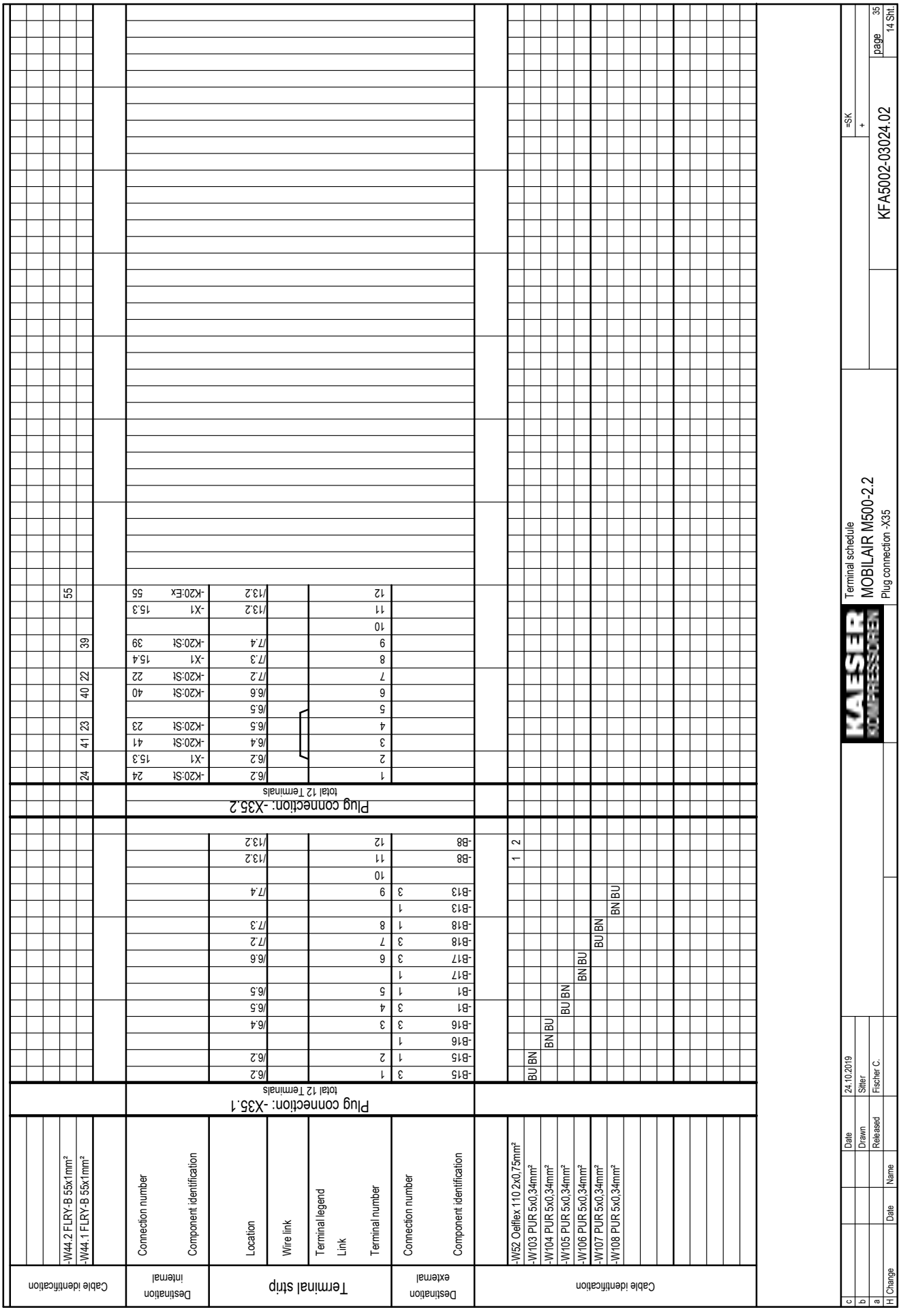

Terminal schedule
MOBILAIR M500-2.2
Plug connection -X25
KFA5002-03024.02
page 25
14 Sht.
Terminal strip
Destination external
Destination internal
Cable identification
Plug connection: =BT-X25.1
total 12 Terminals
Plug connection: =SK-X25.2
total 12 Terminals
-W12 Oelflex 110 12G1,5mm²
-W44.1 FLRY-B 55x1mm²
Component identification
Connection number
Terminal number
Link
Terminal legend
Wire link
Location
Date
Name
Drawn
Released
24.10.2019
Sitter
Fischer C.
Change

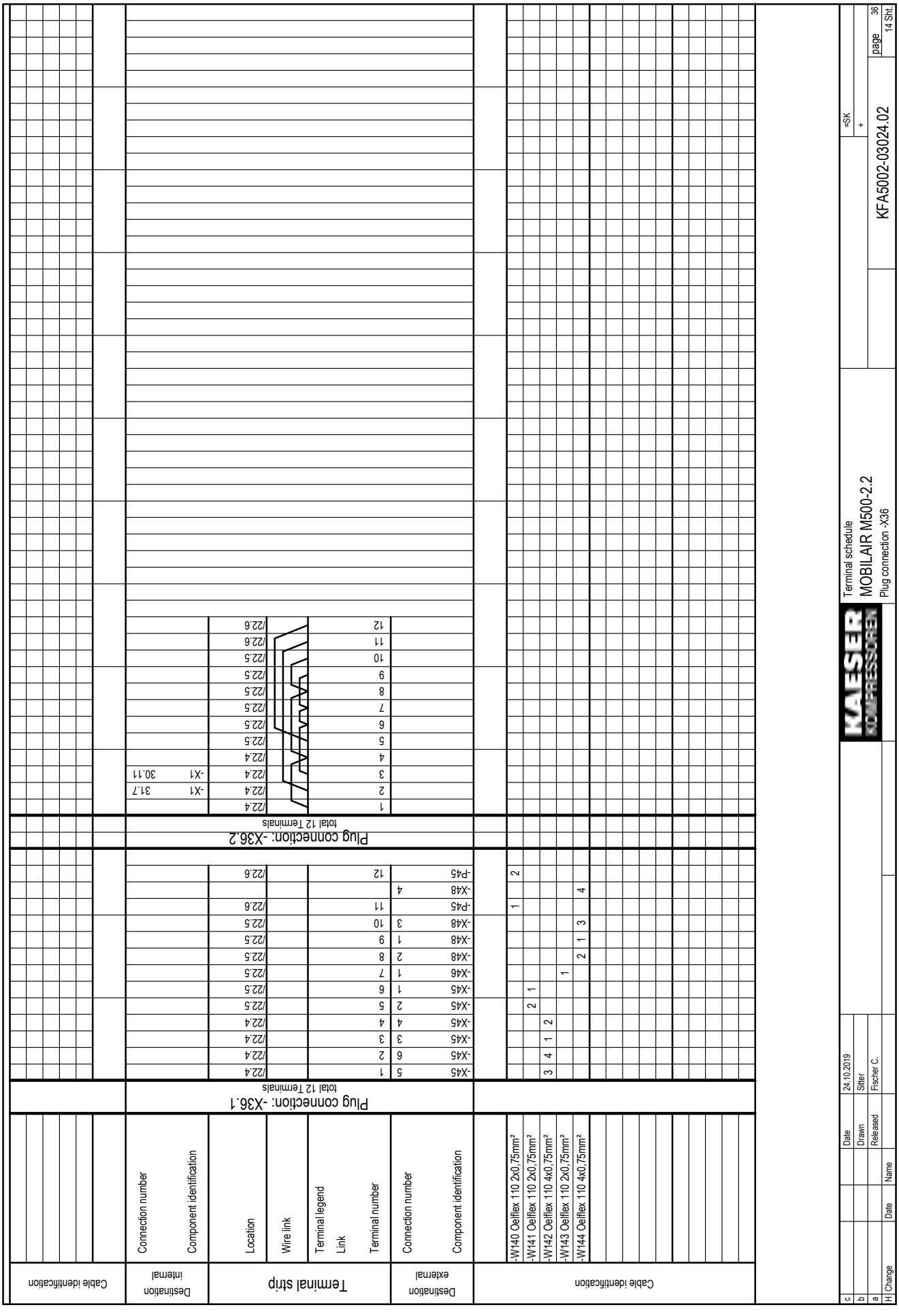

Terminal schedule
MOBILAIR M500-2.2
Plug connection -X31
KFA5002-03024.02
page 31
14 Sht.
=SK
+
Date
Drawn
Released
24.10.2019
Sitter
Fischer C.
Name
Date
Change
Cable identification
Destination external
Terminal strip
Destination internal
Cable identification
Plug connection: -X31.1
total 12 Terminals
Plug connection: -X31.2
total 12 Terminals
-W44.2 FLRY-B 55x1mm²
-W44.1 FLRY-B 55x1mm²
Component identification
Connection number
Terminal number
Link
Terminal legend
Wire link
Location
-W102 Oelflex 110 2x0,75mm²
-W111 Oelflex 110 2x0,75mm²
-W123 Oelflex 110 2x0,75mm²
-W124 Oelflex 110 2x0,75mm²
-W133 Oelflex 110 2x0,75mm²
-W138 Oelflex 110 4x0,75mm²
-B38
-B33
-K11
-K10.2
-X20
-K20:St
-K20:Ex
-K58
-X1
/7.6
/13.7
/11.2
/10.2
/10.3
/11.5
/11.8
E23
E24
RD
BU

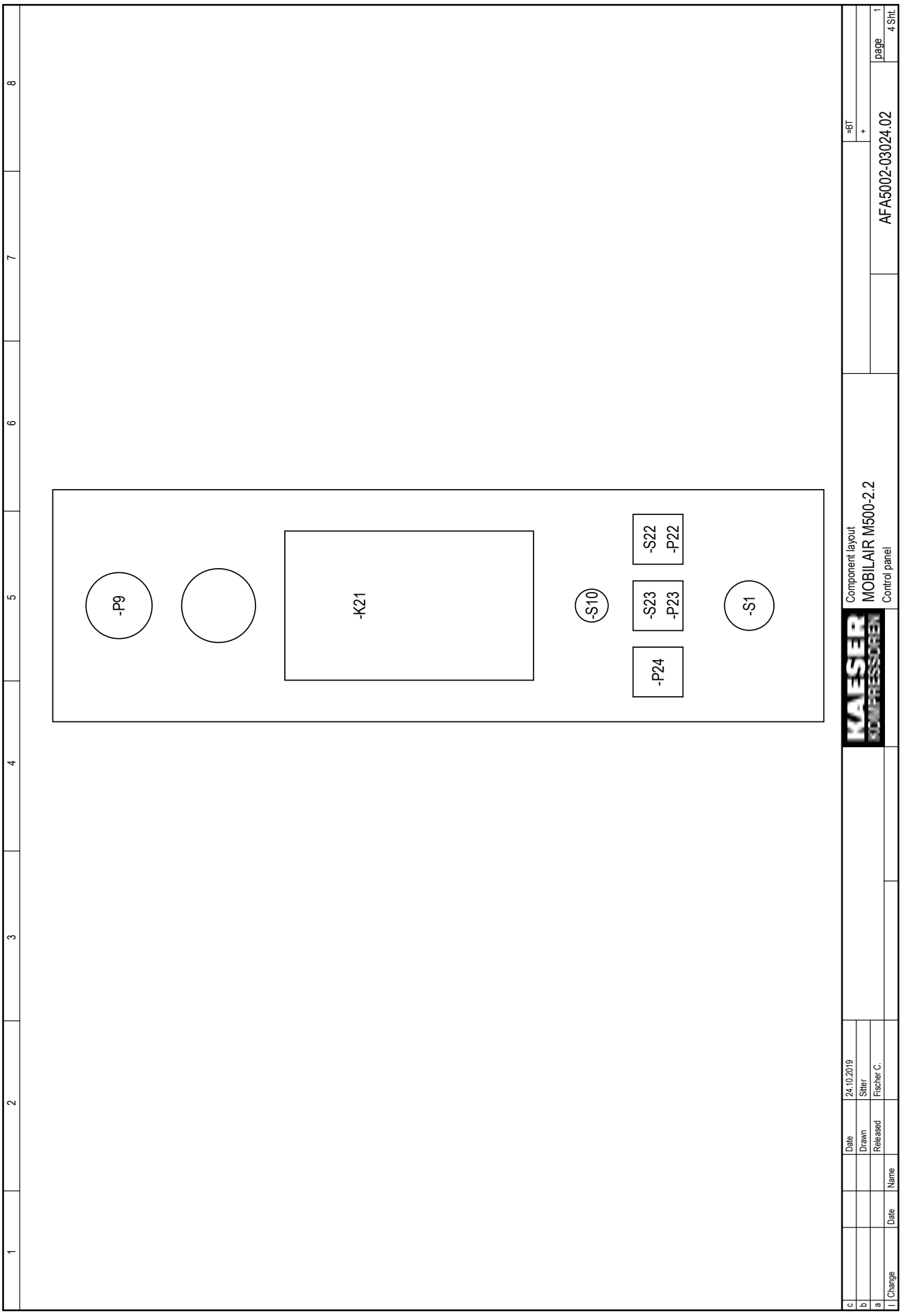

Terminal schedule
MOBILAIR M500-2.2
Plug connection -X32
KFA5002-03024.02
page 32
14 Sht.
=SK
+
Date
Drawn
Released
24.10.2019
Sitter
Fischer C.
Name
Change
Cable identification
Destination external
Terminal strip
Destination internal
Cable identification
Component identification
Connection number
Terminal number
Link
Terminal legend
Wire link
Location
Plug connection: -X32.1
total 12 Terminals
-M29 + 1 /10.8
-M29 - 2 /10.8
-S30 3 /13.5
-S30 4 /13.5
-S31 5 /13.6
-S31 6 /13.6
-P41 7 /19.6
-P41 8 /19.6
-K95 9 /11.2
-K95 10 /11.2
11 /13.8
12 /13.8
Plug connection: -X32.2
total 12 Terminals
1 /10.8 -K29 2
2 /10.8 -K29 3
3 /13.5 -X1 9
4 /13.5 -K20:Ex 54
5 /13.6
6 /13.6 -K20:Ex 35
7 /19.6 -K20:Ex 50
8 /19.6 -X1 31.9
9 /11.2 -K20:Sl 6
10 /11.2 -X1 31.6
11 /13.8
12 /13.8
-W60 Oelflex 110 2x0,75mm²
-W80 Oelflex 8x1mm²
-W180 Oelflex 110 2x1,5mm²
BU BN GN VT BK WH
1 2
1 2
-W44.2 FLRY-B 55x1mm²
-W44.1 FLRY-B 55x1mm²
54 35 50 9

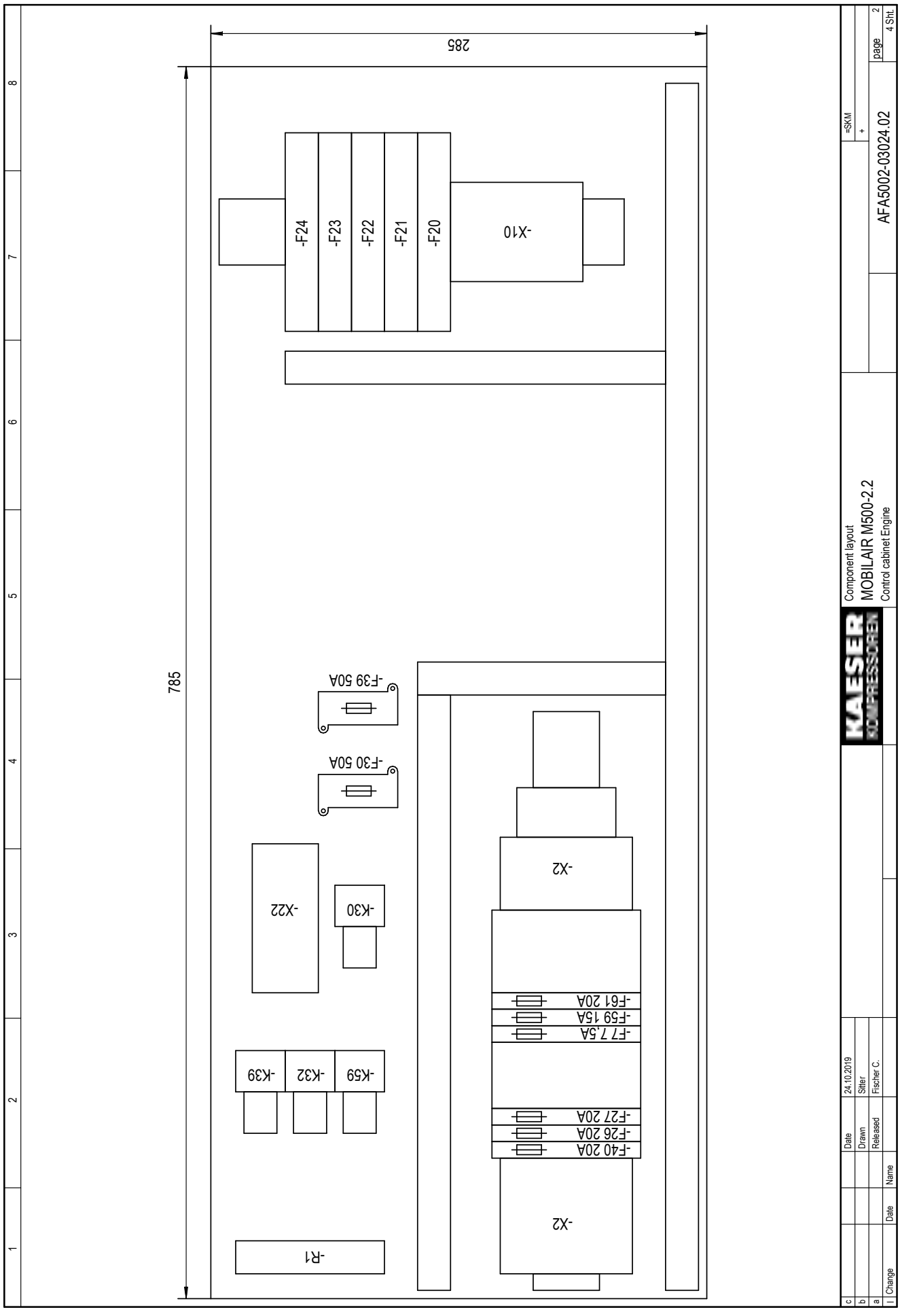

Terminal schedule
MOBILAIR M500-2.2
Plug connection -X33
KFA5002-03024.02
page 33
14 Sht.
=SK
+
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
H Change
Cable identification
Destination external
Terminal strip
Destination internal
Cable identification
-W36 Oelflex 180 Heat 2x0,75mm²
-W37 Oelflex 180 Heat 2x0,75mm²
-W136 Oelflex 110 4x1mm²
-W195 Oelflex 110 4x0,75mm²
Component identification
Connection number
Terminal number
Link
Terminal legend
Wire link
Location
Component identification
Connection number
-W44.1 FLRY-B 55x1mm²
-W44.2 FLRY-B 55x1mm²
Plug connection: -X33.1
total 12 Terminals
Plug connection: -X33.2
total 12 Terminals

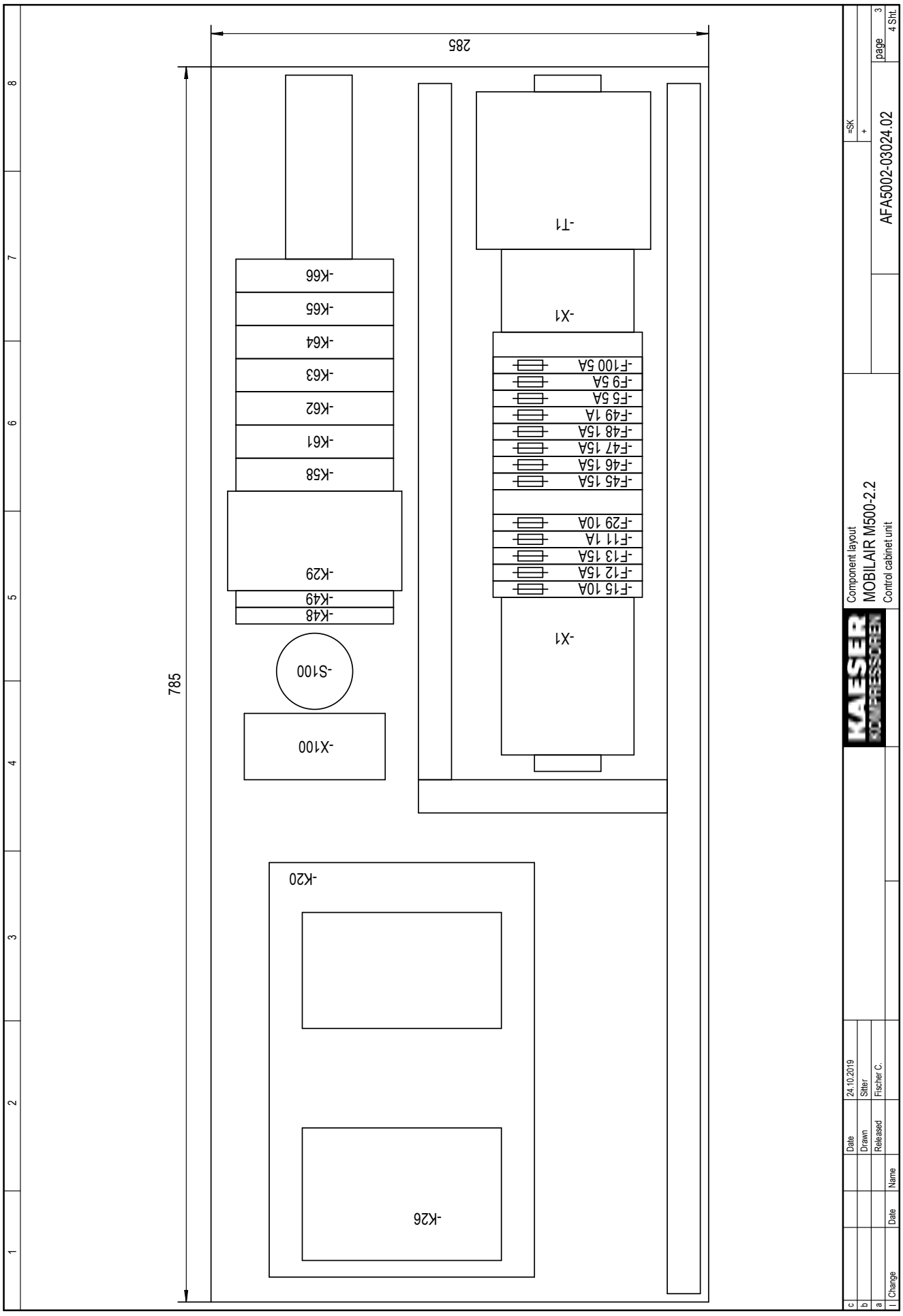

Terminal schedule
MOBILAIR M500-2.2
Plug connection -X34
KFA5002-03024.02
page 34
14 Sht.
=SK
+
Date
Drawn
Released
24.10.2019
Sitter
Fischer C.
Name
Change
Cable identification
Destination external
Terminal strip
Destination internal
Cable identification
Component identification
Connection number
Terminal number
Link
Terminal legend
Wire link
Location
Plug connection: -X34.1
total 12 Terminals
Plug connection: -X34.2
total 12 Terminals
-W9 Oelflex 110 5G0,75mm²
-W31 Oelflex 110 2x0,75mm²
-W32 Oelflex 110 2x0,75mm²
-W33 Oelflex 110 2x0,75mm²
-W101 Oelflex 110 2x0,75mm²
-K1
-K2
-K3
-K10.1
-S2
-K20:Sl
-X1
-X25.2
-K20:Ex
-W44.1 FLRY-B 55x1mm²
-W44.2 FLRY-B 55x1mm²

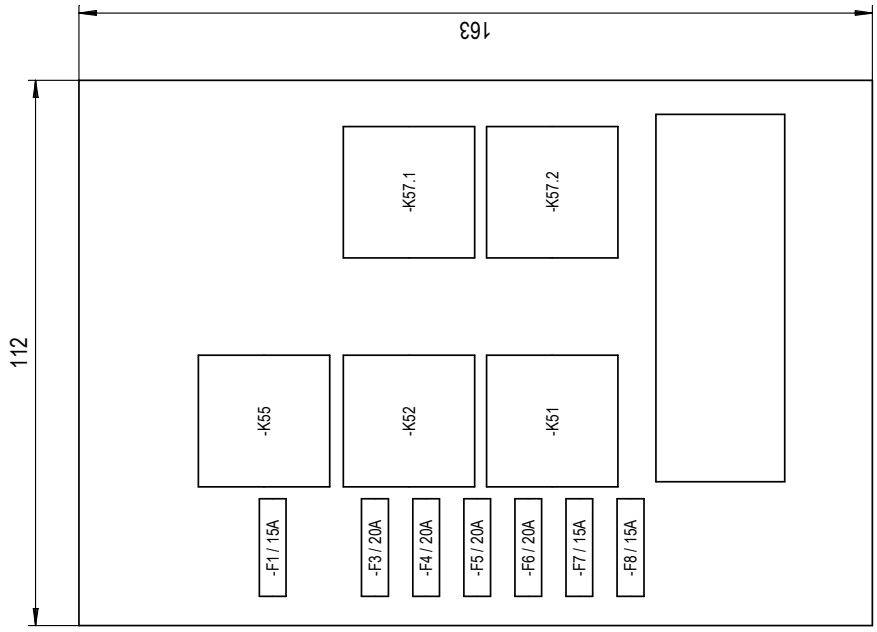

Terminal schedule
MOBILAIR M500-2.2
Plug connection -X35
KFA5002-03024.02
page 35
14 Sht.
=SK
+
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
H Change
Cable identification
Destination external
Terminal strip
Destination internal
Cable identification
-W52 Oelflex 110 2x0,75mm²
-W103 PUR 5x0,34mm²
-W104 PUR 5x0,34mm²
-W105 PUR 5x0,34mm²
-W106 PUR 5x0,34mm²
-W107 PUR 5x0,34mm²
-W108 PUR 5x0,34mm²
Component identification
Connection number
Terminal number
Link
Terminal legend
Wire link
Location
Component identification
Connection number
-W44.1 FLRY-B 55x1mm²
-W44.2 FLRY-B 55x1mm²
Plug connection: -X35.1
total 12 Terminals
Plug connection: -X35.2
total 12 Terminals


Cable identification
Destination external
Terminal strip
Destination internal
Cable identification
Component identification
Connection number
Location
Wire link
Terminal legend
Link
Terminal number
Component identification
Connection number
Date
Name
Change
Drawn
Released
24.10.2019
Sitter
Fischer C.
Terminal schedule
MOBILAIR M500-2.2
Plug connection -X36
KFA5002-03024.02
=SK
+
page 36
14 Sht.
Plug connection: -X36.1
total 12 Terminals
Plug connection: -X36.2
total 12 Terminals
-W140 Oelflex 110 2x0,75mm²
-W141 Oelflex 110 2x0,75mm²
-W142 Oelflex 110 4x0,75mm²
-W143 Oelflex 110 2x0,75mm²
-W144 Oelflex 110 4x0,75mm²


-P9
-K21
-S10
-S22
-P22
-S23
-P23
-P24
-S1
Component layout
MOBILAIR M500-2.2
Control panel
AFA5002-03024.02
page 1
4 Sht.
=BT
+
Date
Drawn
Released
24.10.2019
Stiter
Fischer C.
Change
Date
Name


285
785
-F24
-F23
-F22
-F21
-F20
-X10
-F39 50A
-F30 50A
-X22
-K30
-X2
-F61 20A
-F59 15A
-F7 7,5A
-K59
-K32
-K39
-F27 20A
-F26 20A
-F40 20A
-X2
-R1
=SKM
+
AFA5002-03024.02
page 2
4 Sht.
Component layout
MOBILAIR M500-2.2
Control cabinet Engine
KAESER KOMPRESSOREN
Date
Drawn
Released
Name
24.10.2019
Sitter
Fischer C.
Change
Date

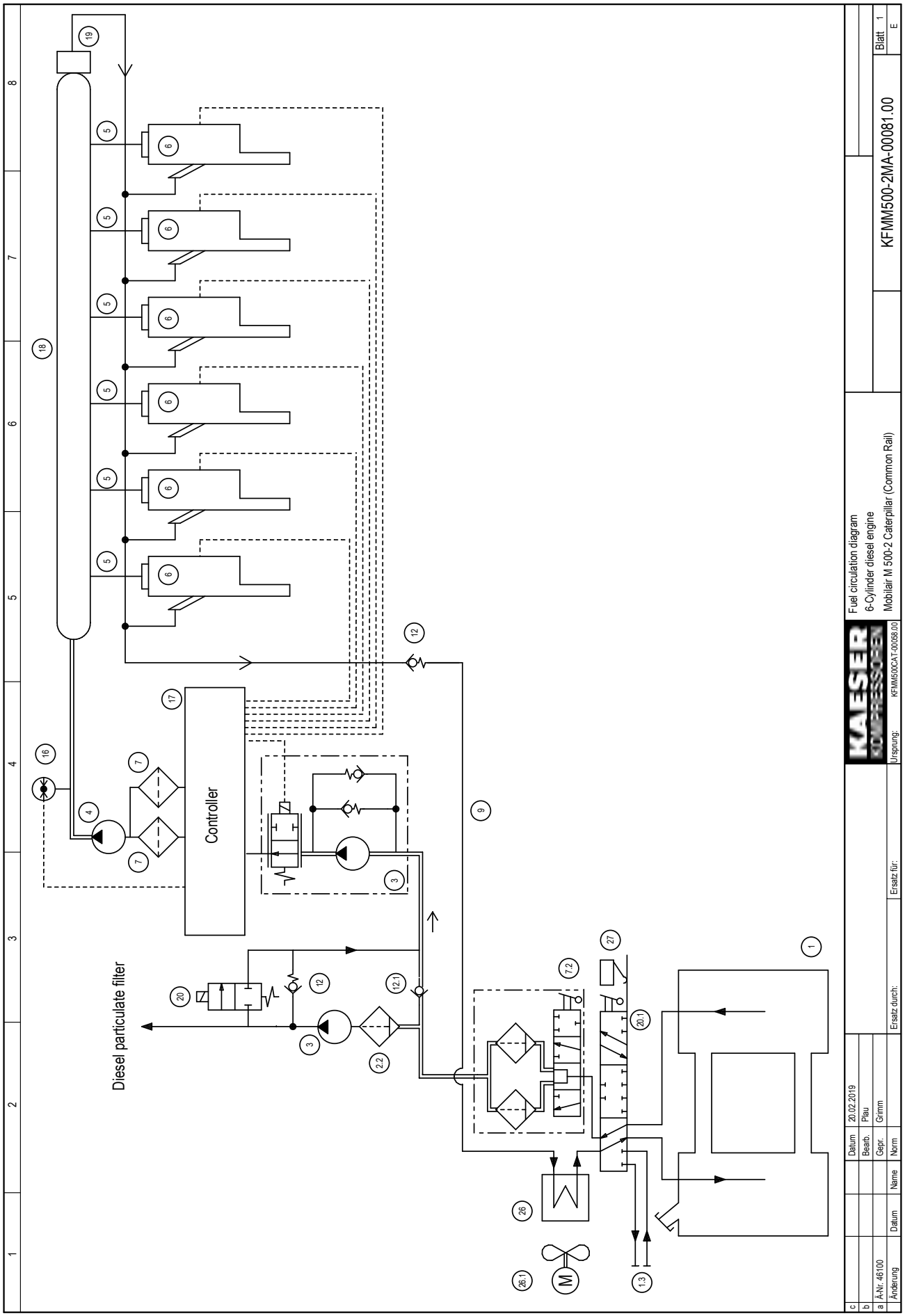

285
785
-T1
-X1
-F100 5A
-F9 5A
-F5 5A
-F49 1A
-F48 15A
-F47 15A
-F46 15A
-F45 15A
-F29 10A
-F11 1A
-F13 15A
-F12 15A
-F15 10A
-X1
-K66
-K65
-K64
-K63
-K62
-K61
-K58
-K29
-K49
-K48
-S100
-X100
-K20
-K26
=SK
+
AFA5002-03024.02
page 3
4 Sht.
Component layout
MOBILAIR M500-2.2
Control cabinet unit
KAESER KOMPRESSOREN
Date 24.10.2019
Drawn Sitter
Released Fischer C.
Name
Date
Change
1
2
3
4
5
6
7
8
a
b
c



Component layout
MOBILAIR M500-2.2
IO extension
AFA5002-03024.02
=BT
+
page 4
4 Sht.

		Date	Name
c			
b			
a		Released	
	Change	Drawn	Sitter
	Date	Date	24.10.2019
	Name		Fischer C.

13.5 Fuel circulation diagram

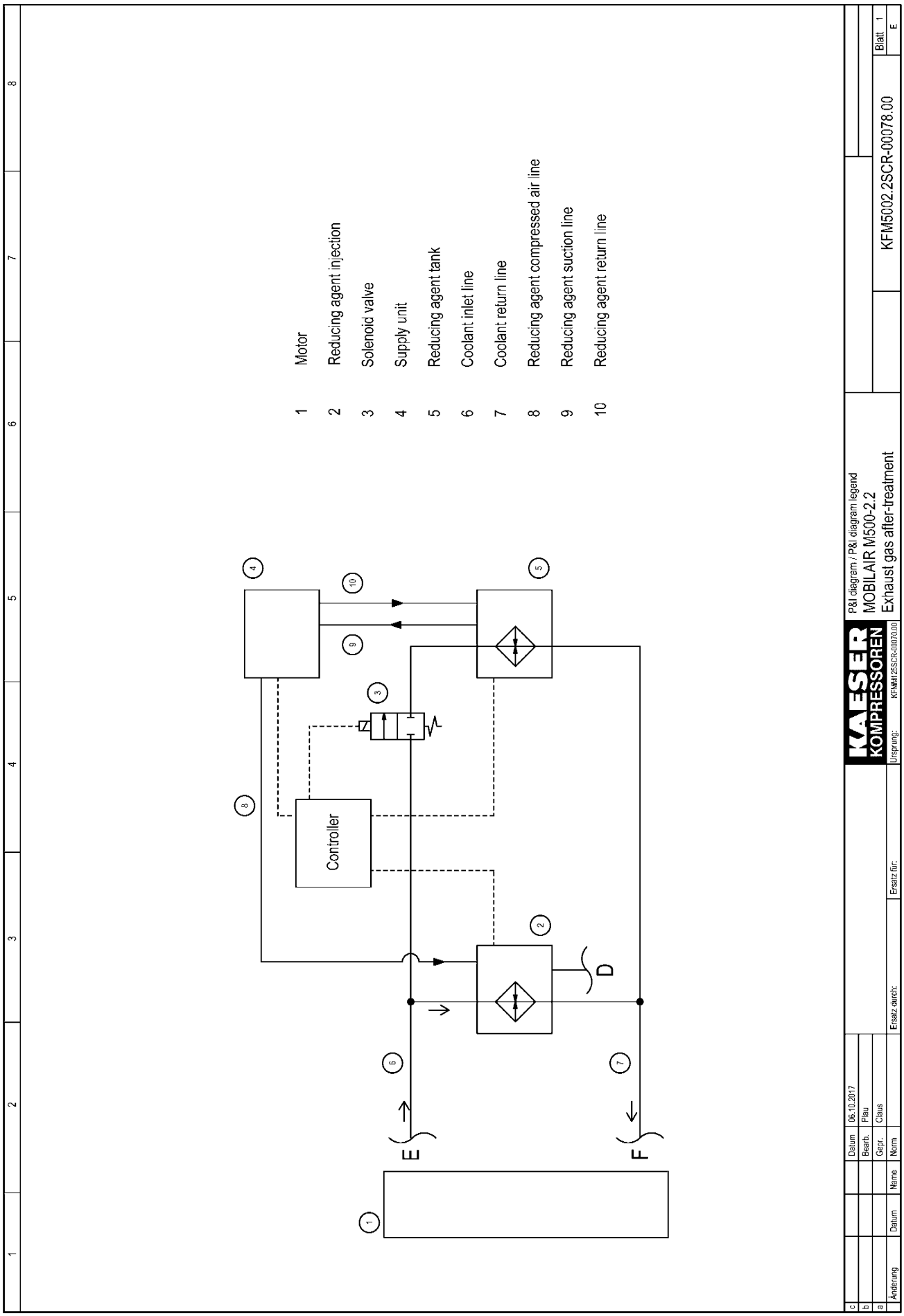

Controller
Diesel particulate filter
Fuel circulation diagram
6-Cylinder diesel engine
Mobilair M 500-2 Caterpillar (Common Rail)
KFMM500-2MA-00081.00
Blatt 1
E
Ursprung:
KFMM500CAT-00058.00
Ersatz für:
Ersatz durch:
Datum
Name
Norm
Gepr.
Grimm
Beartb.
Plau
20.02.2019
Änderung
Datum
Name
a Ä-Nr. 46100
b
c

1	2	3	4	5	6	7	8

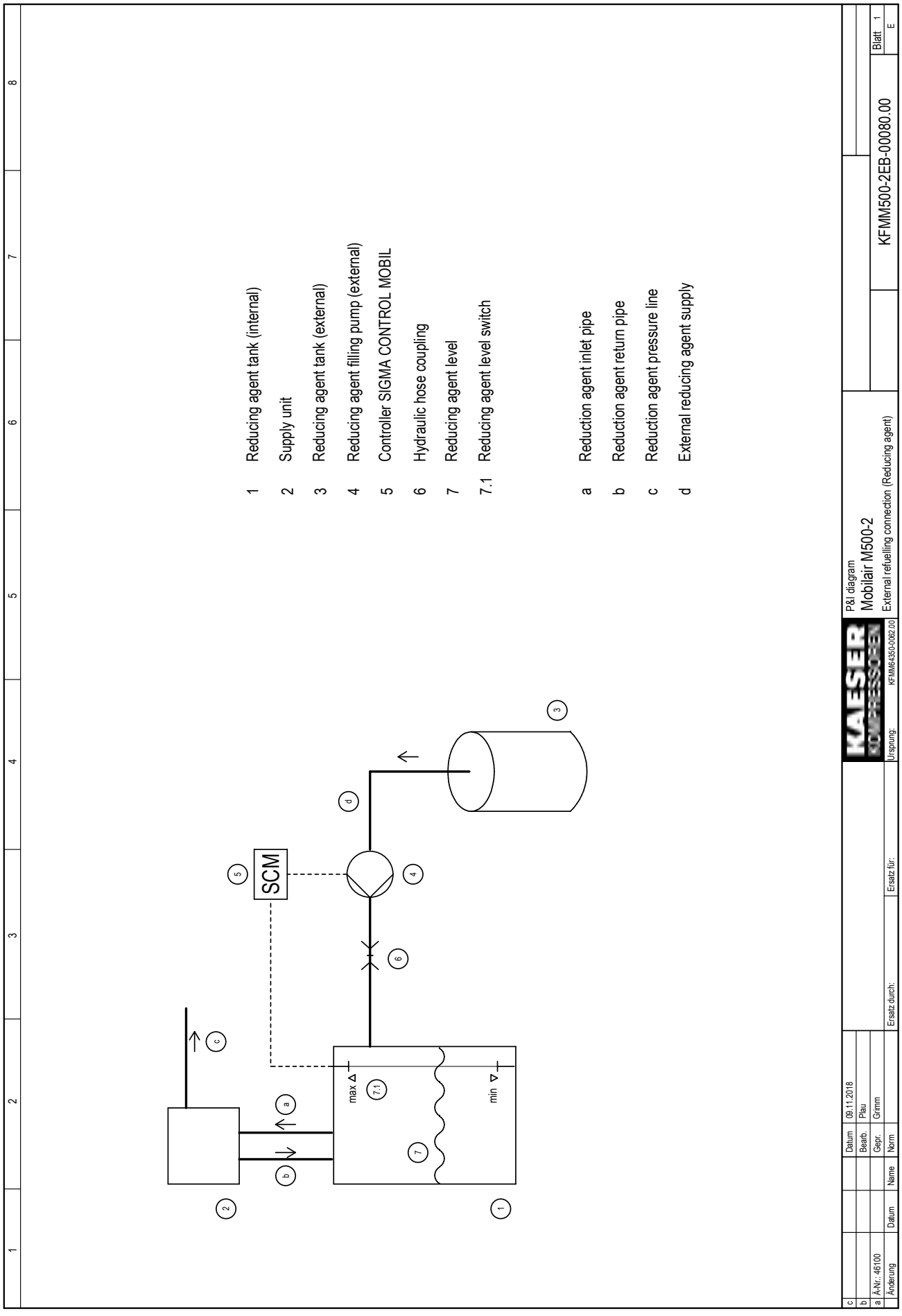
1	Fuel tank	12	Check valve (spring-loaded)
1.3	Hydraulic hose coupling	12.1	Check valve
2.2	Fuel pre-filter with water trap and integrated manual pump	16	Pressure transducer
	(electrically operated)	17	Electronic control unit
3	Fuel feed pump	18	Distributing pipe
4	Injection pump	19	Pressure limiting valve
5	Injection pipe	20	Directional control valve
6	Injector nozzle	20.1	Directional control valve
7	Fuel filter	26	Fuel cooler
7.2	Fuel filter pack (Prefilter + Water separator)	26.1	Fan motor
8	Fuel supply line	27	Limit switch
9	Fuel return line		

c				Datum	20.02.2019			Fuel circulation diagram	
b				Bearb.	Plau			6-Cylinder diesel engine	
a				Gepr.	Grimm			Mobilair M 500-2 Caterpillar (Common Rail)	KFMM500-2MA-00081.00
	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: KFMM500CAT-00058.00	Blatt 2 / E

13.6 Option Id
Pipeline and instrument flow diagram (exhaust treatment)


1 Motor
2 Reducing agent injection
3 Solenoid valve
4 Supply unit
5 Reducing agent tank
6 Coolant inlet line
7 Coolant return line
8 Reducing agent compressed air line
9 Reducing agent suction line
10 Reducing agent return line
Controller
D
E
F
P&I diagram / P&I diagram legend
MOBILAIR M500-2.2
Exhaust gas after-treatment
KFM5002.2SCR-00078.00
Blatt 1
E
Datum 06.10.2017
Bearb. Pfau
Gepr. Claus
Norm
Name
Datum
Änderung
Ersatz durch:
Ersatz für:
Ursprung:
KFMM125SCR-00070.00

13.7 Diagram of external filling with reduction agent


1 Reducing agent tank (internal)
2 Supply unit
3 Reducing agent tank (external)
4 Reducing agent filling pump (external)
5 Controller SIGMA CONTROL MOBIL
6 Hydraulic hose coupling
7 Reducing agent level
7.1 Reducing agent level switch
a Reduction agent inlet pipe
b Reduction agent return pipe
c Reduction agent pressure line
d External reducing agent supply
SCM
max
min
P&I diagram
Mobilair M500-2
External refuelling connection (Reducing agent)
KFMM500-2EB-00080.00
Blatt 1
E
Datum 09.11.2018
Bearb. Plau
Gepr. Grimm
Norm
Name
Datum
Änderung
A-Nr.: 46100
Ersatz durch:
Ersatz für:
Ursprung:
KFMM64350-0062.00

13.8 Configuration of the remote control

7 - Product configuration

7.1- Configuration steps to be respected ~ 10 mn

Before final installation and use, we recommend that you configure the units with customized settings as detailed in steps 1 to 7. These steps must be performed on an insulated work surface in the workshop.

Step 1	Programmation du nouveau code d'identité de l'émetteur > see chapter ***Transmitter identity code programming***		
Step 2	**standard configuration** **Standard** association of transmitter buttons with receiver relays : button nb.1 > relay nb.1, button nb.2 > relay nb.2 etc... (Previous settings are automatically erased) > see chapter ***«Standard» Transmitter / Receiver association***	**or**	**Customized configuration** Receiver pre-settings erased > see chapter ***Receiver parameter erasing procedure*** **Customized** association of transmitter buttons with receiver relays > see chapter ***«Customized» Transmitter / Receiver association***
Step 3 (Optional)	Operating mode programming procedure for function relays > see chapter ***Programming of relay operating modes***		
Step 4 (Optional)	Interlocking of conflicting commands programming procedure > see chapter ***Programming of conflicting command interlocking***		
Step 5 (Optional)	Radio channel programming procedure > see chapter ***Programming of conflicting command interlocking***		
Step 6 (Optional)	«Standby» function time programming procedure > see chapter ***«Standby» function time programming (Automatic shutdown of transmitter)***		
Step 7	Proceed to the installation on site by respecting the installation recommendations described in chapter ***Installation and use recommendations***		

7.2- Transmitter identity code programming

Transmitter and receiver are linked by a radio channel and an identity code.

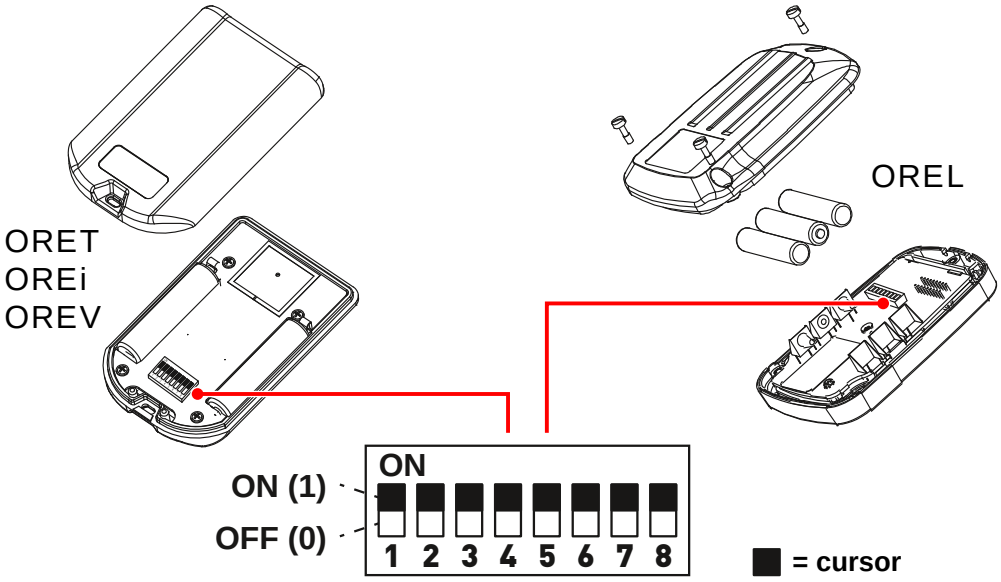
During the «association» programming procedure, one or several relays of the receiver(s) are going **«to learn»** the identity code of one or several transmitters.

This identity code is programmed on the transmitter, it is freely chosen by the user to personalize its installation :

ORET, OREi et OREL : 256 possible codes

OREV : 4096 possible codes (see next section)

The ORE transmitter is equipped with a 8 cursors 2 states DIP switch («ON» or «OFF») to program the identity code.



By default (in the delivery) the transmitter identity code is :

ON - ON - ON - ON - ON - ON - ON - ON

(11111111 binary = 255 decimal)

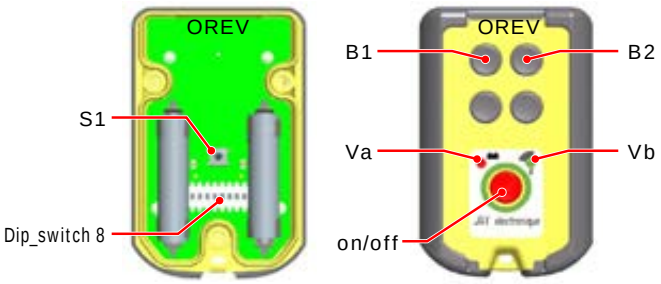
We strongly recommend that you change this code to ensure the uniqueness of your installation and avoid any unintentional commands from another system which may already be installed.

7.2.1- Special features of OREV transmitter

The **OREV** transmitter provides a significant choice of possible identity codes : 4096 (instead of 256 codes for the other transmitter models). This large number of codes is obtained by mixing the « **Identity code group** » (16 groups max.) and the codes programmed using the **8-cursor DIP-Switch** (256 codes).

OREV transmitter identity code	=	Group number (01 to 16)	+	8-cursor DIP_Switch code (256 possibilities)

The **identity code group** is chosen by special programming implementing the internal pushbutton **S1** in the **OREV** transmitter :



Note : steps 2 to 4 are not necessary if the default identity code group on delivery (01) is preserved.

1	Open the housing of the **OREV** transmitter
2	Press button **S1** ; the **Va** and **Vb** indicator lights will flash alternately
3	Press function button **B1** to enter the group programming mode. The number of the identity code group currently used by the **OREV** transmitter is replicated by the **Va** and **Vb** indicator lights : **RED indicator light Va :** indicates tens (if On = group No. > 10) **GREEN indicator light Vb :** indicates units The code group number is incremented each time button **B1** is pressed ; from n° 1 to n°16, then n°1 etc...
4	**Validate** the identity code group by pressing button **B2** (or the «**On/Off**» button if used). or **Cancel** by pressing internal button **S1**
5	Compose a code using the **8-cursor DIP_switch**
6	Close the housing of the **OREV transmitter**

7.3- «Standard» Transmitter / Receiver association

This procedure is used to :

- Automatically erase the previous settings in the receiver,
- Store, in the receiver, the new identity code programmed on the transmitter,
- Programm the receiver on the transmitter radio channel,
- Perform a standard association of the transmitter buttons with the receiver relays as follows :

Button n°1 of the transmitter allocated to the **relay n°1** of the receiver,

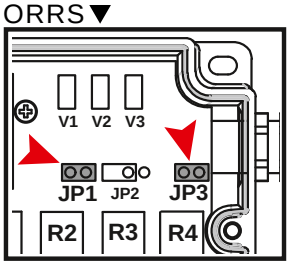
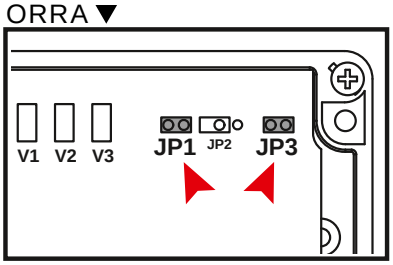
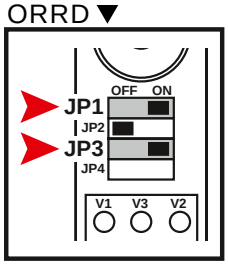
Button n°2 of the transmitter allocated to the **relay n°2** of the receiver,

Button n°3 of the transmitter allocated to the **relay n°3** of the receiver

etc...

This programming procedure erases all the button/ relay associations, interlock functions, relay operating modes of the previously programmed relays and radio channel setting.

It is possible that the receiver is associated with an unwanted transmitter.
During all the duration of the association procedure, it is recommended not ot used any other Orion transmitter.

1	**ORRS and ORRA receivers :** Switch off the receiver **ORRD receiver :** the receiver can remain powered up throughout the procedure.
2	**ORRS and ORRA receivers :** install the jumpers **JP1** and **JP3** to configure the settings. **ORRD receiver :** set the microswitches **JP1** and **JP3** to the «ON» position ORRS ▼  ORRA ▼  ORRD ▼ 
3	**ORRS and ORRA receivers :** Switch on the receiver **ORRD receiver :** go to the next step
4	- V2 and V3 ORRA ORRS ORRD LEDs are blinking. - The receiver waits for an identity code reception (pressure on a transmitter function button) to auto-configure its relays.
5	If transmitter is equipped with an «**On/Off**» button, switch on the transmitter.
6	Press on one transmitter button (anyone) and maintain button pressed to associate transmitter with the receiver, until receiver LEDs V2 and V3 ORRA ORRS ORRD go off. The receiver has received the command to assign the buttons and identity code of the transmitter to the function relays.
7	**ORRS and ORRA receivers :** switch off the receiver and remove the **JP1** and **JP3** jumpers. **ORRD receiver :** set the **JP1** and **JP3** microswitches to the «OFF» position

If no transmitter button is activated during this programming procedure, the receiver parameter settings (buttons / relay association, interlocking and operating mode previously programmed) will not be erased.

7.4- «Customized» Transmitter / Receiver association

Once transmitter identity code was chosen and programmed, receiver relays must be associated to transmitter buttons. **Transmitter and receiver have to be on the same operating radio channel.**

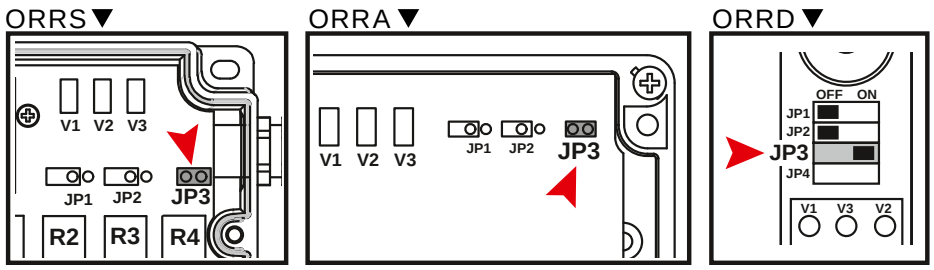
IMPORTANT :

each receiver relay can learn a maximum of :

ORRS and ORRD receivers : 10 different «button numbers + identity codes»

ORRA receivers : 4 different «button numbers + identity codes»

In case of association programming error, the receiver memory can be erased by following the procedure described in chapter *Receiver parameter erasing procedure*.

1	**ORRS and ORRA receivers :** Switch off the receiver **ORRD receiver :** the receiver can remain powered up throughout the procedure
2	**ORRS and ORRA receivers :** install the jumper **JP3** to configure the settings. **ORRD receiver :** set the microswitch **JP3** to the «ON» position 
3	**ORRS and ORRA receivers :** Switch on the receiver **ORRD receiver :** go to the next step

4

- V2 and V3 ORRA ORRS ORRD are ON steady.
- The receiver is waiting for an order from the transmitter to start the buttons / relay assignment

5

If the transmitter has a «**On/Off**» button, turn on the transmitter.

6

- Press on and release any transmitter function button
- V3 ORRA ORRS ORRD **goes OFF,** the programming procedure starts

V2 **blinks 1 time**
the receiver is waiting for a "button number and identity code" to "assign" them to its relay n°1

- Press on transmitter **button n°1** (i.e) within 6,5 seconds
- The receiver records the assignment : "button nb.1 + identity code (xxxxxxxx)" / relay nb.1

if no button is pressed within 6,5s the receiver selects the relay n°2

V2 **blinks 1 times**
the receiver is waiting for a "button number and identity code" to "assign" them to its relay n°2

- Press on transmitter **button n°2** (i.e) within 6,5 seconds
- The receiver records the assignment : "button nb.2 + identity code (xxxxxxxx)" / relay nb.2

if no button is pressed within 6,5s the receiver selects the relay n°X

V2 **blinks X times**
the receiver is waiting for a "button number and identity code" to "assign" them to its relay **X**

- Press on transmitter **button n°**Y (i.e) within 6,5 seconds
- The receiver records the assignment : "button nb.Y + identity code (xxxxxxxx)" / relay nb.X

(1)

V2 **and** V3 ORRA ORRS ORRD **blink in a alternative way then go OFF**
The last relay of the receiver has been assigned, the procedure is ended.

ORRS and ORRA receivers : Switch off the receiver
ORRD receiver : set the microswitch **JP3** to the «ON» position

(1) = Special case of ORRA receiver with number «X» > 9

In this case, the number of the relay to be programmed is given by the flashing indicator lights V2 and V3 ORRA ORRS ORRD V2 indicates the tens, and V3 the units (i.e. : V2 flashes once and V3 flashes 5 times: the receiver is on standby for a «button + identity code» assignment for its relay No. 15).

7

If other associations are required, repeat the procedure in step N°3

8

Once you have completed the associations :
ORRS and ORRA receivers : switch off the receiver and remove the jumper **JP3**
ORRD receiver : set the microswitch **JP3** to the «OFF» position

7.5- Multi-receiver selection modes

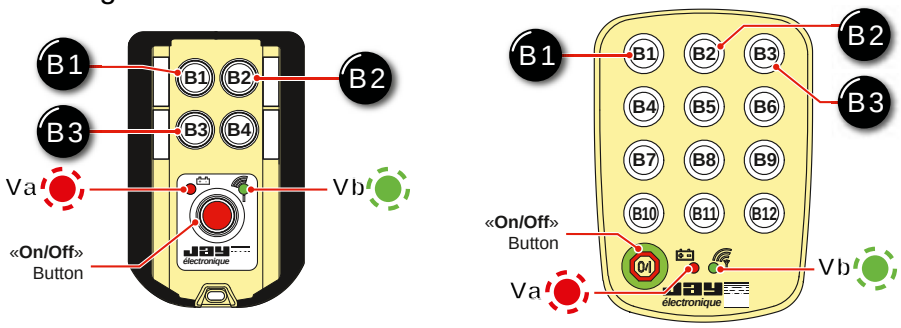
This operating mode is used to select the receiver(s) to be controlled from the transmitter.

Only the OREV **and** OREL **transmitters with at least 4 function buttons and the « On/Off » button allow for use of the multi-receiver selection mode**

2 modes are proposed :

Fixed channel multi-receiver selection mode.
Auto channel multi-receiver selection mode.

Accessing the multi-receiver selection modes :

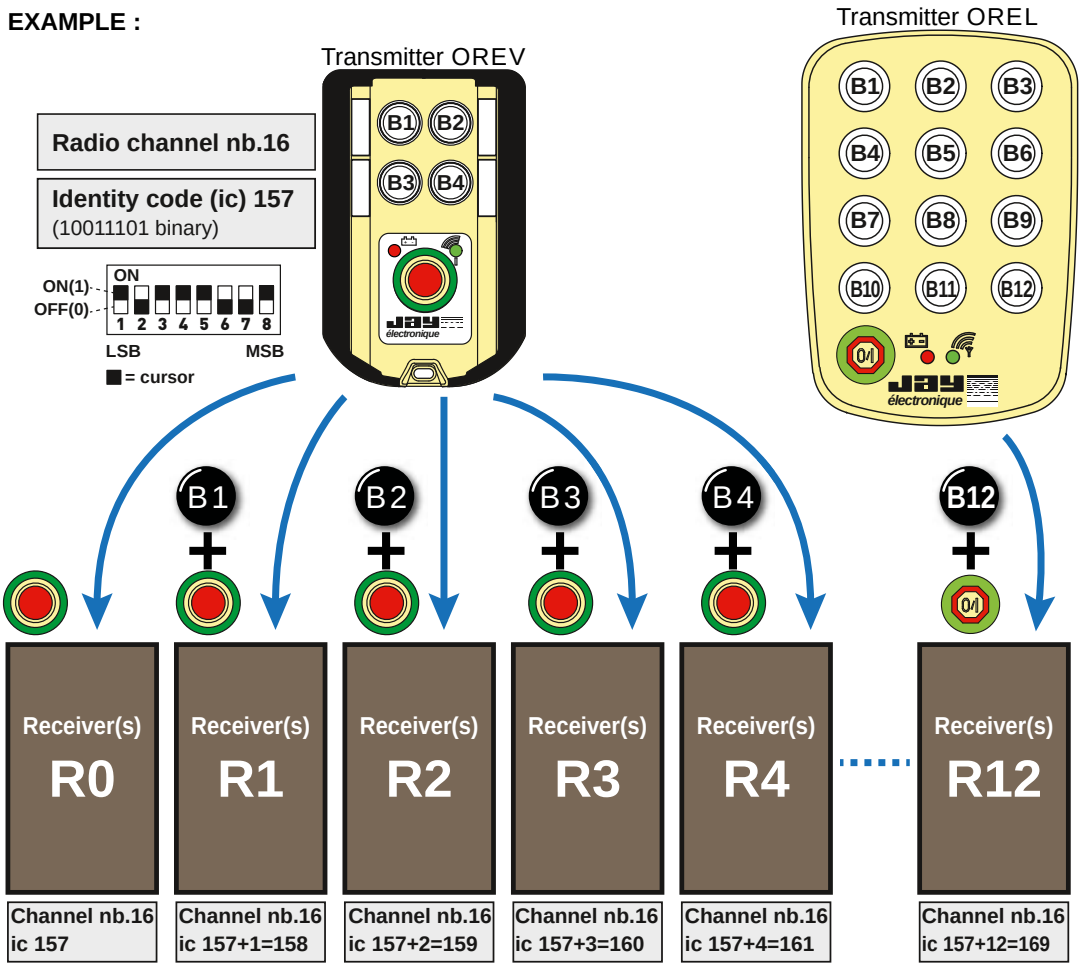


1	Simultaneously press and hold the B1 and B2 buttons, then press the «**On/Off**» button on the transmitter and hold the 3 buttons in for 1 second, then release them. The Va and Vb indicator lights of the transmitter are on ; the transmitter is on standby for the choice of programming mode (the standby period lasts around 3 seconds, after which the transmitter shuts down).
2	Press the B3 button to enter the « **change operating mode** » function The green Vb indicator light indicates the current operating mode by flashing : **1 flash** = normal mode **2 flashes** = fixed channel multi-receiver selection mode **3 flashes** = auto channel multi-receiver selection mode. Each time the B3 button is pressed, the operating mode is modified.
3	Validate the operating mode by pressing the «**On/Off**» button.

7.5.1- Fixed channel multi-receiver selection mode

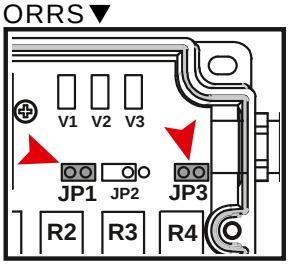
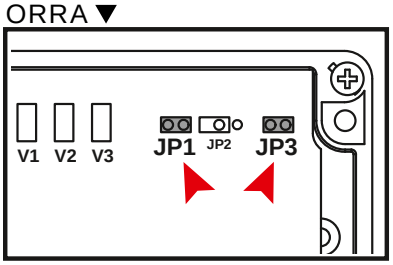
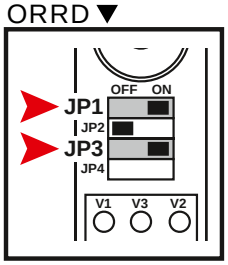
This mode is used to control receivers on the same radio channel.

OPERATING PRINCIPLE :



ASSOCIATION METHOD AND PROCEDURE :

After you have chosen an identity code (8-cursor DIP_switch) and possibly an identity code group for the **OREV** transmitter, the transmitter / receivers are successively associated for each receiver (see next page).

1	**ORRS and ORRA receivers :** Switch off the receiver **ORRD receiver :** the receiver can remain powered up throughout the procedure
2	**ORRS and ORRA receivers :** install the jumpers **JP1** and **JP3** to configure the settings. **ORRD receiver :** set the microswitches **JP1** and **JP3** to the «ON» position ORRS ▼  ORRA ▼  ORRD ▼ 
3	**ORRS and ORRA receivers :** Switch on the receiver **ORRD receiver :** go to the next step
4	- V2 and V3 ORRA ORRS ORRD LEDs are blinking. - The receiver waits for an identity code reception (pressure on a transmitter function button) to auto-configure its relays.
5	Press Bx then press the « **On/Off** » button (for the **Rx** association) or on the « **On/Off** » button only (for R0 association), then release the buttons. x = 1 to 12
6	Press on one transmitter button (anyone) and maintain button pressed to associate transmitter with the receiver, until receiver LEDs V2 and V3 ORRA ORRS ORRD go off. The receiver has received the command to assign the buttons and identity code of the transmitter to the function relays.
7	**ORRS and ORRA receivers :** switch off the receiver and remove the **JP1** and **JP3** jumpers. **ORRD receiver :** set the **JP1** and **JP3** microswitches to the «OFF» position
8	Repeat the association procedure for each receiver to be associated

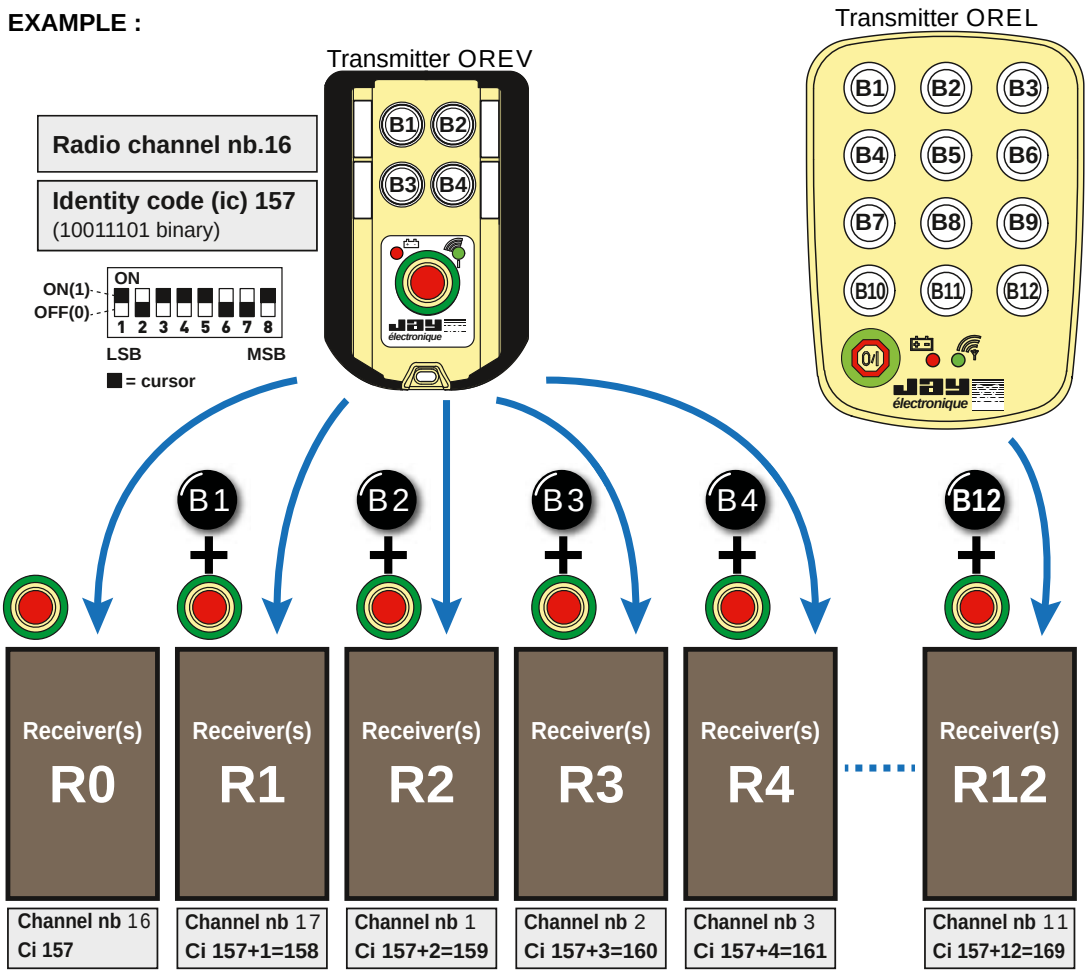
7.5.2- Auto channel multi-receiver selection mode

This mode is used to control receivers on different channels (transmitter automatically changes radio channel for each « function button + «**On/ Off**» button combination).

This mode allows you to use several transmitters at the same time.

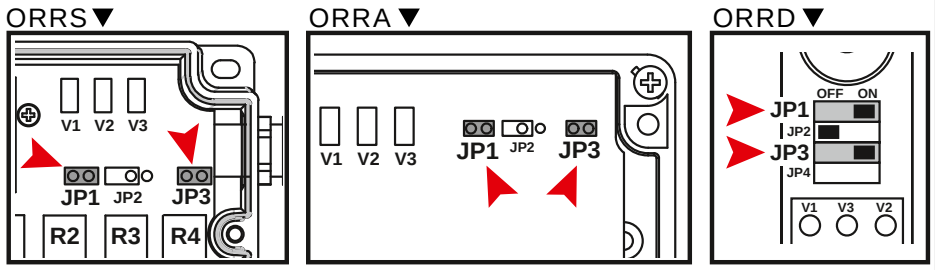
Radio transmit channel N° 18 will not be used.
The channels will be automatically programmed from 1 to 17.

OPERATING PRINCIPLE :



ASSOCIATION METHOD AND PROCEDURE :

After you have chosen an identity code (8-cursor DIP_switch) and possibly an identity code group for the OREV transmitter, the transmitter / receivers are successively associated for each receiver (see next page).

1	**ORRS and ORRA receivers :** Switch off the receiver **ORRD receiver :** the receiver can remain powered up throughout the procedure
2	**ORRS and ORRA receivers :** install the jumpers **JP1** and **JP3** to configure the settings. **ORRD receiver :** set the microswitches **JP1** and **JP3** to the «ON» position 
3	**ORRS and ORRA receivers :** Switch on the receiver **ORRD receiver :** go to the next step
4	- V2 and V3 ORRA ORRS ORRD LEDs are blinking. - The receiver waits for an identity code reception (pressure on a transmitter function button) to auto-configure its relays.
5	Press Bx then press the « **On/Off** » button (for the **Rx** association) or on the « **On/Off** » button only (for R0 association), then release the buttons. x = 1 to 12
6	Press on one transmitter button (anyone) and maintain button pressed to associate transmitter with the receiver, until receiver LEDs V2 and V3 ORRA ORRS ORRD go off. The receiver has received the command to assign the buttons and identity code of the transmitter to the function relays.
7	**ORRS and ORRA receivers :** switch off the receiver and remove the **JP1** and **JP3** jumpers. **ORRD receiver :** set the **JP1** and **JP3** microswitches to the «OFF» position
8	Repeat the association procedure for each receiver to be associated

7.6- Programming of relay operating modes

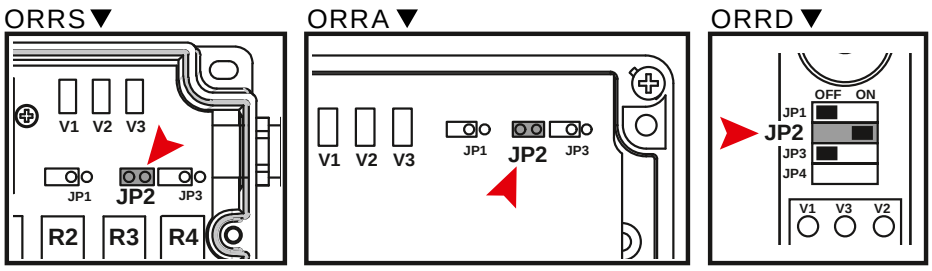
There are three operating modes for receiver function relays :

Mode 1 **Continuous make contact**	Mode 2 **Continuous break contact**	Mode 3 **Bistable (on/off)**
The contact of receiver relay remains closed so long as the corresponding control button on the transmitter remains pressed. The contact opens if the transmitter button is released, or if the transmitter is switched off or if there is a radio jamming (>1s).	The contact of receiver relay remains open so long as the corresponding control button on the transmitter remains pressed or receiver is switched off. The contact closes if the transmitter button is released, or if there is a radio jamming (>1s).	The receiver relay is closed the first time the corresponding control button on the transmitter is pressed, and maintained until the second time the control button is pressed (when the receiver is switched OFF, the relay state is not saved). **If the transmitter is equipped with an «On/ Off» button :** The state of the bistable relay is maintained if the transmitter is shutdown («On/Off» button pressed or “Standby” time elapsed).

General remark :
The relay contacts are «opened» when the receiver is switched OFF. Once the receiver is switched ON, only relays programmed with **Mode 2** are activated.

Changing the relay operating :

- A transmitter/receiver association must have been realized.
- This procedure requires transmitter and receiver.

1	**ORRS and ORRA receivers :** Switch off the receiver **ORRD receiver :** the receiver can remain powered up throughout the procedure
2	**ORRS and ORRA receivers :** install the jumper **JP2** to configure the settings. **ORRD receiver :** set the microswitch **JP2** to the «ON» position 
3	**ORRS and ORRA receivers :** Switch on the receiver **ORRD receiver :** go to the next step
4	V2 and V3 ORRA ORRS ORRD LEDs blink 3 times then go off.
5	If the transmitter has a «**On/Off**» button, turn on the transmitter.
6	Press and maintain the pressure (approximately 2 seconds) before releasing the transmitter button wich associated relays must have a personalized operating mode. Each maintained pressure (2 seconds) then loosened on the button will change the current operating mode of associated relay(s), V2 indicates the current mode: V2 ▶ V2 ▶ V2 = **Relay on Mode nb.3** « bistable » V2 ▶ V2 ▶ relay = **Relay on Mode nb.2** «Continuous break contact» V2 ▶ V2 ▶ relay = **Relay on Mode nb.1** «Continuous make contact» **Remark : If the pressure on the transmitter button is not maintained for a long time (approximately 2 seconds) before being loosened** V3 ORRA ORRS ORRD remains switched on, indicating that the order of modification did not correctly take place
7	**Once the programming procedure is finished :** **ORRS and ORRA receivers :** switch off the receiver and remove the **JP2** jumper **ORRD receiver :** set the **JP2** microswitch to the «OFF» position

7.7- Programming of conflicting command interlocking

This procedure allows to forbid conflicting actions activated by the simultaneous pressure of two transmitter function buttons.

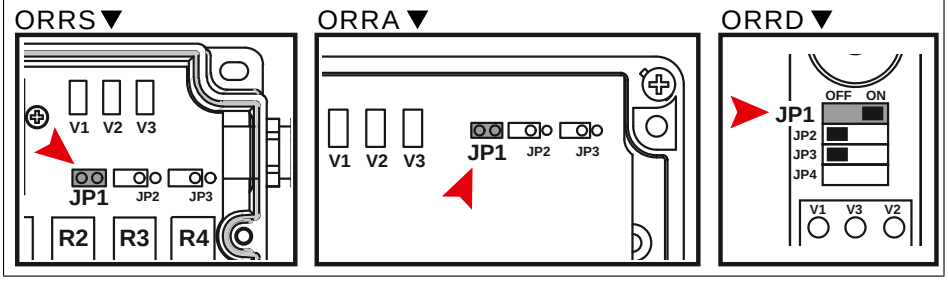
Relays concerned by the interlocking will be deactivated (**OFF state**) if an interlocking is detected..

IMPORTANT :

This programming procedure uses the receiver **JP1** jumper / microswitch.

Every time **JP1** jumper (ORRS and ORRA) is put in short circuit **JP1** microswitch (ORRD) is set on «ON» position, previously programmed interlockings are erased.

- A transmitter / receiver association must have been realized..
- This procedure requires transmitter and receiver.

1	**ORRS and ORRA receivers :** Switch off the receiver **ORRD receiver :** the receiver can remain powered up throughout the procedure
2	**ORRS and ORRA receivers :** install the jumper **JP1** to configure the settings. **ORRD receiver :** set the microswitch **JP1** to the «ON» position ORRS▼ ORRA▼ ORRD▼ 
3	**ORRS and ORRA receivers :** Switch on the receiver **ORRD receiver :** go to the next step
4	V2 and V3 ORRA ORRS ORRD LEDs blink 2 times then go off.

5	If the transmitter has a «**On/Off**» button, turn on the transmitter.
6	Press simultaneously on both transmitter buttons controlling relays that must be interlocked. V2 and V3 ORRA ORRS ORRD LEDs blink alternatively, then go off, The receiver recorded the interlocking of two relays.
7	Repeat point n°6 if other interlocking must be realized.
8	**Once the programming procedure is finished :** **ORRS and ORRA receivers :** switch off the receiver and remove the **JP1** **ORRD receiver :** set the **JP1** microswitch to the «OFF» position

7.7.1- Particularity of the «bistable ON/OFF» relay operating mode

In the «**bistable**» relay operating mode, the conflicting commands are not necessarily simultaneously emitted, in that case a priority is given to the last pressed button.

Example: interlocking between the button no.1 and the button no.2 in «bistable» relay operating mode.
An impulse on the button no.1 activates the relay no.1 (and remains activated), an impulse on the button no.2 deactivates the relay no.1 and activates the relay no.2.

7.7.2- Particularity of ORRA industrial receiver, «large model»

The interlocking functions are distributed among 4 relay groups :

Group 1 : relay nb.1 (R1) to relay nb.4 (R4),
Group 2 : relay nb.5 (R5) to relay nb.8 (R8),
Group 3 : relay nb.9 (R9) to relay nb.12 (R12),
Group 4 : relay nb.13 (R13) to relay nb.16 (R16)..

The interlocking functions can only be programmed for this receiver on relays belonging to a **same group**.

Example : interlocking is possible between relay R1 and relay R3 but not possible between relays R1 and R6.

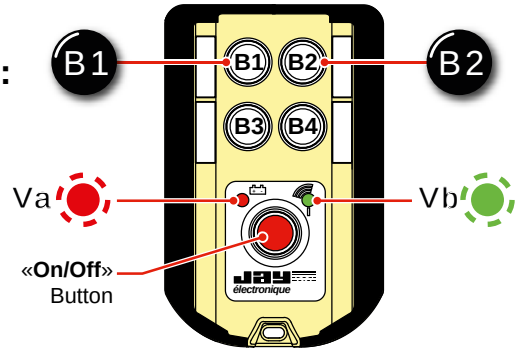
7.8- Radio channel programming procedure

Only transmitters equipped with «On/Off» button allow the user to modify and consult the operating radio channel.

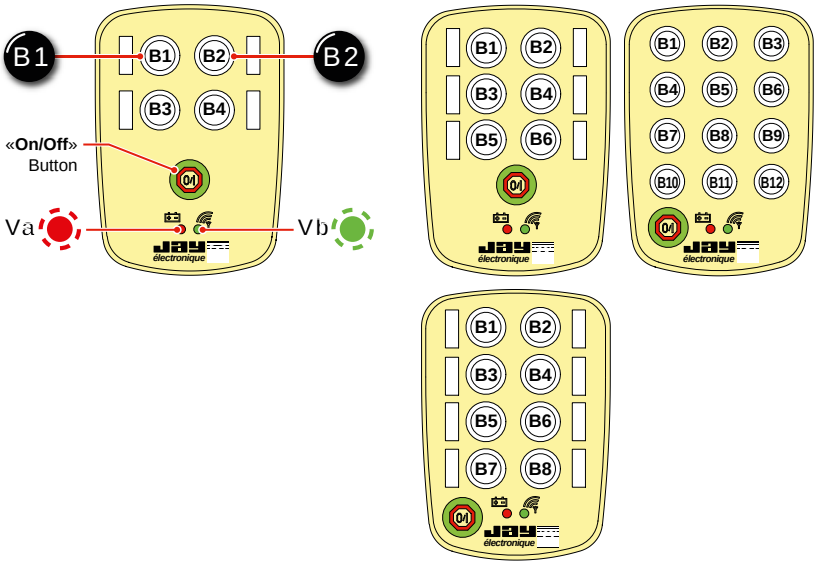
On the other transmitter models (without «**On/Off**» button), the radio frequency is fixed to nb.17 - 434,700 MHz.

- A transmitter / receiver association must have been realized.
- This procedure is realized by the transmitter with buttons B1, B2 and «**on/off**».
- The receiver will stay ON during the procedure to receive the channel modification command

Industrial transmitters :



Multifunction transmitters :



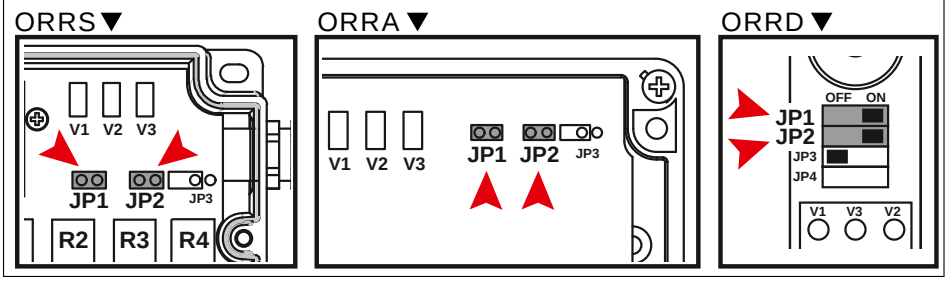
See list of available radio frequencies (channels) in ***appendix H***

1	**Switch OFF the transmitter** (Vb green LED goes OFF).
2	**Switch ON the receiver**
3	Simultaneously press and hold buttons B1 and B2 then press the «**On/Off**» button on the transmitter; keep the three buttons pressed for 1 second, then release the 3 buttons. Va and Vb transmitter LEDs come on steady,The transmitter is waiting for a programming choice (this waiting time lasts 4 seconds, after, the transmitter switches itself off).
4	Press B1 button to enter in **«radio channel changing»** mode Va and Vb indicate the transmitter current radio channel. Va red LED indicates the tens («On» = 10, «Off» =0), Vb green led indicates the units by flashing. **Example :** Va is light on, and Vb flashes 7 times, goes off, then flashes 7 times etc... the current radio channel number is «17» (434.700MHz)
5	Press B1 to increment the radio channel number (01 to 18)
6	Once the desired channel is selected, press the «on/of» button to validate your choice. **Briefly pressing «On/Off» button (<1s) :** the transmitter sends the selected radio channel number to the receiver and saves its new working radio channel. **By pressing and holding the «On/Off» button (during 3 seconds) :** **(This procedure should be performed when you are not familiar with the initial working channel of the receiver)** he transmitter sends the selected channel number to the receiver on each of the radio link channels (01 to 18), and both equipment save the change. The procedure is finished when Va and Vb go off (around 10s).

7.8.1- Reading the current receiver radio channel

- The reading of the receiver radio channel number is done from the receiver by **JP1** and **JP2** jumper/microswitch and V2 and V3 ORRA ORRS ORRD LEDs.

See list of available radio frequencies (radio channels) in ***appendix H***

1	**ORRS and ORRA receivers :** Switch off the receiver **ORRD receiver :** the receiver can remain powered up throughout the procedure
2	**ORRS and ORRA receivers :** install the jumpers **JP1** and **JP2** to configure the settings. **ORRD receiver :** set the microswitches **JP1** and **JP2** to the «ON» position 
3	**ORRS and ORRA receivers :** Switch on the receiver **ORRD receiver :** go to the next step
4	V2 and V3 ORRA ORRS ORRD LEDs indicate the current receiver radio channel number. V2 (red) indicates the **tens**, «ON» = 10, «OFF» = 0 V3 ORRA ORRS ORRD (green) indicates the **units** by flashing. **Example :** V2 «OFF», and V3 ORRA ORRS ORRD flashing 6 times, the current radio channel number is «06» (433.600MHz).
5	**ORRS and ORRA receivers :** switch off the receiver and remove the **JP1** and **JP2** jumpers. **ORRD receiver :** set the **JP1** and **JP2** microswitches to the «OFF» position

7.9- Modification of radio power

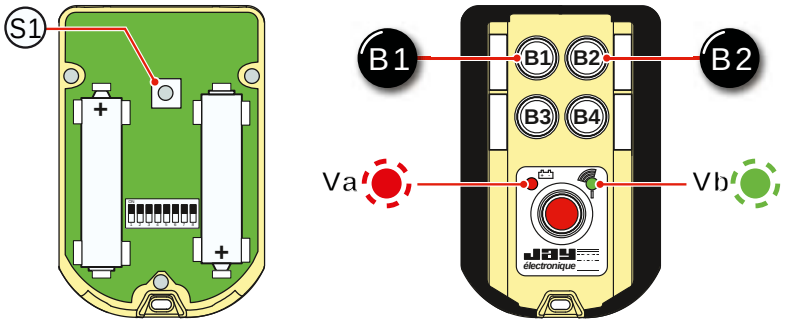
It is the user's responsibility to adjust the radio transmit power to limit or adapt the range in accordance with the application and the desired endurance.

Only the OREV **transmitters will allow the user to modify and look-up the radio transmit power level (levels 1 to 5).** On the other transmitter versions, the radio transmit power is defined for level 4 of 5.

The average range in open space depends on the environment conditions, the position of the reception antenna and the orientation of the transmitter, but is relative as indicated below :

Radio power	Average range
Level 5	**180 m**
Level 4	**140 m**
Level 3	**90 m**
Level 2	**40 m**
Level 1	**10 m**

- The procedure for modification and look-up of the radio transmit power is performed on the transmitter using buttons B1, B2 and internal button S1.
- The receiver does not need to be powered up

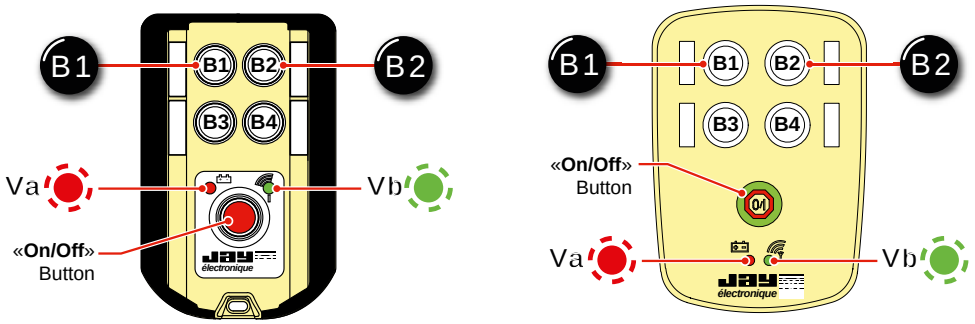


1	Open the housing of the OREV transmitter
2	Press button S1 ; the Va and Vb indicator lights flash alternately
3	Press function button B2 to enter the « modify/look-up radio transmit power» mode : The radio power level currently used by the OREV transmitter is replicated by the green Vb indicator light (number of flashes from 1 to 5). The value of the radio transmit power level is incremented by 1 each time button B1 is pressed.
4	**Validate** the radio power level by pressing button B2 (or by pressing the « **On/Off** » button if used). or **Cancel** by pressing internal button S1
5	Close the housing of the OREV transmitter

7.10-Programming the « Standby » time delay

Only transmitters equipped with «On/Off» button allow the user to view or to modify the duration of the «Standby» function temporization.

- This procedure is realized by the transmitter with buttons B1, B2 and «**On/Off**» button.
- The receiver does not need to be powered up



1	Simultaneously press and hold buttons B1 and B2 then press the «**On/Off**» button on the transmitter; keep the three buttons pressed for 1 second, then release the 3 buttons. Va and Vb transmitter LEDs come on steady,The transmitter is waiting for a programming choice (this waiting time lasts 4 seconds, after, the transmitter switches itself off).
2	Press B2 button to enter in «**Standby function time**» mode Vb LED indicates the current duration : 1 flash, off, 1 flash etc... = 4mn 2 flashes, off, 2 flashes etc... = 15mn 3 flashes, off, 3 flashes etc... = 60mn 4 flashes, off, 4 flashes etc... = infinite time (function is deactivated) **Only on OREV and OREL transmitters :** 5 flashes, off, 5 flashes etc... = 30s
3	Press B2 to modify the duration, each pressure on the button increments the duration..
4	Once the desired duration is selected, press the «**on/off**» button to validate your choice. The transmitter saves the changing.

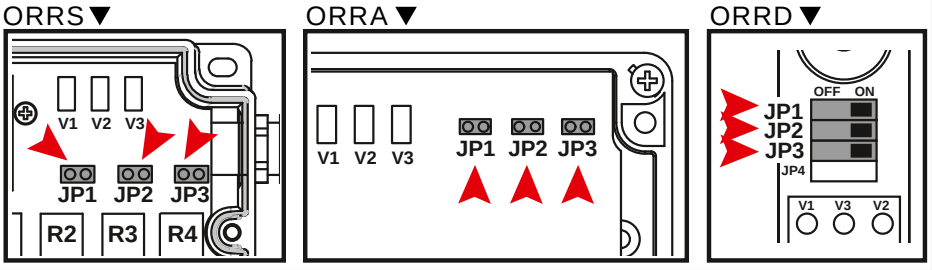
7.11- Receiver parameter erasing procedure

This procedure has the following effects :

- Erasing of all programmed transmitter(s) / receiver(s) associations,
- Erasing of all programmed interlockings,
- All relays operating mode turn by default mode : «Continuous make contact».

Only the radio channel setting is preserved

■ The receiver parameter erasing procedure is done from the receiver by **JP1**, **JP2** and **JP3** jumpers/microswitches.

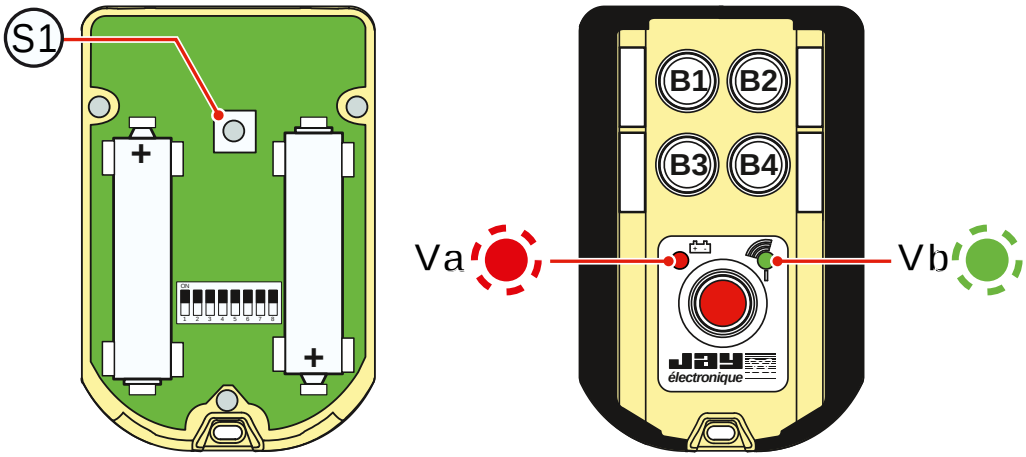
1	**ORRS and ORRA receivers :** Switch off the receiver **ORRD receiver :** the receiver can remain powered up throughout the procedure
2	**ORRS and ORRA receivers :** install the jumpers **JP1**, **JP2** and **JP3** to configure the settings. **ORRD receiver :** set the microswitches **JP1**, **JP2** and **JP3** to the «ON» position. ORRS▼ ORRA▼ ORRD▼ 
3	**ORRS and ORRA receivers :** Switch on the receiver **ORRD receiver :** go to the next step
4	V2 and V3 ORRA ORRS ORRD LEDs flash 5 times during the parameter erasing, then go off (except on **ORRD** DIN rail receiver, indicator lights stop to blink for a few time and re-start to blink 5 times etc...). All the receiver parameters (except the radio channel setting) are erased.
5	**ORRS and ORRA receivers :** switch off the receiver and remove the **JP1**, **JP2** and **JP3** jumpers. **ORRD receiver :** set the **JP1**, **JP2** and **JP3** microswitches to the «OFF» position.

7.12-Clearing the OREV transmitter parameters

This procedure returns the **OREV** transmitter to its « factory » configuration (default configuration on delivery), with the following settings :

- Identity code group N°1,
- Radio transmit power level 4,
- «Normal» operating mode,
- Radio channel N°17,
- «Standby» time delay period of 4min.

■ The procedure for clearing the parameters of the **OREV** transmitter is performed using internal button **S1** of the transmitter.



1	Open the housing of the **OREV** transmitter.
2	Press and hold button **S1** for around 10 seconds. The Va and Vb indicator lights of the transmitter flash alternately. Clearing and re-programming of the « factory » parameters of the transmitter is completed when the Va and Vb indicator lights go off.
3	Close the housing of the **OREV** transmitter.

13.9 Dimensional drawing – frame structure as wheel receiver

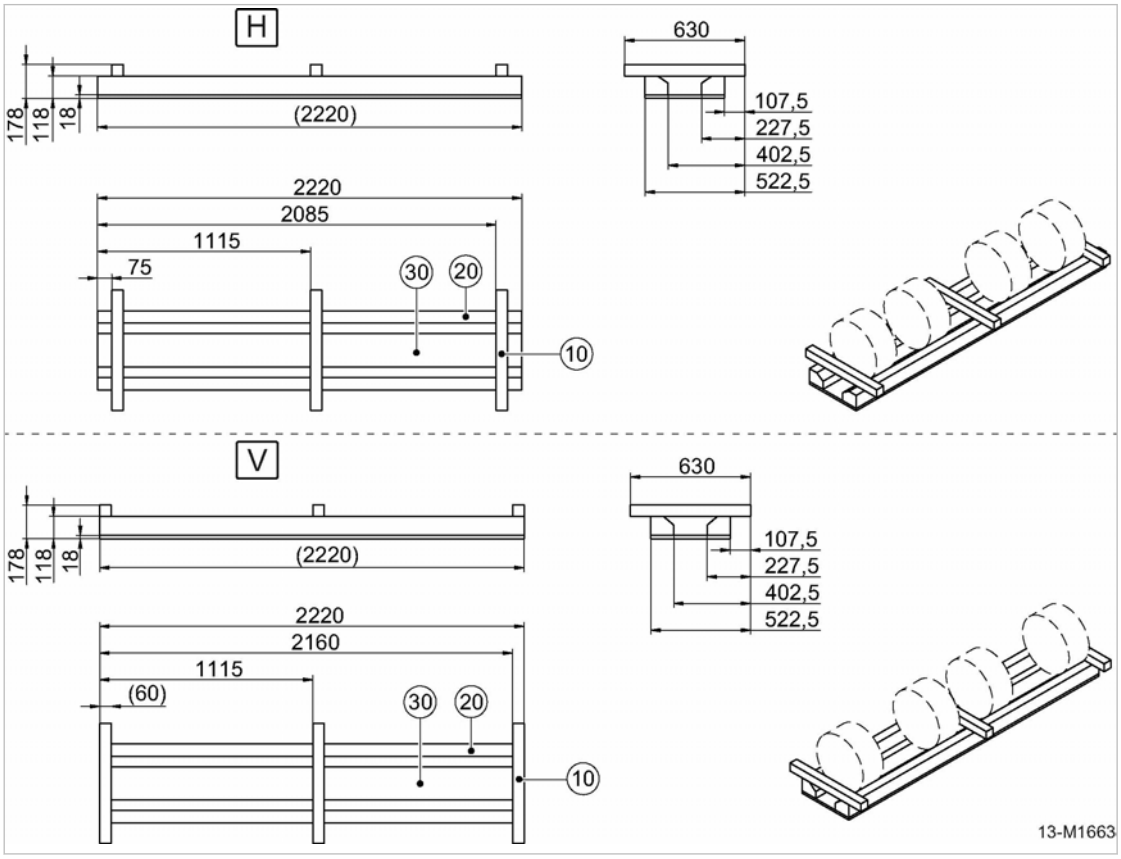


Fig. 97 Dimensions of the wooden frame structure as a wheel receiver

- [H] = Rear axle
- [V] = Front axle
- Dimensions in mm

Position	Name	Dimensions [mm]	Quantity [pieces]
(10)	Squared timber	60x60x630	4
(20)	Squared timber	120x100x2220	6
(30)	Base plate	2220x415x18	2

Tab. 86 Legend, wooden frame structure as wheel receiver

Positions 10 and 20 joined with “JD construction screws with wafer head” M 8x120.

13.10 MOBILAIR service intervals

MOBILAIR parts, M500–2.2, service intervals

Service maintenance packages - Part 1:

Package sequence	A	B	A	B	C	B	A	B	A	D	A	B	A	B	E	B	continued, see next table
(x1000 oper. hrs)	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	

Tab. 87 Service maintenance packages - Part 1

Service maintenance packages - Part 2:

Package sequence	A	B	A	D	A	B	A	B	C	B	A	B	A	F	from the beginning
(x1000 oper. hrs)	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15	

Tab. 88 Service maintenance packages - Part 2

BASIS group: (Oil, filter, antifreeze)	Item Parts list	Change intervals and maintenance packages (Oper.h = operating hours							Note
Part		A 500 oper. h	B 1000 oper. h	C 2500 oper. h	D 5000 oper. h	E 7500 oper. h	F 15000 oper. h	Years max.	
Hydraulic oil	1620			X	X	X	X	2	
Transmission oil	1610				X		X	4	
Hydraulic oil filter	1562		X		X		X	1	
Gearbox oil filter	1210			X	X	X	X	2	
Vapour filter	1216		X		X		X	1	
Intake air filter, compressor	1260		X		X		X	1	
Filter element, gear ventilation	1551				X		X	4	
O-ring for filter element, gear ventilation	1548				X		X	4	
Control air filter element	1556					X	X	6	
O-ring for filter element, control air	1547					X	X	6	
Engine oil	1925	X	X	X	X	X	X	1	
Engine oil filter	1905	X	X	X	X	X	X	1	
Fuel prefilter	1915	X	X	X	X	X	X	1	Fuel dual filter
Fuel prefilter and water separator element	1985	X	X	X	X	X	X	1	Fuel prefilter
Fuel filter	1920	X	X	X	X	X	X	1	Fuel filter
Air intake filter, engine (kit)	1280		X		X		X	1	Primary and secondary filter
Filter element, venting, engine oil auxiliary tank	1241			X	X	X	X	2	
Filter element, ventilation, fuel tank	1243			X	X	X	X	2	

BASIS group: (Oil, filter, antifreeze)	Item Parts list	Change intervals and maintenance packages (Oper.h = operating hours							Note
Part		A 500 oper. h	B 1000 oper. h	C 2500 oper. h	D 5000 oper. h	E 7500 oper. h	F 15000 oper. h	Years max.	
Antifreeze	5195					X	X	6	Type: CAT-ELC
Antifreeze additive	5197			X	X	X	X	3	CAT ELC Extender (Refresher)
Distilled water	5198	X	X	X	X	X	X	1	

Tab. 89 Service intervals for MOBILAIR parts, BASIS group

PLUS group:	Item Parts list	Change intervals and maintenance packages (Oper.h = operating hours						Note
Part		A 500 oper. h	B 1000 oper. h	C 2500 oper. h	D 5000 oper. h	E 7500 oper. h	F 15000 oper. h	Years max.	
Valves, belts, etc.									
Service kit, inlet valve	2042					X	X	6	
Combination valve	2060					X	X	6	
Service kit, overflow valve [MDRV]	2192					X	X	6	
Service kit, pressure control valve	2332					X	X	6	
Check valve at pulse damper	2125					X	X	6	
Service kit, check valve, pulse damper	2128		X	X					Seals
Check valve, hydraulic system	2410					X	X	6	
Check valve, condensate drain, compressor stage 1	2135			X	X	X	X	2	
Solenoid valve, condensate drain, compressor stage 2	6464			X	X	X	X	2	
Solenoid valve, condensate drainage	2490			X	X	X	X	2	
Solenoid valve, gear ventilation	2140					X	X	6	
Solenoid valve, inlet valve, activation	2150					X	X	6	
Solenoid valve, engine oil auxiliary tank	2250					X	X	6	
Temperature regulator, hydraulic oil	2220					X	X	6	
Venting silencer	6710					X	X	6	
V-belt, engine fan	4470					X	X	6	
V-belt engine generator (alternator)	1800					X	X	6	
Rollover valve, tank venting	2640					X	X	6	
Position switch (limit switch), fuel supply	3832					X	X	6	

Tab. 90 Service intervals for MOBILAIR parts, PLUS group

REVISION group: (hoses, fans, operating materials)	Item Parts list	Change intervals and maintenance packages (Oper.h = operating hours						Note
Part		A 500 oper. h	B 1000 oper. h	C 2500 oper. h	D 5000 oper. h	E 7500 oper. h	F 15000 oper. h	Years max.	
Fan for drive engine coupling	4915				X		X	4	
Hydraulic fan	4920					X	X	6	
Revision kit, control lines	7350					X	X	6	
Pressure hoses, gear oil, hydraulic oil, compressed air, condensate	*					X	X	6	
Pressure hoses, engine oil, engine coolant, fuel	**					X	X	6	
* 7150, 7160, 7170, 7172, 7180, 7190, 7195, 7200, 7205, 7210, 7220, 7240, 7255, 7260, 7270, 7400, 740,2 7504, 7510, 7562, 7563, 7564, 7565, 7600, 9450,									
** 4511, 4512, 4513, 5193, 7100, 7110, 7120, 7130, 7460, 7470, 7561, 7960, 7961, 7962, 7963, 7964, 7965, 7966, 7967, 7968, 7969									

Tab. 91 Service intervals for MOBILAIR parts, REVISION group

CAT group:	Item Parts list	Change intervals and maintenance packages (Oper.h = operating hours							Note
Part		A 500 oper. h	B 1000 oper. h	C 2500 oper. h	D 5000 oper. h	E 7500 oper. h	F 15000 oper. h	Years max.	
Fuel venting pump	-				X		X	4	Replacement by engine manufacturer service.
Spark plug for diesel particulate filter	-				X		X	4	Replacement by engine manufacturer service.
Engine overhaul	-						X	12	Performed by engine manufacturer service.

Tab. 92 Service intervals for MOBILAIR parts, CAT group