Service Manual

Screw Compressor

M170 SIGMA CONTROL MOBIL

No.: 9_9425 01 E

Manufacturer:

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Original instructions
/KKW/M170 1.01 en SBA-MOBILAIR

KAESER KOMPRESSOREN

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1 Regarding this document

1.1 Using the Document

The service manual is part of the machine. It describes the machine as it was at the time of first delivery after manufacture.

- ➢ Keep the service manual in a safe place throughout the life of the machine.
- ➢ Pass the manual on to the next owner/user of the machine.
- ➢ Ensure that all amendments received are entered in the manual.
- ➢ Enter details from the machine nameplate and individual items of equipment in the table in chapter 2.

1.2 Further documents

Included with this service manual are additional documents intended to assist in the safe operation of the machine:

- Certificate of acceptance / operating instructions for the pressure vessel
- Manufacturer's declaration / declaration of conformity in accordance with applicable directives
- Engine documentation (compressors driven by internal combustion engine)

Missing documents can be requested from KAESER.

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

1.3 Copyright

1.4 Symbols and markings

1.4.1 Warning notices

Warning notices indicate three levels of danger signified by the signal word.

- DANGER
- WARNING
- CAUTION

DANGER
These show the kind of danger and its source.
The possible consequences of ignoring a warning are shown here.
The signal word "DANGER" indicates that death or severe injury can result from ignoring the warning.

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

➢ Always read and comply with warning instructions.

Signal word	Meaning	Consequences of non-observance
DANGER	Warns of an imminent threat of danger	Death or serious injury may result
WARNING	Warns of possible danger	Death or serious injury are possible
CAUTION	Warns of a possibly dangerous situation	Light injuries or material damage are possible

Tab. 1 The levels of danger and their meaning

1.4.2 Other notices and symbols

This symbol refers to particularly 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.
Here conditions relevant to safety are named that will help you to avoid dangerous situations.

Option da — ➢ This symbol is is placed by lists of actions comprising one stage of a task.
In lists of actions with several stages the sequence of actions is numbered.
Information that refers to only one option is marked with a code (e.g.: "option da" means that this section is only valid for machines with the air treatment components "aftercooler and cyclone separator"). Option codes used in this service manual are explained in chapter 2.2.

Information referring to potential problems are identified by a question mark.
The cause is named in the help text ...
➢ ... and a remedy given.

This symbol refers to important information or measures concerning environmental protection.

Further information — Here, your attention is drawn to further topics.

2 Technical Specification

2.1 Nameplate

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

➢ Enter the data from the nameplate here as a reference.

Characteristic	Value
Vehicle identity no.	
Permissible total weight	
Permissible axle load	
Permissible coupling load	
Compressor model	
Material number	
serial number	
Year of manufacture	
Total weight	
Lifting point load capacity	
Rated engine power	
Engine speed	
Maximum working pressure	

Tab. 2 Nameplate

2.2 List of Options

A list of the options fitted to your machine helps to relate the information in this service manual.
A list of options fitted is given as code letters on the right side of the coupling load / options label.

The label is to be found

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

The following table lists all possible options.
Only the codes for those options fitted appear on the label.

➢ Take a list of fitted options from the combined coupling load / options label.

M170 MATNR SERNR

Options fitted

Here is given the specified coupling load.

da db dc dd __
__ __ __ __ __
fa __ __ __ __
__ __ hc hd __
__ __ __ __ __
ba bb __ __ __
__ __ __ __ __
__ __ __ __ __
__ ob __ od __
__ __ __ __ __
__ __ __ __ __
__ __ va si sh
sa __ sc sd __
ta tb tc __ te
__ sg __ __ __

02-M0277

Tab. 3 Combined label for coupling load and options fitted

2.2.1 Option da, db, dc, dd Air Treatment

➢ Enter the fitted options as reference in this overview.

Option	Option code	Available?
Aftercooler and cyclone separator	da	
Heat exchanger	db	
Fresh air filter	dc	
Filter combination	dd	

Tab. 4 Air Treatment

2.2.2 Option fa Compressed air distributor

➢ Enter the fitted option as reference.

Option	Option code	Exists?
Non-separated compressed air distribution line	fa	

Tab. 5 Compressed air distributor

2.2.3 Option hc, hd
Check valve function

➢ Enter the fitted option as reference.

Option	Option code	Exists?
Check valve	hc, hd	

Tab. 6 Check valve function

2.2.4 Option ba, bb
Low temperature equipment

➢ Enter the fitted option as reference.

Option	Option code	Exists?
Low temperature equipment	ba	
Low temperature equipment + engine coolant pre-heating	bb	

Tab. 7 Low temperature equipment

2.2.5 Option ob, od
Automatic engine start/stop

➢ Enter the fitted option as a reference in this overview:

Option	Option code	Available?
Automatic engine start/stop	ob	
Trickle charging for starter batteries	od	

Tab. 8 Automatic engine start/stop

2.2.6 Option va
External fuel pump

➢ Enter the fitted option as a reference in this overview:

Option	Option code	Available?
External fuel pump	va	

Tab. 9 External fuel pump

2.2.7 Option sa, sc, sd, sh, si
Chassis

➢ Enter the fitted option as a reference in this overview:

Option	Permissible axle load [kg]	Option code	Available?
Height adjustable towbar	2700	sa	

Option	Permissible axle load [kg]	Option code	Available?
Fixed-height towbar	2700	sd	
Fixed height towbar without parking brake	2700	sh	
Stationary, on skids	–	sc	
Stationary, on a base frame	–	si	

Tab. 10 Chassis

2.2.8 Option ta, tb, tc, te Lighting

➢ Enter the fitted option as reference.

Option	Option code	Exists?
None (stationary)	ta	
Reflective warning triangle	tb	
EG - 12 V	tc	
USA 12 V (DOT conformity)	te	

Tab. 11 Lighting

2.2.9 Option sg Pedestrian protection

➢ Enter the fitted option as reference.

Option	Option code	Exists?
Pedestrian protection	sg	

Tab. 12 Pedestrian protection

2.3 Machine (without options)

2.3.1 Sound emission

2.3.1.1 Sound emission

Model	M170
Guaranteed sound power level* [dB(A)]	99
* To Directive 2000/14/EC	

Tab. 13 Guaranteed sound power level

Model	M170
Emission sound pressure level* [dB(A)] According to EN ISO 11203: 1995 number 6.2.3.d.	80.5
Measurement distance: d = 1 m Logarithmic surface ratio: Q2 = 18dB(A) * Calculated from the guaranteed sound power level (2000/14/EC Directive, Sound Emission Standard ISO 3744)	

Tab. 14 Emission sound pressure level

2.3.1.2 Sound pressure level

Model	M170
Sound pressure level* [dB(A)]	76
Measurement distance: 7 m * Sound pressure levels comply with the American EPA Standard.	

Tab. 15 Guaranteed sound pressure level

2.3.2 Torques

Recommended values for hexagonal bolts of strength category 8.8

Hex-head screws							
Thread	M6	M8	M10	M12	M14	M16	M18
Torque [Nm]	9,5	23	46	80	127	195	280

Tab. 16 Torques for hex-head screws

2.3.3 Ambient conditions

Installation	Limit value
Maximum altitude AMSL* [m]	1000
Minimum ambient temperature [°C]	−10
Maximum ambient temperature [°C]	+50
* Higher altitudes are permissible only after consultation with the manufacturer.	

Tab. 17 Ambient conditions

2.3.4 Additional specifications

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

- dimensions,
- track width,
- footprint,

see the dimensional drawings in 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

2.4 Chassis

2.4.1 Weights

Maximum weights are shown. Actual weights of individual machines are dependent on equipment fitted (see machine nameplate).

Characteristic	Chassis		Stationary
Height adjustment	with	without	–
Actual total weight [kg]*			
Permissible axle load [kg]	2700	2700	–
* Enter here for reference, the actual total weight taken from the nameplate.			

Tab. 18 Machine weights

2.4.2 Tyres

Characteristic/marking	Value
Tyre size	215/75R 17.5
Minimum and recommended tyre pressure [bar]	5.75
Wheel bolts	M 18 x 1.5

Tab. 19 Tyres

Further information See tyre side wall for maximum pressure.

2.4.3 Wheel nut/bolt tightening torque

Fixing medium	Thread	Wrench size	Torque [Nm]
Wheel bolt	M 18 x 1.5	34	325

Tab. 20 Wheel nut/bolt tightening torque

2.4.4 Towbar tightening torque

Component	Thread	Strength category	Torque [Nm]
Ball coupling	M16	8.8	210
Towing eye	M16	8.8	210

Component	Thread	Strength category	Torque [Nm]
Towbar	M20	10.9	540–560
	M24	8.8	670–690

Tab. 21 Towbar tightening torque

2.5 Compressor

2.5.1 Working pressure and FAD

Maximum working pressure [bar]	8.6	10	12	14
SIGMA airend	293 G			
Free air delivery [m^3/min]	17	15.5	13.5	11.5

Tab. 22 Working pressure and FAD

2.5.2 Compressed air outlet

Outlet valve ["]	Number
G 3/4	3
G 2	1

Tab. 23 Compressed air distributor

2.5.3 Pressure relief valve

Further information Maximum working pressure: see nameplate

Maximum working over-pressure [bar]	Activating pressure [bar]
8.6	11
10	13
12	15
14	16

Tab. 24 Relief valve activating pressure

2.5.4 Temperature

Machine temperatures	Values
Recommended airend discharge temperature for switching to load [°C]	30
Typical airend discharge temperature during operation [°C]	75 100
Maximum airend discharge temperature (automatic safety shut-down) [°C]	117

Tab. 25 Machine temperatures

2.5.5 Cooling oil recommendation

A sticker showing the type of oil used is located near the oil separator tank filler.

Information on ordering cooling oil is found in chapter 11.

Characteristic	SIGMA FLUID	
Oil grade	S–460	MOL
Classification	Silicone-free, synthetic oil	Mineral oil
Application	Standard oil for all applications except in connection with foodstuffs. Particularly suitable for machines with a high duty cycle.	Standard oil for all applications except in connection with foodstuffs. Particularly suitable for machines with a low duty cycle.
Approval	—	—
Viscosity at 40 °C	45 mm^2/s (D 445; ASTM test)	44 mm^2/s (DIN 51562–1)
Viscosity at 100 °C	7.2 mm^2/s (D 445; ASTM test)	6.8 mm^2/s (DIN 51562–1)
Flash point	238 °C (D 92; ASTM test)	220 °C (ISO 2592)
Density at 15 °C	864 kg/m^3 (ISO 12185)	–
Pour point	-46 °C (D 97; ASTM test)	-33 °C (ISO 3016)
Demulsibility at 54 °C	40/40/0/10 min (D 1401; ASTM test)	–

Tab. 26 Cooling oil recommendation

2.5.6 Cooling oil charge

Cooling oil	Fluid volume [l]
Machine	43
Compressor unit + heat exchanger (option db)	46

Tab. 27 Cooling oil charge

2.6 Engine

2.6.1 Engine data

Feature	Specification
Make/Model	Deutz / TCD 2012 L06
* Use only diesel fuel to EN 590 or ASTM D975. Consult the engine manufacturer on the use of other fuels if necessary.	

Feature	Specification
Engine control	Electronic
Fuel injection	Common rail system
Rated engine power [kW]	127
Speed under FULL LOAD [min^{-1}]	1800
Speed at IDLE [min^{-1}]	1300
Type of fuel	Diesel *
Fuel consumption under FULL LOAD [l/h]	32.5
Oil consumption related to fuel consumption [%]	approx. 0.5
* Use only diesel fuel to EN 590 or ASTM D975. Consult the engine manufacturer on the use of other fuels if necessary.	

Tab. 28 Engine data

2.6.2 Oil recommendation

The engine oil must meet the following classification:

- ACEA, class E4, E7
- API, class CF, CI-4

The engine is filled initially with engine oil of viscosity class SAE 10 W / 40.

Ambient temperature [°C]	Viscosity class
−30 30	SAE 0 W / 30 SAE 5 W / 30
−30 50	SAE 0 W / 40 SAE 5 W / 40
−20 30	SAE 10 W / 30
−30 50	SAE 10 W / 40
−15 50	SAE 15 W / 40
−5 50	SAE 20 W / 50

Tab. 29 Engine oil recommendation

2.6.3 Engine coolant recommendation

Engine coolant must meet the requirements of specification ASTM D4985.

Do not use a common coolant / antifreeze that meets only the requirements of ASTM D3306. Such coolants are intended only for light use in vehicles and could shorten the useful life of the engine.

The engine service manual gives further information on coolant application.

2.6.4 Fluid volumes

Name	Fluid volume [l]
Engine oil	17.5
Fuel	200.0
Engine coolant	21.5

Tab. 30 Engine fluid volumes

2.6.5 Batteries

Characteristic	Value
Voltage [V]	24 (2 x 12)
Capacity [Ah]	2 x 100
PTC testing current [A] (according to EN 50342)	850

Tab. 31 Batteries

Further information Depending on machine equipment, a higher capacity battery may be required. See chapter 2.7.2 for low temperature equipment.

2.7 Options

2.7.1 Option dc Fresh air filter

Feature	Value
Maximum working pressure [bar]	16
Minimum ambient temperature [°C]	1.5
Maximum ambient temperature [°C]	30

Tab. 32 Fresh air filter conditions

2.7.2 Option ba Low temperature equipment

2.7.2.1 Ambient conditions

Positioning	Limit value
Maximum altitude AMSL* [m]	1000
Minimum ambient temperature [°C]	−25
Maximum ambient temperature [°C]	+50
* Higher altitudes are permissible only after consultation with the manufacturer.	

Tab. 33 Ambient conditions

2.7.2.2 Batteries

Feature	Value
Voltage [V]	24 (2 x 12)
Capacity [Ah]	2 x 135
PTC testing current [A] (according to EN 50342)	1000

Tab. 34 Batteries

2.7.2.3 Option bb Coolant pre-heating

Coolant pre-heater	Value
Voltage [V]	240
Power [W]	1000
Rated current [A]	6.0

Tab. 35 Coolant pre-heater

2.7.3 Option od Trickle Charging Starter Batteries

Battery charger	Value
Model	24V DC/10A
Charging voltage [V]	26.6
Charging current [A]	>0.5
Maximum charging current [A]	10
Degree of protection	IP 54
Motor overload protection switch	3 poles
Setpoint [A]	4
Miniature circuit breaker [A]	16

Tab. 36 Battery charger

Mains supply	Value
Mains voltage [V/3~/N/PE]	400
Frequency [Hz]	50
Supply cable cross-section [mm^2] (Cu multi-core)	5 x 1.5
User's fusing [A]	16

Tab. 37 Mains supply

3 Safety and Responsibility

3.1 Basic Information

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.

DANGER
Disregard of these instructions can result in serious injury.
➢ Read the service manual carefully and take note of the contents for safe machine operation.

➢ 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.

➢ Do not use compressed for any application that will bring it into direct contact with foodstuffs unless it is specifically treated.

3.3 Improper Use

➢ Never direct compressed air at persons or animals.

➢ Do not use untreated compressed air for breathing purposes.

➢ Do not allow the machine to breath 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.

These are, for example, nationally applied European directives and/or valid national legislation, safety and accident prevention regulations.

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

3.4.2 Defining 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 authorisation to operate vehicles and electrical and compressed air devices.

Authorised maintenance personnel possess the following qualifications:

- are of legal age,
- have read, are conversant with and adhere to the safety instructions and sections of the service manual applicable to installation and 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.

DANGER
There is danger of fatal injury caused by contact with live components.

➢ Only qualified electricians may work on the installation, maintenance and repair of the machine's electrical assemblies. This includes work on current-carrying components.

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

3.4.3 Adherence to inspection schedules and accident prevention regulations

The machine is subject to local inspection schedules.

Examples of German operation

➢ Have the pre-commissioning inspection carried out according to the Ordnance on Safety and Health, paragraph 14.

- ➢ Recurring inspections according to BGR 500, chapter 2.11:
  The user must ensure that the machine's safety devices are checked for function as required or at least annually.
- ➢ Oil changing according to BGR 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 Safety and Health with maximum intervals as laid down in §15.

Inspection	Inspection interval	Inspecting 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. 38

The following questions must be answered in preparation for an ISO 14001 certification/monitoring (see WI-210001-Preparation for an ISO 14001 audit).

Checking the lifting eye

The user is responsible for ensuring that the machine's lifting eye and fixings are inspected according to national regulations for wear and damage.

- ➢ Have the lifting eye checked.

  If the lifting eye or fixings are not fully in order the machine may not be lifted in this way. Have the machine repaired immediately.

3.5 Dangers

Basic Information

Information concerning the various forms of danger that can arise during machine operation are found here.

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

Information is found here concerning how to counter the various types of danger that can arise during machine operation.

Exhaust fumes:

Exhaust fumes from combustion engines contain carbon monoxide; this gas is odourless and can cause death.

Furthermore, diesel exhaust contains soot particles, some of which are noxious.

- ➢ Use the machine only outdoors!

- ➢ Do not inhale exhaust fumes.
- ➢ Direct the exhaust fumes to the open air with a pipe of at least 100 mm dia.

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 re-fueling.
- ➢ Never refuel the machine when it is running.
- ➢ Do not allow fuel to overflow.
- ➢ Wipe up spilled fuel immediately.
- ➢ Keep fuel away from hot machine parts.
- ➢ Make sure that the ambient temperature at the machine's place of use is within permissible limits.

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.

Forces of compression:

Escaping compressed air can cause serious injury. The following information concerns work on components that could be under pressure.

- ➢ 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 affects the component's resistance to pressure.
  The safety of the machine is no longer ensured.

Spring forces:

Sudden release of springs under tension can cause serious injuries.

Minimum pressure / check valves, pressure relief valves and inlet valves are powerfully spring-loaded.

- ➢ Do not open or dismantle any valves.

Air quality:

Compressed air from oil-injected compressors may not be used for breathing or processing foodstuff without suitable treatment.

- ➢ Never directly inhale compressed air.
- ➢ Use appropriate systems for air treatment before using the compressed air from this machine as breathing air (fresh air reinforcement) and/or in the processing of foodstuffs.
- ➢ Use foodstuff-compatible cooling oil whenever compressed air is to come into contact with foodstuffs.

Rotating components:

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

- ➢ Operate the machine only with closed safety guards, access doors and panels.
- ➢ Shut down the machine before opening a door or canopy.
- ➢ Wear close-fitting clothes and a hair net if necessary.
- ➢ Install all safety devices and panels before starting the engine.

Electricity:

- ➢ Allow only qualified and authorised electricians or trained personnel under the supervision of a qualified and authorised electrician to carry out work on electrical equipment according to electrical engineering regulations.
- ➢ Check regularly that all electrical connections are tight and in proper condition.

Temperature:

- ➢ Avoid contact with hot components. These include, for example, engine, compressor airend, oil and compressed air lines, coolers and oil separator tank. Any objects in or near the flow of exhaust gas or discharged cooling air will become very hot.
- ➢ Wear long-sleeved garments (no synthetics such as polyester) and protective gloves.
- ➢ Wear protective gloves when connecting or disconnecting compressed air hoses.
- ➢ 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 fuel or oil vapours or parts of the machine.

Noise:

- ➢ Operate the machine only with intact sound insulation.
- ➢ Wear hearing protection if necessary. The pressure relief valve blowing off, for example, can be particularly loud.

Operating materials:

- ➢ Strictly forbid fire, open flame and smoking.
- ➢ Follow safety regulations when dealing with fuel, lubricants 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, cooling and lubricating fluids.
- ➢ Have suitable fire extinguishing materials at hand and clearly indicate the location and use of fire extinguishers.
- ➢ Use only KAESER approved operating materials.

Unsuitable spare parts:

- ➢ Use only spare parts approved by the manufacturer for use in this machine. Unsuitable spare parts compromise the safety of the machine.
- ➢ Use only genuine KAESER replacement parts on pressure bearing parts.

Conversion or modification of the machine:

- ➢ Do not permit conversion or modification of the machine as this can compromise function and safe working.
  - 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.

Any such changes invalidate the approval to use the machine or tow it on the road.

3.5.2 Safe machine operation

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

WARNING
Danger of injury from hot, rotating and electrically live components!
Serious injury can be caused by touching such components.

- ➢ Operate the machine only with closed doors/canopy.
- ➢ Carry out maintenance and checks only with the machine shut down.

Transportation

- ➢ Shut down and fully disconnect the machine before transporting it.
- ➢ Allow transportation only by personnel trained in safe dealing with motor vehicles and the transporting of goods.
- ➢ Ensure that no persons are on the machine when transporting.
- ➢ If the machine is towed on public roads:
  - Ensure all running gear, including chassis, wheels, brakes, signaling and lighting, is in safe condition.
  - The local laws and regulations regarding the use of public roads must be observed.
- ➢ Follow the basic rules for safe towing:
  - The maximum permissible load for the towing vehicle coupling and the maximum coupling load given for the machine must not be exceeded.
  - Avoid causing a shift in the centre of gravity by an excessive or incorrectly distributed load.
  - Do not tow in a manner that will impose excessive stress on the machine or chassis.
  - Adjust towing speed to accommodate ground conditions. This applies particularly to unpaved roads and when negotiating curves.
- ➢ The towbar must be parallel with the ground otherwise towing instability can develop, resulting in damage to the machine and/or towing vehicle.
- ➢ Before moving the machine, make sure any security devices (e.g. anti-theft chain) are disassembled or turned off.

➢ When moving the machine using a crane: Observe regulations when using hoisting gear and load suspension equipment:
  - Do not enter the danger zone while the machine is being lifted.
  - Never lift and move the machine over people or occupied buildings.
  - Secondary or attached loads may not:
    - cause excessive load on the machine's lifting point (lifting eye),
    - adversely affect the machine's centre of gravity so that it is slanted.
  - Only the designated lifting point should be used to attach lifting gear and under no circumstances are handles, towbar or other components to be used.
  - Use only load suspension devices that are suitable for the stresses to which they will be subjected.
  - Use only hooks and shackles that comply with local safety regulations
  - Do not attach cables, chains or ropes directly to the machine's lifting eye.
  - Never tamper with the machine's lifting eye or its fixing.
  - 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:
  - transporting by slinging beneath a helicopter,
  - dropping by parachute.

Positioning:

➢ Do not position the machine directly against a wall. A build-up of heat from the exhaust can damage the machine.
➢ Do not operate in areas in which specific requirements regarding explosion protection are in force, e.g., the requirements of the ATEX directive 94/9/EC "Equipment and Protective Systems for use in Explosive Atmospheres".
➢ Ensure adequate ventilation.
➢ Ensure that required ambient conditions are maintained with regard to:
  - Ambient temperature
  - Clean inlet air with no damaging contaminants
  - Inlet air free of explosive or chemically unstable gases or vapours
  - Inlet air free of exhaust gasses from internal combustion engines
  - Inlet air free of acid/alkaline forming substances, particularly ammonia, chlorine or hydrogen sulphide.
➢ Do not position the machine in warm cooling outlet air from other machines.
➢ Ensure accessibility so that all work on the machine can be carried out without danger or hindrance.
➢ Chock the wheels to prevent unwanted movement.
➢ Do not place additional loads on the machine (e.g. excavator bucket as anti-theft measure).

Operation:

➢ Use the machine only when all safety devices, emergency stop devices and sound damping measures are in place and fully functioning.
➢ Before starting the machine, make sure that nobody will be at risk from the starting machine.

- ➢ Keep the access doors closed and panels in place for safety, quiet running and to ensure correct cooling air flow.
- ➢ Immediately stop and secure the machine against restarting if any malfunctions occur. Have any malfunctions corrected immediately.
- ➢ Carry out regular inspections:
  - for visible damage and leakage,
  - of safety devices,
  - of components needing to be monitored.
- ➢ Never operate machines without an air filter when drawing in air from the surroundings.
- ➢ Outlet valves must be closed when no consumers are connected.
- ➢ Use only suitable compressed air hoses:
  - that are of the right type and size for the highest permissible machine working pressure,
  - that are not damaged, worn or of reduced quality,
  - that have hose couplings and connections of the right type and size.
- ➢ 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.

Maintenance:

- ➢ Before commencing any work on the machine, make sure it is shut down, cooled down, pressure-free and locked off against unwanted starting.
- ➢ Wear close-fitting, flame-resistant clothing. Wear protective clothing as necessary.
- ➢ Do not leave any loose components, tools or cleaning rags on or in the machine.
- ➢ Adhere to the planned intervals for maintenance and exchange of wear parts.
- ➢ Pressure lines must be fitted correctly. Perform a test run and check for leaks.
- ➢ Components removed from the machine can still be dangerous.
  Do not open or destroy removed components as some (inlet valves, for instance) are powerfully spring-loaded.
- ➢ Never remove or change sound damping materials. Ensure that sound damping material is not damaged or dirty. Replace as necessary.

De-commissioning, storage and disposal:

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

3.5.3 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.

3.5.4 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. 39 Danger areas

3.6 Safety Devices

Safety devices ensure safe working with the machine.

- ➢ Do not change, bypass or disable safety devices.
- ➢ Check safety devices for correct function regularly.
- ➢ 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, section 4.5.

3.7 Safety signs

The diagram shows the positions of safety signs on the machine. The table lists the various safety signs used and their meanings.

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.

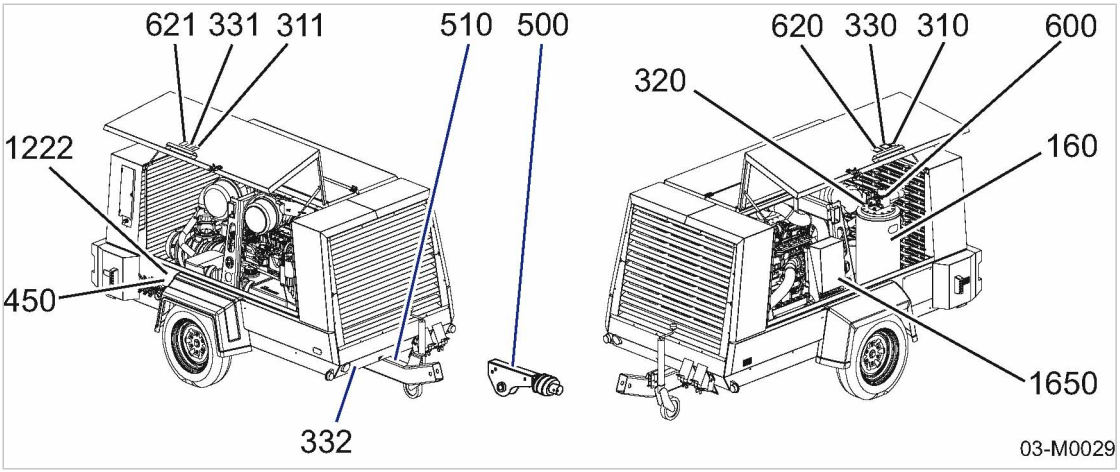


Fig. 1 Location of safety signs

Item	Symbol	Meaning
160*		Incorrect oil levels can cause damage to the machine or excessive oil content in the compressed air! ➢ Check the oil level regularly and correct as necessary.
310 311		It is forbidden to operate the machine with open doors or cover panels! Injuries or machine damage may result if the machine is operated when open. ➢ Operate only with the enclosure fully closed. ➢ Transport only with the enclosure fully closed.
320*		Loud noise and oil mist! Hearing damage and burns from relief valve blow off. ➢ Wear hearing protectors and protective clothing. ➢ Close the canopy or doors. ➢ Work carefully.
330 331		Hot surface! Risk of burns caused by contact with hot components! ➢ Do not touch the surface. ➢ Wear long-sleeved garments (no synthetics such as polyester) and protective gloves.
332		Hot surfaces and dangerous gasses! Burns from contact with hot components or gasses. ➢ Do not touch the surface. ➢ Wear long-sleeved garments (no synthetics such as polyester) and protective gloves. ➢ Do not inhale dangerous gases.

* Location within the machine
** Portable machines only
*** Only machines with option dc

Item	Symbol	Meaning
450		Loud noise and compressed air blast! Damage to hearing and injury if ball valve is opened without a compressed air hose being connected. ➢ Connect a compressed air hose. ➢ Open the ball valve.
500**		Risk of accident from unstable towing! Injury and machine damage possible. ➢ The compressor towbar must be parallel with the ground when coupled to the towing vehicle. ➢ Note instructions in the service manual regarding transporting.
510**		Malfunction due to insufficient maintenance. Injury and machine damage possible. ➢ Regularly maintain the chassis. ➢ Note the instructions in the operating manual regarding the chassis.
600*		Risk of fatal injury caused by dismantling valves (spring-loaded or under pressure)! ➢ Do not open or dismantle valves. ➢ Call an authorised Service Technician in the event of a fault.
620 621		Risk of serious lacerations or even severing of extremities (fingers) 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.
1222***		Danger! Mortal danger from CO, CO_2 or toxic gasses. ➢ Draw in only surrounding air of breathing quality.
		Danger! Danger to health from discharge of oily compressed air. ➢ Maintain surrounding air temperature between +1.5 °C and 30 °C. ➢ Check the oil indicator at least once a day.
1650*		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.

* Location within the machine
** Portable machines only
*** Only machines with option dc

Tab. 40 Safety signs

3.8 Emergency situations

3.8.1 Correct fire fighting

Suitable extinguishing media:

- foam
- carbon dioxide
- sand or earth

Unsuitable extinguishing agents:

- Strong jet of water

1. Keep calm.
2. Give the alarm.
3. If possible: Turn off engine using control devices.
4. To ensure safety:
   - warn persons in danger,
   - help incapacitated persons,
   - leave the danger area as fast as possible.
5. When trained accordingly: Attempt to extinguish the fire.

3.8.2 Contact with operating fluids/materials

The following operating fluids/materials are in the machine:

- fuel
- lubricating oils
- compressor cooling oil
- engine coolant
- battery acid

If necessary, request a copy of the applicable safety data sheet for KAESER SIGMA FLUID cooling oil.

➢ Eye contact:
Rinse eyes thoroughly with lukewarm water and seek medical assistance.

➢ Skin contact:
Wash off immediately.

3.9 Warranty

This service manual contains no independent warranty commitment. Our general terms and conditions of business apply with regard to warranty.

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

In addition, we accept no warranty obligation for:

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

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

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

3.10 Environmental Protection

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

➢ Observe relevant national regulations.

This applies particularly to parts contaminated with fuel, oil, coolants and acids.

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

4 Design and Function

4.1 Bodywork

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

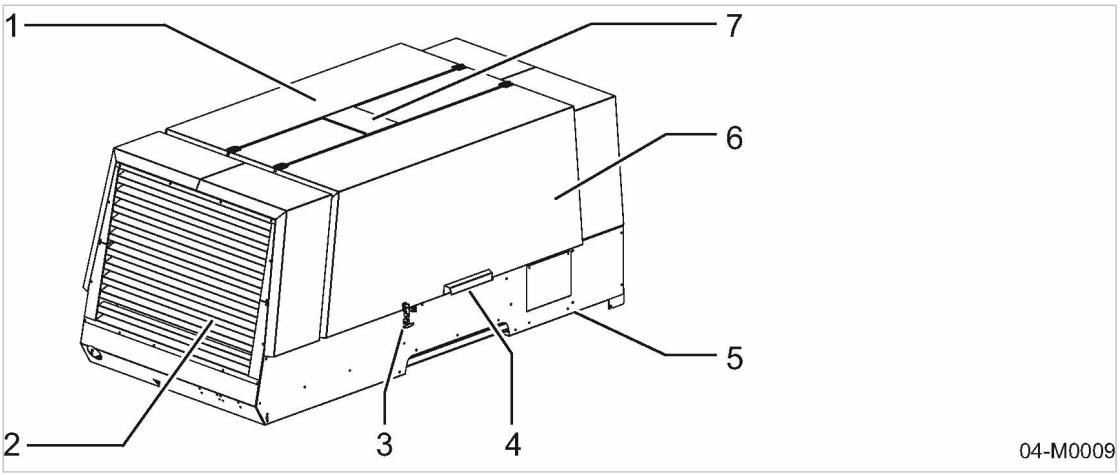


Fig. 2 Overview Bodywork

1 Right-hand wing door
2 Sound damping louvre for cooler
3 Snap fastener
4 Handle
5 Lower body
6 Left-hand wing door
7 Cover for lifting eye

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:

- Persons walking, standing or sitting on the machine.
- Use as resting place or storage of any kind of load.

Safe and reliable operation is only ensured when the bodywork is closed.
The wing doors are provided with handles for opening. Release the doors by the snap fasteners.
The doors are held open by gas springs.

4.2 Component identification

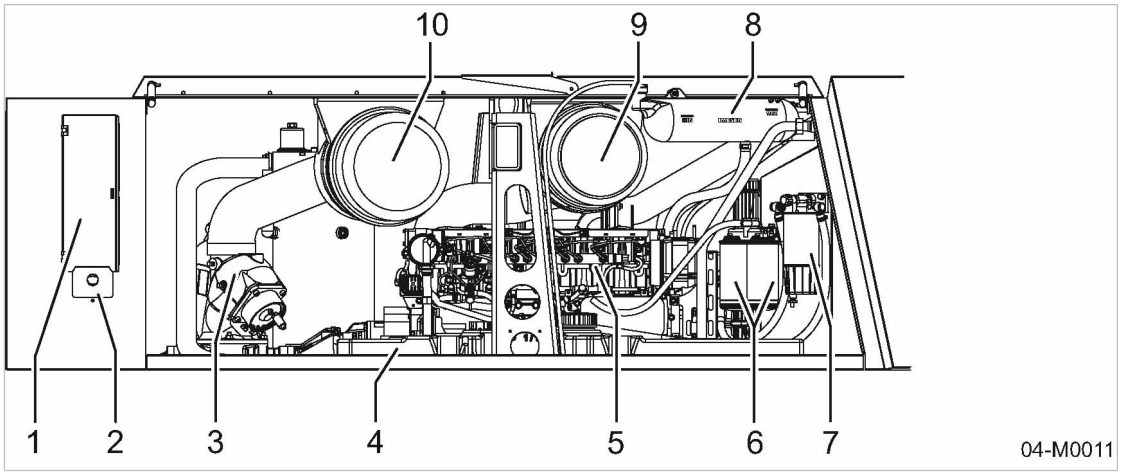


Fig. 3 Right-hand door opened

1 Instrument panel (cover closed)
2 Quick-stop pushbutton
3 Inlet valve
4 Fuel tank
5 Engine
6 Fuel filter
7 Fuel filter with water trap
8 Coolant expansion tank
9 Engine air filter
10 Compressor air filter

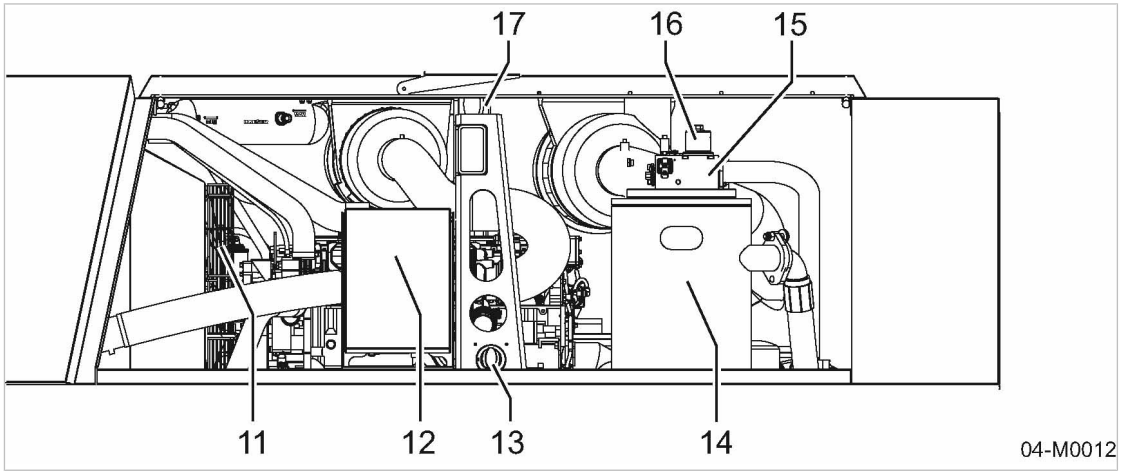


Fig. 4 Left-hand door opened

11 Fan
12 Control cabinet
13 Battery isolating switch
14 Oil separator tank
15 Control valve with proportional controller
16 Minimum pressure/check valve
17 Lifting eye

4.3 Machine function

Machine function (without options)

Item numbers correspond to the pipe and instrument flow diagram in chapter 13.2.

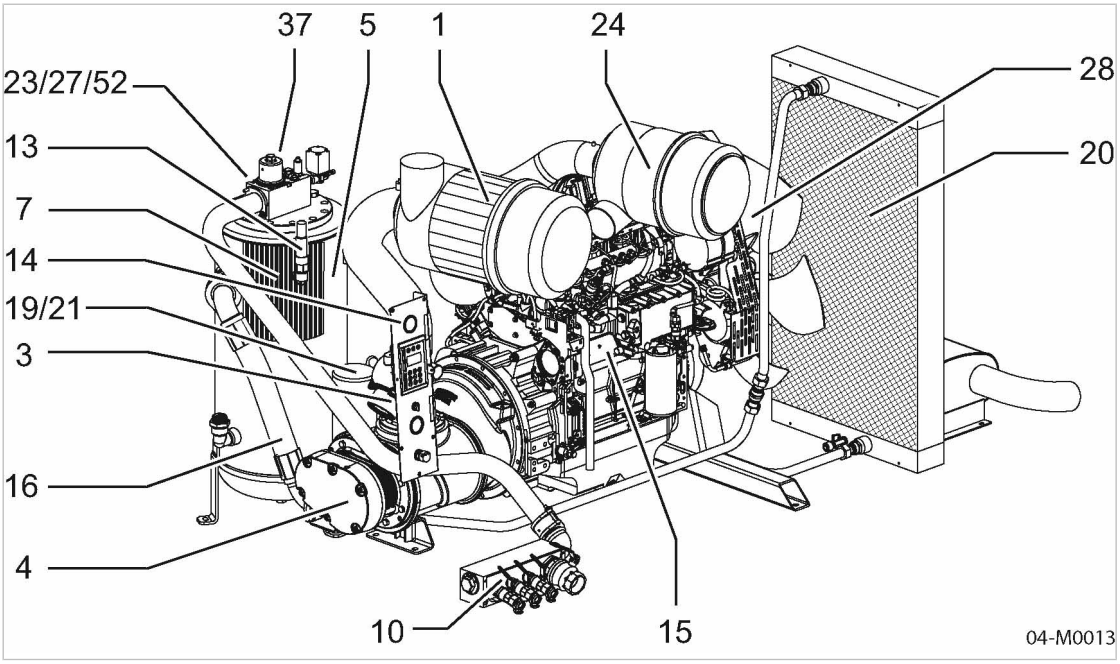


Fig. 5 General design

1	Compressor air filter	19	Combination valve (oil temperature thermostat)
3	Inlet valve	20	Oil cooler
4	Airend	21	oil filter
5	Oil separator tank	23	Proportional controller
7	Oil separator cartridge	24	Engine air filter
10	Compressed air distributor	27	Venting valve
13	Pressure relief valve	28	Fan
14	Pressure gauge (on the instrument panel)	37	Minimum pressure/check valve
15	Engine	52	Control valve
16	Oil return line		

Ambient air is cleaned as it is drawn in through the filter 1.

The air is then compressed in the airend 4.

The airend is driven by an internal combustion engine 15.

Cooling oil is injected into the airend. It lubricates moving parts and forms a seal between the rotors themselves and between them and the airend casing. This direct cooling in the compression chamber ensures a very low airend discharge temperature.

Cooling oil recovered from the compressed air in the oil separator tank 5 gives up its heat in the oil cooler 20. The oil then flows through the oil filter 21 and back to the point of injection. Pressure within the machine keeps the oil circulating. A separate pump is not necessary. A thermostatic valve 19 regulates the compressor's temperature.

Compressed air, freed of cooling oil in the oil separator tank 5, flows through the minimum pressure / check valve 37 into the air distributor 10. The minimum pressure / check valve ensures that there is always a minimum internal pressure sufficient to maintain cooling oil circulation in the machine.

The cooling fan 28 ensures optimum cooling of all components within the enclosure.

4.4 Operating modes and control modes

4.4.1 Operating modes

The machine operates in the following modes:

- LOAD
  - The inlet valve is open.
  - The engine runs at maximum speed.
  - The airend delivers compressed air.
- MODULATING
  - With the help of a control valve (the proportional controller) the degree of opening of the inlet valve is steplessly varied in response to the air demand.
  - The load and fuel consumption of the engine rises and falls with the air demand.
  - The airend delivers compressed air.
- IDLE
  - The inlet valve is closed.
  - The control valve opens, allowing pressure in the oil separator tank to be applied to the inlet valve.
  - Compressed air then flows in a closed circuit through the airend, the oil separator tank and the control valve.
  - The pressure in the oil separator tank remains constant.
  - The engine runs at minimum speed.
- STANDSTILL (shut down)
  - The inlet valve closes.
  - The venting valve opens to de-pressurise the machine.
  - The engine stops.

4.4.2 PART LOAD control

The control system regulates the volume of air generated to match the actual demand. The machine keeps the working pressure constant by varying the volume of compressed air delivered, thereby matching the air demand.

With the help of an electrical control valve (the proportional controller), the opening and closing of the inlet valve is continuously varied in response to the actual air demand. The airend provides compressed air for connected consumers.

This stepless delivery regulation minimises fuel consumption of the engine. The load and fuel consumption of the engine rises and falls with the air demand.

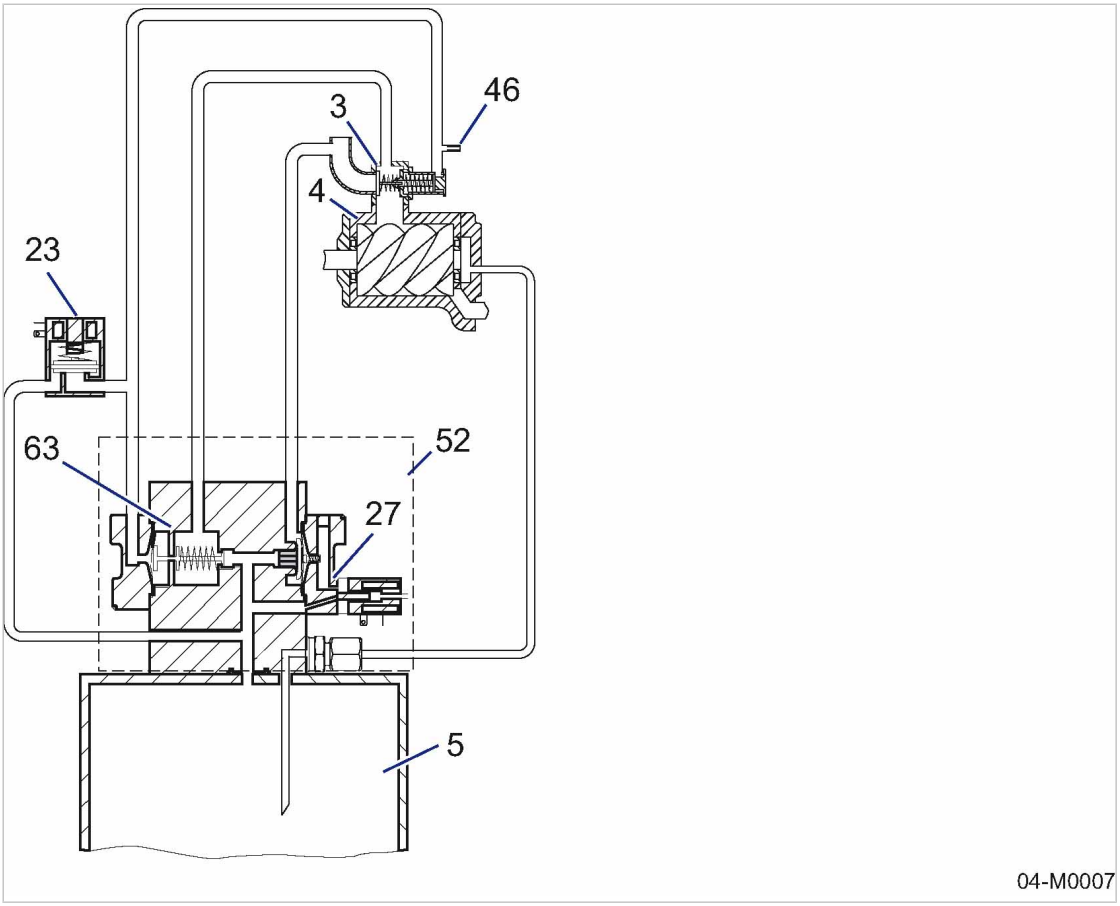


Fig. 6 Stepless regulation of FAD (standstill)

3	Inlet valve	27	Venting valve
4	Compressor block	46	Nozzle
5	Oil separator tank	52	Control valve
23	Proportional controller (electric)	63	Control valve (proportional valve)

4.5 Safety devices

4.5.1 Monitoring functions with shutdown

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.

Further information Further information on alarm messages is to be found 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.

- Quick stop button
  For immediate shutdown of the machine. The engine comes to a stop. The pressure system is vented.

- Pressure relief valves
  Pressure relief valves protect the system against unacceptable pressure rise. They are factory set.
- Enclosures and covers over moving parts and electrical connections:
  These protect against accidental contact.

4.5.3 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).

CAUTION
Danger of short circuit
Damage to the machine electrics is possible.
➢ Use the «battery isolating switch» only when the machine is at standstill.
➢ Do not use the «battery isolating switch» as a main or emergency switch.

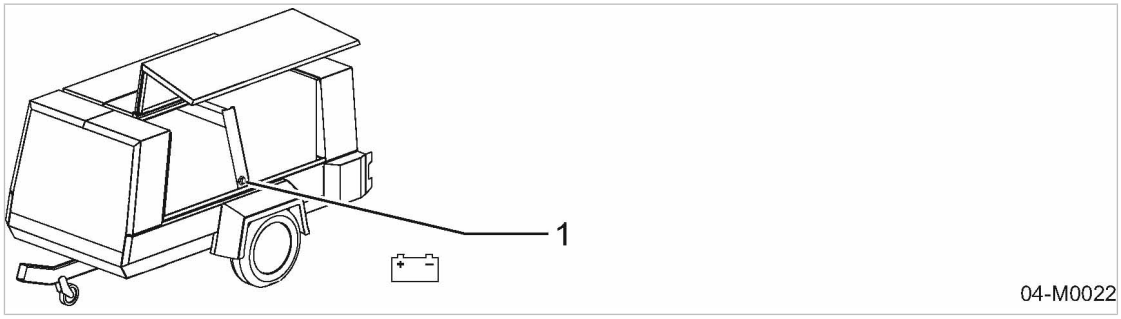


Fig. 7 Battery isolating switch
[1] «Battery isolating switch»

4.6 SIGMA CONTROL MOBIL keys and displays

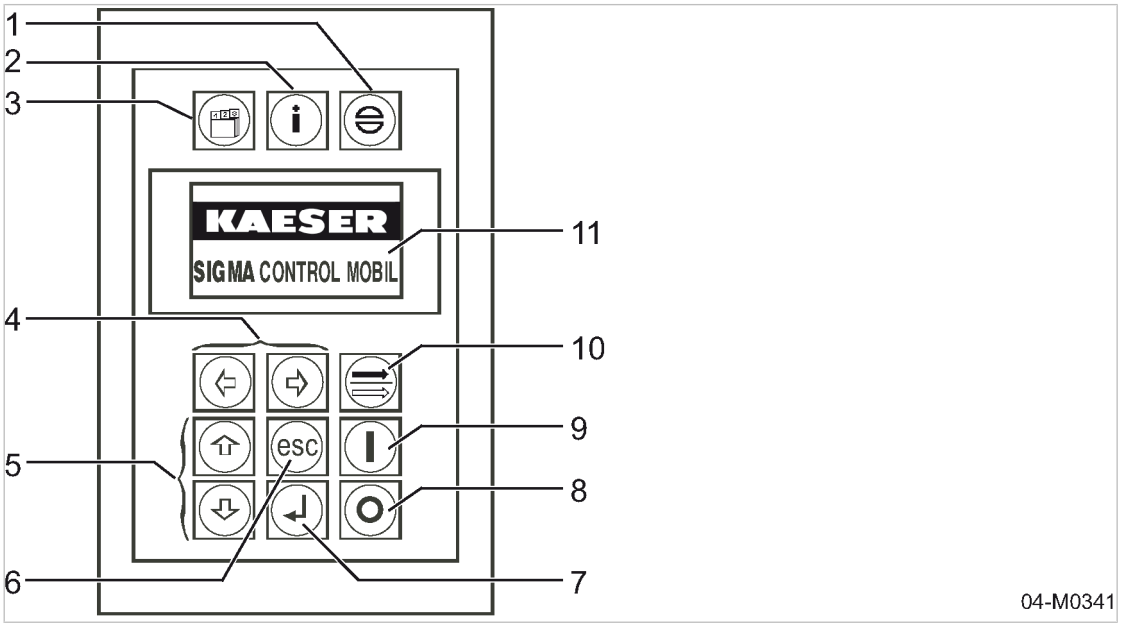


Fig. 8 Instrument panel keys and displays

Item	Sign	Name	Function	Background LED
1		«Acknowledge » key.	Acknowledge key Acknowledges active and displayed messages.	Flashes when a message is active and waiting for acknowledgement.
2		«Information» key	Displays the event memory.	Flashes if a message is active.
3		«Menu» key	Displays the main menu.	–
4		«Horizontal arrows» change values «LEFT» and «RIGHT» keys	Change parameter values, cursor movement when entering a password.	–
5		«UP» and «DOWN» keys	Vertical movement in menus. Change values in password entry.	–
6	esc	«esc» key	Returns to the menu, interrupts an entry.	–
7		«Enter» key	Selects a menu option, confirms an entry.	–
8		«Stop» key	Stops the machine.	Lights when an alarm occurs

Item	Sign	Name	Function	Background LED
9		«Start» key	Starts the machine	Flashes when ready to start. Illuminates when the engine is running.
10		«Load» key	Toggles between warm up and load.	Flashes when ready to switch to LOAD. Illuminates when the machine is operating under LOAD.
11	–	Indicator field or display	Graphic display	–

Tab. 41 Instrument panel keys and displays

4.7 SIGMA CONTROL MOBIL function

4.7.1 Display

Description of display field

- Graphic display
- Monochrome display
- 128 x 64 pixels

Opening page

The following is shown on this page while the controller is booting up:

Fig. 9 Opening page

Preheating

At temperatures below zero the engine is preheated, regulated by the engine control unit. The preheating period is influenced by an ambient temperature sensor.

Fig. 10 Engine preheating

Display of messages before the machine is ready to start

If there are messages in the event memory from the last machine operation, these will be displayed.

Message type	Function
Alarm	➢ Displayed alarm rectified ➢ Press the «Acknowledge» key. The message is deleted and the engine can be started.
Warning	➢ Press the «Acknowledge» key. The message is deleted and the engine can be started.
Maintenance	➢ Press the «Acknowledge» key. The message is deleted and the engine can be started.

Tab. 42 Display of messages prior to starting

See chapter 4.8.3 for explanation of messages.

Operating mode display

As soon as the machine is started, the display changes to show the operating mode.

The display changes automatically with each change in the machine's operating mode.

The display can be composed of symbols and alpha-numeric characters that together give a clear and logical meaning.

The display of operating mode is in two parts. The common display in the upper screen **always** shows the current airend discharge temperature. The lower half shows the machine's operating mode.

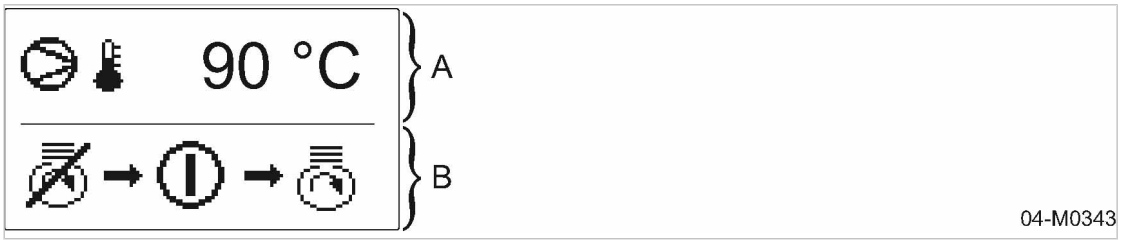


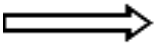
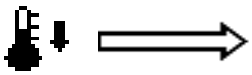
Fig. 11 Display of operating mode (example)
Ⓐ Airend discharge temperature (ADT)
Ⓑ Operational state

Meaning of the display	Explanation
Airend discharge temperature	The airend discharge temperature can be displayed in °C, °F or K as selected by the user.
Operational state	See table for displays of operational states.

Tab. 43 Operating mode display

Display of operational state

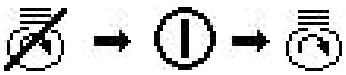
The machine's current operational state is shown in the lower half of the display. The following states are available:

Item	Operational state	Meaning of the display	Explanation
B1		Ready to start	The machine can be started.
B2		IDLE	The machine is running in IDLE.
B3		Start-up	The engine is run up.
B4		LOAD	The machine is running under LOAD.
B5		Run-on phase	Cool-down function The timer setting is 60 seconds.
B6		Cool-down phase when machine overheated	Cool-down phase when the compressor and/or engine coolant overheated.
B7		Back pressure	The remaining pressure in the OST* is displayed and the machine cannot be started. The display is in bar or psi as selected by the user.
B8		Start inhibit	A start sequence is inhibited and the display shows the time remaining until the next start sequence is allowed. The timer setting is 20 seconds.

OST* = oil separator tank

Tab. 44 Display of operational state

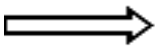
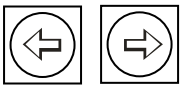
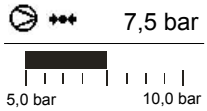
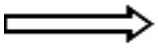
4.7.2 SIGMA CONTROL MOBIL operating sequence

Operating sequence	Key	Indication	Explanation
Ready to start			The «Start» key flashes.

* ADT = airend discharge temperature

** ECT = engine coolant temperature

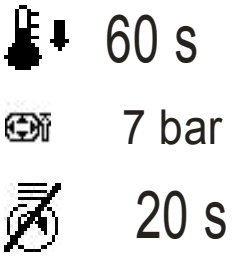
*** OST = oil separator tank

Operating sequence	Key	Indication	Explanation
Start ➢ Press the «Start» key.			The engine starts automatically. Maximum starting time 15 seconds. The starter disengages automatically when the engine picks up speed.
Engine running			The «Start» key illuminates.
Warm-up / IDLE phase			The machine runs in IDLE until the ADT* and ECT** reach 30 °C. While the either of the temperatures is > 30 °C, the machine cannot be switched to LOAD. The machine may be switched to LOAD when the «Load» key flashes.
LOAD ➢ Press the «Load» key.			The machine switches over to LOAD. The «Load» key illuminates.
Setting pressure			The outlet pressure is set.
either **Run-on phase** ➢ Press the «Load» key.			The machine switches over to unloaded run-on. The engine runs at IDLE speed. The machine is vented. The «Load» key flashes.

* ADT = airend discharge temperature

** ECT = engine coolant temperature

*** OST = oil separator tank

Operating sequence	Key	Indication	Explanation
or **Stop** ➢ Press the «Stop» key and hold for more than a second.			The machine switches over to unloaded run-on. The cool-down period is displayed The engine runs at IDLE speed. The machine is vented. The «Load» key flashes. Pressure in the OST** > 1 bar: back-pressure displayed. Pressure in the OST** ≤ 1 bar: display indicates "ready to start".
Failed start, starting sequence interrupted			The start inhibit function is activated if the machine fails to start or if the starting sequence is interrupted. The display shows the time remaining until the next starting sequence is allowed.

* ADT = airend discharge temperature

** ECT = engine coolant temperature

*** OST = oil separator tank

Tab. 45 SIGMA CONTROL MOBIL operating sequence

4.7.3 Menu structure of the SIGMA CONTROL MOBIL

Menu structure

Main menu	Menu level 1	Menu level 2
Display of operating modes	Main menu	Operating data Compressor engine
		Settings menu
		Password input
		Engine test mode (ECU)
		Generator operating data
	Event memory	Alarm messages
		Warning messages
		Maintenance messages

Tab. 46 Menu structure of the SIGMA CONTROL MOBIL

Settings menu

Menu level 2	Menu level 3	Menu level 4
Settings menu	Setting indicator unit	–
	Controller functions (password-protected)	Compressor model
		Options
		Service functions
	Engine settings	–
	Options	"Start/stop/automatic" option
		"External fuel pump" option
		"GSM/GPS module" option

Tab. 47 Settings menu

4.8 List of menus

Pressing the «Menu» key (Fig. 8, item 3) opens the main menu.

By looking through the menu options, the engine and compressor unit data can be seen and adjustments made. The event memory can also be viewed.

Format

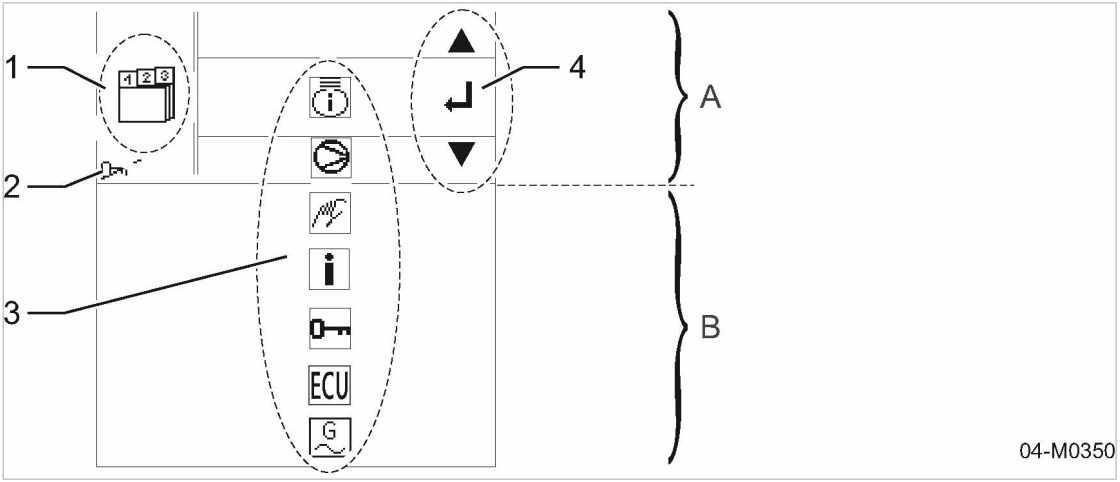


Fig. 12 Menu structure of the SIGMA CONTROL MOBIL

1 Menu selection
2 Display password level
3 Menu option list
4 Navigation (menu)
A Display field size (white background)
B Selection choice (grey background)

Menu selection

Selection	Menu	Sign	Description
1a	Main menu		Home page Display of machine data

Selection	Menu	Sign	Description
1b	Settings menu		Parameter settings for machine data
1c	Controller menu		Not available to user. Password protected.
1d	Event memory		The following events (messages) are saved: ■ Alarms, ■ warnings, ■ maintenance due.
1e	Fault memory		Display of alarms. An alarm shuts the machine down automatically.
1f	Maintenance memory		Display of maintenance due

Tab. 48 Menu selection

Menu option list

Selection	Sign	Meaning
3a		Engine data
3b		Compressor unit data
3c		Parameter settings
3d		Messages
3e		Password
3f	ECU	Engine control unit (for Service personnel)
3g	G	Generator data (only machines with generators)

Tab. 49 Menu option list

Navigation (menu)

Selection	Sign	Meaning	Key
4a	▲	Menu option above	
4b	▼	Menu option below	
4c	↵	Key to confirm or change to the next menu option.	

Tab. 50 Navigation (menu)

4.8.1 SIGMA CONTROL MOBIL main menu

By selecting menu options from the main menu, the machine's current operating data can be viewed.

he data display consists of graphic symbols and parameter values (value + unit).
The graphic symbol can be made up of pictograms that together make up a logical meaning.
Two machine parameters are shown on each display page.

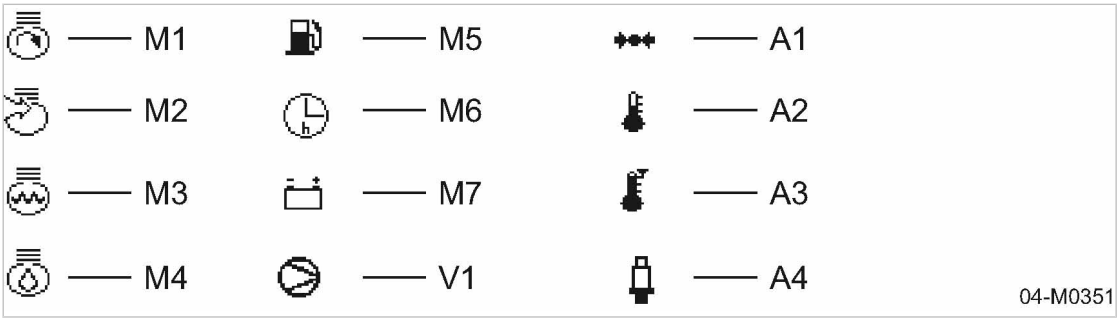


Fig. 13 Machine data symbol

- M1 Engine speed
- M2 Engine intake/turbo air
- M3 Engine coolant
- M4 Engine oil
- M5 Fuel level
- M6 Operating hours counter
- M7 Battery
- V1 Compressor (airend)
- A1 Pressure
- A2 Temperature
- A3 Temperature high
- A4 Sensor

Example of a composed symbol

Indication	Symbol meaning	Parameter
4,6 bar	Engine oil + pressure = engine oil pressure	4.6 bar

Tab. 51 Symbolic display of engine oil pressure

Engine data

The engine operating data is presented on numerous display pages. With the aid of the arrow keys, one can page through the menu guide between the display pages.

The following data are shown:

Display page	Figure	Motor data
1. Page	4,6 bar 76 °C	Oil pressure Coolant temperature
2. Page	110,5 h 1000 U/min	Operating hours Speed
3. Page	65 % 25,5 V	Fuel level Battery voltage

Display page	Figure	Motor data
4. Page	2,2 bar 23 °C	Turbo air pressure Turbo air temperature

Tab. 52 Engine data display

Compressor data

The compressor unit operating data is presented on numerous display pages. With the aid of the arrow keys, one can page through the menu guide between the display pages.

The following data are shown:

Display page	Figure	Compressor unit data
1. Page	88 °C 7,5 bar	Airend discharge temperature Pressure in the oil separator tank (OST)
2. Page	7,5 bar 5,0 bar 10,0 bar	Set pressure in the oil separator tank (OST)

Tab. 53 Display of compressor operating data

4.8.2 SIGMA CONTROL MOBIL settings menu

Selecting the hand symbol (table 48, item 1b) in the main menu will open the settings menu.

Password level

Entries and changes in the settings menu are only possible with the correct password.

The password level is reached by means of the "key" symbol in the individual menu views.

The password level is reset 3 minutes after the last key has been depressed. Temporary settings are not saved and are lost!

There are more than one password levels

Password level	Symbol	Authorization
0		No password ■ Only user settings possible
1	1	Renter password ■ Engine basic settings. ■ Confirm maintenance carried out. ■ Temporary pressure increase of 1.5 bar above working pressure.

* Maximum machine working pressure

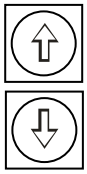
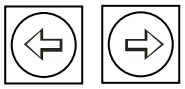
Password level	Symbol	Authorization
2	0⊸2	Customer service password ■ Engine basic settings. ■ Confirm maintenance carried out. ■ Release options. ■ Temporary pressure increase of 1.5 bar above working pressure.
3	0⊸3	Service password ■ All settings possible.
* Maximum machine working pressure		

Tab. 54 Password level

Further information See chapter 7.5 for information on entering passwords.

Operation

The following keys are used in the settings menu:

Symbol	Key name	Location on the operating panel	Function
	«UP and DOWN »arrows	5	Navigation to parameters.
	«Value changing» keys	4	Change parameter value
	«Enter» key	7	Save settings.
	«esc »key	6	Interrupts an entry. Returns to menu.

Tab. 55 Menu guidance

List of menus

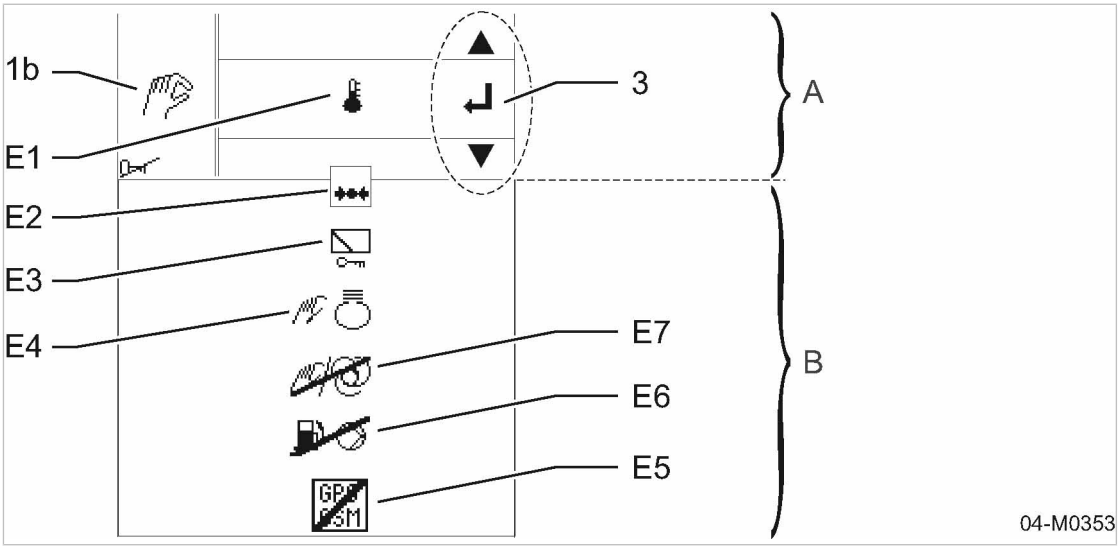


Fig. 14 Symbolic settings menu

- 1b Settings menu
- 3 Navigation
- E1 Unit of temperature
- E2 unit of press.
- E3 Controller settings (with key symbol, so long as the right password is not entered)
- E4 Engine settings
- E5 GSM/GPS module option (option illustrated as inactive, in preparation)
- E6 Fuel pump option (illustrated as inactive)
- E7 Start-stop-automatic option (illustrated as inactive)
- A Display field size (white background)
- B Selection choice (grey background)

Unit of temperature

The temperature unit is selected in the Temperature unit menu option E1.

Temperature can be displayed in the following units:

- °C
- °F
- K

Unit of pressure

The displayed unit of pressure is selected in the pressure unit menu option E2.

Pressure can be displayed in the following units:

- bar
- psi

Controller settings

This menu option is not available to users. Changes in this menu option can only be made with the correct password.

Engine settings

Settings are made in the menu option "engine settings" E4.

This menu option is not available to users. Changes in this menu option can only be made with the correct password.

The following parameters can be set:

- Starter running time
- Cool-down run-on time of the engine (machine in IDLE).
- FULL LOAD engine speed.
- IDLE engine speed.

Option ob "Start/stop/automatic" option

The symbol is stricken through if this option is not available on the machine. The menu option cannot be entered.

Changes to the parameter are made in the start/stop/automatic menu option E7.

The following parameters can be changed:

- Run-on period under LOAD.
- Run-on period in IDLE.
- Manual or automatic operation (only in Service password level 3).

Option va "External fuel pump" option

The symbol is stricken through if this option is not available on the machine. The menu option cannot be entered.

By selecting the fuel pump menu option E6 the fuel tank can be filled with an external pump.

4.8.3 SIGMA CONTROL MOBIL event memory

Selecting the i symbol (table 48, item 1d) in the main menu will open the event menu menu option.

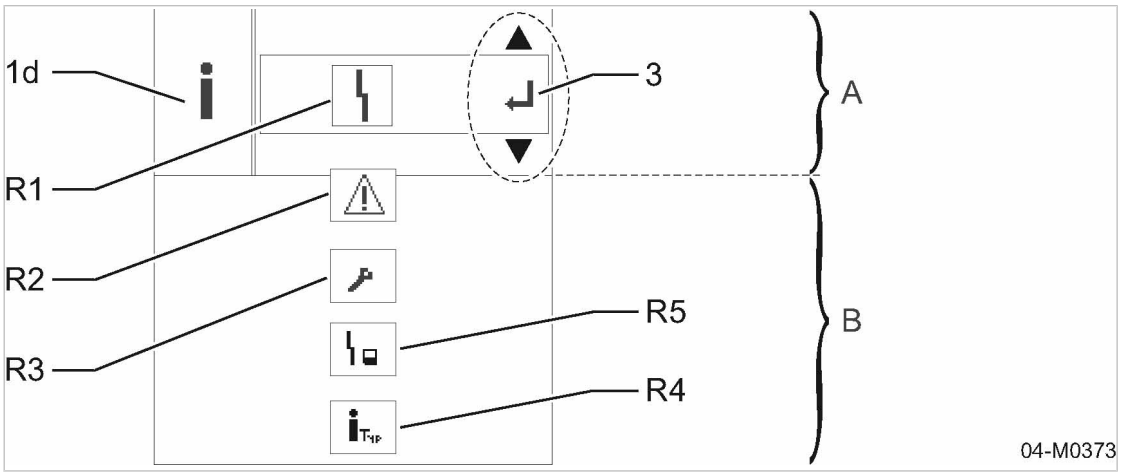


Fig. 15 Event memory

1d Event memory
R1 Alarms
R2 Warnings
R3 Maintenance
R4 Machine data information page
R5 Fault memory
3 Navigation
A Display field size (white background)
B Selection choice (grey background)

The event memory is sub-divided into menu options:

Category	Short description	Sign	Note
Alarms	R1		The machine will be shut down. The «Acknowledge » key flashes. The «Information» key and «Stop» key are illuminated. If acknowledgement of the alarm by pressing the «Acknowledge » key is possible, both lamps are extinguished. The machine can only be restarted when the cause of the alarm is corrected.
Warnings	R2		The machine will not be shut down. The «Acknowledge » key flashes. The «Information» key illuminates. These are extinguished by pressing the «Acknowledge » key. The «Information» key remains illuminated, even after restarting, until the cause of the warning is rectified.
Maintenance	R3		The machine will not be shut down. The «Acknowledge » key flashes. The «Information» key illuminates. These are extinguished by pressing the «Acknowledge » key. The «Information» key remains illuminated, even after restarting, until the maintenance is carried out and the maintenance interval counter reset.
Machine data information page	R4		The following data are shown: ■ Compressor model ■ Pressure ■ Speeds ■ Equipment number ■ Software version
Fault memory	R5		Display of the last 10 faults with ■ fault code ■ operating hours

Tab. 56 Event memory outline

Selection keys are used to navigate through the event memory.

Make up of messages

The following illustrations show how typical examples of how individual message categories are produced.

Alarm message

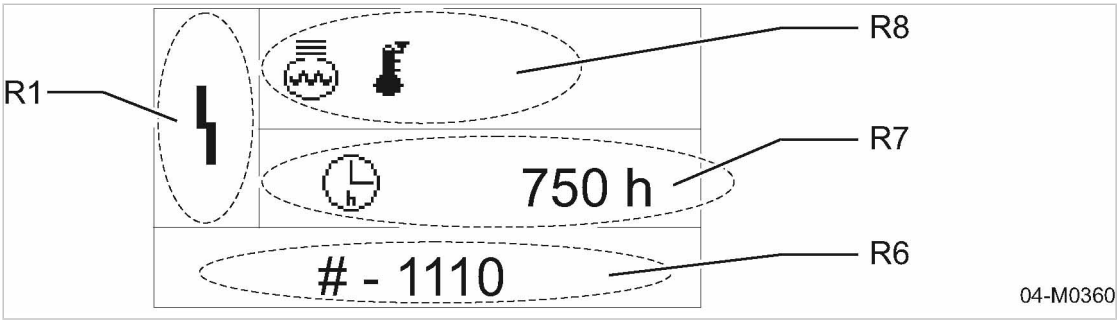


Fig. 16 Event memory example: Alarm message

- R1 Event memory category: Alarm
- R6 Message code
- R7 Operating hours since this occurred last time
- R8 Symbolic fault location (example: coolant - temperature fault)

Warning messages

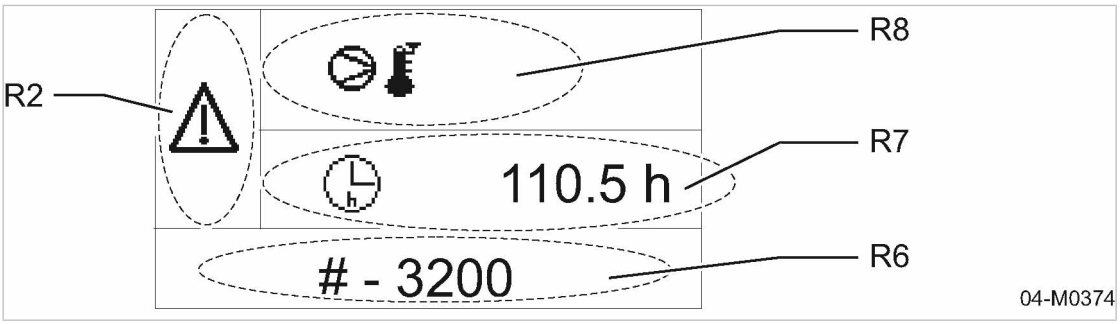


Fig. 17 Event memory example: Warning message

- R2 Message category: Warning
- R6 Message code
- R7 Operating hours since this occurred last time
- R8 Symbolic fault location (example: airend discharge temperature too high)

Maintenance message

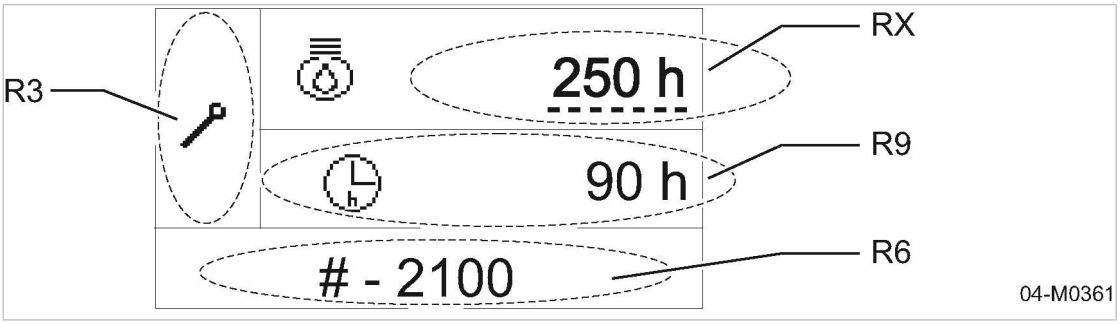


Fig. 18 Event memory example: Maintenance message

- R3 Message category: Maintenance
- R6 Message code
- R9 Time when maintenance is due.
- RX Maintenance interval

Message code

The key to the 4-character message code R6 is as follows.

Fig. 19 Message code structure

a Type of message
b Location of occurrence
c Key

The following table gives further information on message code structure.

Item	Position	Explanation
a	1. Position	Type of message ■ 1 – Alarm ■ 2 – Maintenance ■ 3 – Warning
b	2. Position	Location of occurrence ■ 1 – Engine ■ 2 - Compressor unit ■ 3 – Controller ■ 4 – General
c	3. and 4. positions	Key from 00 ... 99

Tab. 57 Message code structure

Further information See chapter 13.6 for a list of all SIGMA CONTROL MOBIL message codes.

4.9 Air treatment options

For some applications, the compressed air generated by this machine must be treated before use. The following describes the possible air treatment options that may be fitted to the machine.

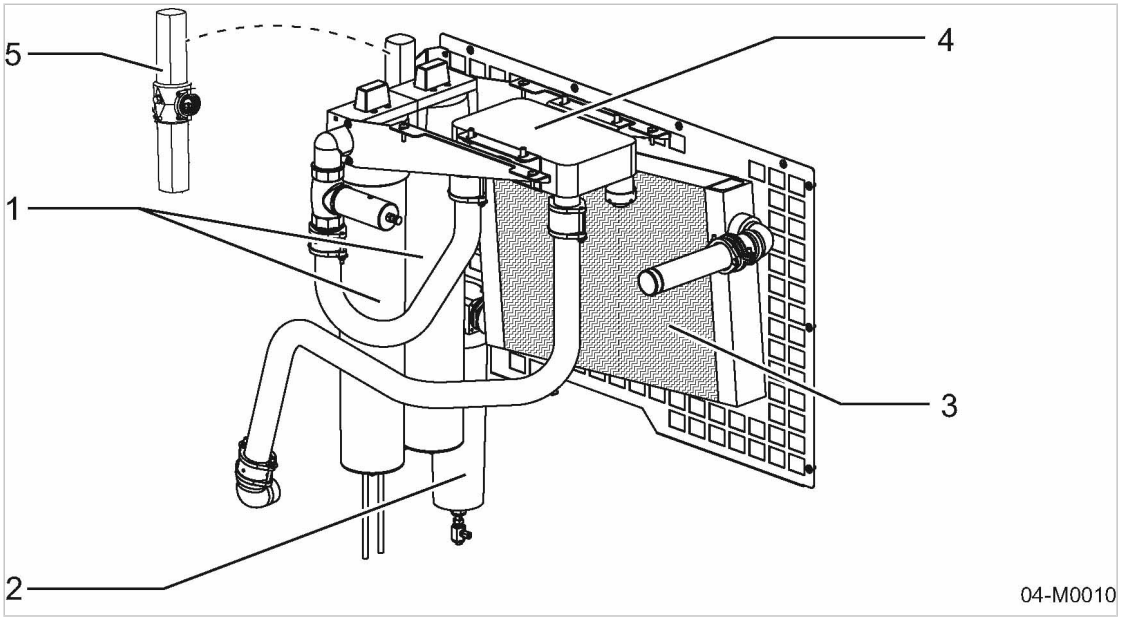


Fig. 20 Air treatment options

1 Compressed air aftercooler (option da)
2 Cyclone separator (option da)
3 Tool lubricator (option e)
4 Heat exchanger (option db)
5 Filter combination (option dd)
6 Fresh air filter (option dc)

4.9.1 Option da
Compressed-air aftercooler

The aftercooler lowers the compressed air temperature to only 5 K to 10 K above ambient. Most of the moisture carried in the air is removed in the aftercooler.

4.9.2 Option da
Cyclone separator

Condensate accumulating during the air cooling process is separated, fed to the exhaust gas silencer and evaporated there.

4.9.3 Option db
Heat exchanger

The oil/air heat exchanger is fed with hot compressor cooling oil that warms the outgoing compressed air. This warm, dry compressed air is ideal for sand blasting, for example.

4.9.4 Option dd
Filter combination

The dried compressed air passes through a combination of pre-filter and micro-filter and emerges oil-free.

4.9.5 Option dc
Fresh air filter

Compressed air from oil-injected compressors may not be use directly as breathing air.

Any contamination in the intake air is concentrated in the compressed air. Furthermore, during passage through the machine, the air may pick up traces of cooling oil and particles resulting from wear and this makes subsequent air treatment essential.

Dried compressed air must be filtered to remove all contaminants, such as fine dust and oil vapours as well as odours, before it can be used for breathing purposes.
To achieve this, part of the compressed air output from the compressor is passed through a combination of micro-filter and activated carbon filter.

The connection to air treated in this way is specially marked. It is designed as a quick-release coupling next to the outlet valves on the compressed air distributor.

DANGER
Danger of toxic contamination of the air!
Danger of respiratory arrest because the filter does not remove CO/CO_2, methane or other toxic gasses or vapours.

- ➢ Never use the machine in enclosed spaces, only in the open.
- ➢ Clean inlet air without hazardous contaminants. Engine exhaust must not be drawn into the compressor.

The treated air does not meet the local Standard for 'Compressed air for breathing apparatus'. Therefore, it must not be used as pure breathing air but may be used to reinforce the flow of fresh air when working in dusty or dirty conditions such as sand blasting.

Further information — See chapter 2.7.1 for ambient conditions under which the fresh air filter can be used.

4.10 Option ba
Low temperature equipment option

Special equipment is provided for operation in extremely low temperatures.

This equipment guaranties trouble-free operation in ambient temperatures from -25 °C to +50 °C.
The electrical system starts the engine without problem at ambient temperatures down to -20 °C.

Option bb Coolant pre-heating

The engine coolant can be pre-heated to improve starting under cold conditions.
A separate mains power connection provides power to the coolant pre-heater. A flexible power cable joins the machine's power plug to the user's power socket.
The coolant pre-heater works according to the principle of self-circulation.

Option bb

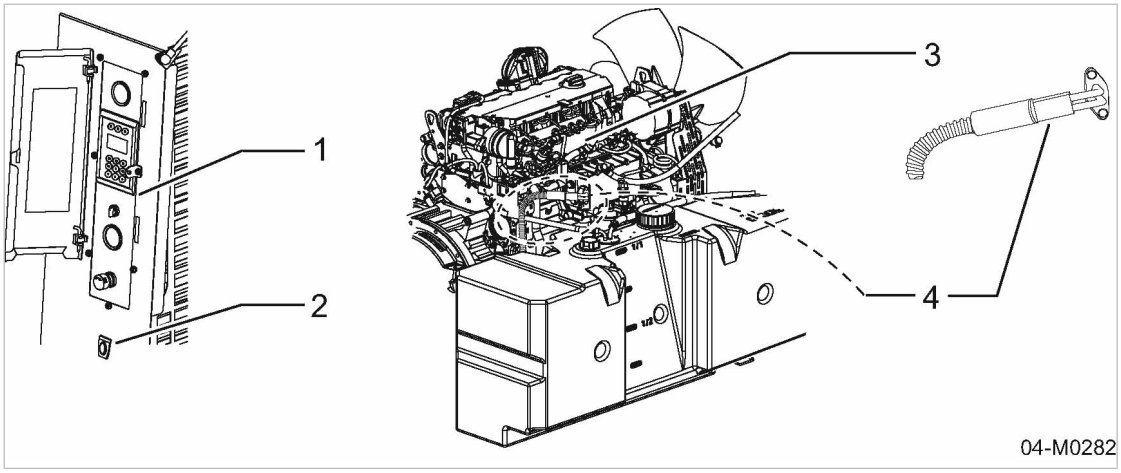


Fig. 21 Coolant pre-heating

[1] Instrument panel
[2] Connection for the coolant pre-heater
[3] Engine block
[4] Coolant pre-heating

The ideal coolant pre-heating period is 2-3 hours before the machine is started. A pre-heating period of more than 3 hours is not necessary, as the maximum effect has already been achieved within this period (thermal balance).

4.11 Option ob, od Start/stop/automatic option

Option ob Automatic engine start/stop

The start/stop automatism can be set in the SIGMA CONTROL MOBIL controller for automatic machine start.

Option od Trickle charging the starter batteries

For the starter batteries of the machine to be sufficiently charged for the starting the drive engine even after longer standstill times, a battery charger is used. This battery charger is connected to the user's electrical system.

4.12 Option va "External fuel pump" option

The machine may be connected to an external controller. The external fuel pump required is operated with the SIGMA CONTROL MOBIL controller.

4.13 Option sa, sc, sd, sh, si Transport options

4.13.1 Option sa Chassis

The chassis has the following features:

- Single-axle
- Rubber-sprung axle
- Height-adjustable towbar

4.13.2 Option sd Chassis

The chassis has the following features:

- Single-axle
- Rubber-sprung axle
- Fixed height towbar

4.13.3 Option sh Chassis

The chassis has the following features:

- Single-axle
- Rubber-sprung axle
- Fixed height towbar
- without parking brake

4.13.4 Option sc Stationary frame

The frame has the following features:

- Skids
- Use as stationary machine
- Mounted on truck/trailer platform

4.13.5 Option si Stationary frame

The frame has the following features:

- Frame
- Use as stationary machine
- Mounted on truck/trailer platform

4.14 Option sg
Pedestrian protection option

The machine is provided with pedestrian protection that functions both as a deflector and against pedestrians being run-over.

5 Installation and Operating Conditions

5.1 Safety

- ➢ 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.
- ➢ The machine is not explosion-proof!
  Do not operate in areas in which specific requirements regarding 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 that required ambient conditions are maintained with regard to:
  - ambient temperature,
  - clean inlet air with no damaging contaminants,
  - inlet air free of explosive or chemically unstable gases or vapours,
  - inlet air free of acid/alkaline forming substances, particularly ammonia, chlorine or hydrogen sulphide.
- ➢ Keep suitable fire extinguishing agents ready for use.

5.2 Installation conditions

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

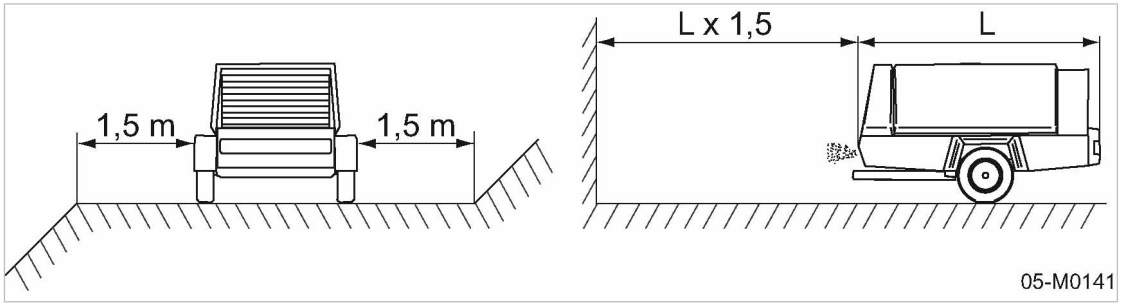


Fig. 22 Minimum distance from excavations/slopes and walls

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 15°.

3. Ensure accessibility so that all work on the machine can be carried out without danger or hindrance.

CAUTION
Fire hazard from build-up of heat and hot exhaust system!
Insufficient distance from a wall may well cause heat build-up that could damage the machine.
- ➢ Do not position the machine directly against a wall.
- ➢ Ensure always sufficient ventilation space around the machine.

4. Position the machine as far as possible from any wall.

5. Ensure there is enough free space around 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. Do not allow wind to blow into the cooling air outlet.
8. Do not allow exhaust gases and heated cooling air to be drawn into the compressor.
9. Ensure accessibility so that all work on the machine can be carried out without danger or hindrance.

CAUTION
Ambient temperature too low!
Frozen condensate and highly viscous engine or compressor oil can cause damage when starting the machine.

➢ Use winter grade engine oil.

➢ Use low viscosity compressor oil.

10. At ambient temperatures below 0 °C, follow instructions in chapter 7.9.

6 Installation

6.1 Safety

Follow the instructions below for safe installation.
Warning instructions are located before a potentially dangerous task.

Basic safety instructions

1. Follow the instructions in chapter "Safety and Responsibility".
2. Installation work may only be carried out by authorized personnel.

Further information
Information on authorized personnel are found in chapter 3.4.2.
Information on 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 Fitting the towbar

If the machine is shipped on a transport frame, it is necessary to dismantle the towbar to save space. The towbar must be re-assembled before removing the transport frame.

Material
Protective gloves
Wrench
Hard rubber hammer

Precondition
The machine is standing firm and level.
The machine is switched off.

CAUTION
Danger of pinching!
Severe pinching injury to fingers is possible.
➢ Always wear protective gloves.
➢ Work carefully.

6.3.1 Option sa
Fitting the height adjustable towbar

Option sa

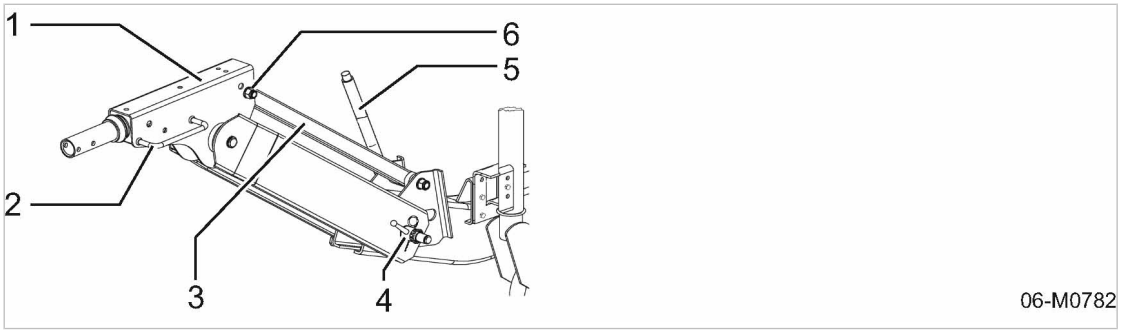


Fig. 23 Height adjustable towbar, fitted

1. Overrun braking mechanism
2. Handle
3. Tie bar
4. Locking lever with split pin
5. Hand brake lever, parking brake
6. Securing bolt with self-locking nut

Option sa

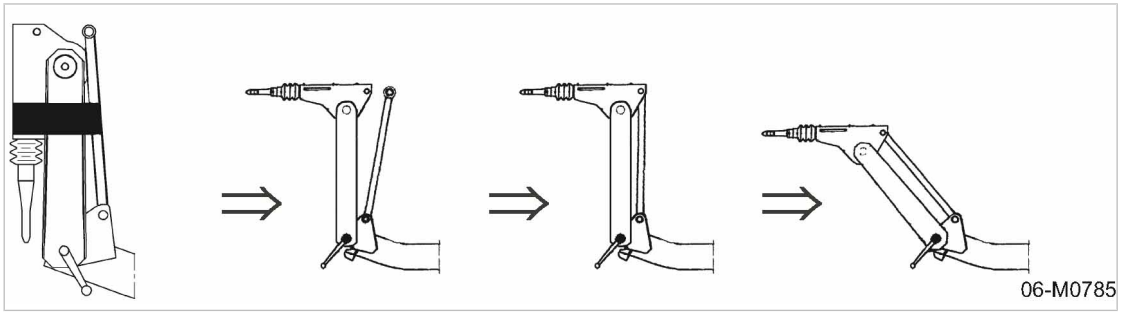


Fig. 24 Fitting the height adjustable towbar

1. Remove all transport securing items (duct tape, foam pads) from the towbar components.
2. Undo the self-locking nut and remove the tie bar fixing bolt.
3. Bring the overrun braking mechanism into the horizontal position.
4. Push the tie bar end between the cheeks of the overrun braking mechanism and align the fixing holes.
5. Push in the securing bolt, using light hammer blows if necessary.
6. Secure the bolt with the self-locking nut (see chapter 2.4.4 for tightening torque).
7. Release the parking brake by pushing the hand brake down.
8. Pull out the split pin and unscrew the locking lever to the stop.
9. Use the positioning handle to push the towbar to the required height.
10. Tighten the locking lever. Make sure the teeth in the adjustment joint mesh together.
11. Fully tighten the lever with a few hammer blows and insert the split pin.
12. Reapply the parking brake. (Pull the hand brake lever up.)

6.3.2 Option sd, sh
Fitting a non-adjustable towbar

Option sd, sh

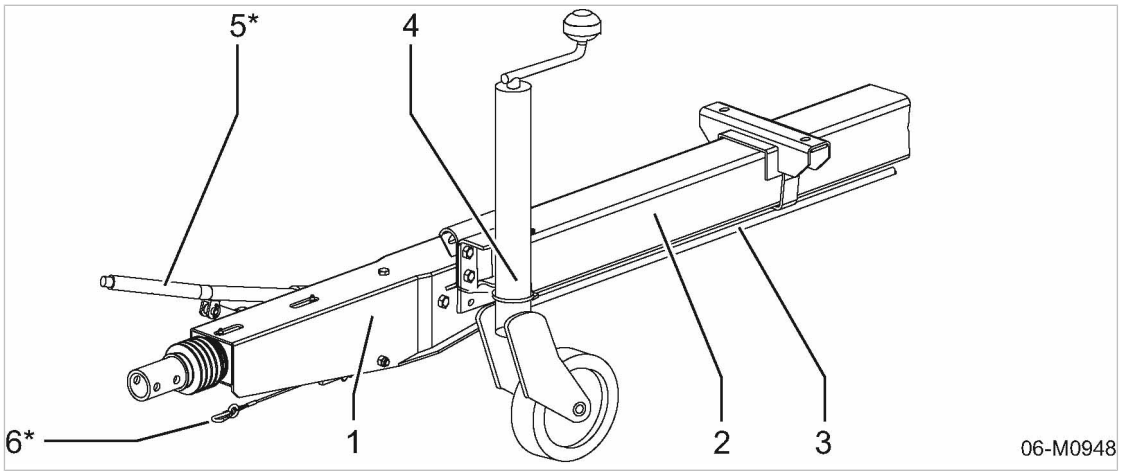


Fig. 25 Non-adjustable towbar fitted

[1] Overrun braking mechanism
[2] Towbar
[3] Brake rod
[4] Jockey wheel
[5] Parking brake
[6] Breakaway cable
[*] not for USA type chassis

1. Open the left-hand door.
2. Remove the bag with fastenings (to be found at the lifting eye strut), and unpack and prepare the fastenings.
3. Close the door.
4. Remove all transport securing items (screw fastenings, duct tape, foam pads) from the towbar components.

Fitting the overrun braking mechanism of the non-adjustable towbar:

Option sd, sh

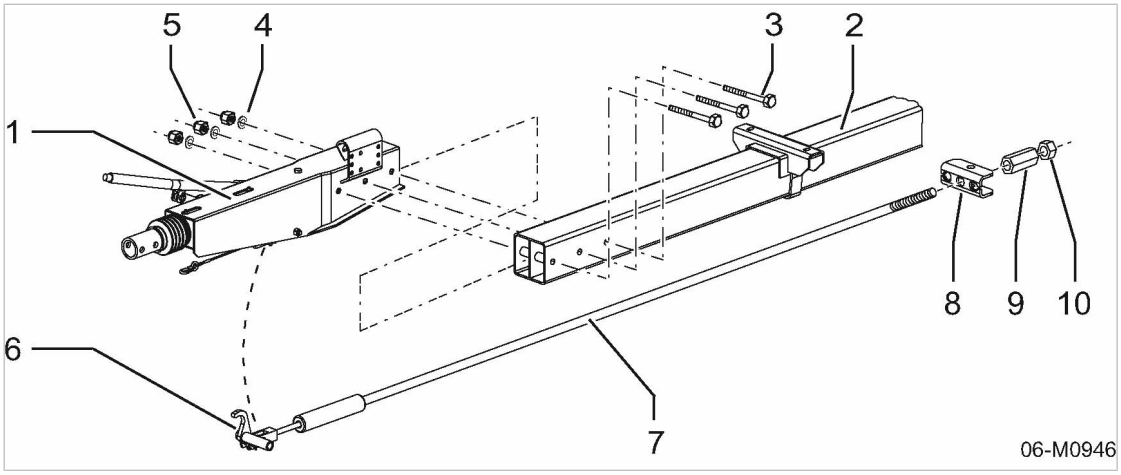


Fig. 26 Fitting the overrun braking mechanism of the non-adjustable towbar

1	Overrun braking mechanism	6	Brake transmission lever
2	Towbar	7	Brake rod
3	Fixing bolt	8	Braking cable bracket (equaliser)
4	U-washer	9	Connecting sleeve
5	Hexagon nut (self-locking)	10	Hexagon nut (locknut)

1. Push the overrun braking mechanism onto the towbar and position so that the securing bolts can be pushed on.
2. Push in the securing bolts (using light hammer blows if necessary) and push on U-washers.
3. Secure the bolts with the self-locking nuts (see chapter 2.4.4 for tightening torque).
4. Insert brake actuating rod into the brake cable bracket and screw the connecting sleeve free of play and tension.
5. Lock the sleeve with the hexagonal nut.

Further information Further information on setting the brake actuating rod is to be found in chapter 10.8.3.3.

Fitting the jockey wheel of the non-adjustable towbar:

Option sd, sh

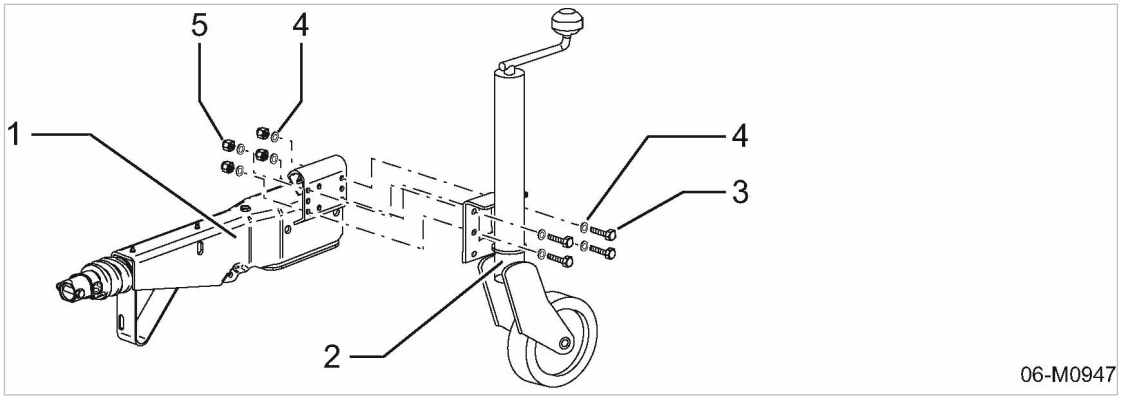


Fig. 27 Fitting the jockey wheel of the non-adjustable towbar

1	Overrun braking mechanism	4	U-washer
2	Jockey wheel	5	Hexagon nut (self-locking)
3	Fixing screw		

1. Place a U-washer on each securing screw and insert each of these into the top four securing holes on the jockey wheel mounting plate.
2. Raise the overrun braking mechanism and position such that the securing holes of the jockey wheel mounting plate and the overrun braking mechanism coincide.
3. Push through the securing screws and push on the U-washers.
4. Secure the bolts with self-locking nuts.

6.4 Adjusting the chassis

Material Pliers

Hard rubber hammer

Precondition The machine is shut down.

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

6.4.1 Option sa
Adjusting the towbar height

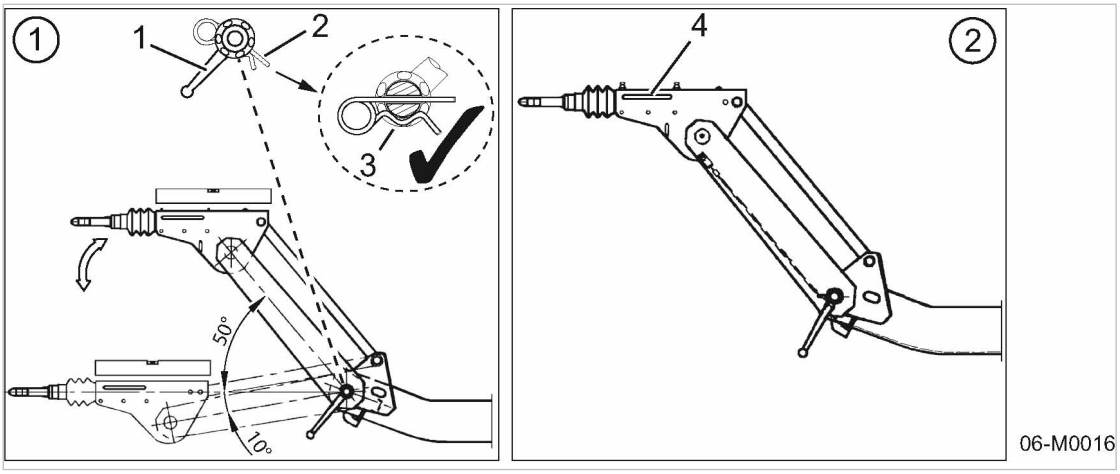


Fig. 28 Towbar height adjustment

1	Locking lever	3	Split pin properly inserted
2	Split pin	4	Handle

1. Pull out the split pin and unscrew the locking lever to the stop.

CAUTION
Danger of pinching!
Severe injury to fingers is possible if they become trapped in the adjusting mechanism.
- ➢ Always wear protective gloves.
- ➢ Work carefully.

2. Adjust the towbar with the handle until it is horizontal with the coupling on the towing vehicle and parallel to the ground.
   The centre-piece can be moved up to 50° upwards and 10° downwards for height adjustment.
   The parallel tie bar ensures that the overrun braking mechanism stays horizontal (Fig. 28).
3. Tighten the locking lever again and secure by striking with a hard rubber hammer.
4. Insert the cotter pin.
5. Check if:
   - The teeth in the adjustment joint are fully engaged.
   - The locking lever is tight.
   - The split pin is correctly inserted to secure the locking lever (see 3 in Fig. 28).
6. Tighten the locking lever again after 50 km.

The serrated joint will not disengage. The serrated washers are corroded.
- ➢ Free the serrated washers by jerking the towbar horizontally and vertically.

6.4.2 Changing the towing eye

The towbar can be fitted with various towing eyes or couplings.

Material
Protective gloves
Wrench
Thin metal rod

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

CAUTION
Danger of pinching!
Severe injury to fingers is possible if they become trapped in the adjusting mechanism.
➢ Always wear protective gloves.
➢ Work carefully.

➢ Ascertain which towbar is fitted to the machine.

6.4.2.1 Option sa
Changing the towing eye on a height-adjustable towbar

The following alternative tasks must be carried out to change the towing eye or coupling.

Option sa

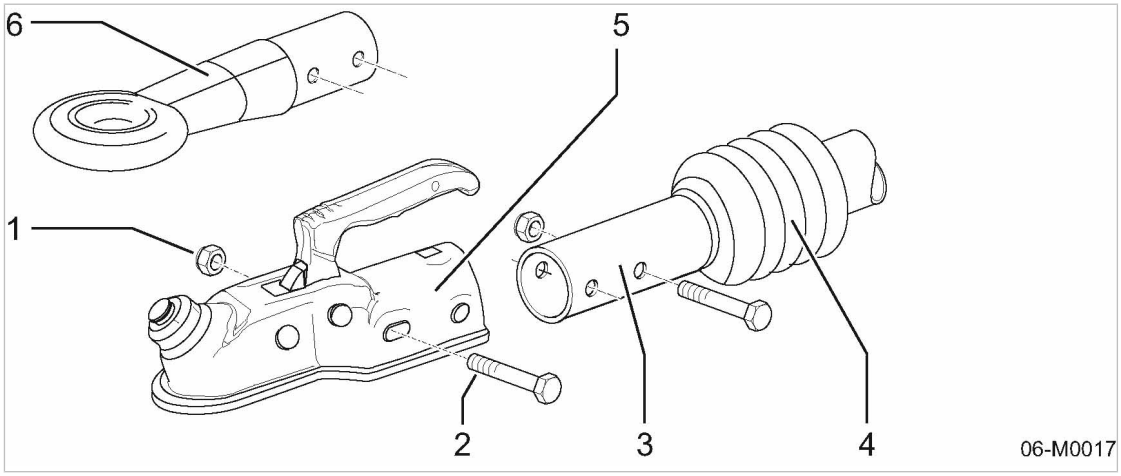


Fig. 29 Changing the towing eye (height-adjustable towbar)

1 Self-locking hexagon nut
2 Hex-head bolt
3 Towbar tube
4 Protective sleeve
5 Ball coupling
6 Towing eye

Remove the ball coupling	Remove the towing eye.
1. Unscrew the nuts 1 and withdraw the fixing bolts 2. 2. Remove the coupling 5 from the towbar tube 3.	1. Push back the protective sleeve 4. 2. Unscrew the nuts 1 and withdraw the fixing bolts 2. 3. Remove the towing eye 6 from the towbar tube 3.

Fitting the ball coupling	Fitting the towing eye
1. Slide the coupling [5] onto the towbar tube. 2. Position the various parts so that the bolts can be freely inserted. 3. Insert the bolts [2] and secure with the self-locking nuts [1].	1. Slide the towing eye [6] into or onto the towbar tube [3]. 2. Position the various parts so that the bolts can be freely inserted. 3. Insert the bolts [2] and secure with the self-locking nuts [1]. 4. Draw the protective sleeve [4] over the fixings.

6.4.2.2 Option sd, sh
Changing the towing eye on a fixed height towbar

Option sd

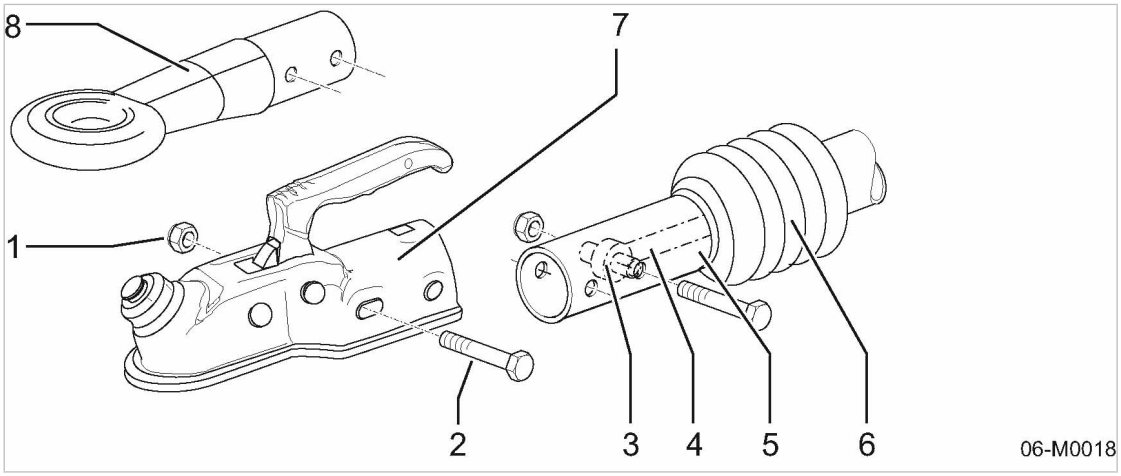


Fig. 30 Changing the towing eye (fixed height towbar, GB chassis version)

[1] Self-locking hexagon nut
[2] Hex-head bolt
[3] Damper fixing eye
[4] Damper
[5] Towbar tube
[6] Protective sleeve
[7] Ball coupling
[8] Towing eye

Option sh

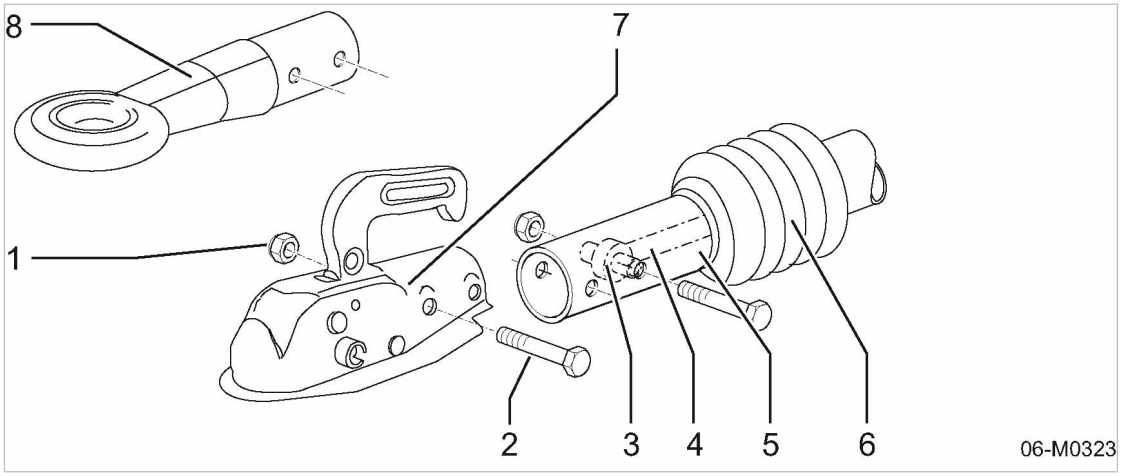


Fig. 31 Changing the towing eye (fixed height towbar, USA chassis version)

1	Self-locking hexagon nut	5	Towbar tube
2	Hex-head bolt	6	Protective sleeve
3	Damper fixing eye	7	Ball coupling
4	Damper	8	Towing eye

1. Push back the protective sleeve 6.
2. Unscrew the nuts 1 and withdraw the fixing bolts 2.
3. Remove the ball coupling 7 or towing eye 8 from the towbar tube 5.
4. Slide the new coupling 7 or towing eye 8 into or onto the towbar tube 5.
5. Position the various parts so that the bolts can be freely inserted.
6. Push the bolts 2 through the front of the two holes in the eye 8 or coupling 7 and fix with the self-locking nuts 1.

In order to insert the rear bolt, the delayed release of the compressed damper is used. During the delayed return stroke, a suitable metal rod is pushed through the holes as they line up to hold them in place.

7. Push heavily against the towing eye 8 or coupling 7 to depress the overrun brake.
8. Pull the coupling and the towbar tube forward quickly and insert a suitable thin metal rod through the rear fixing hole 3 and the damper's fixing eye 4.
9. Insert the bolt 2 through the hole in the coupling/eye and the blocked fixing eye 3 of the damper 4. At the same time, pull out the metal rod again. Secure the bolt 2 with the self-locking nut 1.
10. Tighten the nuts.
11. Draw the protective sleeve 6 over the fixings.

Checking the overrun braking mechanism

➢ Push the towbar tube in and out by hand.

If resistance is felt, the damper is properly connected.

7 Initial Start-up

7.1 Safety

Here you will find instructions for safe commissioning of the machine.

Warning instructions are located before a potentially dangerous task.

Basic safety instructions

1. Follow the instructions in chapter "Safety and Responsibility".
2. Commissioning work may only be carried out by authorized operating and maintenance personnel.

Further information

Information on authorized personnel are found in chapter 3.4.2.

Information on dangers and their avoidance are found in chapter 3.5.

7.2 Instructions to be observed before commissioning or recommissioning

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.

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

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

7.3 Checking installation and operating conditions

- ➢ Check and confirm all the items in the checklist before starting the machine.

Function	See chapter	Confirmed?
➢ Are the operators fully conversant with safety regulations?	–	
➢ Have all the positioning conditions been fulfilled?	5	
➢ Is there sufficient cooling oil in the separator tank?	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, 10.5.7	
➢ Is there sufficient coolant in the coolant expansion tank?	10.4.1	
➢ Is there sufficient fuel in the fuel tank?	–	
➢ Fuel prefilter water trap emptied?.	10.4.3	
➢ Are the access doors closed and all body panels in place?	–	
➢ Are the tyre pressures OK?	–	

Tab. 58 Installation and operating conditions checklist

7.4 Setting the displayed units

The following units can be changed:

- Unit of temperature
- Unit of pressure

The unit must only be set once and all displays are adjusted accordingly. The settings remain when the controller is switched off.

Precondition Controller switched on

Select *<Main menu => settings => unit settings>*.

Setting the unit of temperature

The temperature unit is selected in the temperature unit menu option E1.

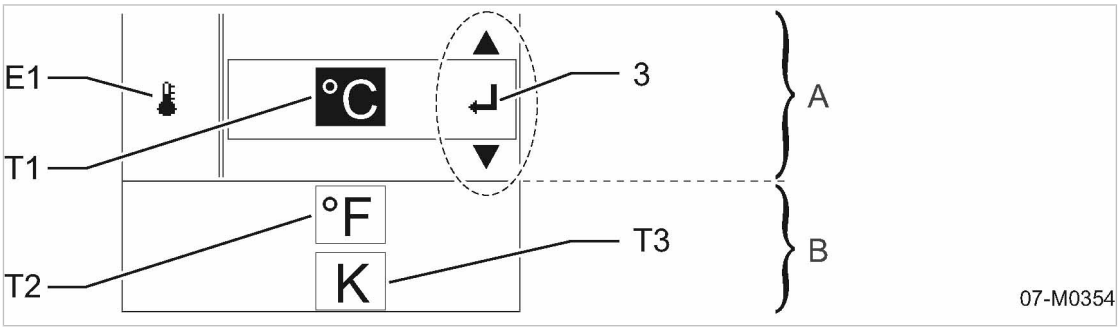


Fig. 32 Temperature display setting

E1 Unit of temperature setting menu
T1 Display unit °C (selected)
T2 Display unit °F
T3 Display unit K
3 Navigation
A Display field size (white background)
B Selection choice (grey background)

1. Use the «UP» and/or «DOWN» arrow keys to select the required unit.
2. Press «Enter».
   The setting is saved.
3. Press «esc».

Result The display changes to show the operating mode.

Setting the unit of pressure

The unit of pressure is selected in the pressure unit menu option E2.

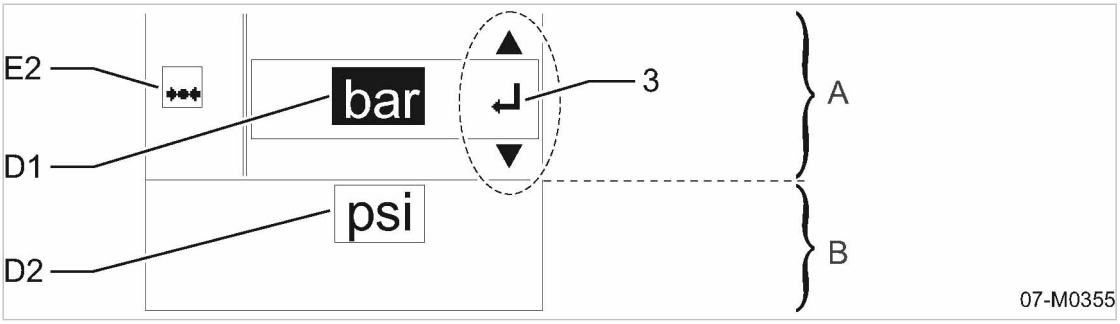


Fig. 33 Unit of pressure setting

E2	Unit of pressure setting menu	3	Navigation
D1	Display unit bar (selected)	A	Display field size (white background)
D2	Display unit psi	B	Selection choice (grey background)

1. Use the «UP» and/or «DOWN» arrow keys to select the required unit.
2. Press «Enter».
   The setting is saved.
3. Press «esc».

Result The display changes to show the operating mode.

7.5 Entering a password

No password is set when the machine is delivered.

- — Password level 0

The following password is required to make entries and changes in the settings menu:

- — Password level 1 (renter password): **4512**

The following displays will require you to enter the password:

Fig. 34 Waiting for password entry

The cursor flashes at the position for the first letter of the password.

1. Keep on pressing the «DOWN» or «UP» key until the required character appears.
2. Use «RIGHT» to move the cursor to the position of the second letter.
   The cursor flashes in the position for the next letter of the password.
3. Set the remaining characters of the password until it is complete.
4. Confirm the password with «Enter».
   The activated password is displayed. (see example in figure 35).

Password is not activated - incorrect password.

➢ Re-enter the password.

The cursor can be moved «LEFT» or «RECHTS» to overwrite and incorrect entries.

Fig. 35 Password level 1 activated.

1. Correct the password.
2. Confirm the correct password with «Enter».
   The activated password is displayed.

The password level is reset 3 minutes after the last key has been depressed. Temporary settings are not saved and are lost!

Passwords for other levels are entered in the same way.

7.6 Engine settings

This menu option is not available to users. Changes in this menu option can only be made with the correct password.

The following parameters can be changed:

- Starter running time (renter, password level 1).
- Engine cool-down period in unloaded run-on (renter, password level 1).

The following parameters can only be set by Service Technicians.

- Engine LOAD speed (password level 3).
- Engine IDLE speed (password level 3).

LOAD and IDLE speeds can be temporarily changed for service purposes or necessary tests. These changes are not saved and are lost when the controller is switched off.

Precondition Controller switched on

<main menu => settings => engine settings> selected.

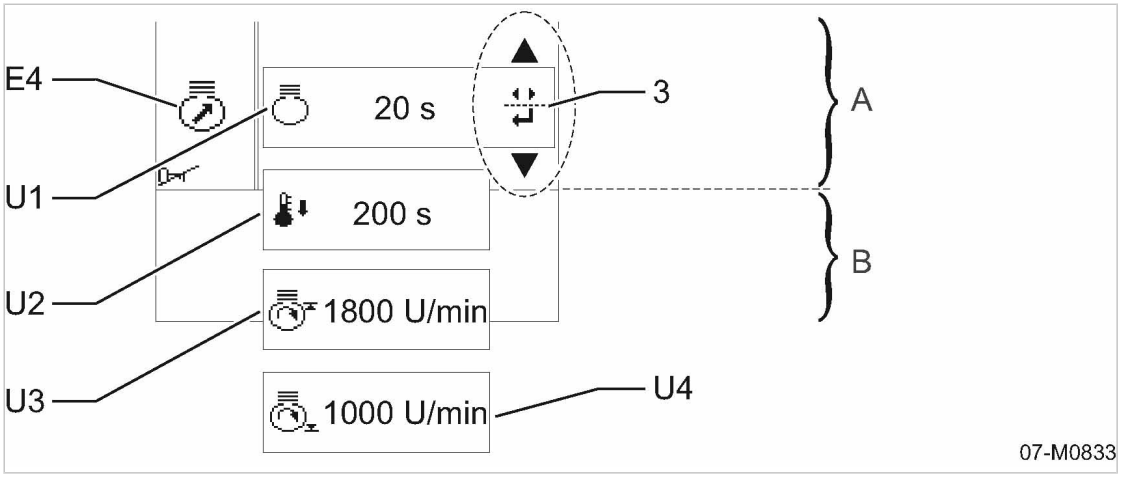


Fig. 36 Engine settings menu

E4 Engine settings menu
U1 Starter running time setting
U2 Cool-down period setting
U3 IDLE speed setting
U4 IDLE speed setting
3 Navigation (menu)
A Display field size (white background)
B Selection choice (grey background)

Starter running time setting

The starter running time can be set between 15 and 45 seconds.

1. Use the «UP» and/or «DOWN» arrow keys to select starter running time setting U1.
2. Press «RIGHT» and/or «LEFT» keys to select the required time.
3. Press «Enter».
   The setting is saved.
4. Press «esc».

Result The display changes to show the operating mode.

Cool-down period setting

When the «Stop» key is pressed, the machine switches to unloaded run-on and stops when the set period has expired.

The COOL-DOWN PERIOD can be set between 30 and 300 seconds.

1. Use the «UP» and/or «DOWN» arrow keys to select cool-down period setting U2.
2. Press «RIGHT» and/or «LEFT» keys to select the required time.
3. Press «Enter».
   The setting is saved.
4. Press «esc».

Result The display changes to show the operating mode.

Setting the engine LOAD speed.

1. Use the «UP» and/or «DOWN» keys to select LOAD speed setting U3.
2. Press «RIGHT» and/or «LEFT» keys to select the required speed.

3. Press «Enter» ⏎.
   The setting is saved.
4. Press «esc» esc.
   The display changes to show the operating mode.

This setting is only temporary and is lost when the controller is switched off.

Setting the engine IDLE speed.

1. Use the «UP» ↑ and/or «DOWN» ↓ keys to select IDLE speed setting U4.
2. Press «RIGHT» → and/or «LEFT» ← keys to select the required speed.
3. Press «Enter» ⏎.
   The setting is saved.
4. Press «esc» esc.
   The display changes to show the operating mode.

This setting is only temporary and is lost when the controller is switched off.

7.7 Option ob
Changing the parameters of the start/stop/automatic option

The following parameters can be changed:

- Run-on period under LOAD.
- Run-on period in IDLE.
- Manual or automatic operation (Service password level 3).

The length of the warm-up period, between starting and switching to LOAD, cannot be changed. The controller switches the machine to LOAD as soon as the airend discharge temperature reaches 40 °C.

Precondition Controller switched on
<Main menu => settings => options => start-stop-automatic > selected.

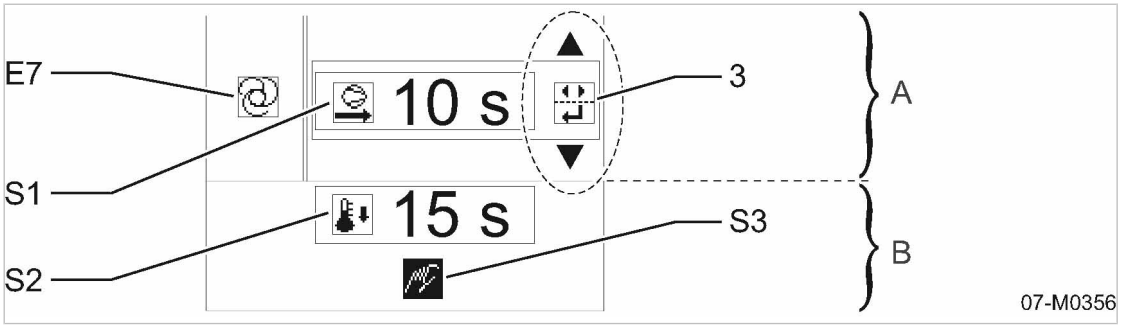


Fig. 37 Settings in start/stop/automatic

- E7 Settings menu start/stop/automatic
- S1 Run-on under load
- S2 Unloaded run-on
- S3 Manual or automatic operation (Service password level 3).
- 3 Navigation and settings
- A Display field size (white background)
- B Selection choice (grey background)

Setting run-on under load

1. Use the «UP» and/or «DOWN» arrow keys to select run-on under load S1.
2. Press «RIGHT» and/or «LEFT» keys to select the required time.
3. Press «Enter».
   The setting is saved.
4. Press «esc».
   The display changes to show the operating mode.

Unloaded run-on setting

1. Use the «UP» and/or «DOWN» arrow keys to select unloaded run-on S2.
2. Press «RIGHT» and/or «LEFT» keys to select the required time.
3. Press «Enter».
   The setting is saved.
4. Press «esc».
   The display changes to show the operating mode.

7.8 After storing the machine for a long period

➢ Carry out the following before every re-commissioning after a long period of storage.

Storage 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. ➢ Drain the preserving oil from the separator tank. ➢ Fill with cooling oil. ➢ Drain the preserving oil from the engine. ➢ Fill with engine oil. ➢ Check the engine coolant ➢ Check the battery charge. ➢ Re-connect the battery (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 cleansing agent. ➢ Check the tyre pressures.
36 months	➢ Have the overall technical condition checked by an authorized KAESER Service Technician.

Tab. 59 Measures for re-commissioning the compressor after a long period of storage

7.9 Low-temperature operation (winter)

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

➢ At temperatures below 0 °C use:
- winter-grade engine oil,
- low viscosity cooling oil for the compressor,
- winter-grade diesel fuel

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

7.9.1 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.
The «battery isolating switch» is off.

DANGER
Fire and explosion hazard.
High currents caused by short-circuited battery. Shorted batteries 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.
- ➢ Do not connect the battery jumper cables to the negative pole of the discharged battery or to the bodywork of the machine.
- ➢ Work carefully.

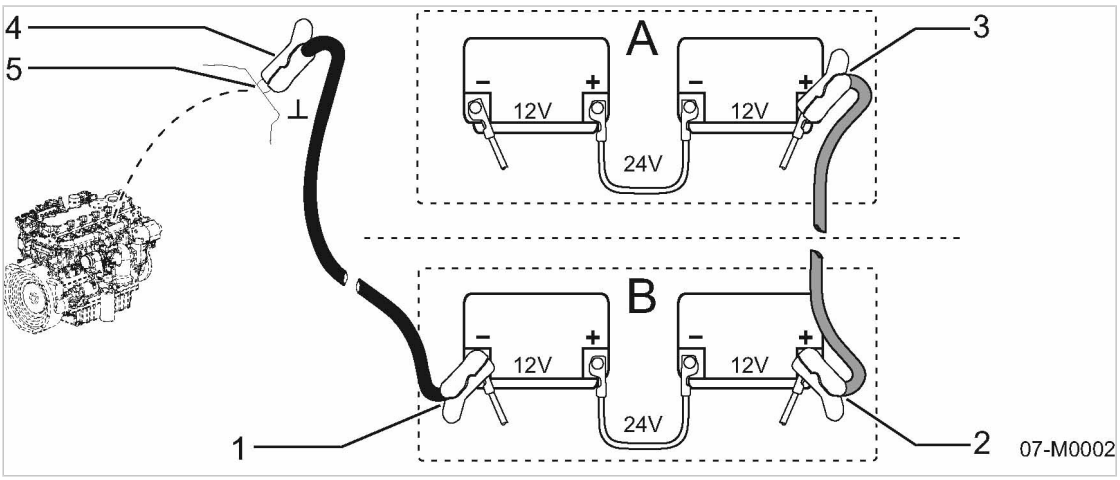


Fig. 38 Jumper cable connection diagram

- [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 engine battery
- [5] Bare metal point on the engine block (earth)

- ➢ Follow the safety rules when dealing with batteries:
  - Connect batteries of the same voltage only.
  - The assisting vehicle and the machine to be started must 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.

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 access 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.

DANGER
Explosion hazard!
A spark may ignite an explosive gas mixture.
➢ Do not, under any circumstances, connect the minus terminal of the assisting vehicle to the negative terminal of the battery in the machine to be started.
This can cause sparks when connecting and disconnecting.
➢ Work carefully.

3. Connect the first pole clamp [4] of the black jumper cable to the engine block or a connected, solid and unpainted metal component of the engine [5] (as distant as possible to the batteries).
4. 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. Switch on the «battery isolating switch».
2. Start the engine of the assisting vehicle and run at high speed.
3. 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 attentuated 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.

7.9.2 Option ba
Starting up low-temperature equipment

Option bb **Coolant pre-heating**

The engine coolant can be pre-heated to improve cold-starting.

The connection for the mains supply is located on the machine's instrument panel.

Option bb

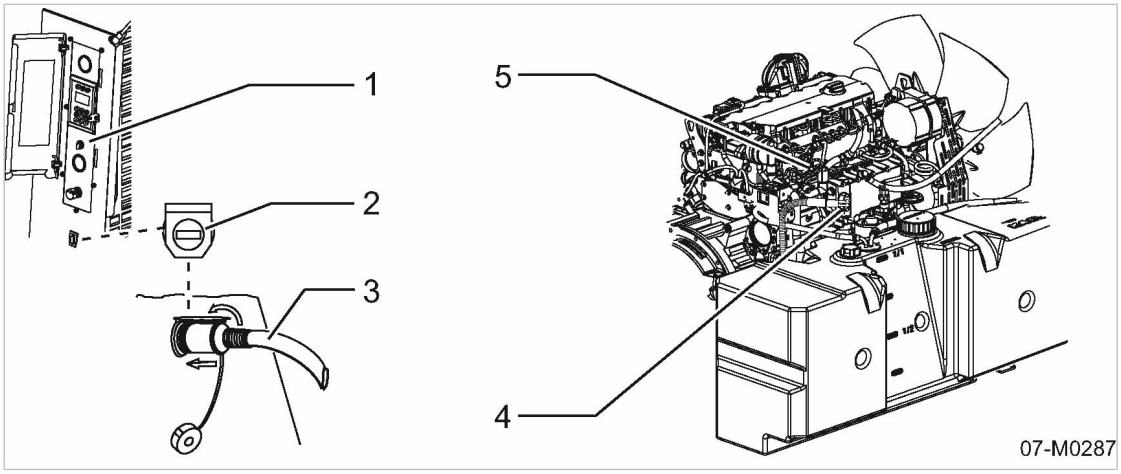


Fig. 39 Coolant pre-heating

[1] Operating panel
[2] Connection for the coolant pre-heater
[3] Power cable
[4] Coolant pre-heating
[5] Engine block

DANGER
Danger of fatal injury from electric shock!
Serious injury or death can result from a short-circuit in the electric coolant pre-heater.

- ➢ The power cable for the coolant pre-heater may only be plugged into an electrical socket fitted with a protective earth.
- ➢ Have the coolant pre-heating and associated wiring checked according to the maintenance schedule.

➢ Connect the coolant pre-heater to the user's power socket with the power cable supplied.

7.10 Option od
Activating the battery trickle charging

The supply voltage must be permanently connected as long as the compressor is to be operated in standby mode. Trickle charging the batteries ensures they are always in a condition to start the portable compressor.

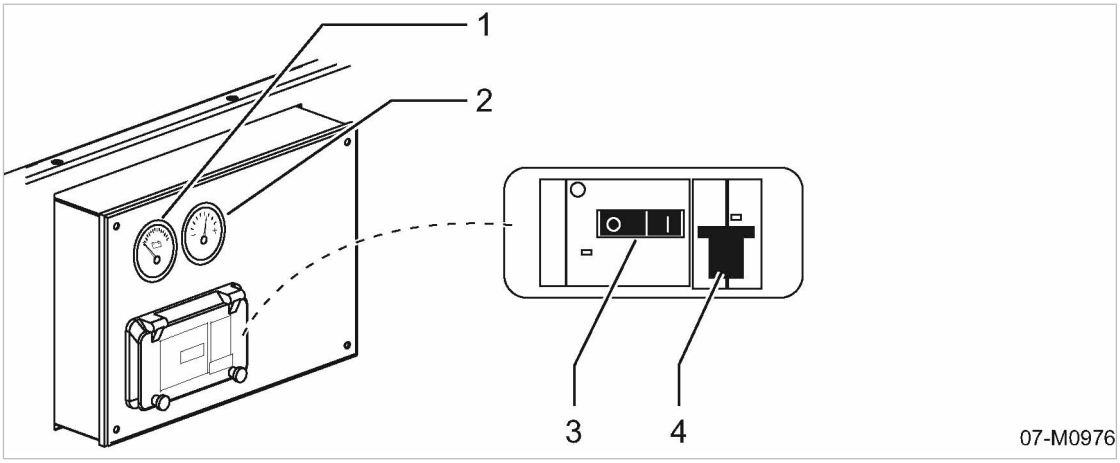


Fig. 40 Battery charger

1	Voltmeter	3	Motor overload protection switch
2	Ammeter	4	Safety cut-out

Activating the battery charger:

1. Switch on the overload protection switch.
2. Switch on the safety cut-out.
   The meters indicate the charging voltage and current.

Checking battery charger function

The charger function should be checked weekly.

Instruments	Voltmeter	Ammeter
Display	Charging voltage [V DC]	Charging current [A DC]
Value	≥26.6	>0.5

Tab. 60 Battery charger control

CAUTION
Cutting the supply voltage of the battery charger.
Starter batteries discharge through a connected battery charger. This can result in a total discharge and destruction of the batteries.
➢ If the supply voltage is switched off: also switch off the motor protection switch and cut-off.

➢ Check the readings on the voltmeter and ammeter.
If deviations are found: contact an authorised electrician.

8 Operation

8.1 Safety

Here are to be found instructions to ensure safe operation of the machine.
Warning instructions are located before a potentially dangerous task.

Basic safety instructions

WARNING
There is danger of injury from hot, rotating and electrically live components!
Serious injury can be caused by touching such components.

- ➢ Operate the machine only with closed doors/canopy.
- ➢ Shut down the machine before opening any doors/canopy.
- ➢ Do not carry out any checks or settings while the machine is running.

Follow the instructions in chapter 'Safety and Responsibility'.
Details of authorized 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.

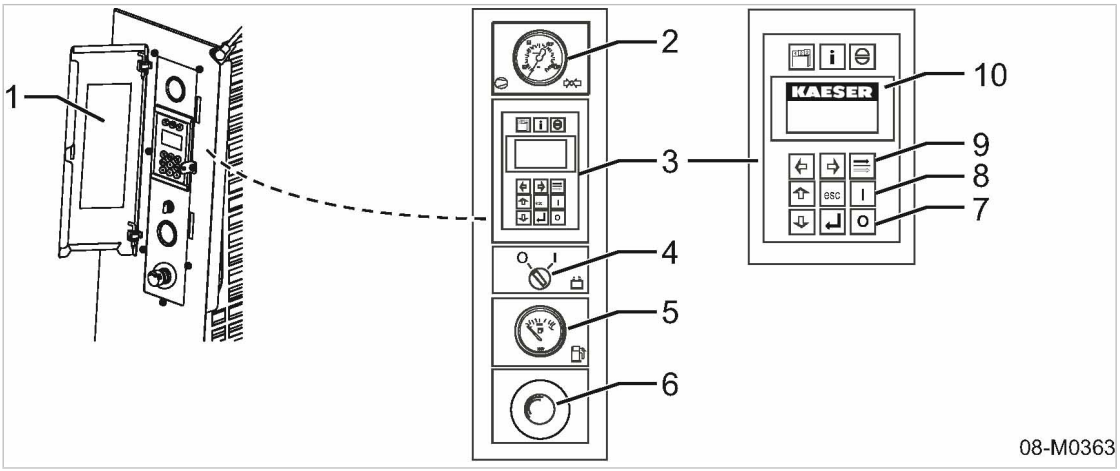


Fig. 41 Starting instruments

1. Instrument panel cover with sticker giving brief instructions
2. Compressed air outlet pressure gauge
3. Controller SIGMA CONTROL MOBIL
4. «Controller On» switch
5. *Fuel gauge*
6. «Quick-stop push-button»
7. «Stop» key
8. «Start» key
9. «Load» key
10. Display

8.2.1 Follow the brief instructions

Brief instructions containing symbolic information on starting and stopping is stuck to the inside of the instrument panel cover.

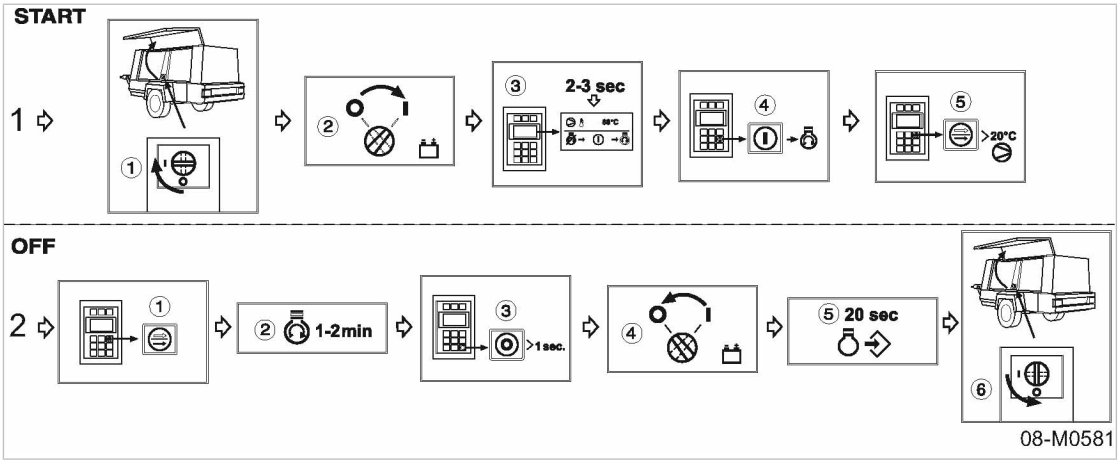


Fig. 42 Brief instructions on starting and stopping

1 Starting sequence
2 Shutdown sequence

➢ Open the instrument panel cover and follow the instructions stuck to the inside.

Each step explained in full.

8.2.2 Running the machine

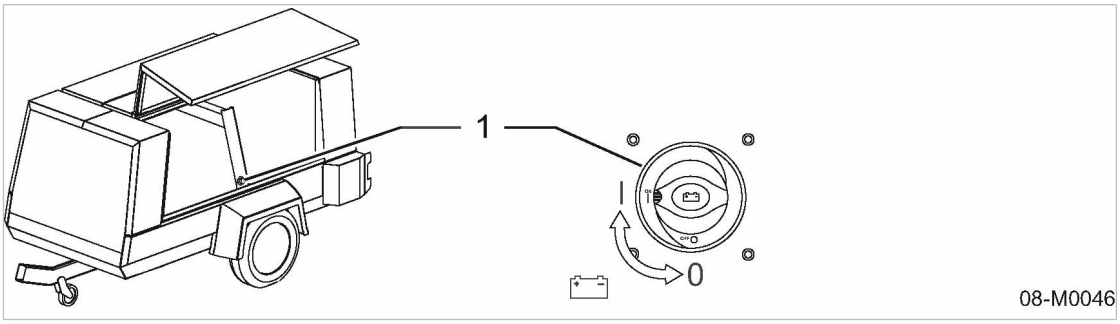


Fig. 43 «Battery isolating switch»

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

1. Open the left-hand door.
2. Activate the «battery isolating switch».
   The battery is now connected to the machine's electrical system.
3. Close the door.
   The machine can now be started.

Notes concerning 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.

As a safety measure, check the function of the «quick stop »push-button.

WARNING
«Quick-stop» button jammed!
The machine cannot be stopped quickly in an emergency.
➢ Check the function of the «quick stop »push-button.
➢ Do not operate the machine if the «quick stop button» does not work.

1. Press the «Quick-stop» button.
   Defrost the «quick stop »button if it cannot be pushed in or does not latch. Defrost the «Quick-stop» button.
2. Unlatch the «quick stop» button.

The «quick stop »button still does not function after defrosting.
➢ Have the «Quick stop» button replaced.

8.2.3 Starting the engine

CAUTION
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.

1. Open the control panel cover.
2. Switch on the «Controller».
   - The controller boots up and the front page is displayed.
   - If the temperature is below zero, the engine control unit will switch on engine pre-heating.
   - If no existing message are displayed (see chapter 4.7, table 42) the display changes to operating data and shows ready to start.
   - The «Start» key ⓘ flashes.
3. Press the «Start» key ⓘ.
   - The engine starts and runs in IDLE until the following conditions are fulfilled:
     - The airend discharge temperature (ADT) reaches 30 C.
     - The engine coolant temperature (ECT) reaches 30 C.
   - When the ADT or ECT reaches 30 °C, the machine can be switched to LOAD.
   - The «Start» key ⓘ illuminates and the «Load» key ⛁ flashes.
4. Press the «Load» key ⛁.
   - The machine switches to LOAD and is ready to deliver compressed air.
   - The «Load» key ⛁ illuminates.

- If the «Load» key ⛁ is pressed before the ADT or ECT reaches 30 °C the engine continues to run at IDLE speed. The controller switches automatically to LOAD when these temperature limits are reached.
- If the starting sequence fails or is interrupted by pressing the «Quick stop» key, the re-start inhibit is activated for 20 seconds. The display shows the remaining time before another start can be attempted.

Further information — See chapter 4.7.2 for the operating sequence of the SIGMA CONTROL MOBIL.

8.2.4 Setting the output pressure

The output pressure is set from the instrument panel.
Setting is in increments of 0.1 bar and shown as a scale on the display.

The output setting menu option can be reached in two ways:

- Quick entry
- Entry via the menu structure

Quick entry

Precondition LOAD
<Main menu> (operating mode display) selected

➢ Press either «LEFT» ⊖ or «RIGHT» ⊕.
This immediately selects the output setting menu.

Entry via menu structure

Precondition LOAD
<Main menu => engine operating data – compressor> selected.
Enter the output pressure in the sub-menu "set pressure in oil separator tank"

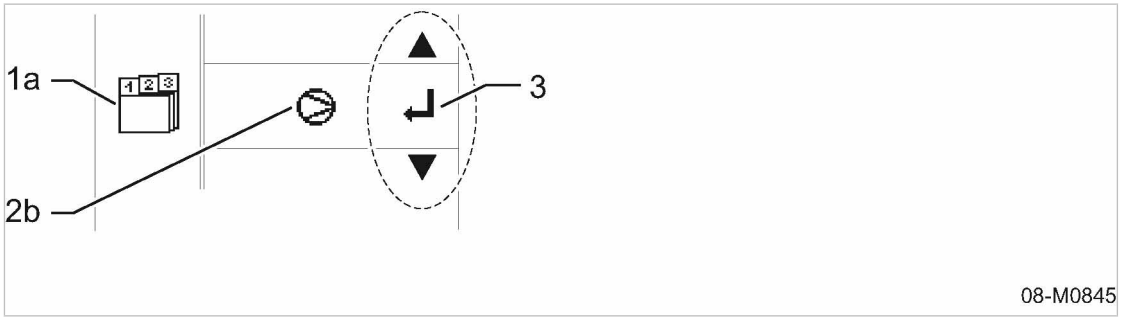


Fig. 44 Select menu option "set pressure in the oil separator tank"
1a Main menu
2b Compressor unit data
3 Navigation (menu)

1. Select the compressor data symbol and confirm with «Enter» ↵.
2. Select menu option "set pressure in the oil separator tank"
   This immediately selects the output setting menu.

Setting pressure

The pressure can only be set at lower than the nominal working pressure of the machine.
A pressure setting 1.5 bar higher than nominal is possible with the appropriate password. This can only be temporary and falls back to nominal if no key is pressed for 3 minutes or if the controller is switched off.

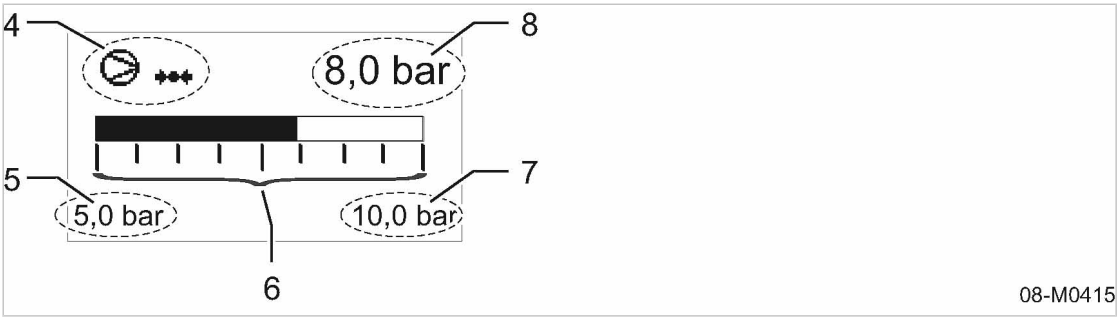


Fig. 45 Setting the output pressure

4 Select menu option "set pressure in the oil separator tank"
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» to select the output pressure and check on the instrument panel pressure gauge.

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

➢ Press «esc».
The display changes to show the operating mode.

8.2.5 Shutting down the machine

CAUTION
Thermal overload of the turbo charger.
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 turbo charger to cool.

Operating the machine in the cool-down phase

➢ Press and hold the «Stop» key for longer than one second.
- The machine switches to unloaded run-on, i.e. the engine runs at IDLE speed and the oil separator tank is vented.
- When the cool-down period has elapsed (engine setting "unloaded run-on") the machine has cooled enough so that the engine can stop automatically.

- The controller display shows *back pressure* if the pressure in the oil separator tank is still > 1 bar.
- When the machine is fully vented, the display changes to *ready to start*.
- When the OST is fully vented after shutdown, the re-start inhibitor is activated and is indicated by the timer counting down from 20 seconds.

Shutting down the machine

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

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

1. Switch off the «Controller».
2. Open the left-hand door.
3. Switch off the battery «battery isolating switch» when the instrument panel display is no longer illuminated.
   The battery is disconnected from the machine's electrical system.
4. Close the «compressed air outlet valves» on the air distributor.
5. Close the operating panel cover and all doors. Lock if necessary.

8.2.6 Shutting down in an emergency

In case of danger, immediately stop the machine by pressing the «Quick stop» button.

Use the «Quick stop» button to stop the machine only in emergencies.

Quick shutdown:

- ➢ Press the «Quick-stop» button.
  - The engine stops immediately.
  - The «Quick stop button »remains latched after being pressed.
  - The re-start inhibitor is activated (20 seconds).
  - The «Information key » ⓘ and the «Stop key» ⊙ are illuminated.
  - The «Acknowledge» key ⊜ flashes.

Reactivating the machine:

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

Precondition The fault has been rectified.

- ➢ Unlatch the «Quick-stop button».
- ➢ Confirm the message with the «Acknowledge key» ⊜.
  The «Information» ⓘ, «Stop» ⊙, and «Acknowledge» ⊜ keys extinguish.
  The machine can now be started again.

8.3 Setting parameters

Parameter setting and changing takes place in the controller settings menu.

- Select *<Main menu => setting>*.
- See chapter 4.8.2 for using the settings menu.
- Some menu options are password protected.

1. Use the «UP» key and/or «DOWN» key to navigate to the menu option containing the parameter to be set.
2. Use the «RIGHT» key and/or «LEFT» key to set the required parameter value.
3. Confirm and save the setting with «Enter».

Every action can be cancelled with the «escape» key.

8.4 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.

See chapter 4.8.3 for further information on the event memory.

8.4.1 Acknowledge alarm message.

An alarm message is displayed and:

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

Precondition Alarm rectified

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

8.4.2 Acknowledging warning and maintenance messages

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

- The «Information key » lights up,
- The «Acknowledge» key flashes.

Precondition The cause of the warning is rectified
Maintenance is 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.

8.5 Resetting maintenance interval counters

Each maintenance interval counter must be separately reset. Only the counter currently displayed can be reset.

Only personnel with passwords of at least level 1 (renter level) can reset the maintenance interval counter.
See chapter 7.5 for information on entering passwords.

Precondition Maintenance is carried out
Service message is acknowledged.
Password level is activated.

➢ Simultaneously press and hold «Acknowledge» and «Enter» for two seconds.
The displayed maintenance interval counter will be reset.

8.6 Displaying machine operating data

Precondition Controller switched on
<Main menu => engine operating data – compressor> selected.

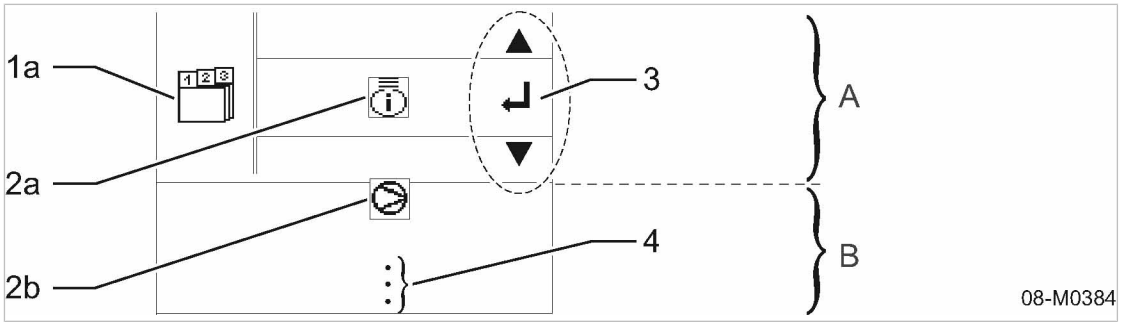


Fig. 46 Operating data menu

[1a] Main menu
[2a] Motor data
[2b] Compressor unit data
[3] Navigation (menu)
[4] Further menu options
[A] Display field size (white background)
[B] Selection choice (grey background)

Display engine data

Engine data is shown in four display menus. With the aid of the arrow keys, one can page through the display.

1. Select the engine data symbol [2a] and confirm with «Enter».
2. Call up the required display menu by pressing and/or .

Further information See chapter 4.8.1 for information on engine data display menus.

Display compressor data

Engine data is shown in two different display menus. With the aid of the arrow keys, one can page through the display.

1. Select the compressor data symbol [2b] and confirm with «Enter».
2. Call up the required display menu by pressing and/or .

Further information See chapter 4.8.1 for information on compressor data display menus.

Menu exit

➢ Press «esc» ⎋.
The display changes to show the operating mode.

8.7 Option va
Using the external fuel pump option

Precondition Controller switched on
<main menu => settings => options => external fuel pump>

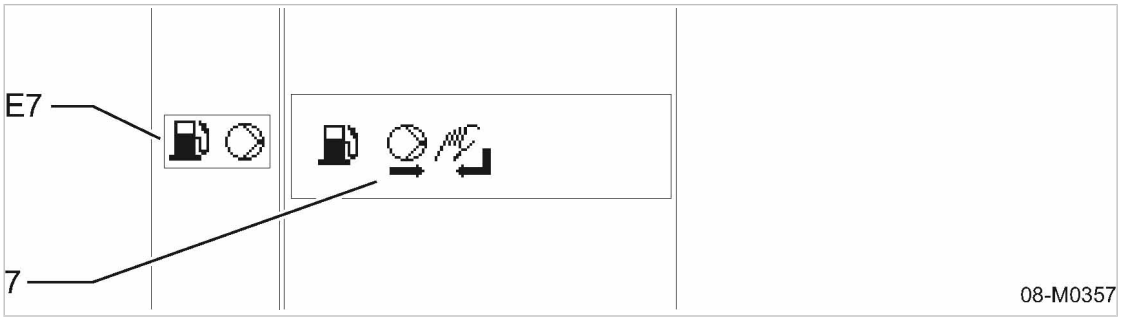


Fig. 47 External fuel pump switch-on symbol
E7 External fuel pump setting menu
7 External fuel pump on/off
Confirm with «Enter» ↵

Switching the external fuel pump on

➢ Press «Enter» ↵.
The pump switches on and fills the machine's fuel tank.

Switching the external fuel pump off

➢ Press «Enter» ↵.
The external fuel pump switches off.

Menu exit

➢ Press «esc» ⎋.

Result The display changes to show the operating mode.

8.8 Option ba
Using the low-temperature equipment

➢ Heed the safety instructions in chapter 3.5.

Option bb Coolant pre-heating

➢ Start the coolant pre-heating as described in chapter 7.9.2.

9 Fault Recognition and Rectification

9.1 Basic instructions

1. Do not attempt fault rectification measures other than those given in this manual.
2. Inform KAESER Service if the fault cannot be removed by the action suggested.

Further information

Observe the instructions in chapter "Safety" and prevailing local safety regulations when rectifying faults and malfunctions.

9.2 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)

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

You must acknowledge the service message upon correction of the fault before you can re-start the machine.

Further information

Further information on the acknowledgement of service messages can be found in chapter8.4.

Message code, range 1100 – 1199 “engine faults”:

Code	Meaning	Remedy	See chapter	Where can I get help?	
				Specialised workshop	KAESER Service
1100	Oil pressure fault.	Check the engine oil level.	10.4.4	–	–
		Have the engine oil pressure checked.	–	X	–
		Have the oil pressure switch checked.	–	X	X
1101	Oil pressure sensor defective.	Have the sensor changed.	–	X	X
1110	Coolant temperature high.	Check the coolant level.	10.4.1	–	–
		Clean the radiator.	10.6	–	–
		Check the cooling system.	–	X	X
1111	Coolant level too low.	Check the coolant level.	10.4.1	–	–

Code	Meaning	Remedy	See chapter	Where can I get help?	
				Specialised workshop	KAESER Service
1112	Coolant temperature sensor defective.	Have the sensor changed.	–	X	X
1120	Turbo air pressure too high/low.	Have the turbo air pressure sensor checked.	–	X	X
1121	Turbo air temperature too high.	Check operating conditions. Allow the machine to cool down.	5.2	–	–
		Clean the radiator.	10.6	–	–
1122	Turbo air temperature sensor defective.	Have the sensor changed.	–	X	X
1123	Turbo air temperature sensor defective.	Have the sensor changed.	–	X	X
1130	Fuel level low.	Refuel.	–	–	–
1131	Fuel temperature high.	Allow the machine to cool down.	–	–	–
1132	Fuel pressure low.	Have checked.	–	X	X
		Clean / replace the fuel filter.	10.4.3	–	–
1133	Fuel temperature sensor defective.	Have the sensor changed.	–	X	X
1134	Fuel pressure sensor defective.	Have the sensor changed.	–	X	X
1135	Fuel pump fault..	Have checked.	–	X	X
1140	Defective alternator.	Have checked.	–	X	X
1141	Battery voltage too high/ low.	Battery maintenance.	10.4.9	–	–
		Check battery charging system.	–	X	X
1150	Engine electronics fault.	Have checked.	–	X	X
1151	Fault in the engine electronic communication - engine electronics side.	Have checked.	–	X	X
1152	Fault in the engine electronic communication - ECM side.	Have checked.	–	–	X
1160	Rail pressure sensor fault.	Have checked.	–	X	X
1161	Speed sensor fault.	Have checked.	–	X	X
1170	Starting fault (after 3 failed attempts).	Have checked.	–	–	X

Tab. 61 Fault messages and actions concerning the engine.

Message code, range 1200 – 1299 “compressor unit faults”:

Code	Meaning	Remedy	See chapter	Where can I get help?	
				Specialised workshop	KAESER Service
1200	Compressor unit overheating.	Check operating conditions. Allow the machine to cool down.	5.2	–	–
		Check the cooling oil level.	10.5.2	–	–
		Clean the radiator.	10.6	–	–
1201	Compressor pressure too high.	Have checked.	–	–	X

Tab. 62 Fault messages and actions concerning the compressor unit

Message code, range 1300 – 1399 “controller faults”:

Code	Meaning	Remedy	See chapter	Where can I get help?	
				Specialised workshop	KAESER Service
1300	Memory fault.	Have checked.	–	–	X
1301	Fault in bus communication with engine electronics.	Have checked.	–	–	X
1302	Fault in bus communication with display unit.	Have checked.	–	–	X
1303	Overheating.	Check operating conditions. Allow the machine to cool down.	5.2	–	–
1304	Power supply.	Have checked.	–	–	X

Tab. 63 Fault messages and actions concerning the controller.

Message code, range 1400 – 1499 “general faults”:

Code	Meaning	Remedy	See chapter	Where can I get help?	
				Specialised workshop	KAESER Service
1400	Quick stop	Unblock.	8.2.6	–	–
		Have checked.	–	–	X
1410	Open circuit in the oil separator tank pressure sensor.	Have repaired.	–	–	X
1411	Short circuit in the oil separator tank pressure sensor.	Have repaired.	–	–	X

Code	Meaning	Remedy	See chapter	Where can I get help?	
				Specialised workshop	KAESER Service
1412	Open circuit in the inlet valve pressure sensor.	Have repaired.	–	–	X
1413	Short circuit in the inlet valve pressure sensor.	Have repaired.	–	–	X
1414	Open circuit in the compressor unit temperature sensor.	Have repaired.	–	–	X
1415	Short circuit in the compressor unit temperature sensor.	Have repaired.	–	–	X
1416	Open circuit in fuel level sensor.	Have repaired.	–	–	X
1417	Short circuit in fuel level sensor.	Have repaired.	–	–	X
1420	Open circuit in the venting valve (p+e).	Have repaired.	–	–	X
1421	Short circuit in the venting valve (p+e).	Have repaired.	–	–	X
1422	Open circuit in the auxiliary venting valve (p)	Have repaired.	–	–	X
1423	Short circuit in the auxiliary venting valve (p)	Have repaired.	–	–	X
1424	Open circuit in the inlet valve control valve (e).	Have repaired.	–	–	X
1425	Short circuit in the inlet valve control valve (e).	Have repaired.	–	–	X
1426	Open circuit in the frost protector valve.	Have repaired.	–	–	X
1427	Short circuit in the frost protector valve.	Have repaired.	–	–	X
1430	Manual-stop automatic mode.	Unblock.	8.2.6	–	–
		Have checked.	–	–	X
1450	Controller block, GSM/GPS monitoring.	Unblock GSM/GPS module.	–	–	X
1470	Automatic start fault.	Have checked.	–	–	X

Tab. 64 General fault messages and measures

9.2.2 Warning message on the controller

The machine will not be shut down.
The «Acknowledge » key flashes. The «Information key » illuminates.

- In the case of an overheating warning, the machine switches automatically to IDLE to cool down.
- You must acknowledge the alarm message upon correction of the fault.

Further information

Further information on the acknowledgement of maintenance messages can be found in chapter8.4.

Message code, range 3100 – 3199 “engine warning":

Code	Meaning	Remedy	See chapter	Where can I get help?	
				Specialised workshop	KAESER Service
3100	Engine oil level low.	Check the engine oil level.	10.4.4	–	–
		Have the engine oil pressure checked.	–	X	–
		Have the oil pressure sensor checked.	–	X	X
3110	Coolant temperature high.	Check the coolant level.	10.4.1	–	–
		Clean the radiator.	10.6	–	–
		Check the cooling system.	–	X	X
3121	Turbo air temperature high.	Check operating conditions. Allow the machine to cool down.	5.2	–	–
		Clean the radiator.	10.6	–	–
		Have the turbo air pressure sensor checked.	–	X	X
3130	Fuel level low.	Refuel.	–	–	–
3133	Fuel filter water level.	Empty the fuel pre-filter water trap.	10.4.3	–	–

Tab. 65 Warning messages and measures relating to the engine.

Message, code range 3200 – 3299 “compressor unit warnings”:

Code	Meaning	Remedy	See chapter	Where can I get help?	
				Specialised workshop	KAESER Service
3200	Compressor overheating.	Check operating conditions. Allow the machine to cool down.	5.2	–	–
		Check the cooling oil level.	10.5.2	–	–
		Clean the radiator.	10.6	–	–

Code	Meaning	Remedy	See chapter	Where can I get help?	
				Specialised workshop	KAESER Service
3201	Compressor final pressure too high.	Have checked.	–	–	X

Tab. 66 Warning messages and measures relating to the compressor

Message code, range 3400 – 3499 “general warnings”:

Code	Meaning	Remedy	See chapter	Where can I get help?	
				Specialised workshop	KAESER Service
3400	Battery charging voltage.	Have checked.	–	X	X

Tab. 67 General warning messages and measures

9.3 Engine faults and alarms

Further information See also the engine service manual.

9.3.1 Engine refuses to start or does not turn over

Possible cause	Remedy	Where can I get help?		
		Specialised workshop	KAESER Service	Engine service manual
«Quick-stop» button latched in.	Unlatch the «quick-stop» button, see chapter 8.2.6.	–	–	–
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).	–	–	X
Fuel filter clogged.	Clean or replace, see chapter 10.4.3.	–	–	X
Fuel line broken.	Have changed.	X	–	–
Defective control fuse or relay.	Have repaired or replaced if necessary.	X	X	–
Airend discharge temperature too high.	Have adjusted.	–	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	–	–

Possible cause	Remedy	Where can I get help?		
		Specialised workshop	KAESER Service	Engine service manual
Defective battery or low charge.	Maintain battery, see chapter 10.7.	–	–	–
Defective alternator.	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).	–	–	X
	Have the engine repaired or exchanged.	X	–	–

Tab. 68 Fault: engine refuses to start or comes to a stop.

9.3.2 Engine does not reach full speed

Possible cause	Remedy	Where can I get help?		
		Specialised workshop	KAESER Service	Engine service manual
Airlock in the fuel line between fuel tank and injector pump.	Bleed the fuel line (see chapter 10.4.3).	–	–	X
Fuel filter clogged.	Clean or replace, see chapter 10.4.3.	–	–	X
Fuel line broken.	Have changed.	X	–	–
Speed adjustment cylinder maladjusted or defective.	Repair or have replaced if necessary.	X	X	–
Engine electrical fault	Have repaired/changed.	X	–	–
SIGMA CONTROL MOBIL defective.	Have repaired/changed.	–	X	–

Tab. 69 Fault: engine does not reach full speed.

9.4 Compressor faults and alarms

9.4.1 Working pressure too high

Possible cause	Remedy	Where can I get help?	
		Specialised workshop	KAESER Service
Proportional controller defective.	Have repaired or replaced if necessary.	–	X

Possible cause	Remedy	Where can I get help?	
		Specialised workshop	KAESER Service
Inlet valve does not close.	Check the controller, the control air line and the inlet valve and replace if necessary.	–	X
Pressure gauge indicating false pressure.	Have repaired or replaced if necessary.	–	X
Venting valve does not blow off.	Check the connections and function and have repaired or replaced as necessary.	–	X

Tab. 70 Fault: working pressure too high

9.4.2 Working pressure too low.

Possible cause	Remedy	Where can I get help?	
		Specialised workshop	KAESER Service
Proportional controller defective.	Have repaired or replaced if necessary.	–	X
Inlet valve not opening or only opening partially.	Repair or have replaced if necessary.	–	X
Pressure gauge indicating false pressure.	Have repaired or replaced if necessary.	–	X
Pressure relief valve maladjusted and/or leaking.	Have replaced if necessary.	–	X
Venting valve does not close.	Check the connections and function and have repaired or replaced as necessary.	–	X
Engine does not run at FULL LOAD speed.	See chapter 9.3.	–	–
Engine air filter and/or compressor air filter clogged.	Clean or change, see chapters 10.4.2 and 10.5.7.	–	–
Oil separator cartridge heavily clogged.	Change, see chapter 10.5.6.	–	–

Tab. 71 Fault: working pressure too low

9.4.3 Pressure relief valve blowing off

Possible cause	Remedy	Where can I get help?	
		Specialised workshop	KAESER Service
Oil separator cartridge heavily clogged.	Change, see chapter 10.5.6.	–	–

Possible cause	Remedy	Where can I get help?	
		Specialised workshop	KAESER Service
Inlet valve does not close.	Check the controller, the control air line and the inlet valve and replace if necessary.	–	X
Pressure relief valve maladjusted and/or leaking.	Adjust or have replaced if necessary.	–	X

Tab. 72 Fault: pressure relief valve blowing off

9.4.4 Machine overheating

Possible cause	Remedy	Where can I get help?	
		Specialised workshop	KAESER Service
Defective cooling fan.	Have the blades or the complete fan wheel replaced.	–	X
Oil cooler clogged.	Clean surface, see chapter 10.6.	–	–
Defective working element in the combination valve.	Have repaired or replaced if necessary.	–	X
Oil separator cartridge heavily clogged.	Measure the pressure differential and change the cartridge if greater than 1 bar (see chapter 10.5.6).	–	X
Compressor oil filter clogged.	Change, see chapter 10.5.4.	–	–
Compressor cooling oil level too low.	Top up (see chapter 10.5.2).	–	–
Oil pipes leaking.	Seal leaks or have pipes changed.	X	X
Engine cooling system or cooling fan defective.	Have repaired.	X	X
Ambient temperature too high.	See installation conditions in chapter 5.2.	–	–

Tab. 73 Fault: machine overheating

9.4.5 Too much oil residue in the compressed air

Possible cause	Remedy	Where can I get help?	
		Specialised workshop	KAESER Service
Oil separator cartridge scavenge line clogged.	Clean the strainer in the separator cartridge dirt trap or have changed if necessary.	–	X
Fractured oil separator cartridge.	See chapter 10.5.6 for changing.	–	–

Possible cause	Remedy	Where can I get help?	
		Specialised workshop	KAESER Service
Oil level in the oil separator tank too high.	Reduce to maximum level, see chapters 10.5.1 and 10.5.3.	–	–

Tab. 74 Fault: too much oil residue in the compressed air

9.4.6 Oil flows from the compressor air filter after shutdown

Possible cause	Remedy	Where can I get help?	
		Specialised workshop	KAESER Service
Defective non-return function of the inlet valve.	Repair or have replaced if necessary.	–	X

Tab. 75 Fault: oil flows from the compressor air filter after shutdown

9.4.7 Option da, db, dc, dd High moisture content in the compressed air

Possible cause	Remedy	Where can I get help?	
		Specialised workshop	KAESER Service
Blocked condensate drain on the cyclone separator.	Clean the cyclone separator dirt trap or replace the strainer and nozzle if necessary. Replace (see chapter 10.9.1).	–	X

Tab. 76 Fault: high moisture content in the compressed air

10 Maintenance

10.1 Safety

Follow the instructions below to ensure safe machine maintenance.

Warning instructions are located before a potentially dangerous task.

Basic safety instructions:

WARNING
Danger of injury from hot, rotating and electrically live components!
Serious injury can be caused by touching such components.

- ➢ Shut down the machine before opening any doors/canopy.
- ➢ Do not carry out any checks or maintenance while the machine is running.

1. Follow the instructions in chapter 'Safety and Responsibility'.
2. Allow maintenance work to be performed by authorised personnel only.
3. Before restarting the machine, make sure that:
   - No personnel are working on the machine,
   - All protective devices and cover panels are in place and secured,
   - All tools have been removed from the machine.

The access doors are held up by gas struts.

➢ Check that the doors remain open.

If door does not remain opened: Have the gas-filled spring changed.

Working on pressure system:

1. Check that all air consumers are disconnected.
2. Wait until the compressor has automatically vented (check that the pressure gauge indicates 0 bar).
3. Open outlet valves carefully to ensure that the line between the minimum pressure/check valve and the compressed air outlet is vented.
4. Do not open or dismantle any valves.

Working on the drive system:

➢ Before commencing work make sure that:
   - The «battery isolating switch» is off.
   - The machine has cooled down.

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.

10.2 Maintenance message on the controller

The controller displays maintenance intervals. Display begins 25 hours before the interval will expire.

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

Further information Further information on the acknowledgement of maintenance messages can be found in chapter8.4. Resetting the maintenance timer is described in chapter 8.5.

Message code, range 2100 – 2199 “engine maintenance”

Code	Meaning	Remedy	See chapter
2100	Change engine oil and filter (500h).	Change the engine oil.	10.4.6
		Change the engine oil filter.	10.4.7
2101	Clean or change the engine air filter (500h).	Clean or change air filter.	10.4.2

Tab. 77 Maintenance messages and measures connected with engine maintenance.

Message code, range 2200 – 2299 “compressor unit maintenance”

Code	Meaning	Remedy	See chapter
2200	Change the compressor cooling oil and filter (1000h).	Change the cooling oil.	10.5.3
		Change the oil filter.	10.5.4
2201	Clean or change the compressor air filter (250h).	Clean or change air filter.	10.5.7

Tab. 78 Maintenance messages and measures connected with compressor maintenance.

10.3 Maintenance schedules

The maintenance schedules provide an overview of the maintenance instructions for the machine.

➢ Read the relative section before undertaking maintenance.

10.3.1 Logging maintenance work

The maintenance intervals given are those recommended for average applications and operating conditions.
Maintenance schedules may be modified to take into account the application, the environment and the quality of maintenance.

WARNING
Wear and machine damage through unusual applications or operating conditions.

➢ Maintenance tasks must be carried out more frequently when operating conditions are unfavourable (e.g. dusty atmosphere) or when the equipment is in constant use.

➢ Adjust the maintenance intervals with regard to local installation and operating conditions.

➢ Keep a log of all properly carried out maintenance and service work.
This enables the frequency of individual maintenance tasks and deviations from our recommendations to be determined.

Further information A prepared list is provided in chapter 10.10.

10.3.2 Maintenance tasks after commissioning

The table below lists maintenance tasks required after commissioning (initial start-up).

➢ Perform maintenance tasks according to the following schedule.

Component: Task	After the first 10 h	After the first 50 h	See chapter	Note
Engine:				
Check belt tension and re-tension if necessary.		X	10.4.8	Engine SM
Check coolant level.		X	10.4.1	Engine SM
Wheels/chassis:				
Re-tighten the wheel nuts/bolts.		X		
h = operating hours; Engine SM = engine manufacturer's service manual				

Tab. 79 Maintenance tasks after commissioning

10.3.3 Regular maintenance tasks

The following table lists the various maintenance intervals.

Maintenance interval	Short description
Daily	–
Every 250 h, at least annually.	A250
Every 500 h, at least annually.	A500
Every 1000 h, at least annually.	A1000
Every 1500 h, at least annually.	A1500
Every 2000 h, at least every 2 years.	A2000
Every 3000 operating hours	A3000
Every 6000 operating hours	A6000
Every 36,000 h, at least every 6 years.	A36000

Tab. 80 Maintenance intervals and regular maintenance tasks

The table below lists regular maintenance tasks.

➢ Carry out maintenance tasks punctually taking ambient and operating conditions into consideration.

10.3.3.1 Maintenance schedule

➢ Perform maintenance tasks according to the following schedule.

Component: Function	Daily	A250	A500	A1000	A1500	A2000	A3000	A6000	A36000	See chapter	Note
Engine:											
Check inlet air filter maintenance indicator	X									10.4.2	
Check engine oil level.	X									10.4.4	Engine SM
Clean the engine air filter			X							10.4.2	
Change the engine oil			X							10.4.6	
Change the engine oil filter.			X							10.4.7	Engine SM
Check and re-tension the drive belt.			X							10.4.8	Engine SM
Change engine air filter.				X						10.4.2	
Have intercooler maintained.			X								SW
Have the turbocharger checked.				X							SW
Have the crankcase venting valve checked.				X							SW
Have the engine mounts checked.				X							SW Engine SM
Have the valve clearance adjusted.					X						SW Engine SM
Replace the drive belts.							X			10.4.8	SW Engine SM
Have the multi-ribbed belt / jockey wheel checked/replaced.							X				Engine SM SW
Have the crankcase venting valve replaced.							X				SW
Check the engine coolant level.	X									10.4.1	Engine SM
Clean the radiator.		X								10.6	
Check coolant hoses and clamps.			X								
Engine SM = engine manufacturer's service manual; SW = specialised workshop.											

Component: Function	Daily	A250	A500	A1000	A1500	A2000	A3000	A6000	A36000	See chapter	Note
Check antifreeze concentration.			X							10.4.1	Engine SM
Change the coolant.				X						10.4.1	Engine SM
Fill up the fuel tank.	X										
Empty the fuel pre-filter water trap.	X									10.4.3	
Clean the fuel filter.			X							10.4.3	Engine SM
Have the fuel pump cleaned.				X							SW
Clean the tank fuel strainer.			X								
Clean the fuel tank.			X								
Check fuel lines and hose clamping bands, replace if necessary.				X							SW
Change the fuel pre-filter.				X						10.4.3	Engine SM
Replace the fuel micro-filter.				X						10.4.3	Engine SM
Check the fuel return line for leakage and firm fixing.			X								
Have the fuel injectors checked.							X				SW
Have the fuel injector pump checked.							X				SW
Check the battery electrolyte level and connections.			X							10.4.9	
Have an electronic test made on the injectors.								X			SW
Compressor unit											
Check inlet air filter maintenance indicator.	X									10.5.7	
Check the cooling oil level.	X									10.5.1	
Clean the compressor air filter.		X								10.5.7	
Clean the oil cooler.		X								10.6	
Have the pressure relief valve(s) checked.			X							10.5.8	
Check/clean the oil separator tank dirt trap.			X							10.5.5	
Change engine air filter.				X						10.5.7	
Engine SM = engine manufacturer's service manual; SW = specialised workshop.											

Component: Function	Daily	A250	A500	A1000	A1500	A2000	A3000	A6000	A36000	See chapter	Note
Change the cooling oil.				X						10.5.3	
Change the compressor oil filter.				X						10.5.4	
Change the separator cartridge in the oil separator tank.						X				10.5.6	
Wheels/chassis/bodywork:											
Check the tyre pressures.		X									
Check wheel fixings are tight.		X									
Carry out chassis maintenance.			X							10.8	
Grease the ball coupling, joints and towbar.			X							10.8.2	
Brake maintenance			X							10.8.3	
Check wear on the brake linings.			X							10.8.3.2	
Have the wheel brakes adjusted.			X								SW
Check all screw connections, hinges, locks, handles and snap fasteners of the doors for wear and secure fixing.		X									
Grease the door hinges.			X								
Carry out rubber sealing strip maintenance.			X							10.7	
Have lifting eye and fixings checked.			X								SW
Other maintenance tasks											
Check all accessible screw fittings, pipes and clamps for wear and tightness.			X								
Check hoses for proper seating, leaks and wear.			X								
Have hose lines replaced.									X		SW
Check that all electrical connections are tight.			X								
Engine SM = engine manufacturer's service manual; SW = specialised workshop.											

Tab. 81 Regular maintenance tasks

10.3.3.2 Maintenance schedule for options

➢ Perform maintenance tasks according to the following schedule.

Option: Function	Daily	A250	A500	See chapter	Note
Options da, db, dc, dd – cyclone separator:					
Clean and check the dirt trap.			X	10.9.1	
Options da, db, dc, dd – compressed air aftercooler:					
Clean the radiator.		X		10.6.1	
Option dd – filter combination:					
Drain condensate.	X			10.9.2	
Change the filter elements			X	10.9.2	
Option dc – fresh air filter:					
Drain condensate.	X			10.9.3	
Check the oil indicator.				10.9.3	
Change the filter elements			X	10.9.3	
Option ba – low-temperature equipment:					
Have the coolant pre-heating and associated wiring checked.			X		SW
SW = specialised workshop					

Tab. 82 Regular maintenance task options

10.4 Engine

➢ Carry out maintenance according to the schedule in chapter 10.3.3.1.

10.4.1 Cooler maintenance

Material
Coolant
Coolant tester
Receptacle
Drain hose
Funnel
Cleaning cloth

Precondition
The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
Machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.

WARNING
Danger of scalding by hot coolant!
Serious injuries can be caused by hot coolant.
➢ Allow the machine to cool down before opening the enclosure.

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.

CAUTION
Insufficient coolant can damage the engine.
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 the right-hand access door.

10.4.1.1 Checking coolant level

Check the coolant level of the engine daily before starting.
The level is checked on the coolant expansion tank.

- The tank is semi-transparent so the coolant level can be seen from outside.
- The level should be between the minimum and maximum markings with the engine cooled down.

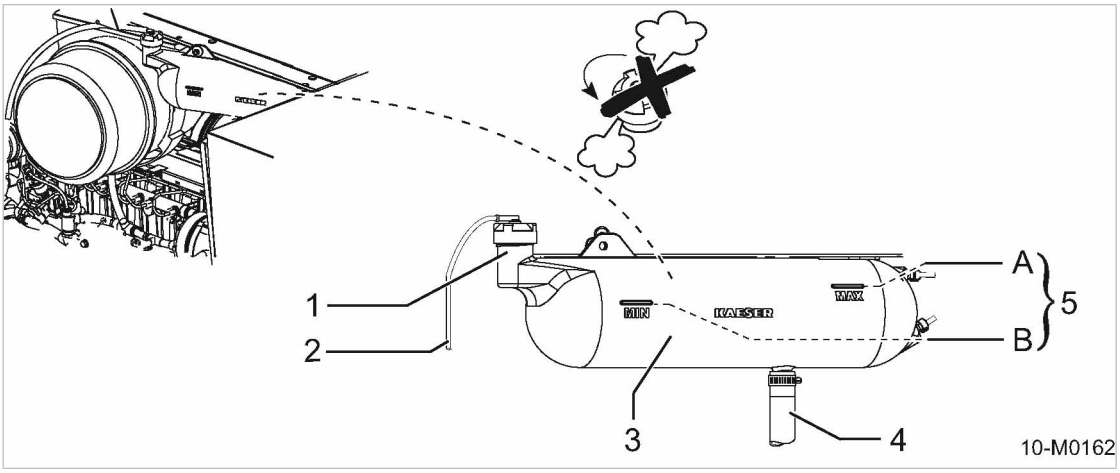


Fig. 48 Checking coolant level

1	Filler neck with cap	5	Coolant level
2	Overflow	A	Maximum mark (FULL)
3	Coolant expansion tank	B	Minimum mark (LOW)
4	Radiator connection hose		

1. Check the level of coolant in the expansion tank.
   Top up when the coolant level falls below the minimum level B. Replenish the coolant.

2. Close the door.

Determine and rectify the cause of coolant loss.

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 measurement

➢ Unscrew and remove the expansion tank filler cap [1].

Visual check

The coolant should be checked for its colour and any particles or sediments floating in it.

➢ Take a coolant sample and analyze.

The coolant is discoloured and/or has contains floating particles. Change the coolant.

Antifreeze concentration measurement

An instrument (e.g. refractometer) is used to check antifreeze concentration.

Maximum frost protection is ensured with an antifreeze concentration of 55% by volume, as frost protection and heat transfer properties deteriorate beyond this point. Higher concentration also leads to higher operating temperature.

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 frost.
➢ Top up as necessary.

1. Use the coolant tester as instructed by the manufacturer to test the coolant.
   When the concentration of antifreeze is too low: Change the coolant.
1. Screw on the filler cap.
2. Close the door.

10.4.1.3 Mixing coolant

Do not use water without coolant additive. Water alone is corrosive at engine operating temperature. Water also offers no protection from boiling or freezing.

The coolant is a mixture of clean, fresh water and antifreeze with corrosion inhibitor.

For reasons of corrosion protection and the need to raise the boiling point, the coolant must remain in the cooling system throughout the year.
The maximum permissible coolant life is 2 years.

➢ Follow coolant recommendations in chapter 2.6.3.

Preparing coolant

Precondition Coolant must meet the specification of ASTM D4985.

➢ The coolant should be mixed in the proportions given by the manufacturer.

KAESER coolant mixture table

Antifreeze	Water	Frost protection to [°C]
1 part	2 parts	–20
1 part	1.5 parts	–27
1 part	1 part	–37

Tab. 83 KAESER coolant mixture table

The concentration of antifreeze should not be less than 33% for ensured corrosion protection.

10.4.1.4 Filling and topping up the coolant

The proportion of antifreeze in the coolant should not fall below 33% to ensure frost and corrosion protection and prevent the build up of deposits in the cooling circuit. Topping up with water alone dilutes the antifreeze concentration and is forbidden.

Make sure that there is sufficient room for hot coolant to expand without overflowing.

Precondition The «battery isolating switch» is off.

1. Twist and remove the expansion tank filler cap.
2. Mix a quantity of coolant according to the table and top up to the mark.
   Top up until the coolant level is just below the maximum mark Ⓐ
3. Screw on the filler cap.
4. Activate the «battery isolating switch».
5. Close the door.
6. Start the engine and allow to IDLE for about 1 minute.
7. Stop the engine.
8. Open the right-hand access door.
9. Check the coolant level.
   If the coolant level in the expansion tank has decreased: Replenish the coolant.
10. Visually inspect for leaks.
11. Close the door.

10.4.1.5 Draining the coolant

The complete volume of coolant contained in the circuit can be drained from the radiator. This is done from a drain valve with the aid of a separate drain hose.

Precondition Machine cooled down.
The «battery isolating switch» is off.

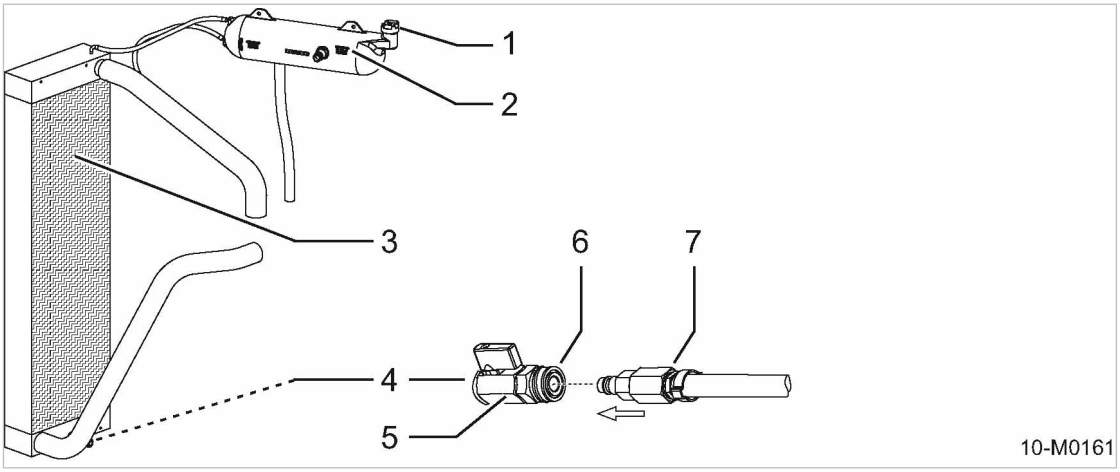


Fig. 49 Draining the coolant from the radiator

1. Filler cap
2. Coolant expansion tank
3. Water cooler
4. Radiator drain
5. Drain valve (ball)
6. Quick-release coupling
7. Drain hose with male fitting

1. Unscrew and remove the expansion tank filler cap 1.
2. Position a coolant receptacle beneath the radiator (hole in the floor panel).
3. Connect a suitable drain hose 7 to the radiator quick-release coupling 6.
4. Lead the hose through the hole in the floor panel and into the receptacle, securing it in place.
5. Open the drain valve 5 and drain the coolant.
6. Close the drain valve and remove the drain hose.
7. Screw on the filler cap.
8. Close the door.

➢ Dispose of used coolant in accordance with environmental protection regulations.

Further information The operating manual supplied by the engine manufacturer provides further information on coolant change and cleaning the cooling system.

Option sc, si **Draining coolant (stationary compressors):**

Compressor cooling oil and engine coolant drain lines are led to a central point outside the machine on stationary machines. Coolant is drained via a hose screwed into the radiator drain point. The hose is provided with a shut-off valve and a plug.

Precondition Machine cooled down.

The «battery isolating switch» is off.

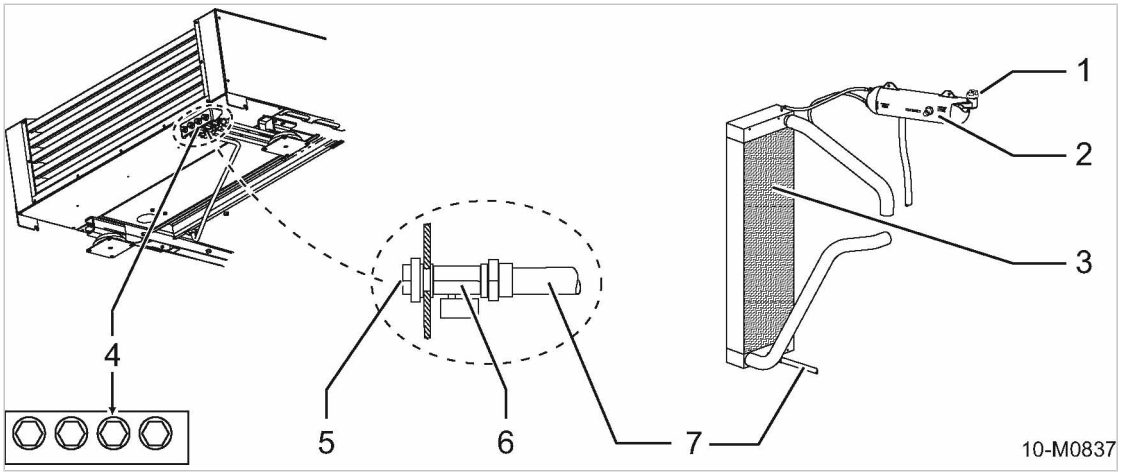


Fig. 50 Radiator with centralised drainage

1. Filler cap
2. Coolant expansion tank
3. Water cooler
4. Radiator drain
5. Screw plug
6. Drain valve (ball)
7. Drain hose

1. Unscrew and remove the expansion tank filler cap 1.
2. Place the coolant receptacle below the radiator drain point 4.
3. Remove the plug 5, open the shut-off valve 6 and collect the coolant.
4. Close the valve and replace the plug with sealing ring.
5. Close the door.

➢ Dispose of used coolant in accordance with environmental protection regulations.

Further information The operating manual supplied by the engine manufacturer provides further information on coolant change and cleaning the cooling system.

10.4.2 Air filter maintenance

Clean the filter according to the maintenance schedule or if the maintenance indicator shows this to be necessary.

Renew the air filter element after 2 years at the latest or after it has been cleaned 5 times.

Using the engine without an air filter element is not permitted! Do not use an air filter element with damaged folds or gasket.

Material Compressed air for blowing out

Spare parts (as required)

Cleaning cloth

Precondition The machine is shut down.

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

Machine is cooled down.

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

WARNING
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.

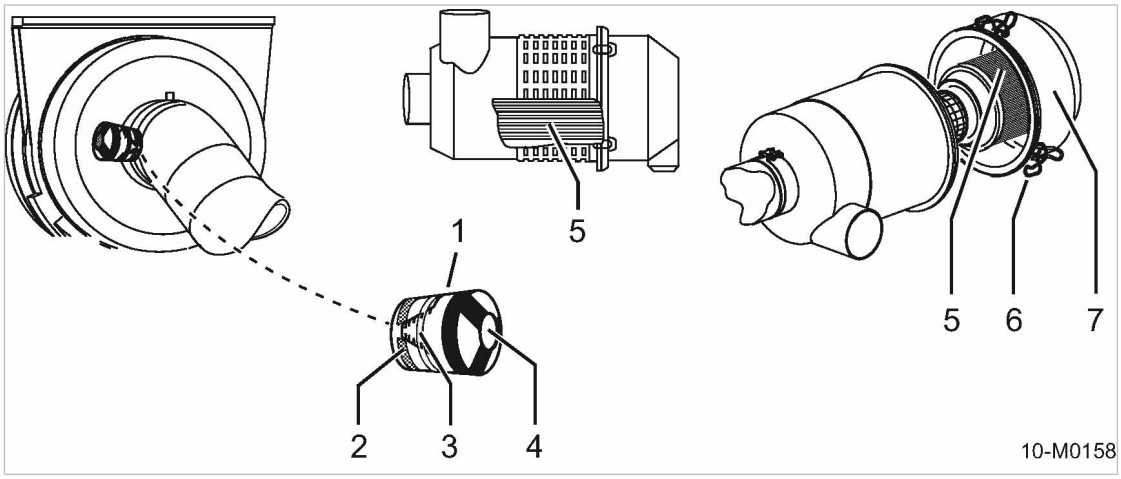


Fig. 51 Engine air filter maintenance

1. Maintenance indicator
2. Red zone indicator scale
3. Indicating piston of the maintenance indicator
4. Reset knob for the maintenance indicator
5. Filter element
6. Retaining clip
7. Filter cap

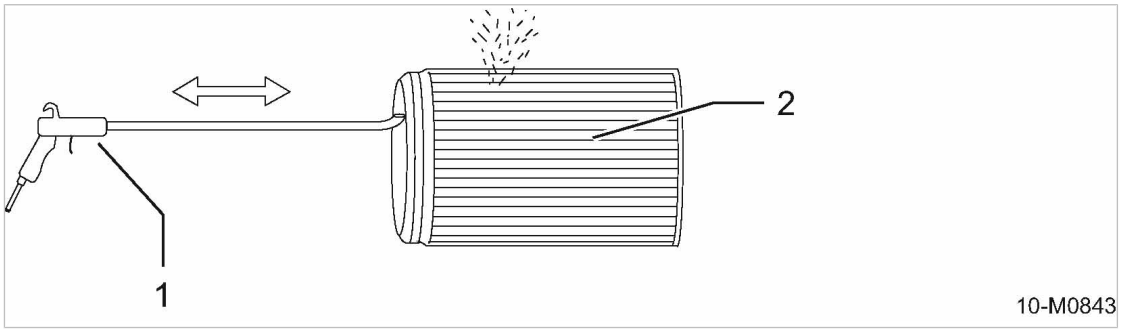


Fig. 52 Cleaning the filter element

1. Compressed air gun with blast pipe bent to 90° at the end
2. Filter element

Checking contamination of the air filter:

Air filter maintenance is necessary when the yellow piston inside the maintenance indicator reaches the red zone.

1. Open the left-hand door.
2. Check the air filter maintenance indicator.
   If the yellow piston reaches the red zone, clean or renew the filter element.
3. Close the door.

Cleaning the air filter:

1. Open both doors.
2. Release the retaining clip. Lift off the cap and extract the element.
3. Carefully clean the inside of the housing, the cover and sealing faces with a damp cloth.
4. 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 element.
   - Cleaning sealing faces.
5. Inspect the element carefully for any damage.
   Damaged filter element: replace filter element.
6. Insert the cleaned or new filter element into the filter housing. Make sure it is properly in place and sealed by its gaskets.
7. Replace the cap and secure with the clip.

Resetting the maintenance indicator:

➢ Repeatedly press the reset knob on the maintenance indicator.
The yellow piston within the indicator is reset and the maintenance indicator is ready for use again.

➢ Close the doors.

Dispose of old parts and contaminated materials according to 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.

Material
Spare parts
Receptacle
Cleaning cloth

Precondition
The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
Machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is off.

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.

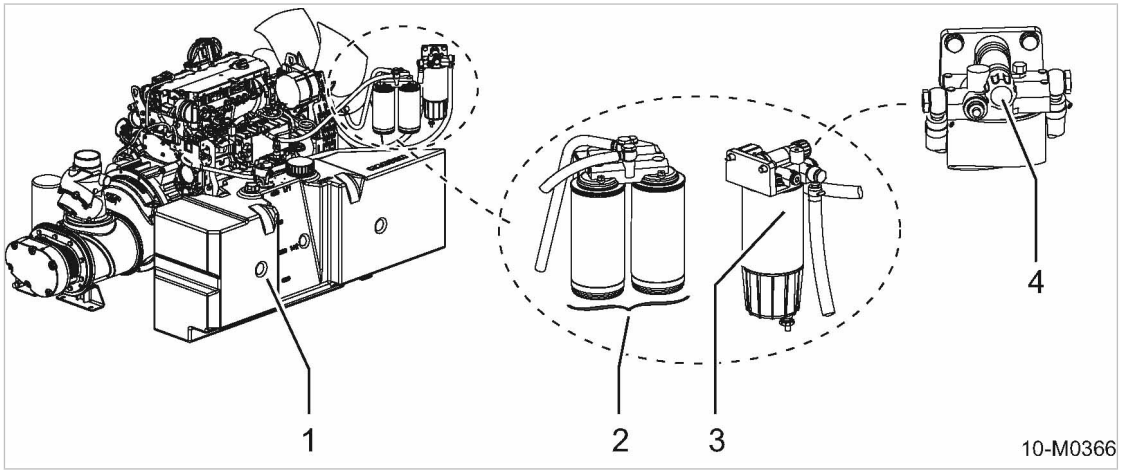


Fig. 53 Fuel system maintenance

1 Fuel tank
2 Fuel fine filter
3 Fuel pre-filter with water trap
4 Manual fuel pump with bayonet fitting

➢ Open the right-hand access door.

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.
Bleed the fuel system if the engine refuses to start despite a full fuel tank.

1. Open the right-hand access door.
2. Unlatch the manual fuel pump bayonet lock by pressing and turning anti-clockwise.
   The pump piston is pushed out by the spring.
3. Pump the piston until high resistance is felt.
4. Keep pumping until the return line is filled.
5. Activate the «battery isolating switch».
6. Close the door.

Start the engine as soon as the fuel system has been bled and allow to run for at least 5 minutes in IDLE.

7. Open the right-hand access door.
8. Latch the manual fuel pump bayonet lock by pressing and turning clockwise.
9. Check the fuel pre-filter for leaks.
   Fuel has escaped: Re-tighten filter cartridge and all screw connections.
10. Close the door.

10.4.3.2 Fuel pre-filter maintenance

Emptying the water trap

The fuel pre-filter is equipped with a water trap. Contaminating water is trapped in the water receptacle. The water trap is connected by a sensor to the controller. If the water in the trap reaches a set level, the controller displays a warning.

- The display indicate water in the fuel filter.
- The «Information key » ⓘ lights up,
- The «Acknowledge» key ⓔ flashes.

The water trap receptacle must be emptied when this warning is given.

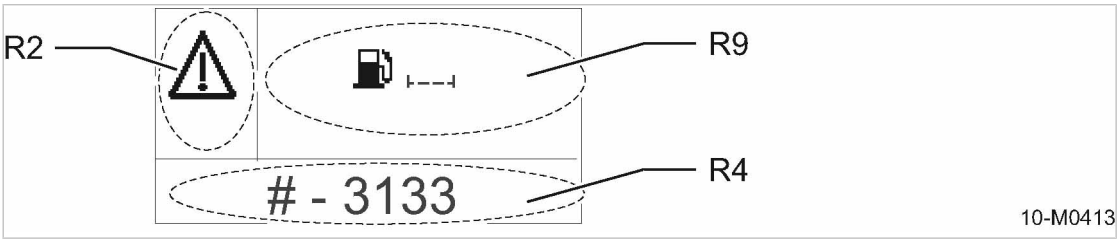


Fig. 54 Warning messages: Fuel filter water level

[R2] Message category: warning
[R4] Message code
[R9] Fuel filter water level

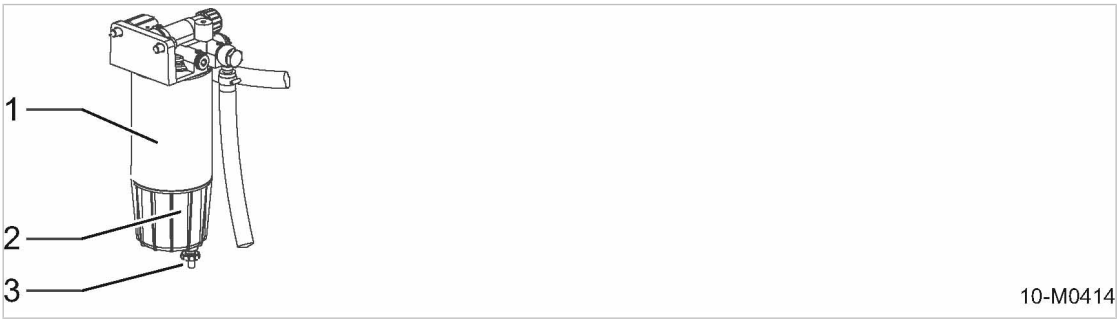


Fig. 55 Emptying the fuel pre-filter water trap

[1] Fuel pre-filter with water trap
[2] Water receptacle
[3] Drainage tap

1. Place a receptacle beneath the fuel pre-filter.
2. Open the drainage tap and allow water and dirt to drain out into the receptacle.
3. Close the drainage tap.
4. Activate the «battery isolating switch».
5. Close the door.

Maintenance must be acknowledged after the water trap has been emptied.

Precondition Draining the water trap

➢ Confirm the maintenance with the «Quit » key.

The illuminated «Quit » 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

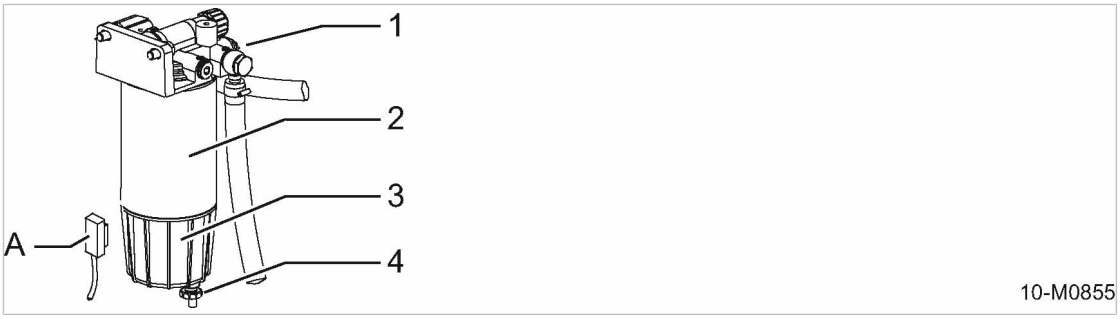


Fig. 56 Changing the fuel pre-filter cartridge

1 Filter head
2 Filter cartridge
3 Water receptacle
4 Drainage tap
A Connection for filter maintenance sensor

1. Place a receptacle beneath the fuel pre-filter.
2. Open the drainage tap and allow water and dirt to drain out into the receptacle.
3. Disconnect the filter maintenance sensor.
4. Unscrew the filter cartridge and water trap anti-clockwise and remove.
5. Disconnect the water trap from the filter cartridge by unscrewing anti-clockwise.
6. Clean any fuel from the receptacle and clean the water trap.
7. Close the drainage tap.
8. Screw the water trap onto the new filter cartridge.
9. Clean the sealing faces of the filter cartridge and filter head with a damp cloth.
10. Coat the sealing face of the new cartridge lightly with fuel and screw into the filter head.
11. Reconnect the filter maintenance sensor.
12. Activate the «battery isolating switch».
13. Close the door.

The fuel system must be bled after the filter cartridge has been changed.

Dispose of fuel and any materials and components contaminated with it in accordance with environmental protection regulations.

Further information The engine service manual gives further information on fuel filter changing.

10.4.3.3 Fuel filter maintenance

Fig. 57 Fuel filter maintenance

1. Filter holder
2. Filter cartridge
3. Turn in this direction to unscrew the filter cartridge.

1. Place a container beneath the fuel filter.
2. Use a filter wrench to loosen then unscrew the filter cartridge. Catch fuel in the receptacle.
3. Carefully clean the filter holder sealing face using lint-free cloth.
4. Lightly coat the filter holder rubber gasket with fuel.
5. Lightly coat the new fuel filter cartridge with fuel and screw tight by hand.
6. Activate the «battery isolating switch».
7. Close the door.

The fuel system must be bled after the filter cartridge has been changed.

Dispose of fuel and any materials and components contaminated with it in accordance with environmental protection regulations.

Further information The engine service manual gives further information on fuel filter changing.

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 the right-hand access door.
4. Visually check the fuel system for leaks.
5. Tighten all fittings.
6. Close the door.

10.4.4 Checking the engine oil level

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».

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.

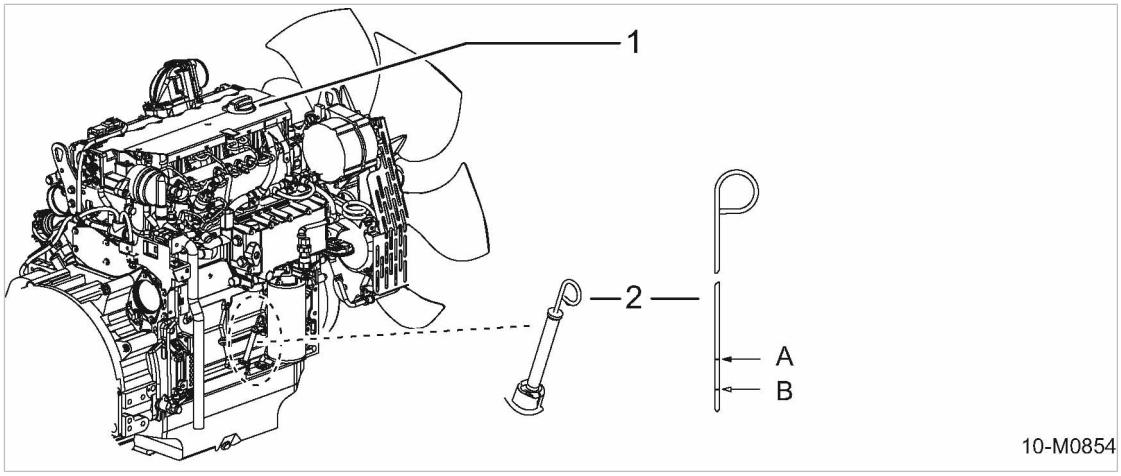


Fig. 58 Checking the engine oil level

1	Engine oil filler cap	A	Mark for «maximum oil level»
2	Oil dipstick	B	Mark for «minimum oil level»

1. Open the right-hand access door.
2. Withdraw the dipstick, wipe with a lint-free cloth and replace fully.
3. Withdraw the dipstick once more and read off the oil level.
   Oil level between both markings: Oil level OK.
   The level has reached the «minimum level» or is below the mark: Replenish engine oil.
4. Close the door.

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.

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 2.6.4 for engine oil filling volume.
The oil dipstick is marked with the «maximum oil level».

1. Open the right-hand access door.
2. Remove the filler cap and fill with fresh oil.
3. Wait 5 minutes then check the oil level.

It takes a few minutes for oil to reach the sump.

Low oil level: Replenish engine oil.

4. Replace the filler cap.
5. Activate the «battery isolating switch».
6. Close the door.

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. After approximately 5 minutes: Check the engine oil level.
   Low oil level: Add more engine oil.
5. Visually inspect for leaks.

10.4.6 Changing the engine oil

The engine oil should be changed:

- according to the maintenance schedule,
- according to the degree of contamination of the intake air,
- at least once a year.

See chapter 2.6.4 for engine oil filling volume.
See engine service manual for oil change under dusty conditions.

Material
Engine oil
Receptacle
Cleaning cloths

Precondition
The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
Engine at operating temperature.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is off.

CAUTION
Danger of burns from hot components and escaping engine oil!
➢ Wear long-sleeved clothing and gloves.

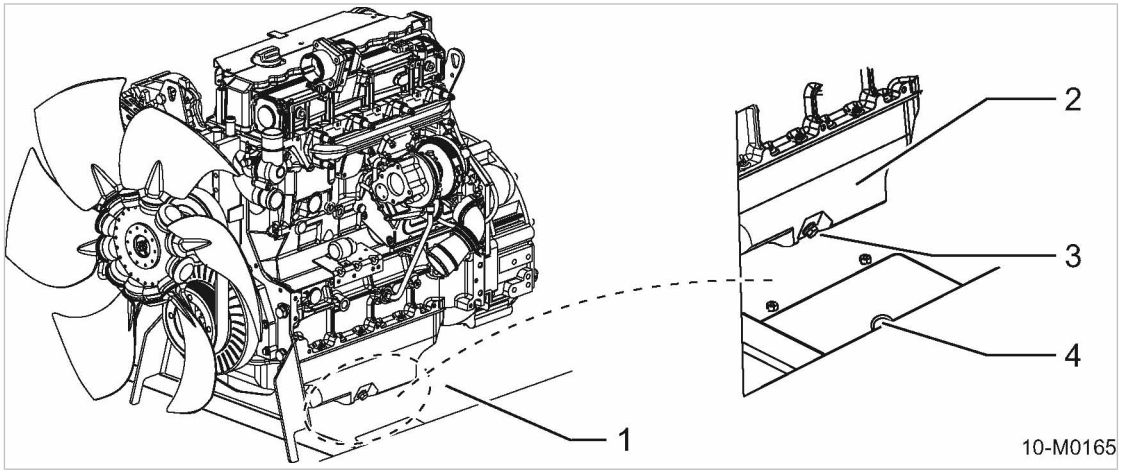


Fig. 59 Draining the engine oil

1 Floor pan
2 Engine oil sump
3 Drain plug
4 Drain hole in the floor pan

Draining the engine oil

1. Open the right-hand access door.
2. Place the oil receptacle below the drain hole in the floor pan.
3. Unscrew the drain plug.
   Engine oil flows into the receptacle.
4. Clean the drain plug and screw in with a new gasket.
5. Close the access door.

Dispose of old oil and oil-soaked working materials according to environmental protection regulations.

Further information See chapter 10.4.5 for oil filling.
The engine service manual gives instructions on oil changing.

Option sc, si Draining the engine oil (stationary machine)

Compressor cooling oil and engine coolant drain lines are led to a central point outside the machine on stationary machines. Engine oil is drained via a hose connected to a drain point on the engine block. The hose is provided with a shut-off valve and a plug.

Option sc, si

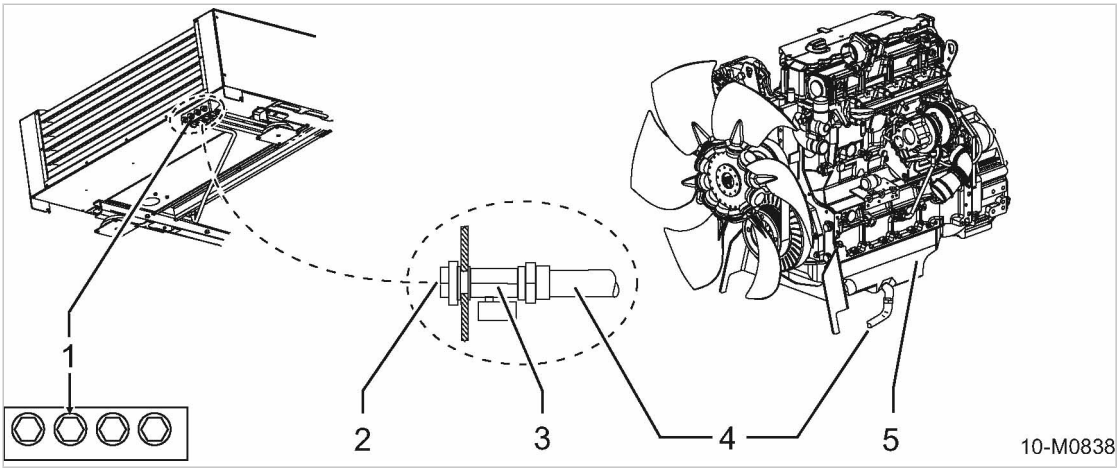


Fig. 60 Draining the engine oil, central drain point

1 Engine oil drain
2 Screw plug
3 Drain valve (ball)
4 Drain hose
5 Engine oil sump

1. Place the oil receptacle below the drain point 1.
2. Remove the plug 2, open the shut-off valve 3 and collect the oil.
3. Close the valve and replace the plug with sealing ring.

Dispose of old oil and oil-soaked working materials according to environmental protection regulations.

Further information
See chapter 10.4.5 for oil filling.
The engine service manual gives instructions on oil changing.

10.4.7 Changing the oil filter

Material
Spares
Chain pipe wrench (part no. 8.8095.0)
Cleaning cloth
Receptacle

Precondition
The machine is shut down.
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 off.

CAUTION
Danger of burns from hot components and escaping engine oil!
➢ Wear long-sleeved clothing and gloves.

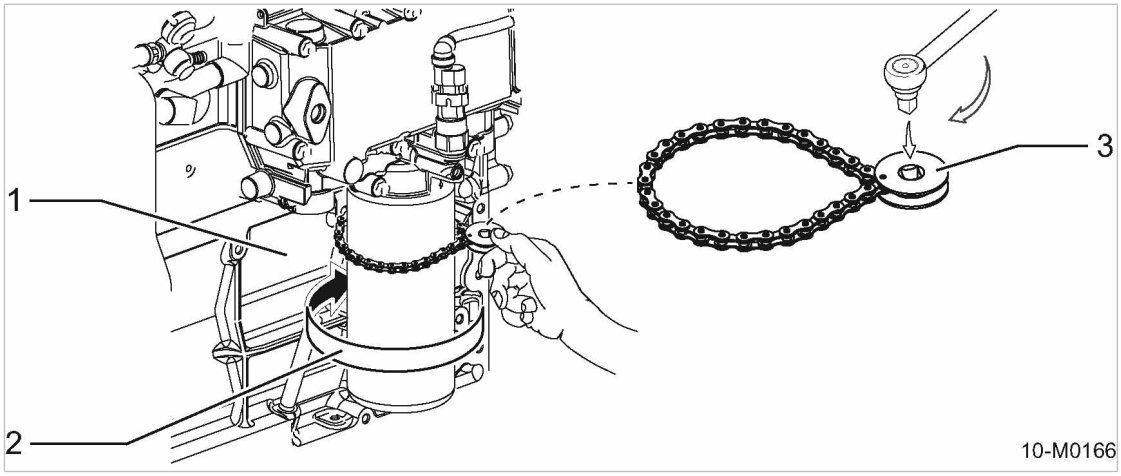


Fig. 61 Changing the oil filter

1 Engine
2 Direction of rotation to unscrew the filter
3 Chain wrench

1. Open the right-hand access door.
2. Prepare a receptacle.
3. Loosen the filter with the chain wrench and screw off. 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 engine oil level.
   Low oil level: Replenish engine oil.
8. Activate the «battery isolating switch».
9. Close the door.

Further information The engine service manual gives further information on oil filter changing.

Dispose of old oil filters, old oil and materials contaminated with oil according to environmental protection regulations.

10.4.8 Maintaining the drive belt

The life of the drive belts is affected by the belt tension.

- Slack belts can slip and become damaged and may result in engine overheating.
- Over-tight belts stretch and wear quicker. Over-tight belts also place unnecessary stress on bearings and shorten their life.

Material
Ratchet
Locking pin
V-belt tension measuring device
Spares

Precondition
The machine is shut down.
The machine is fully vented, the pressure gauge reads 0 bar.
Machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is off.

WARNING
Beware of rotating pulleys and moving belts.
There is danger of serious injury from pinching.
- ➢ Never check the drive belts unless the engine is at standstill.
- ➢ Never run the machine without a belt guard.

➢ Open both doors.

Removing the belt guard:

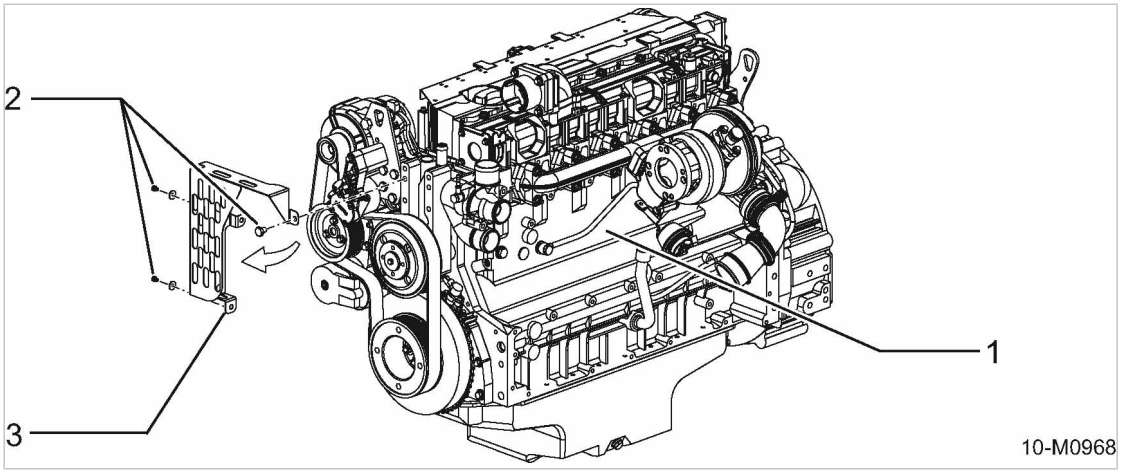


Fig. 62 Belt guard attachment
1 Engine
2 Hexagon screws (belt guard attachment)
0 Belt guard

➢ Unscrew the securing screws of the belt guard and remove the belt guard.

10.4.8.1 Visual inspection

1. Check the belts thoroughly for cracks, fraying or stretching.
   When damaged or worn: Replace the drive belt immediately.
2. Replace the belt guard.
3. Activate the «battery isolating switch».
4. Close the doors.

10.4.8.2 Checking belt tension

Check belt tensions only when they are warm, not hot, to avoid length differences due to temperature differences.

The engine manufacturer recommends a tension measuring device for belts. For operation see the engine service manual.

The belt tension may also be checked by hand if no tension measuring device is available.

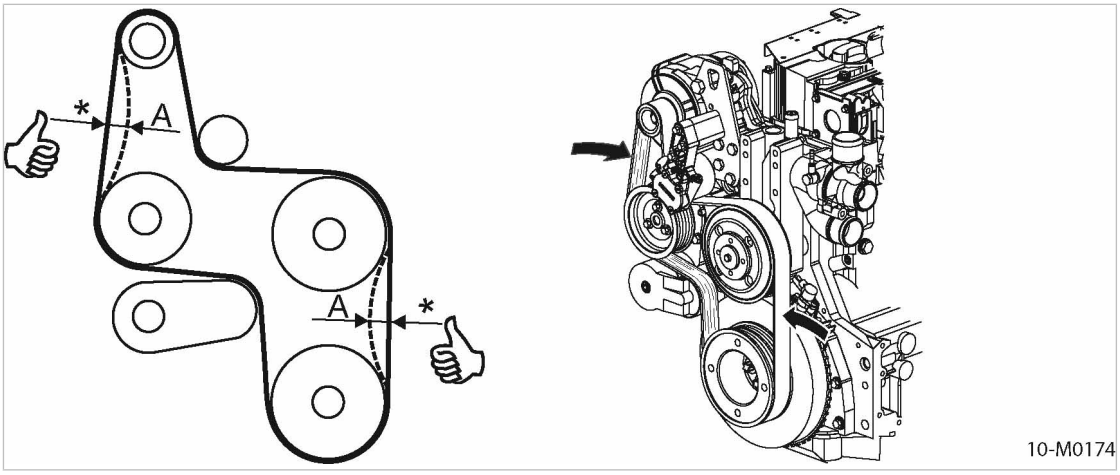


Fig. 63 Manual checking of the belt tension

Ⓐ Permissible intrusion depth of the belt

[*] Approximate pressure exerted: 10 kg
Permissible movement: 10 – 15 mm

Checking belt tension with tension measuring device.	Belt tension checking by hand
1. Check belt tension with the tension measuring device. 2. Increase the tension on a loose belt.	Press the belts in with the thumb at the mid-point between pulleys. 1. Check belt tension by hand (see Fig. 63). 2. Increase the tension on a loose belt.

Putting in operation:

1. Replace the belt guard.
2. Activate the «battery isolating switch».
3. Close the doors.

10.4.8.3 Changing/tensioning the drive belt

The drive belt is pre-tensioned by the spring force in the jockey wheel. By turning the jockey wheel you can adjust the belt tension.

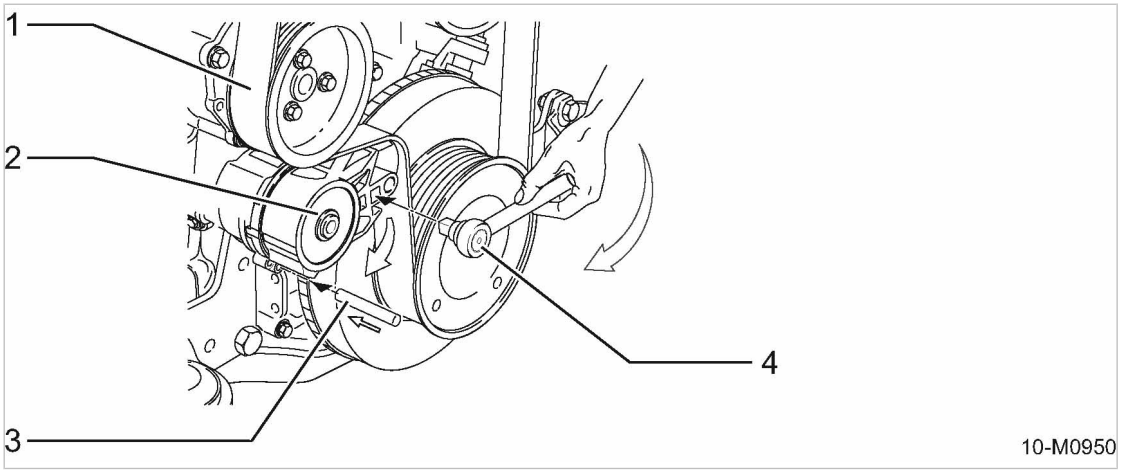


Fig. 64 Changing/tensioning the drive belt

[1] Drive belt
[2] Jockey wheel
[3] Locking pin
[4] Ratchet

Tensioning the drive belt:

1. Insert the ratchet square in the corresponding hole in the jockey wheel.
2. Using the ratchet, press the jockey wheel opposite the arrow direction. Ensure that the drive belt is correctly positioned in its guide.
3. Check the belt tension (see Fig. 63).

   Belt tension too low: Using the ratchet, further press the jockey wheel opposite the arrow direction.
   Belt tension too high: Using the ratchet, slightly press the jockey wheel in arrow direction.

Changing the drive belt:

1. Insert the ratchet square in the corresponding hole in the jockey wheel.
2. Using the ratchet, press the jockey wheel in arrow direction until the locking pin can be fastened in the mounting hole.
3. Insert locking pin in mounting hole.

   The drive belt is free of tension.
4. Pull the drive belt first off the smallest or the jockey wheel.
5. Check the pulleys for dirt and wear.

   Dirty pulley: Clean pulley.
   Worn pulley: Have the pulley changed.
6. Manually route the new drive belt over the pulleys without using force.
7. Hold up the jockey wheel with the ratchet and remove the locking pin.

   The jockey wheel is pushed upwards by spring tension and pre-tensions the drive belt.
8. Tension the drive belt. Ensure that the drive belt is correctly positioned in its guide.

A belt that has been replaced may not be used again.
Check the belt tension after running for approximately 15 minutes.

Old belts should be disposed of in accordance with the latest environmental regulations.

Putting in operation:

1. Replace the belt guard.
2. Activate the «battery isolating switch».
3. Close the doors.

Further information

The operating manual of the engine manufacturer provides further information on removing, changing and tensioning drive belts.

10.4.9 Battery maintenance

➢ Check the charging system if batteries discharge without reason.

10.4.9.1 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 run out of the vent holes.
➢ Work carefully.

Observe the following points when working on the batteries:

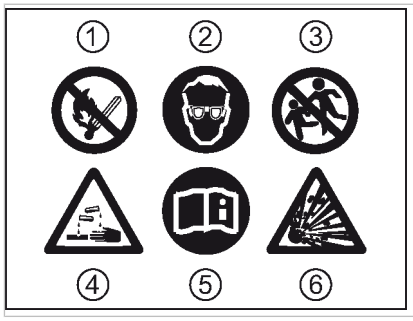


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Fig. 65 Safety signs - warning stickers on the battery.

1. Fire, sparks, open flame and smoking are forbidden!
2. Wear eye and face protection! Danger of chemical burns!
3. Keep children well away from batteries and electrolytes!
4. Batteries are filled with caustic electrolyte!
5. Observe the battery manufacturer's instructions!
6. Explosion hazard!

➢ Note and adhere to any safety signs on the battery warning labels.

Further instructions on working with batteries:

1. Do not remove battery terminal covers unnecessarily.
2. Do not place tools on the battery. This can lead to short circuiting, overheating and bursting of the battery!
3. 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 good ventilation.

10.4.9.2 Battery checking 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 shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
Machine is cooled down.

➢ Open the left-hand door.
1. Clean the casing and terminals.
2. Lightly grease the terminals to prevent corrosion.
3. Check that connections are tight and tighten if necessary.

Check the battery electrolyte level:

The acid quantity 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.

WARNING
Battery destruction!
Topping up with pure acid will increase the electrolyte concentration and can destroy the battery.
➢ Top up only with distilled water.

➢ Check the electrolyte level.

If the level does not reach the mark -
➢ top up with distilled water.

➢ Close the door.

Winter operation:

Batteries are particularly stressed in winter. Only a fraction of the normal starting energy is available at low temperatures.

CAUTION
Danger of battery freezing!
Discharged batteries are subject to frost damage and can freeze at –10 °C.
➢ Check battery charge with a acid density tester.
➢ Recharge the battery.
➢ Clean the cable connections and apply terminal grease.

1. Check the battery charge weekly.
   Recharge as necessary.
2. For machine standstill times of several weeks: Remove the batteries and store in a frost-free room.

In extreme cases, the use of heavy-duty cold-start batteries and/or additional batteries is recommended.

10.4.9.3 Battery removal and installation

Precondition
The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
Machine is cooled down.
The «battery isolating switch» is off.

WARNING
Risk of battery bursting!
If a battery is short circuited it will overheat and can burst.
Battery electrolyte will be sprayed out in such an event.
➢ Never short-circuit a battery (e.g. with a hand tool).
➢ Wear gloves and eye protection.

CAUTION
Excessive voltage produced by the alternator.
Voltage peaks can destroy the alternator regulator and diodes.
➢ The battery serves as a buffer and must not be disconnected while the engine is running.

1. Open the left-hand door.
2. Disconnect the negative cable first, then the positive cable.
3. Unscrew the battery fixing clamp.
4. Replace in the reverse order.
5. Activate the «battery isolating switch».
6. Close the door.

Replacing batteries

Replacement batteries must have the same capacity, current strength and form as the original batteries.
➢ Always replace a battery with one of the same type.

Old batteries are special waste and must be disposed of correctly in accordance with local environment protection regulations.

10.5 Compressor

➢ Carry out maintenance according to the schedule in chapter 10.3.3.1.

10.5.1 Checking cooling oil level

The oil level is checked at the oil separator tank filling port. Oil must be visible in the port when the filler plug is removed.

Material Cleaning cloths

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.

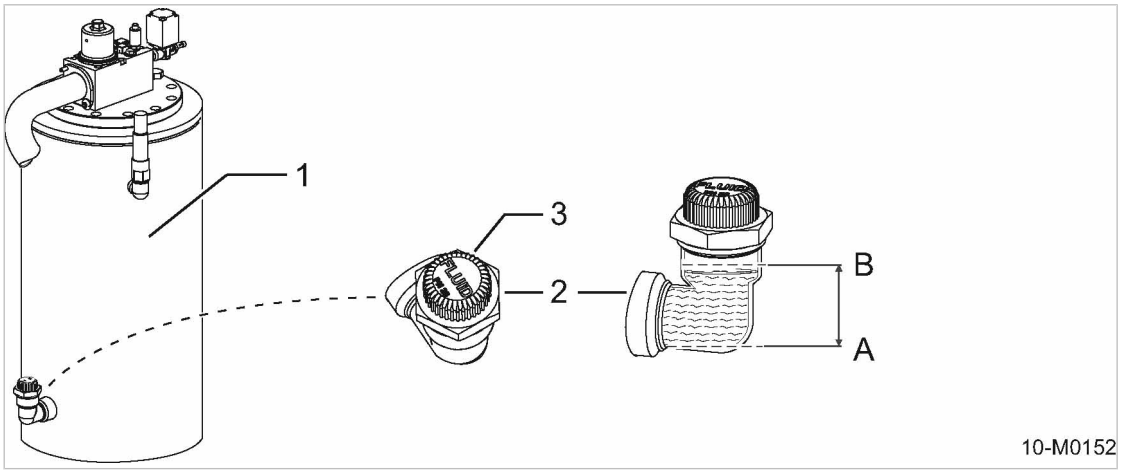


Fig. 66 Checking cooling oil level

[1] Oil separator tank
[2] Oil filler port
[3] Screw plug
[A] Minimum level
[B] Maximum level

1. Open the left-hand door.
2. Slowly unscrew and withdraw the plug from the oil filler port.
3. Check that oil is visible.
   Top up if no oil is visible.
4. Replace the filler plug.
5. Close the access door.

10.5.2 Cooling oil filling and topping up

Material
Cooling oil
Funnel
Cleaning cloth
Wrench

Precondition
The machine is shut down.
The machine is standing level.
The machine is fully vented, the pressure gauge reads 0 bar.
Machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is off.

Filling with cooling oil

A sticker on the oil separator tank specifies the type of oil used.

CAUTION
The machine could be damaged by unsuitable oil!
- ➢ Never mix incompatible types of oil.
- ➢ Never top up with a different type of oil than that already used in the machine.

1. Open the left-hand door.
2. Slowly unscrew and withdraw the plug from the oil filler port.
3. Top up the cooling oil to the maximum level Ⓑ with the help of a funnel.
4. Check the oil level.
5. Check the filler plug gasket for damage.
   Damaged gasket: replace gasket.
6. Replace the plug in the filler port.
7. Activate the «battery isolating switch».
8. Close the door.

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 the left-hand door.
7. Check the oil level after about 5 minutes.
   Cooling oil level too low: Replenish with more cooling oil.
8. Visually inspect for leaks.
9. Close the door.

10.5.3 Changing the cooling oil

Drain all cooling-oil from:

- Oil separator tank
- Oil cooler
- Oil pipes

Material
cooling oil
Receptacle
Drain hose
New gasket for the drain plug
Funnel
Cleaning cloths

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 at operating temperature.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is off.

CAUTION
There is risk of burns from hot components and escaping oil.
➢ Wear long-sleeved clothing and gloves.

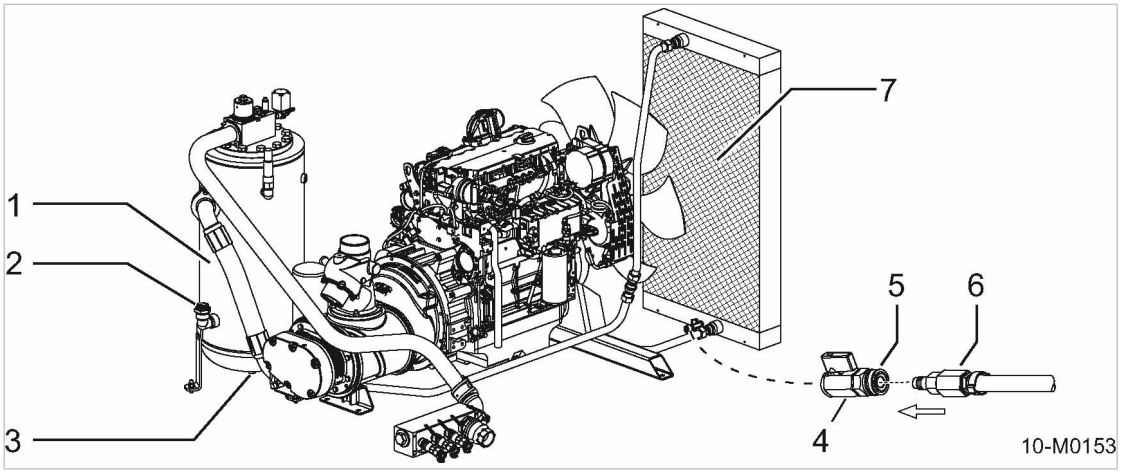


Fig. 67 Changing the cooling oil

1 Oil separator tank
2 Oil filler plug
3 Oil separator tank drain plug
4 Shut-off valve (ball)
5 Quick-release coupling
6 Drain hose with male fitting
7 Oil cooler

➢ Heed the safety instructions in chapter 3.5.

10.5.3.1 Draining the cooling oil

1. Open both doors.
2. Remove the plug [2] from the oil separator tank filling port.

Draining the oil from the separator tank:

The oil separator tank can be drained from a point accessible through a hole in the floor panel.

1. Position a receptacle below the separator tank drain plug [3].
2. Unscrew the drain plug [3] and allow the cooling oil to drain into the receptacle.
3. Fit a new gasket on the drain plug and screw it back in again.

Draining the oil from the cooler:

This is done from a drain valve with the aid of a separate drain hose.

1. Position a receptacle beneath the oil cooler drain point (accessible through a hole in the floor panel).
2. Connect a suitable drain hose [6] to the oil cooler quick-release coupling [5].
3. Lead the hose through the hole in the floor panel and into the receptacle, securing it in place.
4. Open the drain valve [4] slowly and drain the cooling oil.
5. Close the drain valve and remove the drain hose.

Performing final work steps:

1. Replace the plug [2] in the oil separator tank filling port.
2. Close the doors.

Dispose of used oil and oil-contaminated working materials according to environmental protection regulations.

Further information See chapter 10.5.2 for oil filling.

10.5.3.2 Option sc, si
Draining cooling oil (stationary compressors)

Compressor cooling oil and engine coolant drain lines are led to a central point outside the machine on stationary machines. Oil drainage is via hose lines screwed into the drain ports of the oil separator tank and the airend. Each hose line is provided with a shut-off valve and a plug.

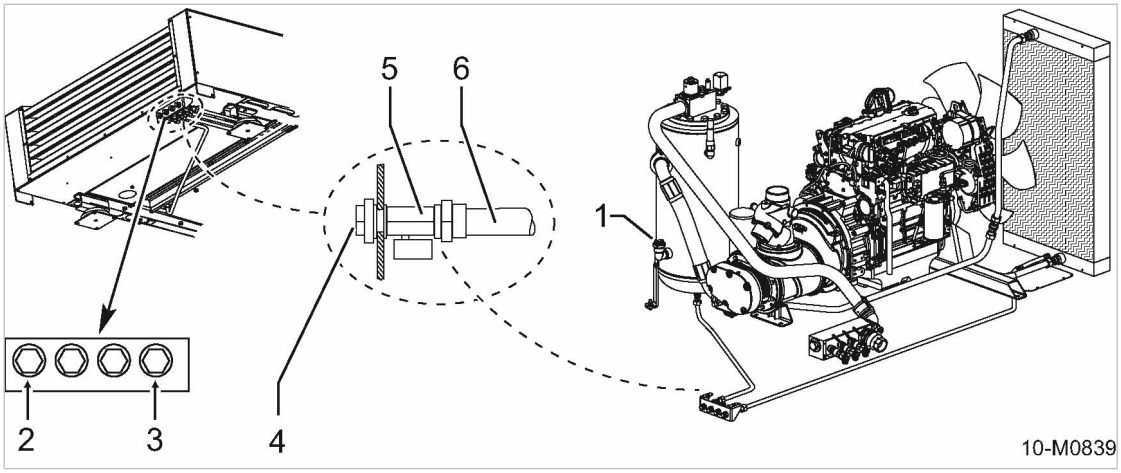


Fig. 68 Central compressor oil drainage

1	Oil filler plug	4	Screw plug
2	Oil separator tank drain connection	5	Drain valve (ball)
3	Oil cooler drain connection	6	Drain hose

1. Open both doors.
2. Remove the plug 1 from the oil separator tank filling port.

Draining the oil from the separator tank:

1. Place the oil receptacle below the oil separator tank drain point 2.
2. Remove the plug, open the shut-off valve and collect the oil.
3. Close the valve and replace the plug with sealing ring.

Draining the oil from the cooler:

1. Place the oil receptacle below the oil cooler drain point 3.
2. Remove the plug, open the shut-off valve and collect the oil.
3. Close the valve and replace the plug with sealing ring.

Performing final work steps:

1. Replace the plug 1 in the oil separator tank filling port.
2. Close the doors.

Dispose of used oil and oil-contaminated working materials according to environmental protection regulations.

Further information See chapter 10.5.2 for oil filling.

10.5.4 Changing the oil filter

Material
Spares
Receptacle
Cleaning cloth

Precondition
The machine is shut down.
The machine is fully vented, the pressure gauge reads 0 bar.
Machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is off.

CAUTION
Danger of burning from hot components and oil.
➢ Wear long-sleeved clothing and gloves.

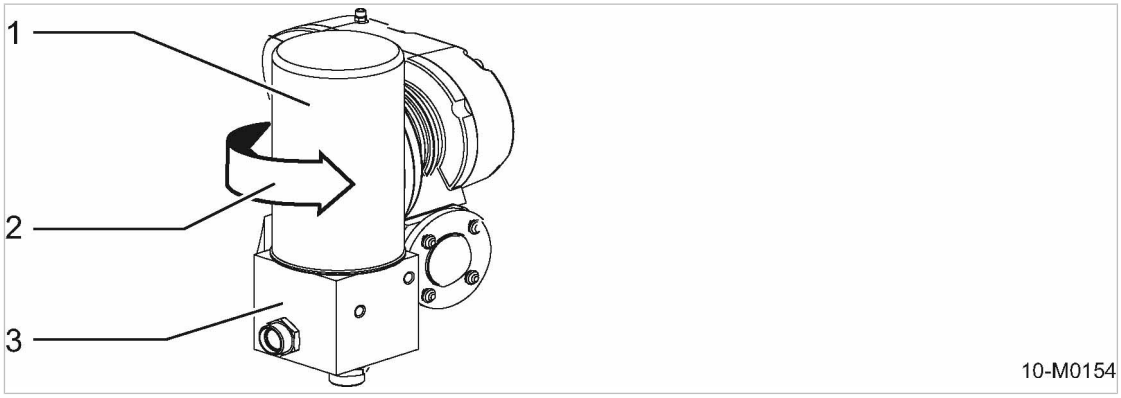


Fig. 69 Changing the oil filter
1 Oil filter
2 Direction of rotation to unscrew the oil filter.
3 Combination valve

Changing the oil filter:

1. Open the left-hand door.
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 oil level in the oil separator tank.
   Cooling oil level too low: Replenish the cooling oil.
8. Activate the «battery isolating switch».
9. Close the door.

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 the left-hand door.
7. After approximately 5 minutes: Check the cooling oil level.
   Cooling oil level too low: Replenish with more cooling oil.
8. Visually inspect for leaks.
9. Close the door.

10.5.5 Oil separator tank dirt trap maintenance

The control valve is mounted on the oil separator tank cover. The control valve has two different dirt traps that must be cleaned at least once a year.

Material
Cleaning cloth
Wrench
Small screwdriver
Maintenance kit, control valve
Petroleum ether or spirit

Precondition
The machine is shut down.
The machine is fully vented, the pressure gauge reads 0 bar.
Machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is off.

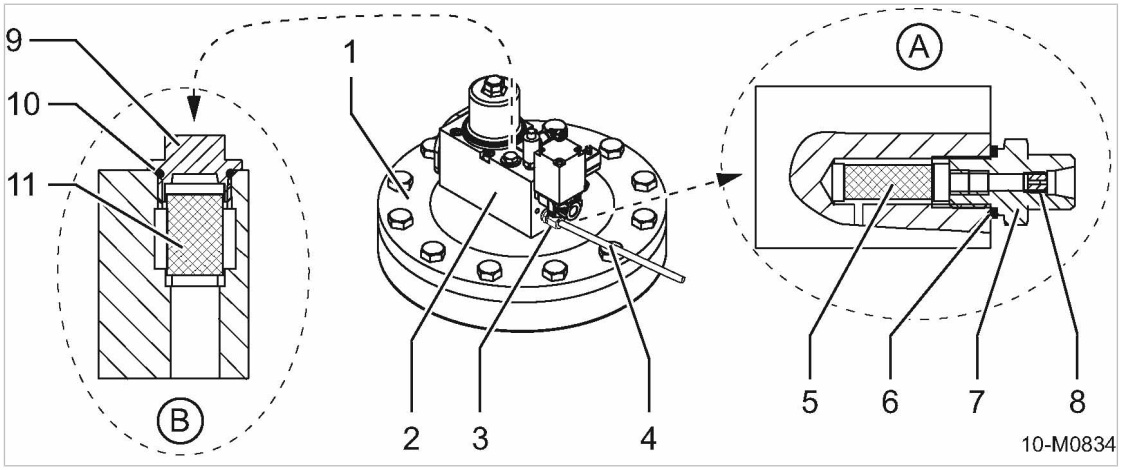


Fig. 70 Oil separator tank dirt trap maintenance

1 Oil separator tank cover
2 Control valve
3 Union nut
4 Oil scavenge tube
A Detail of the oil return line dirt trap
5 Strainer
6 Sealing ring
7 Screw-in connector
8 Nozzle
B Detail of the proportional controller dirt trap
9 Screw plug
10 O-ring
11 Strainer

➢ Open the left-hand door.

10.5.5.1 Oil return line dirt trap maintenance

See Fig. 70; detail: A for the component positions.

1. Undo the union nut 3 and bend the oil return line 4 to one side.
2. Unscrew the screw-in connector 7.
3. Unscrew the strainer 5 from the screw-in connector.
4. Use a screwdriver to unscrew the nozzle 8 from the screw-in connector.
5. Clean the housing, strainer and sealing ring 6 with cleaning solvent or spirit.
6. Check the nozzle, strainer and sealing ring for wear.
   When clearly worn: replace components.
7. Fit the nozzle and strainer to the screw-in connector.
8. Screw in the connector making sure the sealing ring seats properly.
9. Refit the oil scavenge line.

10.5.5.2 Maintenance of the proportional controller dirt trap

See Fig. 70; detail: B for the component positions.

1. Unscrew the plug 9 and remove the strainer 11.
2. Clean the plug, strainer and O-ring 10 with cleaning solvent or spirit.
3. Check the strainer and O-ring for wear.
   When clearly worn: replace components.
4. Place the strainer on the screw plug.
5. Screw in the plug making sure the O-ring seats properly.

Putting in operation:

1. Switch the «battery isolating switch» on.
2. Close the door.

Dispose of old parts and contaminated materials according to environmental regulations.

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 the outlet valves.
5. Open the left-hand door.
6. Visually inspect for leaks.
7. Shut down the machine.
8. Close the door.

10.5.6 Changing the oil separator cartridge

The oil separator element cannot be cleaned.
The life of the oil separator cartridge is influenced by:

- Contamination in the air drawn into the compressor
- and adherence to the changing intervals for:
  - Cooling oil
  - Oil filter
  - Air filter

Material
Spare parts
Cleaning cloth
Wrench

Precondition
The machine is shut down.
The machine is fully vented, the pressure gauge reads 0 bar.
Machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.
The «battery isolating switch» is off.

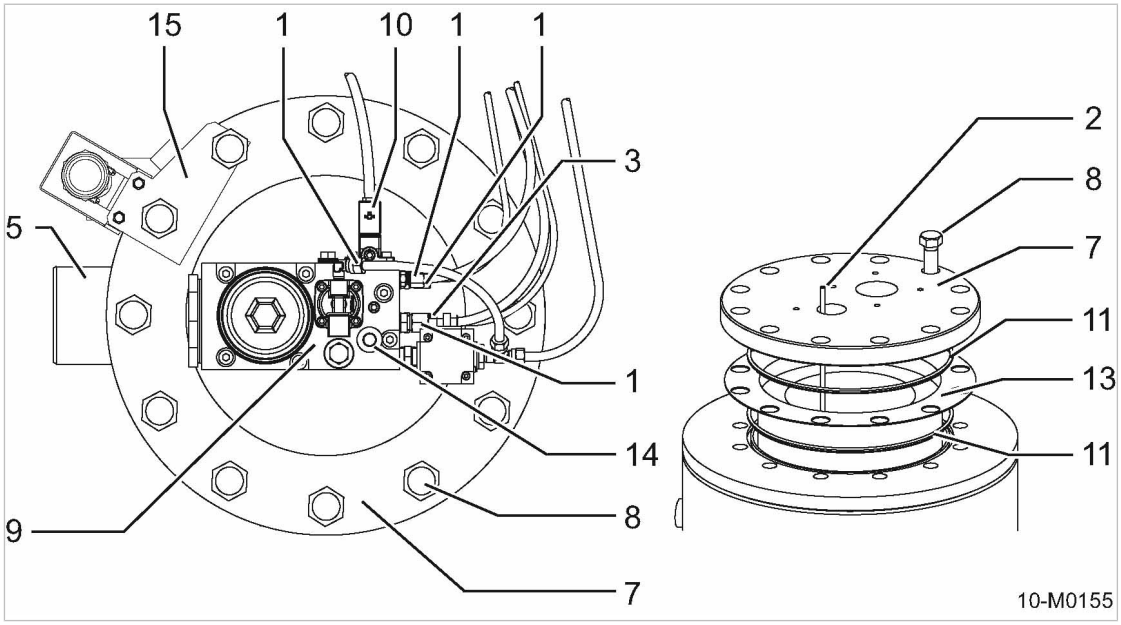


Fig. 71 Changing the oil separator cartridge

1 Control air line union nut
2 Oil scavenge pipe (screwed to the cover)
3 Oil scavenge pipe union nut (lower fitting, screwed to the dirt trap)
5 Air pipe
7 Cover
8 Fixing screw
9 Control valve
10 Solenoid valve
11 Sealing ring
13 Oil separator cartridge
14 Pressure transducer
15 Relief valve guard plate

➢ Open the left-hand door.

Changing the oil separator cartridge

1. Unscrew the union nuts 1 and 3 and place the components with connections carefully to one side.
2. Pull out the plug to the solenoid valve 10 and withdraw the cable.
3. Pull out the plug to the sensor 14 and withdraw the cable.
4. Remove the screws 8 securing the cover 7 to the tank.
5. Remove the protective guard 15 from the relief valve.
6. Carefully lift the cover and put to one side.

Take particular care with the following components:

- The oil scavenge line 2 screwed to the underside of the cover.
- The pressure relief valve, covered by the guard plate 15.

7. Take out the old cartridge 13 and sealing rings 11.
8. Clean all sealing surfaces, taking care that no foreign bodies (dirt particles) fall into the oil separator tank.
9. Insert the new oil separator cartridge with sealing rings and screw down the cover.
10. Replace the relief valve guard plate 15.
11. Replace and tighten all fittings.
12. Reconnect cables.

13. Check the oil level in the oil separator tank.
    Cooling oil level too low: Replenish the cooling oil.

Maintenance of the control valve dirt trap must be carried out whenever the oil separator cartridge is changed.

Further information — Information on control valve dirt trap maintenance is given in chapter 10.5.5.

Putting in operation:

1. Switch the «battery isolating switch» on.
2. Close the door.

Dispose of old parts and contaminated materials according to environmental 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 the left-hand door.
7. Check the oil level after about 5 minutes.
   Top up if necessary.
8. Visually inspect for leaks.
9. Close the door.

10.5.7 Air filter maintenance

Clean the filter according to the maintenance schedule or if the maintenance indicator shows this to be necessary.

Renew the air filter element after 2 years at the latest or after it has been cleaned 5 times.

Using the machine without an air filter element is not permitted! Do not use an air filter element with damaged folds or gasket.

Material — Compressed air for blowing out
Spare parts (as required)
Cleaning cloth

Precondition — The machine is shut down.
The machine is fully vented, the pressure gauge reads 0 bar.
Machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.

WARNING
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.

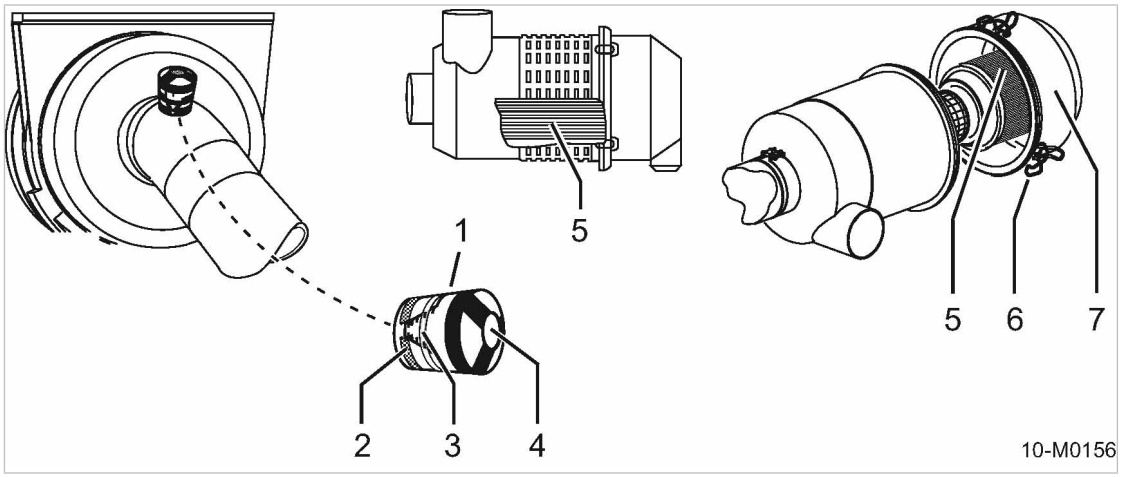


Fig. 72 Compressor air filter maintenance

1. Maintenance indicator
2. Red zone indicator scale
3. Indicating piston of the maintenance indicator
4. Reset knob for the maintenance indicator
5. Filter element
6. Retaining clip
7. Filter cap

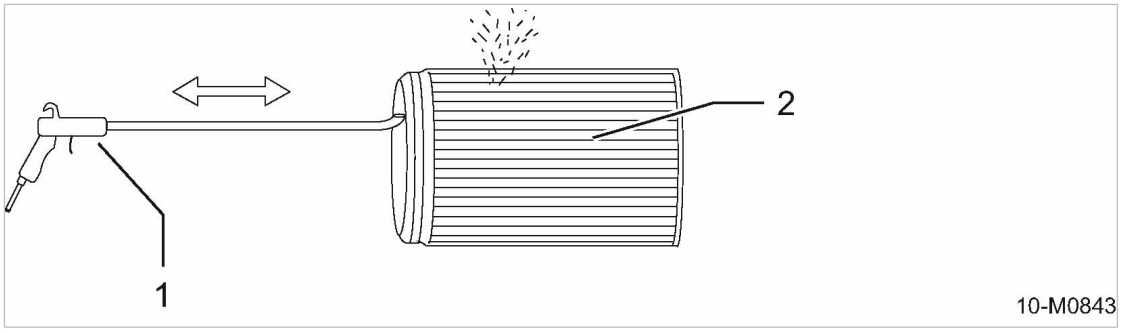


Fig. 73 Cleaning the filter element

1. Compressed air gun with blast pipe bent to 90° at the end
2. Filter element

- ➢ Open both doors.

Checking contamination of the air filter:

Air filter maintenance is necessary when the yellow piston inside the maintenance indicator reaches the red zone.

- ➢ Check the air filter maintenance indicator.
  If the yellow piston reaches the red zone, clean or renew the filter element.

Cleaning the air filter:

1. Release the retaining clip. Lift off the cap and extract the element.
2. Carefully clean the inside of the housing, the cover and sealing faces with a damp cloth.
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 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 clip.

Resetting the maintenance indicator:

➢ Repeatedly press the reset knob on the maintenance indicator.
The yellow piston within the indicator is reset and the maintenance indicator is ready for use again.

➢ Close the doors.

10.5.8 Checking pressure relief valves

➢ Have pressure relief valves checked by KAESER Service in accordance with the maintenance schedule.

10.6 Cleaning the coolers and radiator

The compressor oil cooler and engine coolant radiator are combined in a single cooler block.
The frequency of cleaning is mainly dependent on local operating conditions.
Heavy clogging of the cooler/radiator can cause oil overheating and overheating of the engine.
Check the cooler/radiator regularly for clogging.
Avoid creating dust eddies. Wear breathing protection if necessary.
Do not clean the cooler/radiator with a sharp instrument, otherwise it could be damaged.
A severely contaminated cooler/radiator should be cleaned by KAESER Service.

Material
Compressed air
Water or steam jet blaster

Precondition
Machine placed over a washing point equipped with an oil separator.
The machine is shut down.
Machine 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.
The «battery isolating switch» is off.

CAUTION
Damage to the machine can be caused by water or steam jets.
Direct water or steam jets can damage or destroy electrical components and indicating instruments.

- ➢ Cover up electrical components such as the control cubicle, alternator, starter and instruments.
- ➢ Do **not** direct water or steam jets at sensitive components such as alternator, starter or indicating instruments.

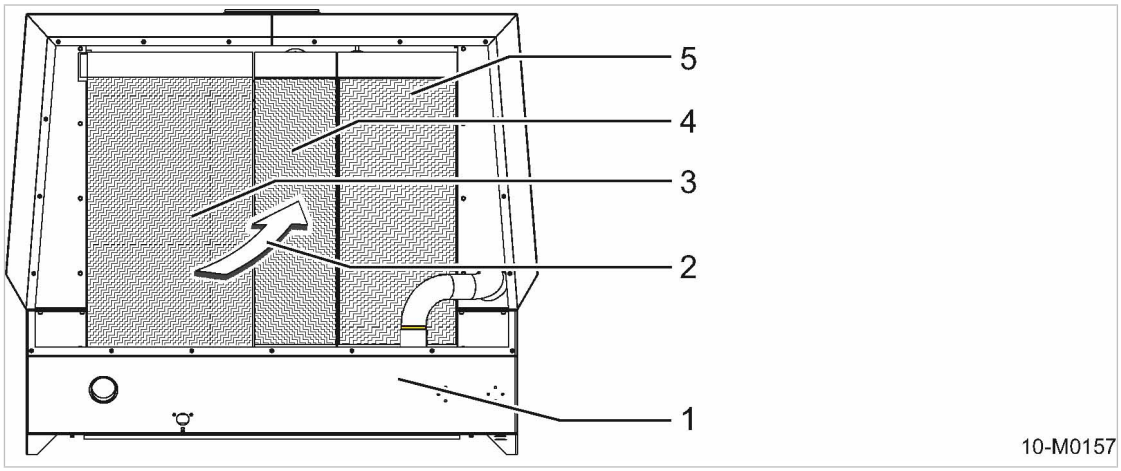


Fig. 74 Cooler/radiator cleaning

1. Front end of compressor, sound insulation (radiator grill) removed
2. Direction of impacting water or steam jet (from outside to inside).
3. Oil cooler
4. Air cooler
5. Radiator

1. Open both doors.
2. Seal off the air intakes of the engine and compressor air filters before starting cleaning.
3. Remove the sound damping louver in front of the cooler/radiator.
4. Clean the cooling fins with compressed air, water or steam jet in the opposite direction to the cooling air flow (from inside to outside).
5. Replace the sound damping louver.
6. Remove the protective coverings from the air filters.
7. Switch the «battery isolating switch» on again.
8. Close the doors.
9. Start the machine and run up to operating temperature so that excess water is evaporated.

Clean the cooler/radiator only in a washing area equipped with an oil separator.

10.6.1 Option da, db, dc, dd Cleaning the compressed air aftercooler

The compressed air aftercooler is located near the air treatment devices.

Material Compressed air
Water or steam jet blaster

Precondition Machine placed over a washing point equipped with an oil separator.
The machine is shut down.
Machine 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.
The «battery isolating switch» is off.

CAUTION
Damage to the machine can be caused by water or steam jets.
Direct water or steam jets can damage or destroy electrical components and indicating instruments.
- ➢ Cover up electrical components such as the control cabinet, alternator, starter and instruments.
- ➢ Do **not** direct water or steam jets at sensitive components such as operating and indicating instruments.

Option da, db, dc, dd

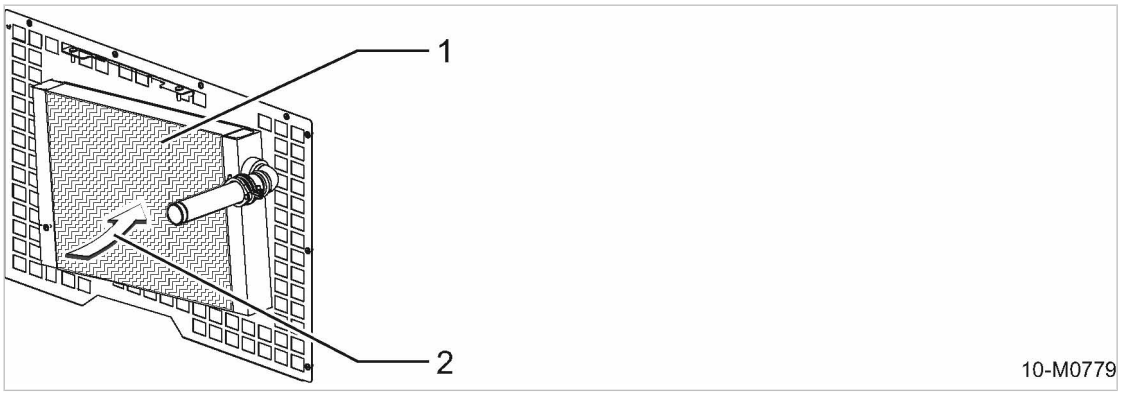


Fig. 75 Cleaning the compressed air aftercooler
[1] Compressed air aftercooler
[2] Direction of impacting water or steam jet (from inside to outside).

1. Open both doors.
2. Seal off the air intakes of the engine and compressor air filters before starting cleaning.
3. Clean the aftercooler with compressed air, water or steam jet in the opposite direction to the cooling air flow (from inside to outside).
4. Remove the protective coverings from the air filters.
5. Switch the «battery isolating switch» on again.
6. Close the doors.
7. Start the machine and run up to operating temperature so that excess water is evaporated.

10.7 Maintenance of rubber sealing strips

The rubber sealing strips between the body panels and the access doors serve both as a sound-proofing 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.
Machine is cooled down.
All compressed air consumers are disconnected and the air outlet valves are open.

1. Open all the doors.
2. Clean the rubber sealing strips with a lint-free cloth and check for cracks, holes and other damage.
   Damaged gasket: have gasket replaced.
3. Properly grease the rubber strips.
4. Close the doors.

10.8 Chassis

➢ Carry out maintenance according to the schedule in chapter 10.3.3.1.

10.8.1 Wheel checks

Check the wheels and tyres after the first 50 km and after every wheel change, but at least every six months for tightness, visible damage and tyre pressures.

Material Torque wrench
Tyre pressure gauge

Precondition Machine shut down and secured against restarting.

1. Check that the wheel fixings are tight.
2. Check the tyres and wheels for any defect.
   When damaged or worn: replace tyre/wheel rim.
3. Check the tyre treads for sufficient depth according to local roadworthy regulations (at least 1.6 mm in most countries).
4. Check the tyre pressures.

Further information See chapter 2.4.3 for wheel fixing torques.
See chapter 2.4.2 for tyre pressures.
A sticker on each wheel arch provides the recommended tyre pressure.

10.8.2 Towbar maintenance

Clean and lubricate all sliding and rotating bearings as necessary but at least every 6 months.

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.

Option sa

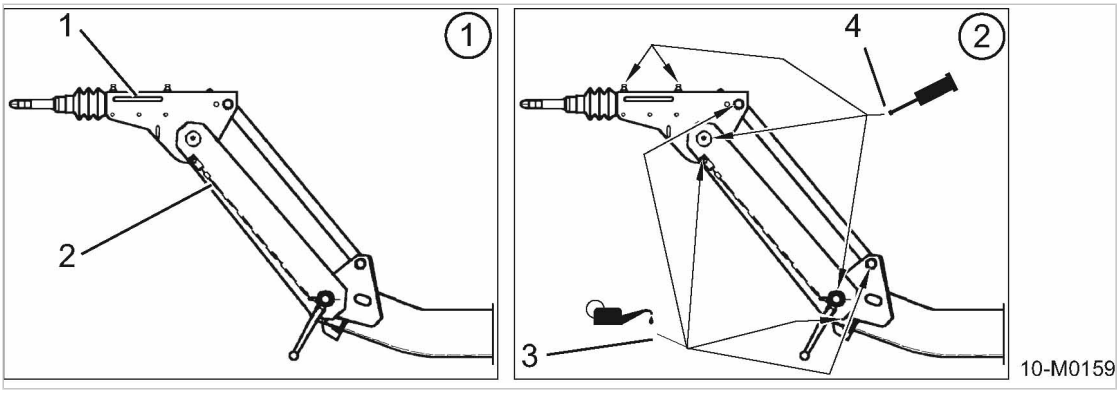


Fig. 76 Towbar maintenance

1	Handle	3	Lubricating points
2	Transfer cable	4	Lubricating points

10.8.2.1 Check the towbar

1. Check the towbar for correct function and movement.
2. Clean and oil all sliding and rotating bearings.

Option sa **Check the height setting of the towbar**

➢ Check the towbar height adjustment function.

The locking teeth on the towbar height adjustment joint are corroded and jammed and the towbar height cannot be adjusted.

➢ If necessary, free the teeth by jerking the towbar horizontally and vertically.

➢ Clean the toothed coupling and smear with water-repellent grease.

Further information See chapter 6.4.1 for towbar height adjustment.

Option sa, sd **Maintaining the parking brake**

➢ Lightly lubricate the pins and adjustment joints.

10.8.2.2 Overrun braking mechanism maintenance

Overrun braking mechanism greasing

➢ Pump fresh grease into the nipple until old grease is squeezed out.

Further information For greasing points see figure 76.

Checking the shock absorber

1. Loosen the transfer cable one side.

2. Press in the shock absorber against its damping force.
   Have the shock absorber replaced by a specialist workshop if:
   - there is little resistance to pushing in,
   - air has entered the device,
   - there is little resistance to pulling out,
   - oil leaks out.

10.8.2.3 Ball coupling maintenance

Option sa, sd

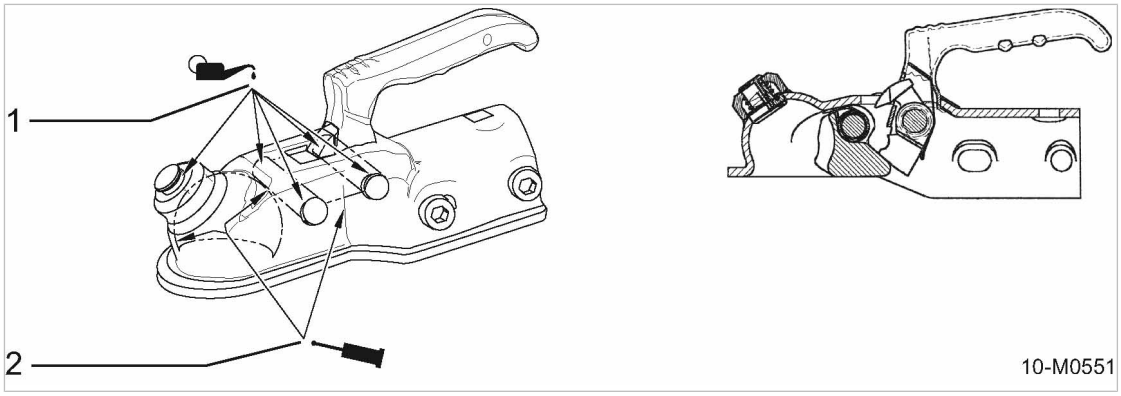


Fig. 77 Ball coupling (EC version)
[1] Lubricating points
[2] Lubricating points

Option sh

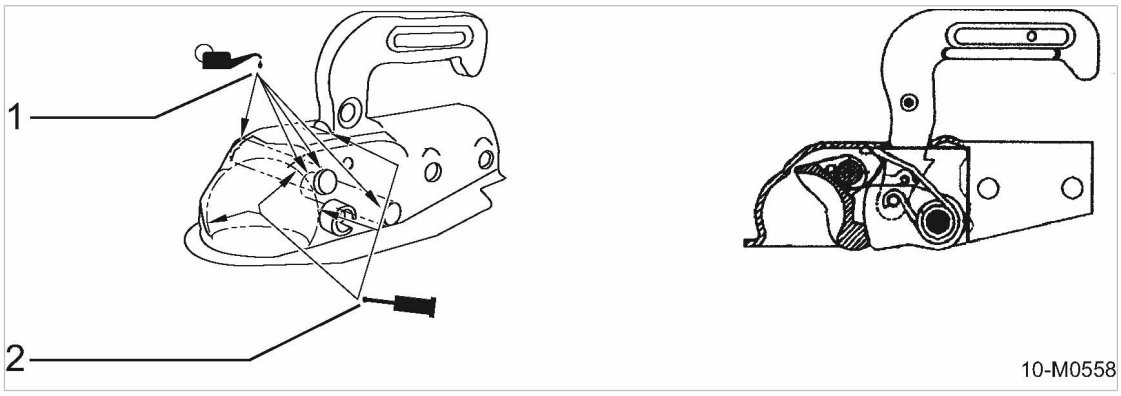


Fig. 78 Ball coupling (USA version)
[1] Lubricating points
[2] Lubricating points

1. Check the ball coupling for correct function and movement.
2. Clean the ball coupling. Grease or oil the ball cup, joints and bearings.

10.8.3 Brake system maintenance

The brake adjusting procedure ensures even wear on the brake linings by adjusting the brake shoes.

The following points must be observed:

- Carry out the adjustment procedure on all wheel brakes, one after the other.
- During adjustment, turn the wheel in the 'forward' direction only.

Material Screwdriver
Torch
Lithium-enriched multi-purpose grease

Precondition The machine is switched off.

1. Jack up the machine and lower it onto supports.
2. Release the parking brake and completely pull out the overrun braking mechanism.
   The brake cables are not tensioned.

10.8.3.1 Checking the brake system settings

1. Pull up the parking brake to first notch.
2. Turn the wheels in the forward direction.
3. Check that there is the same braking resistance on both wheels.
   Adjust the braking system if the resistance is not the same.
4. Release the parking brake.

10.8.3.2 Checking wheel brake lining wear

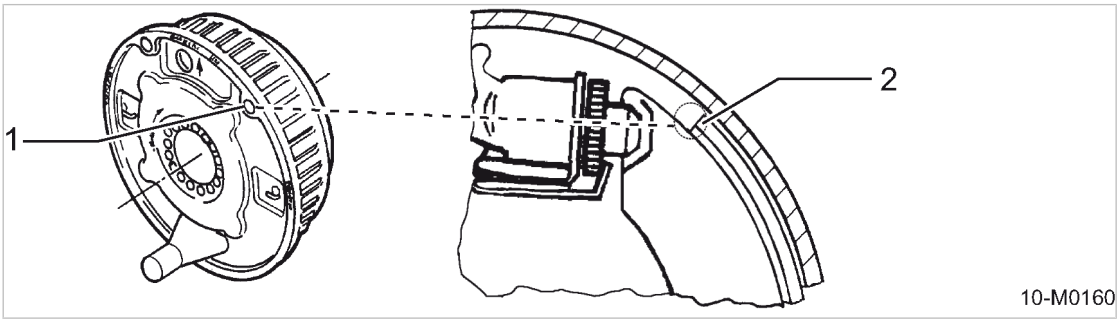


Fig. 79 Checking the brake lining thickness
[1] Inspection hole
[2] Brake linings

1. Remove the plug from the inspection hole.
2. With the aid of a torch, check the brake lining thickness.
   Have the brake linings replaced by a specialist workshop if they are less than 2 mm thick.
3. Replace the plug in the inspection hole.

10.8.3.3 Brake system adjustment

There is an arrow pressed into the brake back plate near the adjustment hole.

- Turning in the direction of the arrow increases brake force.
- Turning in the opposite direction to the arrow releases brake force.

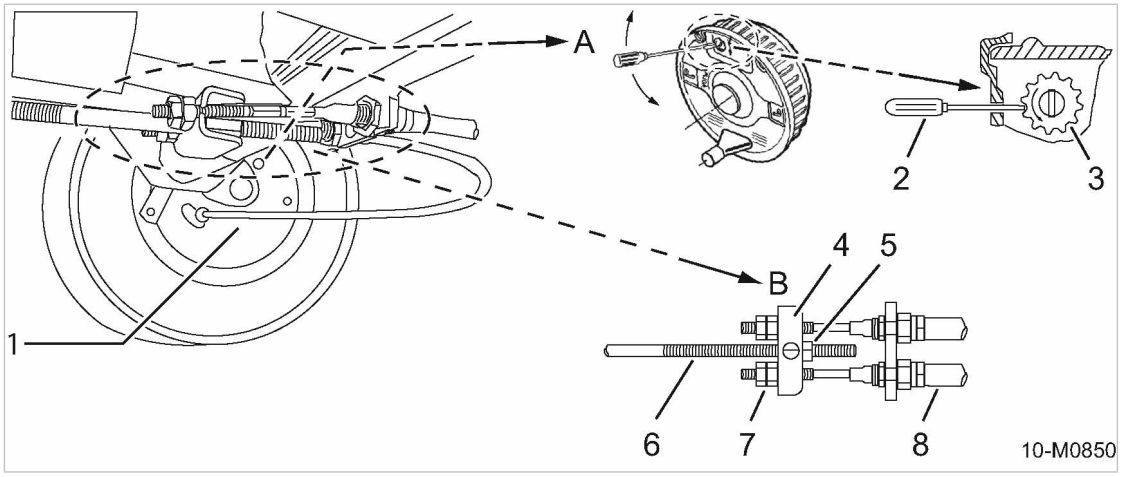


Fig. 80 Brake system adjustment

1	Wheel brakes	4	Equaliser
A	Brake system adjustment	5	Brake rod tensioning nut
2	Screwdriver as adjusting tool	6	Brake rod
3	Adjusting wheel	7	Cable tensioning nut
B	Brake rod adjustment	8	Brake cable (Bowden)

1. Remove the plug from the adjusting hole.
2. Use a screwdriver to turn the adjusting wheel 3 until the wheels no longer turn in the forward direction.
3. Apply the parking brake a number of times to centralize the brake linings.
4. Use the screwdriver to turn the adjusting wheel back (3 to 5 notches) until there is no more braking resistance to the wheels turning forward.
5. Pull on the parking brake.
6. Check the position of the equaliser 4 on the brake rod 6.
   If the equaliser is perpendicular to the brake rod, the brake clearance is the same on each wheel.
   If the equaliser is oblique to the brake rod, adjust the brake rod.
7. Pull the parking brake lightly on and compare the braking force on the wheels.
   If the braking force on the wheels is not equal, re-adjust brake system.
8. Replace the plug in the adjustment hole.

A light rubbing sound when the wheels turn is permissible if it does not affect free turning.

Brake rod adjustment:

1. To loosen the braking rod 6 undo the nut 4 on the equaliser 5.
2. Grease the brake rod threads.
3. Adjust the rod so there is no play or tension.
   The equaliser is perpendicular to the brake rod.
4. Tighten the nut.
5. Tighten all counter nuts.

➢ Test by applying the brake a number of times.

10.8.3.4 Greasing the brake rods

Grease the brake rods when necessary (stiff movement) but at least annually.

Material
Lithium enriched multi-purpose grease
Cleaning cloths

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

➢ Clean and grease the brake rods sliding and adjustment joints.

10.9 Options

➢ Carry out maintenance according to the schedule in chapter 10.3.3.2.

10.9.1 Option da, db, dc, dd Cyclone separator maintenance

Clean the cyclone separator dirt trap if the moisture content in the compressed air is too high.

Material
Cleaning cloth
Wrench
Small screwdriver
Dirt trap maintenance kit
Petroleum ether or spirit

Precondition
The machine is shut down.
Machine is 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.
The «battery isolating switch» is off.

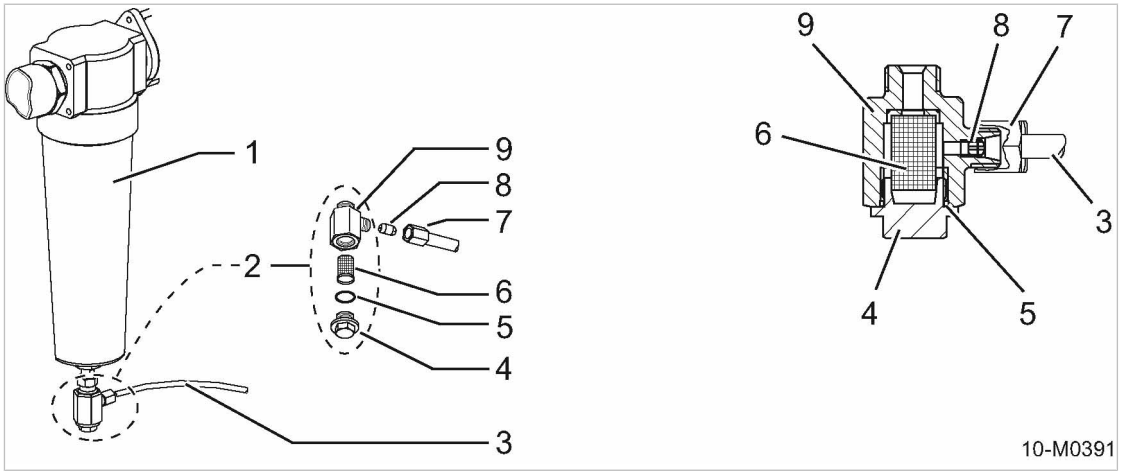


Fig. 81 Cleaning the dirt trap

1 Cyclone separator
2 Dirt trap
3 Condensate drain hose
4 Screw plug
5 O-ring
6 Strainer
7 Condensate drain hose union nut
8 Nozzle
9 Dirt trap housing

➢ Open the right-hand access door.

Cleaning the dirt trap:

1. Unscrew the plug 4 and remove the strainer.
2. Loosen the union nut 7 and detach the condensate drain hose 3 from the dirt trap.
3. Use the small screwdriver to unscrew the nozzle 8 from the dirt trap housing.
4. Clean the nozzle, strainer, screw plug, O-ring 5 and dirt trap housing 9 with cleaning solvent or spirit.
5. Check the nozzle, strainer and O-ring for wear.
   When clearly worn: replace components.
6. Place the strainer on the screw plug.
7. Screw in the plug making sure the O-ring seats properly.
8. Screw in the nozzle and re-attach the condensate drain hose.

Putting in operation:

1. Switch the «battery isolating switch» on.
2. Close the door.

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 the outlet valves.
5. Open the right-hand access door.

6. Check the cyclone separator housing and hose line for leaks.
7. Close the door.

10.9.2 Option dd Combination filter maintenance

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.

WARNING
Danger of injury from compressed air!
Filter combination is pressurised during operation. Serious injury can result from loosening or opening components under pressure.
➢ Make sure there is no electrical power present on the machine. Check: Pressure gauge reads 0 bar!
➢ De-pressurise the combination filter.

Option dd

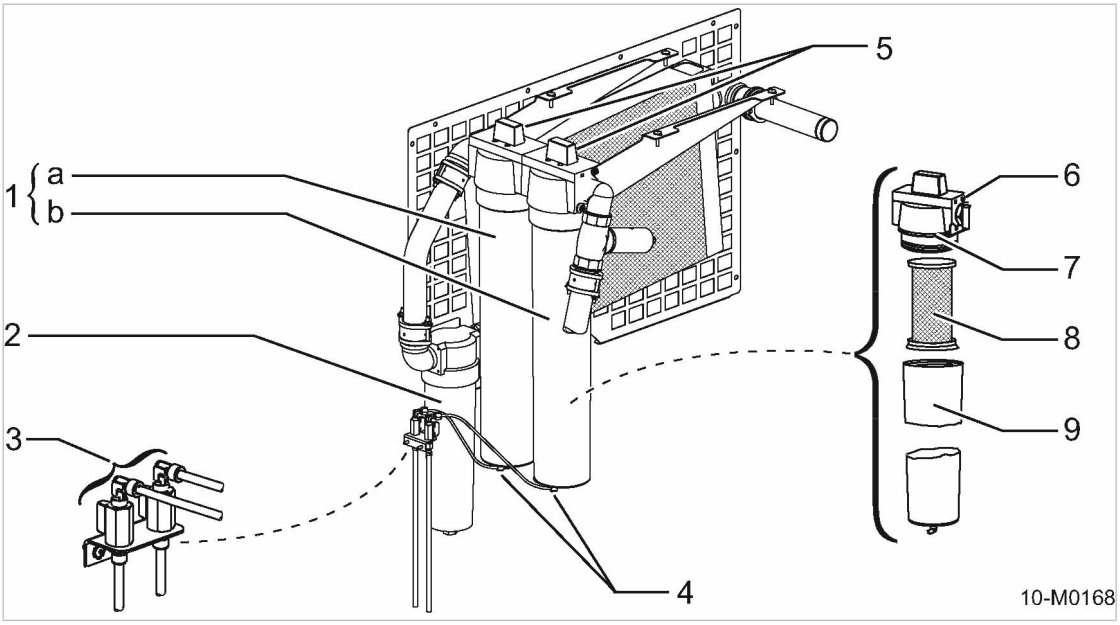


Fig. 82 Combination filter maintenance

1	Filter combination	5	Pressure differential gauge (check fittings for Service personnel)
a	Pre-filter		
b	Micro-filter	6	Filter head
2	Shut-off ball valve for condensate drainage	7	Casing gasket
3	Condensate drain hose fittings	8	Filter element
4	Cyclone separator	9	Filter housing

➢ Open the right-hand access doors.

10.9.2.1 Draining condensate

Material Receptacle
Cleaning cloth

1. Place the receptacle under the combination filter hose lines.
2. Open the pre-filter and micro-filter condensate drain shut off valves.
3. Close the door.
4. Switch the machine on and run it in IDLE mode.
   The condensate collecting in the filter housings is blown out.
5. Stop the compressor as soon as air escapes.
6. Open the right-hand access doors.
7. Close the shut-off valve.
8. Close the doors.

Condensate must be stored in suitable containers and disposed of in accordance with local environmental regulations.

10.9.2.2 Changing the filter elements

The pre-filter and micro-filter contain different elements and these must be changed as a pair. Note their positioning!

Do not touch the new filter elements with bare fingers, as this will impair their function!
Using the combination filter without an element installed is not permitted.

Material Spare parts
Filter wrench
Wrench
Cleaning cloth
Clean fabric gloves

Precondition Machine is cooled down.
The «battery isolating switch» is off.

Ensure that the combination filter is not under pressure.

➢ Slowly open the pre-filter and micro-filter condensate drain shut off valves.
Remaining pressure escapes.

Changing the pre-filter element:

1. Unscrew and remove the drain hose from the filter housing.
2. Unscrew the filter housing counter-clockwise.
3. Draw the filter element down and out.
4. Clean the filter head, housing and sealing surface with a lint-free cloth.
5. Check the housing gasket.
   Housing gasket is damaged: replace gasket.

6. Insert the new filter element.

Wear gloves!

7. Screw on the filter housing clockwise.
8. Screw on the condensate drain hose.

Changing the micro-filter element:

1. Unscrew and remove the drain hose from the filter housing.
2. Unscrew the filter housing counter-clockwise.
3. Draw the filter element down and out.
4. Clean the filter head, housing and sealing surface with a lint-free cloth.
5. Check the housing gasket.
   Housing gasket is damaged: replace gasket.
6. Insert the new filter element.

Wear gloves!

7. Screw on the filter housing clockwise.
8. Screw on the condensate drain hose.

Putting in operation:

1. Close the condensate drain shut-off valves.
2. Tighten the filter combination fittings.
3. Activate the «battery isolating switch».
4. Close the door.

Dispose of old parts and contaminated materials according to environmental regulations.

Further information

Further information on changing elements can be found in the filter instructions in chapter 13.7.

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 the outlet valves.
5. Open the right-hand access doors.
6. Check the combination filter housing and hose lines for leaks.
7. Close the door.

10.9.3 Option dc
Fresh air filter maintenance

Before commencing work on the fresh air filter, read and understand the operating instructions for pressurised air filters (fresh air filters) provided in chapter 13.8.

Using the fresh air filter without installed filter elements is not permitted!

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.

Option dc

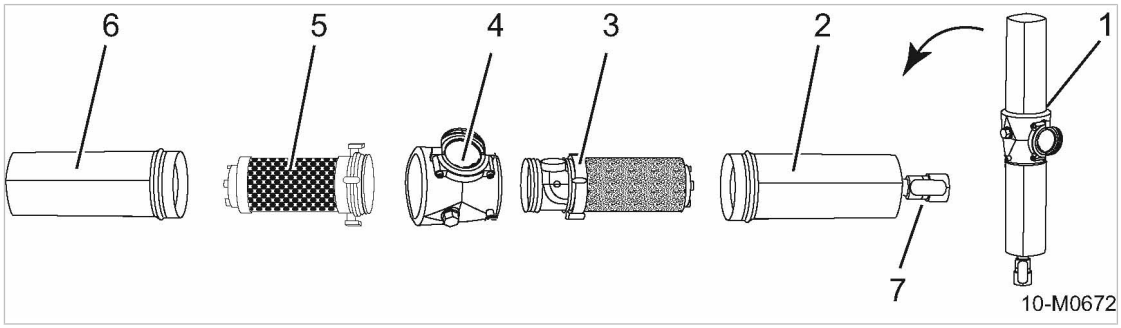


Fig. 83 Fresh air filter maintenance

1. Fresh air filter
2. Lower housing
3. Lower filter element (high capacity element)
4. Body
5. Upper element (adsorption element)
6. Upper housing
7. Oil indicator
8. Condensate drain (with tap for manual draining)

➢ Open the right-hand access door.

10.9.3.1 Draining condensate

Material
Receptacle
Cleaning cloth

1. Place the receptacle below the fresh air filter condensate drain point.
2. Open the drain tap.
3. Close the door.
4. Switch the machine on and run it in IDLE mode for approx. 2 minutes.
   The condensate collecting in the filter housings must be blown out.
5. Shut down the machine.
6. Open the right-hand access door.
7. Close the drain valve.
8. Carefully remove the receptacle.
9. Close the door.

Condensate must be stored in suitable containers and disposed of in accordance with local environmental regulations.

10.9.3.2 Checking the oil indicator

The fresh air filter is fitted with an oil indicator. When the indicator is blue, the filtration function can no longer be ensured and the filter must not be used. Both filter elements and the indicator must be changed (regardless of the maintenance schedule).

The oil indicator must be checked at least once daily.

The oil indicator does not give information on the filter element changing interval.

1. Check the oil indicator.
   Indicator is blue: Replace both filter elements + oil level indicator.
2. Close the door.

10.9.3.3 Changing consumable parts

The fresh air filter contains two different elements which must be changed as a pair. Note their positioning!

Do not touch the new filter elements with bare fingers, as this will impair their function!

Material
Spare parts
Filter wrench
Wrench
Cleaning cloth
Clean fabric gloves

Precondition
Machine is cooled down.
The «battery isolating switch» is off.

Ensuring the fresh air filter is de-pressurised:

➢ Open the fresh air filter drain tap to release any remaining pressure.

Changing the lower filter element (high performance element):

1. Unscrew the lower housing anti-clockwise.
2. Draw the filter element down and out.
3. Clean the lower housing and sealing surface with a lint-free cloth.
4. Check the housing gasket.
   Housing gasket is damaged: replace gasket.
5. Insert a new lower filter element.

Wear gloves!

6. Screw on the lower housing clockwise.

Changing the upper filter element (adsorption insert):

1. Unscrew the upper housing anti-clockwise.
2. Draw the filter element up and out.

3. Clean the lower housing and sealing surface with a lint-free cloth.
4. Check the housing gasket.
   Housing gasket is damaged: replace gasket.
5. Insert a new filter element.

Wear gloves!

6. Screw on the upper housing clockwise.

Changing the oil indicator:

1. Unscrew the oil indicator.
2. Clean the housing and sealing surface with a lint-free cloth.
3. Screw in the new oil indicator.

Putting in operation:

1. Close the drain valve.
2. Activate the «battery isolating switch».
3. Close the door.

Dispose of old parts and contaminated materials according to environmental regulations.

Further information

Further information on changing elements can be found in the operating instructions for pressurised air filters (fresh air filters) in chapter 13.8.

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 the outlet valves.
5. Open the right-hand access door.
6. Check the fresh air filter housing and hose line for leaks.
7. Close the door.

10.10 Document 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. 84 Logged maintenance tasks

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 materials

KAESER consumable parts and operating materials are all genuine KAESER parts. They are selected for use in KAESER machines.

WARNING
There is risk of personal injury or damage to the machine resulting from the use of unsuitable spare parts or operating materials.
Unsuitable or poor quality consumable parts and operating materials may damage the machine or impair its proper function.
In the event of damage, personal injury may result.

➢ Use only genuine KAESER spares and operating materials.

➢ Have an authorized KAESER Service Technician carry out regular maintenance.

Compressor

Name	Quantity	Number
Air filter element	1	1260
Oil filter	1	1210
Oil separator cartridge set	1	1450
Cooling oil	1	1600

Tab. 85 Compressor consumables

Deutz engine parts

Name	Quantity	Number
Air filter element	1	1280
Fuel prefilter insert	1	1915
Main fuel filter cartridge	1	1920
Oil filter	1	1905
Oil drain plug sealing ring	1	4496
Injector nozzle	1	4475
Injector sealing ring	1	4476
V-belt	1	4470
Engine oil	1	1925

Tab. 86 Consumable engine parts

11.3 KAESER AIR SERVICE

KAESER AIR SERVICE offers:

- Authorized 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 spare parts.
- Increased legal certainty as all regulations are kept to.

➢ Why not sign a KAESER AIR SERVICE maintenance agreement.
The advantages:
Lower costs and higher compressed air availability.

11.4 Service Addresses

Addresses of KAESER agents are given at the end of this manual.

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 decommissioning

Decommissioning for about 4 months.

Material Plastic foil
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 inlet
   - Compressor air inlet
   - Exhaust
3. Hang the following notice on the instrument panel informing of the decommissioning measurements taken.

Attention!

1. The machine is temporarily decommissioned.
2. The following machine openings have been covered:

- Engine air inlet
- Compressor air inlet
- Exhaust

3. Recommission according to service manual.

Date / signature

Tab. 87 "Temporarily decommissioned" information notice

Decommissioning of the compressor for several weeks during severe frost

CAUTION
Danger of batteries 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.

1. Remove the battery (batteries) and store in a frost-free room.
2. Make sure batteries are fully charged.

12.1.2 Long-term decommissioning

Decommissioning the machine for 5 months or longer.

Material
Receptacle
Preserving oil
Preservative
Desiccant
Plastic sheeting
Moisture-resistant adhesive tape

➢ The following measures must be taken for long-term decommissioning.

Long-term decommissioning tasks	See chapter	Confirmed?
➢ Check engine coolant.	10.4.1	
➢ Drain the engine oil.	10.4.6	
➢ Drain the oil from the oil separator tank and the oil cooler.	10.5.3	
➢ Fill the separator tank and engine with preserving oil.	10.5.2 10.4.5	
➢ 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 fluid level.	10.7	
➢ 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.	–	
➢ Use plastic sheeting and moisture-resistant adhesive tape to seal off the following openings: – Engine air intake – Compressor air intake – Exhaust outlet	–	
➢ Clean the bodywork and treat with preservative.	–	
➢ Hang a notice on the instrument panel informing of the decommissioning measurements taken.	–	

Tab. 88 Long-term decommissioning checklist

➢ Hang the following notice on the instrument panel informing of the decommissioning measurements taken.

Attention!

1. The machine is decommissioned.
2. It is filled with preserving oil.
3. For recommissioning:

- Take measures for recommissioning after a long period of storage.
- Recommission according to service manual.

Date / signature

Tab. 89 Text for the long-term decommissioned information notice

➢ 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 consumer hoses disconnected, all other lines and hoses disconnected and removed.

Any loose or movable parts that may fall when transporting, removed or secured.

Allow transportation only by personnel trained in safe dealing with motor vehicles and the transporting of goods.

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.

➢ Make sure the danger area is clear of personnel.

12.2.1 Towing the compressor on the road

Machines with appropriate chassis versions and running gear are approved for towing on public roads. The machine is designed for a maximum towing speed of 100 km/h. National and local regulations must be observed when towing the machine on public highways.

➢ Observe the safety instructions in chapter 3.5.2 "Safe machine operation".

12.2.1.1 Preparing for transport

Stowing payload:

Do not exceed the permissible loading (overall weight, coupling load, axle load).
Observe national traffic laws. If additional loading is not permitted, the load must be transported in the towing vehicle.

1. Check that loading the machine with tools or accessories during transport is permissible.
2. Place additional loads only in the spaces provided and secure carefully.

Additional precautions for a very dirty machine

The machine can become very dirty after prolonged use on a construction site. A machine in such condition is not suitable for towing on public roads.

1. Clean the machine, particularly the chassis and running gear.
2. Check the function of wheels, brakes, lights and signaling equipment.
   Malfunctions: Correct any defects before towing.

Additional precautions for conditions of snow and ice

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

CAUTION
Accident hazard due to snow or ice falling off the machine.
Snow or ice falling from the towed machine can endanger following vehicles.
Problems with driving dynamics and damage to the machine could occur.
The maximum permissible axle load could be exceeded.

➢ Do not tow the machine if it is covered by snow or ice.

➢ Remove any snow or ice before towing.

Observe / carry out the following before towing:

1. Make sure the towing hitch is compatible with the ball or eye coupling on the towed machine.
2. Check that the machine is shut down and secured against accidental restarting.
3. Detach all connecting lines and hoses.
4. Make sure there are no unsecured tools lying on or in the machine.
5. Close and lock the access doors.

Option sa **Adjust the towbar to suit the height of the towing vehicle hitch.**

When the machine is coupled up, the towbar must be parallel with the ground.

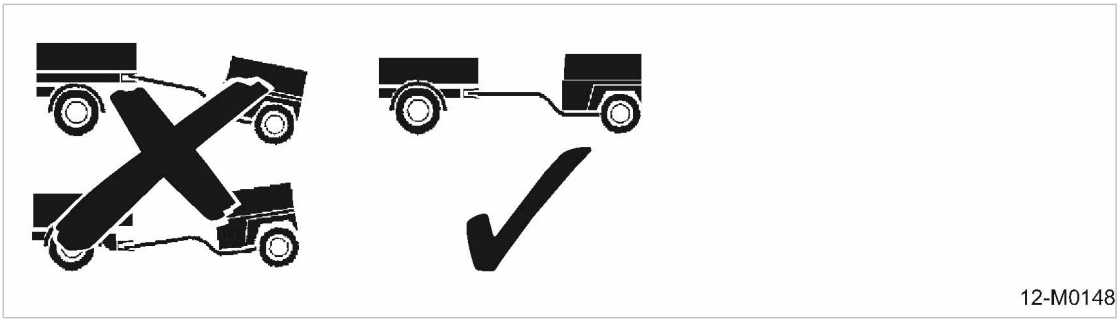


Fig. 84 Towing alignment

WARNING
Danger from problematic driving dynamics!
The permissible loading range may be exceeded or undercut.
Personal injury may result from towing.
Damage to the machine and/or towing vehicle is possible.
➢ Do not couple up the machine at an angle to the towing vehicle.
➢ Ensure that the towbar is horizontal when coupled to the towing vehicle.

➢ Adjust the towbar height to suit the height of the hitch on the towing vehicle.

Further information See chapter 6.4.1 for towbar height adjustment.

12.2.1.2 Coupling-up

Option sa, sd Ball coupling (EC version):

To hitch up the machine, lower the open coupling onto the ball of the towing vehicle so that it clicks into place. The coupling is fully locked when the green locking indicator protrudes and is visible from the side.

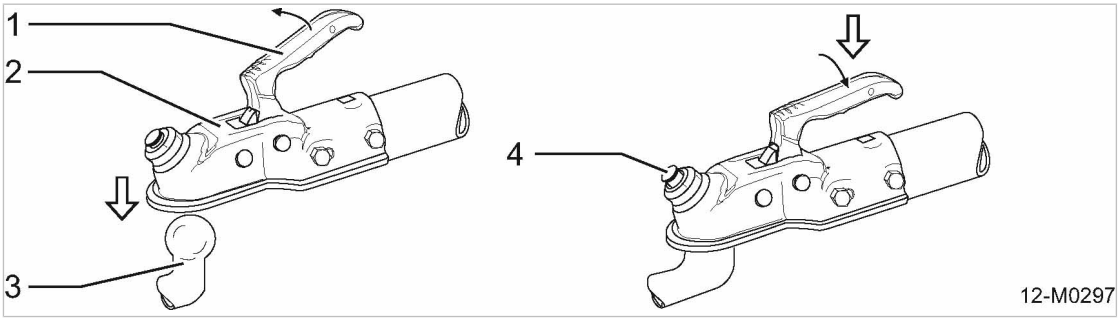


Fig. 85 Ball coupling (ALKO-EU)

[1] Coupling handle
[2] Ball coupling
[3] Towing vehicle ball hitch
[4] Locking indicator (protruding)

CAUTION
There is considerable danger of injury caused by trapped fingers.
They can be trapped in the spring-loaded closing mechanism.
➢ Never place your fingers inside an open ball coupling.
➢ Always wear protective gloves.

1. Pull up the coupling handle.
   The coupling opens.

WARNING
Danger of accident from an incorrectly closed ball coupling.
If the coupling is not fully closed the compressor can become uncoupled from the towing vehicle and cause an accident.
➢ Check correct coupling.

2. Place the open coupling over the towing vehicle ball hitch.
   The weight on the coupling will cause it to audibly close. The coupling locks automatically. Closing and locking is automatic.

3. Push the handle down to be certain of locking.
   The coupling is fully locked when the handle is fully down and can be pushed no further.
4. Check correct coupling.
   - Check that the coupling handle cannot be pushed further down.
   - Check that the locking indicator is protruding and visible.

The locking indicator is not visible.
➢ Lift the handle and uncouple.
➢ Set the coupling back on the towing vehicle ball hitch and push down.

Checking the ball coupling wear indicator (EU version):

The ball coupling is equipped with a wear indicator.

The wear indicator shows:
- Wear on the ball hitch.
- Wear on the coupling.

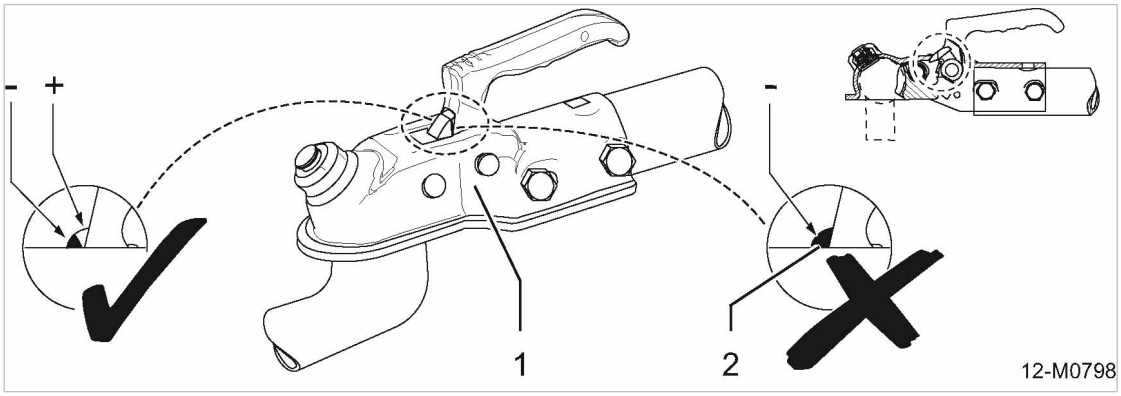


Fig. 86 Ball coupling wear indicator

1	Ball coupling	+	Green zone (OK)
2	Wear indicator	−	Red zone (wear tolerance exceeded)

WARNING
Danger of accident from worn coupling!
The machine may detach from the towing vehicle.
➢ Do not tow the machine.
➢ Have the ball coupling and ball hitch checked.
➢ Replace worn parts.

1. Couple-up the machine and tow slowly and carefully for about 500 m.
   The action of towing sets the coupling mechanism to maximum closure and gives a true reading on the wear indicator.

2. Interpret the wear indicator as follows:

Wear indicator	Meaning
Green zone showing	■ Coupling in new condition. ■ Towing vehicle ball hitch wear within acceptable limits. ➢ No action necessary.
Red zone showing	■ Ball hitch wear at acceptable limit, ball coupling unworn. ■ Ball hitch in new condition; ball coupling showing increased wear. ■ Both ball and coupling showing increased wear. ■ Ball coupling damaged. ➢ Have the ball coupling and ball hitch checked by a specialist workshop. ➢ Replace worn parts.

Tab. 90 Ball coupling wear indicator

Option sh **Ball coupling (USA version):**

To couple up the compressor, lower the open coupling onto the ball hitch of the towing vehicle so that it clicks into place.

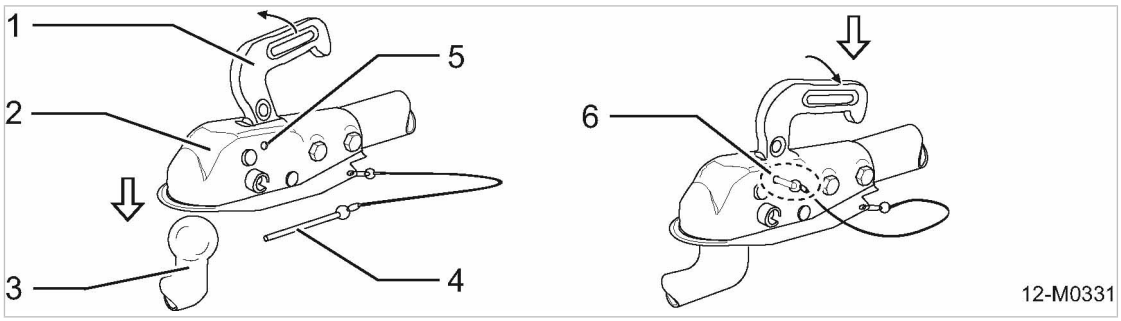


Fig. 87 Ball coupling (ALKO-USA)

[1] Coupling handle
[2] Ball coupling
[3] Towing vehicle ball hitch
[4] Safety pin
[5] Fixing hole for the security pin
[6] Ball coupling properly secured

CAUTION
There is considerable danger of injury caused by trapped fingers.
They can be trapped in the spring-loaded closing mechanism.
➢ Never place your fingers inside an open ball coupling.
➢ Always wear protective gloves.

1. Check if the security pin is removed from the coupling and draw it out if not.
2. Pull up the coupling handle.
   The coupling opens.

WARNING
Incorrectly coupled machine
If the machine is not correctly coupled and locked it may break away from the towing vehicle and cause an accident.
- ➢ Check correct coupling.
- ➢ Check correct location of the security pin.

3. Place the open coupling over the towing vehicle ball hitch.
   The weight on the coupling will cause it to audibly close. The coupling locks automatically. Closing and locking is automatic.
4. Push the handle down to be certain of locking.
   The coupling is fully locked when the handle is fully down and can be pushed no further.
5. Insert the security pin in the ball coupling fixing opening.

12.2.1.3 Tasks to be performed after coupling

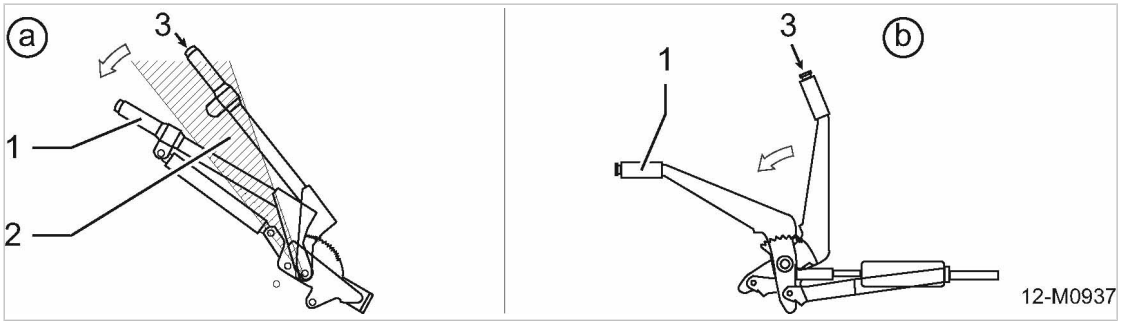


Fig. 88 Release the parking brake.

[a] Parking brake with gas spring assistance
[b] Parking brake with ratchet and spring loading
[1] Parking brake lever
[2] Dead point zone
[3] Brake lever release button

Option sa Height-adjustable chassis:

1. Check that the towbar is adjusted to the correct height. See also chapter 6.4.1.
   Check that:
   - The teeth in the tow bar height adjusting joints are fully engaged
   - The locking levers are tightened
   - The security pin is fully inserted.
2. Wind the jockey wheel to its uppermost position.
3. Check that the wheels are securely fitted and the tyres are in good condition.
4. Check the tyre pressures.
5. Connect the cable for the lighting and indicator systems and carry out a function check.
6. Release the parking brake:
   (see Fig. 88/a).
   - Pull the brake lever a little further on and press the release button.
   - Hold the release button in and push the lever down past the dead point zone.
7. Remove the chocks.

Option sd **Fixed-height chassis (with parking brake):**

1. Wind the jockey wheel to its uppermost position.
2. Check that the wheels are securely fitted and the tyres are in good condition.
3. Check the tyre pressures.
4. Connect the cable for the lighting and indicator systems and carry out a function check.
5. Release the parking brake:
   (see Fig. 88/b).
   - Pull the brake lever a little further on and press the release button.
   - Hold in the release button and push the lever fully down.
6. Remove the chocks.

Option sh **Fixed-height chassis (without parking brake):**

Option sh

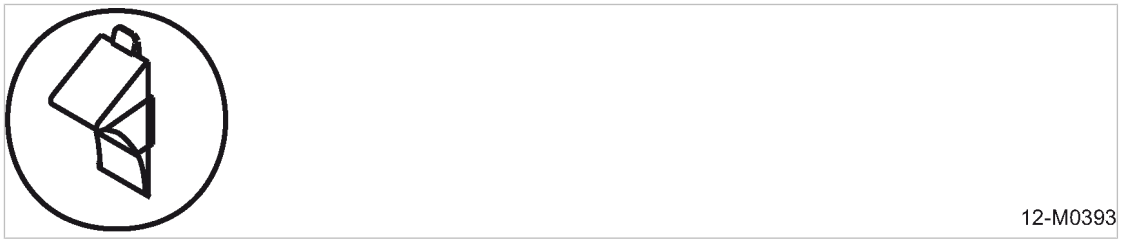


Fig. 89 Safety sign - secure the chocks

WARNING
Missing chocks
Serious injury or death can result from an unsecured machine rolling away.
➢ Secure the chocks in the transport securing device before transporting the machine.
➢ Replace missing chocks immediately.

1. Wind the jockey wheel to its uppermost position.
2. Check that the wheels are securely fitted and the tyres are in good condition.
3. Check the tyre pressures.
4. Attach the lighting and indicator systems and carry out a function check.
5. Remove the chocks and secure them in the transport securing device.

Replacement chocks can be purchased from KAESER representatives. A list is given at the end of this manual. The part number of the chock is 5.1325.0.

Option sa, sd **Ensure emergency braking in the case of breakaway from the towing vehicle:**

If the compressor breaks away from the towing vehicle, the cable tightens and pulls on the emergency brake (parking brake).

It is essential that the breakaway cable is threaded through its guides for correct emergency braking.

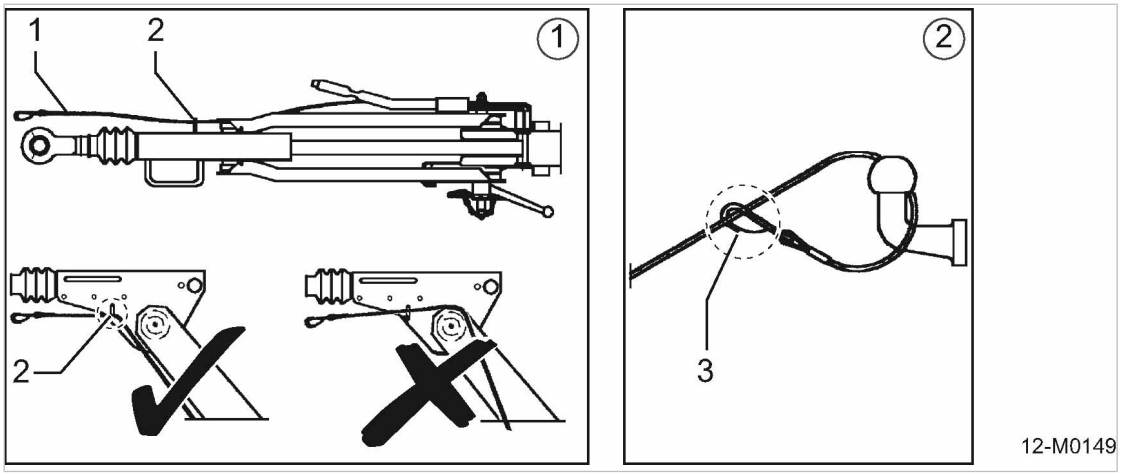


Fig. 90 Breakaway cable attachment

1 Breakaway cable
2 Breakaway cable guide (eye)
3 Connection (snap hook)

CAUTION
Unintentional brake application.
If the breakaway cable is too short it can apply the brakes when rounding a curve. This imposes high wear on the braking system.

➢ Make sure the breakaway cable is long enough.

1. Thread the breakaway cable through the guide welded on the side of the towbar.
2. Loop the end of the cable round the towing vehicle hitch and secure with the snap hook.

12.2.2 Parking the compressor

CAUTION
Injury can occur if the towbar is unsupported and allowed to fall.
A falling towbar can cause injury, especially by crushing the feet.
If the jockey wheel is wound up completely, the spindle can disengage and allow the towbar to fall to the ground.

➢ Do not wind the jockey wheel completely out when the machine is uncoupled from the towing vehicle.

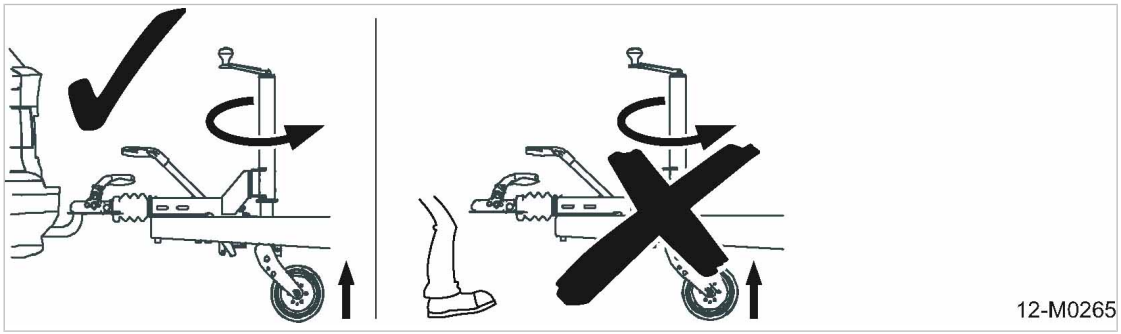


Fig. 91 Injury can occur if the towbar is unsupported and allowed to fall.

Option sa **Height-adjustable chassis:**

When parking on a slope, securely chock the machine before uncoupling.

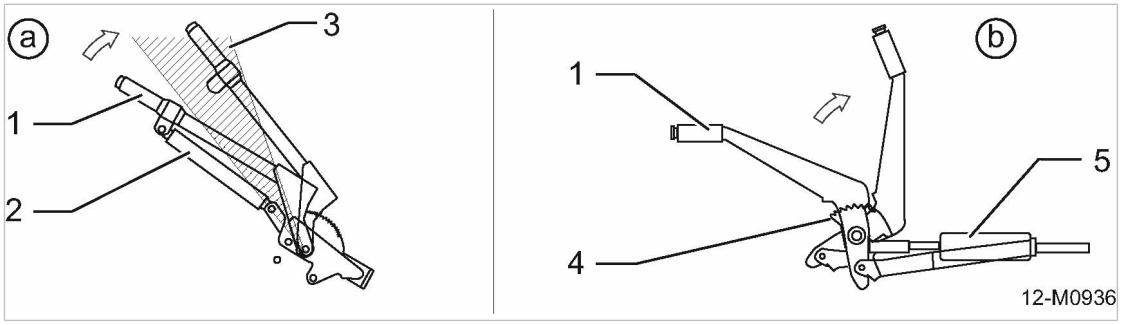


Fig. 92 Actuating the parking brake

[a]	Parking brake with gas spring assistance	[b]	Parking brake with ratchet and spring loading
[1]	Parking brake lever		
[2]	Gas spring	[4]	Ratchet
[3]	Dead point zone	[5]	Spring loading device

1. Disconnect the lighting and signaling cable.
2. Pull on the parking brake past the dead point zone (see Fig.92/a).
   The gas spring holds the brake under tension.
3. Detach the breakaway cable.
4. Wind down the jockey wheel.
5. Place chocks under the wheels.
6. Uncouple the compressor from the towing vehicle:
   - Pull up the coupling release lever.
   - Lift the coupling off the towing hitch ball.

The gas spring automatically increases parking brake force if the machine rolls backwards or when parked on a slope.

Option sd **Fixed-height chassis (with parking brake):**

When parking on a slope, securely chock the machine before uncoupling.

1. Disconnect the lighting and signaling cable.
2. Pull on the parking brake to the last ratchet tooth (see Fig. 92/b).
   Hand brake lever is vertical: the brake is spring-loaded.
   Hand brake lever is not vertical: the machine is not secured against rolling.
3. Detach the breakaway cable.
4. Wind down the jockey wheel.
5. Place chocks under the wheels.
6. Uncouple the compressor from the towing vehicle:
   - Pull up the coupling release lever.
   - Lift the coupling off the towing hitch ball.

Option sh **Fixed-height chassis (without parking brake):**

When parking on a slope, securely chock the machine before uncoupling.

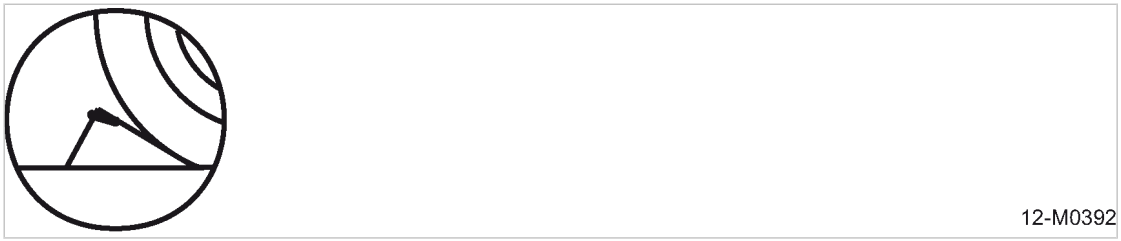


Fig. 93 Safety sign - secure the chocks

WARNING
Machine without parking brake.
Serious injury or death can result from an unsecured machine rolling away.
- ➢ Securely chock the machine before uncoupling.
- ➢ As a general rule, the machine should always be blocked with chocks when it is not being moved.
- ➢ The machine should not be manoeuvred by hand.

1. Wind down the jockey wheel.
2. Place chocks under the wheels.
3. Dismantle the lighting and signaling system.
4. Uncouple the compressor from the towing vehicle:
   - Withdraw the security pin from the ball coupling.
   - Pull up the coupling release lever.
   - Lift the coupling off the towing hitch ball.
   - Insert the security pin in the ball coupling fixing opening.

12.2.3 Transport with a 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.
The permissible load on the crane or lifting eye may be exceeded.

- ➢ Additional measures should be taken under conditions of snow or ice.
  - 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.

Carry out the following tasks before lifting the machine:

A lifting eye is provided for transporting with a crane. The lifting eye is located beneath a lift-up cover in the centre of the canopy.

1. Unlock the cover from inside and lift up.
2. Position the crane hook vertically over the lifting eye.
3. Engage the hook in the eye.
4. Close and lock the access doors.
5. Lift the machine carefully.

Take care when setting down the machine

CAUTION
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.

➢ Set the machine down slowly and carefully.

12.2.4 Option sc
Transporting with a forklift truck

Precondition The machine is shut down.
All connecting lines and hoses disconnected and removed.

CAUTION
Damage to the machine by incorrect lifting with a fork truck.
The machine may fall or be damaged by the forks.
- ➢ Do not use a fork truck to lift towable machines.
- ➢ Only stationary machines with skids may be lifted with a fork truck.
- ➢ Pick up the machine only from the side with the forks through the lifting lugs.

Option sc

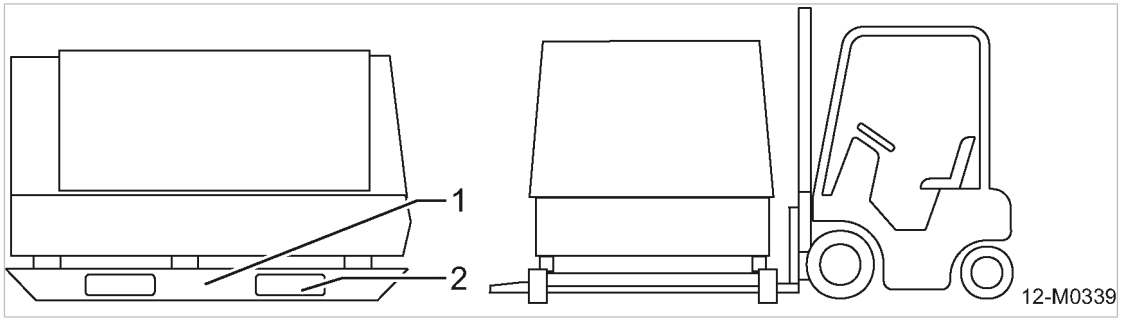


Fig. 94 Transporting using a forklift truck
[1] Skids
[2] Lifting lugs

1. Close and lock the access doors or canopy.
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.

12.2.5 Transporting as a load

The medium of transport determines the type of packing and securing.
Packing and securing methods must be such that, assuming proper handling, the load arrives in perfect condition at the destination.

Consult KAESER Service for advice concerning sea or air transport.

Material Chocks
Restraints or timber balks
Straps

Load securing devices

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. Accepted technical regulations should be observed (e.g. VDI directive 2700 ff in Germany).
Responsibility for properly secured loads falls on the driver, the vehicle keeper and the carrier.

Use chocks, restrainers or timber balks for securing the load.
If necessary, use straps across the chassis and the towbar.

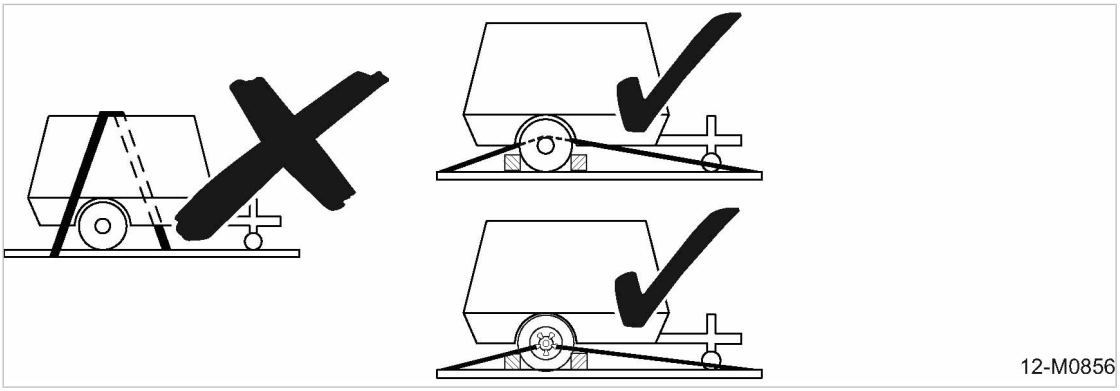


Fig. 95 Load secured by strapping

CAUTION
Braces can damage the bodywork.
Movement during transportation can damage the bodywork.
- ➢ Do not use straps over the bodywork.
- ➢ Use straps only over the chassis.

1. Always observe valid accident and safety regulations when transporting.
2. 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 for damages arising through incorrect transport methods or insufficient or wrong securing of loads.
The transport restraints on rented, hired or exhibition machines should be re-used for the return journey.

Before shipment as air freight

The machine is designated as dangerous goods for air freight purposes; any disregard can result in a heavy fine.

DANGER
Danger of fire or explosion from operating fluids/materials.
The machine incorporates an internal combustion engine.
- ➢ Any dangerous fluids/materials contained within the machine must be removed before transport.

➢ Remove all dangerous fluids/materials.
These include:
- Residues of fuel or fuel vapours
- Lubricating and cooling oils in the engine and compressor unit
- Battery electrolyte

12.3 Storage

Moisture can lead to corrosion, particularly in the engine, airend and oil separator tank.
Frozen moisture can damage components, valve diaphragms and gaskets.

Advice can be obtained from KAESER on storage and commissioning.

CAUTION
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 and engine oil from the machine.
3. Remove used filters and the oil separator cartridge.
4. Drain the coolant from water-cooled engines and systems.
5. Hand the machine over to an authorized disposal expert.

➢ Parts contaminated with cooling oil or engine oil must be disposed of in accordance with local environment protection regulations.

13 Annex

13.1 Marking

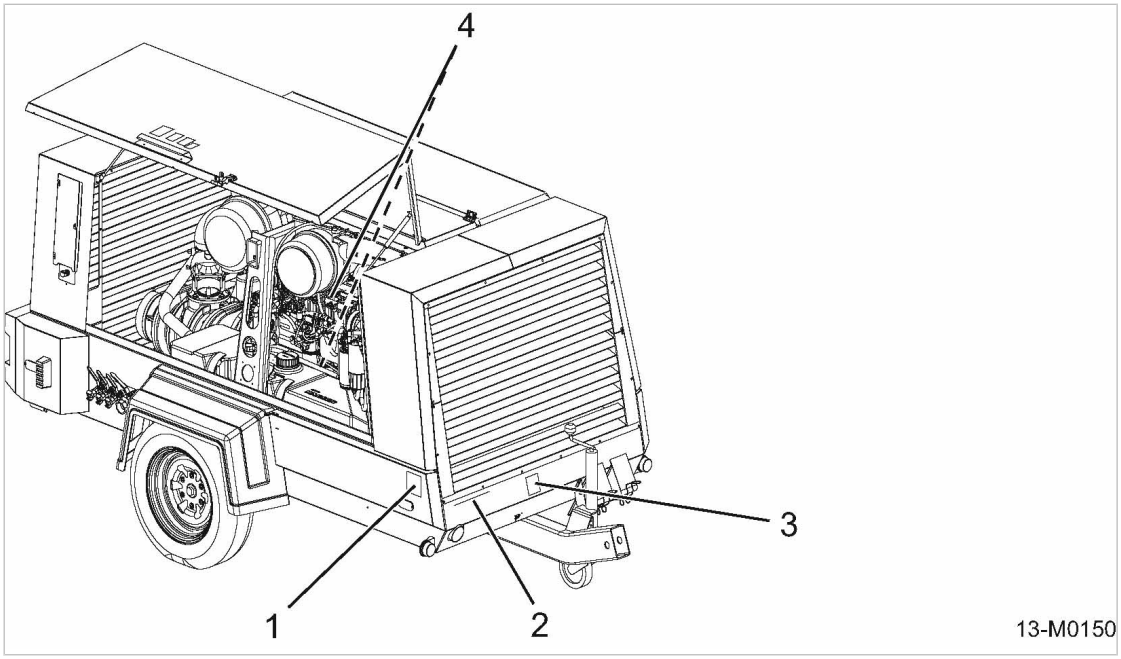
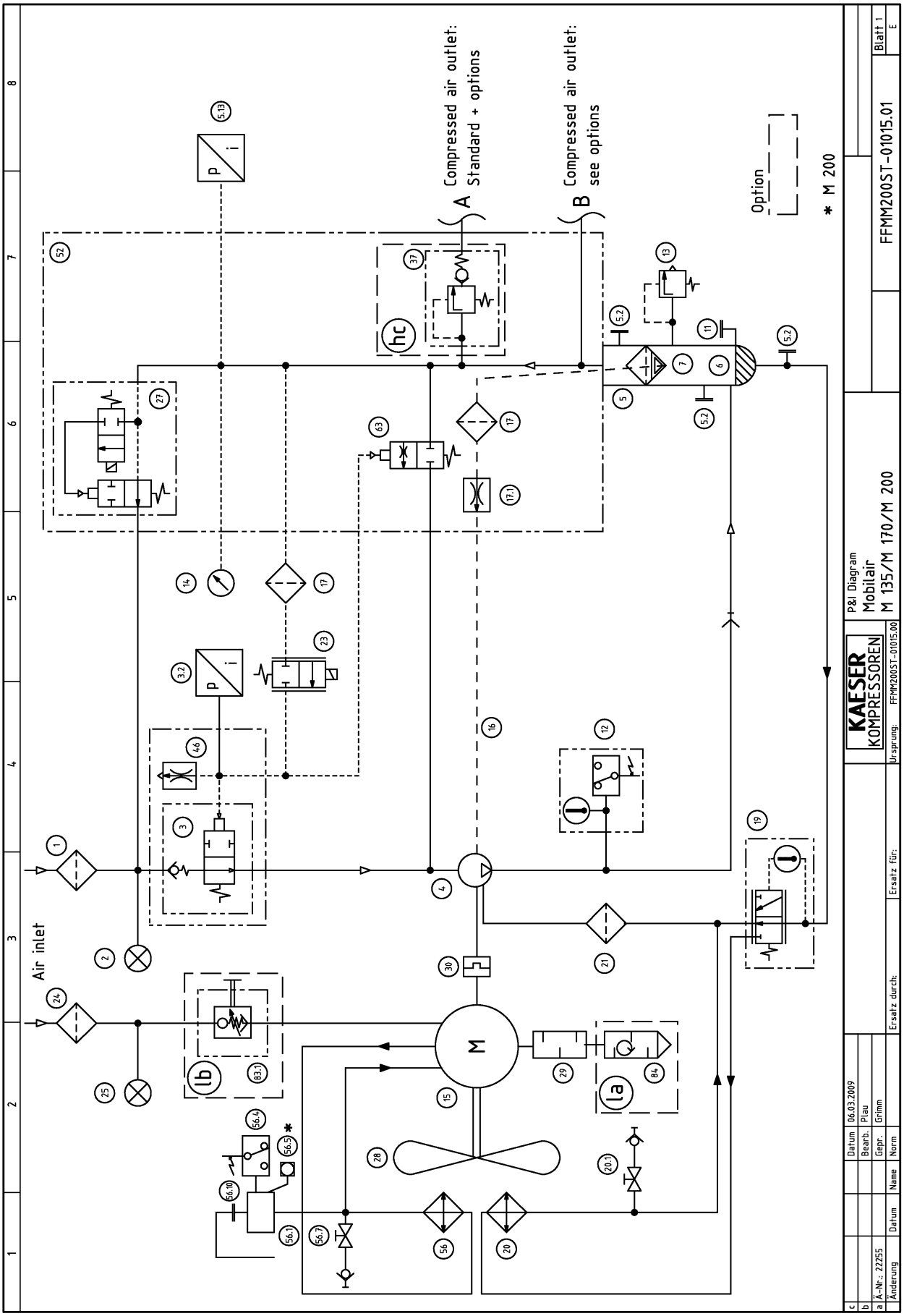


Fig. 96 Marking

1 Machine nameplate with serial number
2 VIN *) (stamped in the bodywork)
* Vehicle identity number
3 Combined label for coupling loading and built-in options
4 Engine nameplate with serial number (on the cylinder head cover or crankcase).

13.2 Pipeline and instrument flow diagram (P+I diagram)

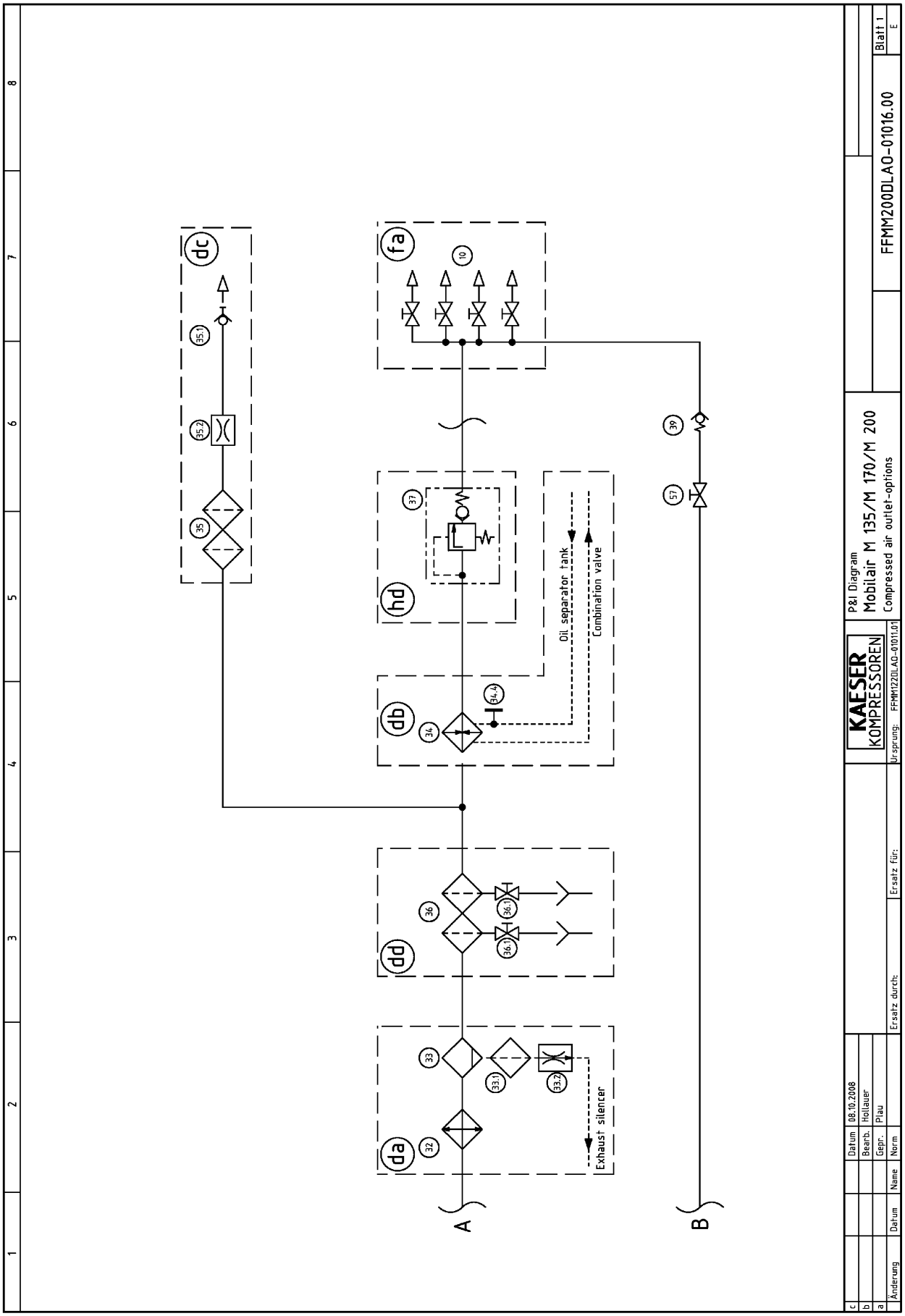

Compressed air outlet:
Standard + options
A
Compressed air outlet:
see options
B
Option
* M 200
Air inlet
M
hc
la
lb
P&I Diagram
Mobilair
M 135/M 170/M 200
KAESER KOMPRESSOREN
FFMM200ST-01015.01
FFMM200ST-01015.00
Blatt 1
E
Datum 06.03.2009
Bearb. Plau
Gepr. Grimm
Norm
Name
Datum
Änderung
Ersatz durch:
Ersatz für:
Ursprung:
Ä.-Nr.: 22255

1	Compressor - Air filter
2	Filter maintenance indicator, Compressor -Air filter
3	Inlet valve
3.2	Pressure transducer - Control pressure
4	Airend
5	Oil separator tank
5.2	Screw plug
5.13	Pressure transducer - Internal pressure
6	Oil reserve
7	Oil separator cartridge
11	Oil filler with screw plug
12	Temperature gauge switch + Indication
13	Pressure relief valve
14	Pressure gauge Compressed air - Control panel
15	Diesel engine
16	Oil return line
17	Dirt trap
17.1	Nozzle
19	Combination valve - Oil temperature controller
20	Oil cooler
20.1	Shut-off valve with hose coupling - Oil drain
21	Oil filter
23	Electric proportional controller
24	Motor - Air filter
25	Filter maintenance indicator, Motor - Air filter
27	Venting valve
28	Fan
29	Exhaust silencer
30	Coupling
37	Minimum pressure check valve
46	Nozzle (Secondary end Proportional controller)
52	Control valve
56	Water cooler
56.1	Cooling water expansion tank
56.4	Opto-electronic cooling water level sensor
56.5	Cooling water sight glass (M 200)
56.7	Shut-off valve with hose coupling - Water drain
56.10	Water filling port with plug and pressure relief valve
63	Control valve (Air circulation valve)
83.1	Engine air intake shut-off valve (automatic and manual shutoff)
84	Spark arrestor

Option

hc	Minimum pressure check valve (without combination filter)
la	Spark arrestor
lb	Spark arrestor + Engine air intake shut-off valve (automatic and manual shutoff)

c				Datum	06.03.2009		KAESER KOMPRESSOREN	P&I Diagram legend Mobilair M 135/M 170/M 200	
b				Bearb.	Plau				
a				Gepr.	Grimm				
	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: FFMM200ST-01015.00	FFMM200ST-01015.01 Blatt 2 E


dc
fa
hd
db
dd
da
Oil separator tank
Combination valve
Exhaust silencer
A
B
P&I Diagram
Mobilair M 135/M 170/M 200
Compressed air outlet-options
FFMM200DLAO-01016.00
KAESER KOMPRESSOREN
Ursprung: FFMM122DLAO-01011.01
Ersatz für:
Ersatz durch:
Datum 08.10.2008
Bearb. Hollauer
Gepr. Plau
Norm
Name
Datum
Änderung
Blatt 1

10	Compressed air distributor	37	Minimum pressure check valve
32	Air cooler	39	Check valve
33	Centrifugal separator	57	Shut-off valve - Venting line
33.1	Dirt trap		
33.2	Nozzle	Option	
34	Heat exchanger	da	Aftercooler + Centrifugal separator
34.4	Screw plug - Oil drain	db	Heat exchanger
35	Breathing air filter	dc	Breathing air filter
35.1	Hose coupling	dd	Filter combination
35.2	Nozzle	fa	Direct air flow
36	Filter combination	hd	Minimum pressure check valve (with combination filter)
36.1	Shut-off valve for condensate drain		

c				Datum	08.10.2008		
b				Bearb.	Plau		
a				Gepr.	Hollauer		
	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:

KAESER KOMPRESSOREN

Ursprung: FFMM122DLAO-01011.01

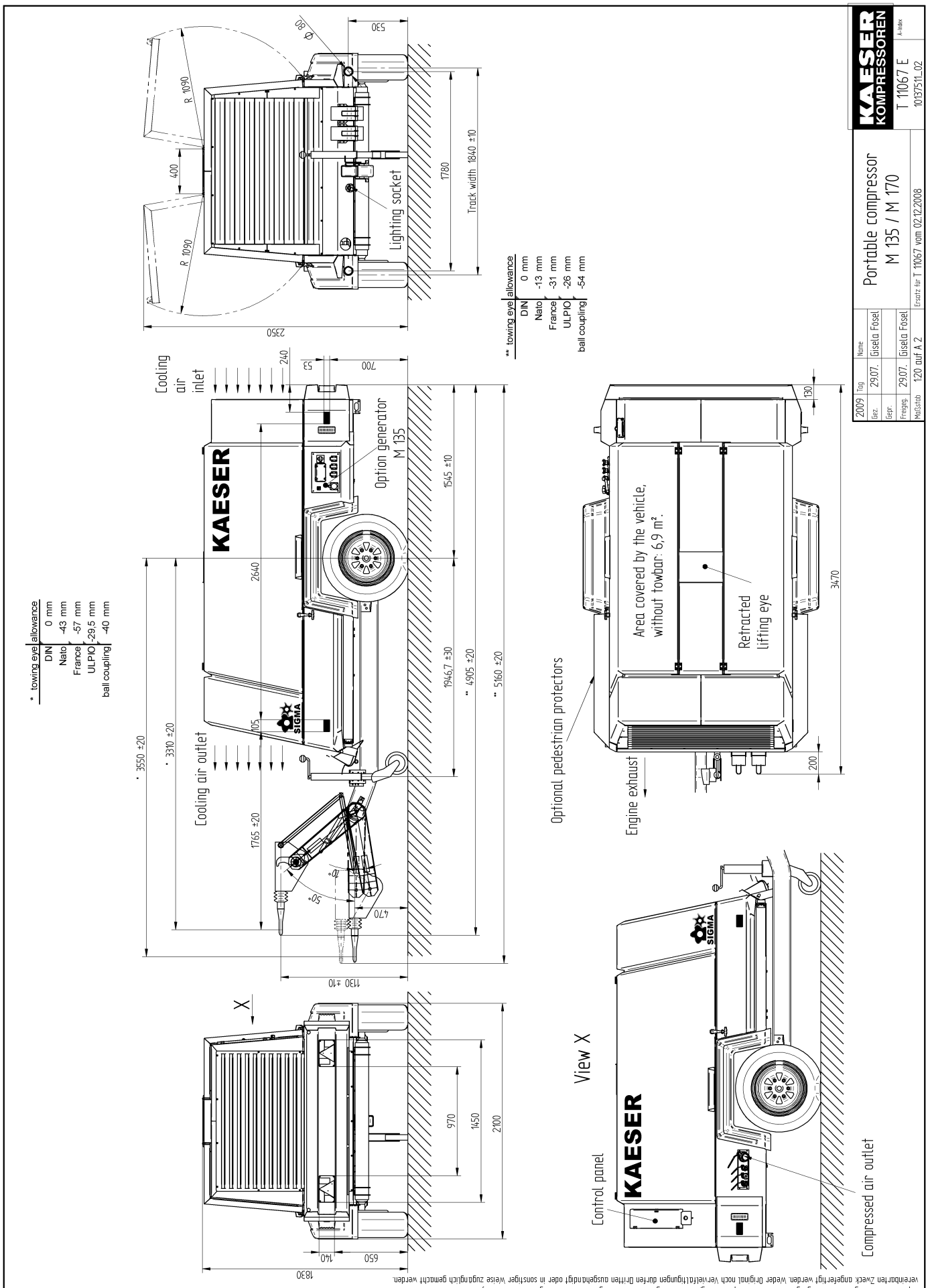
P&I Diagram legend
Mobilair M 135/M 170/M 200
Compressed air outlet-options

FFMM200DLAO-01016.00

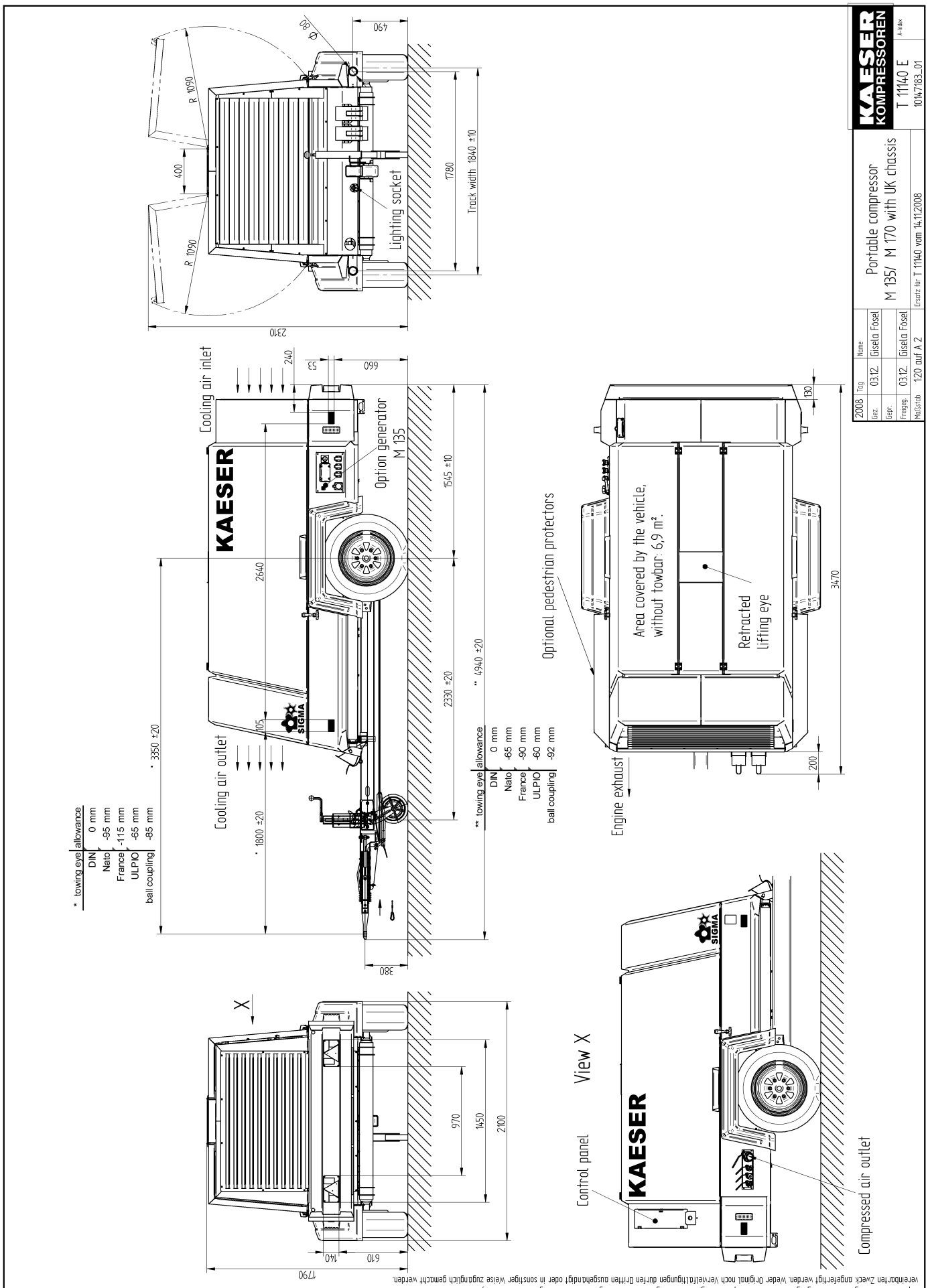
Blatt 2
E

13.3 Dimensional drawings

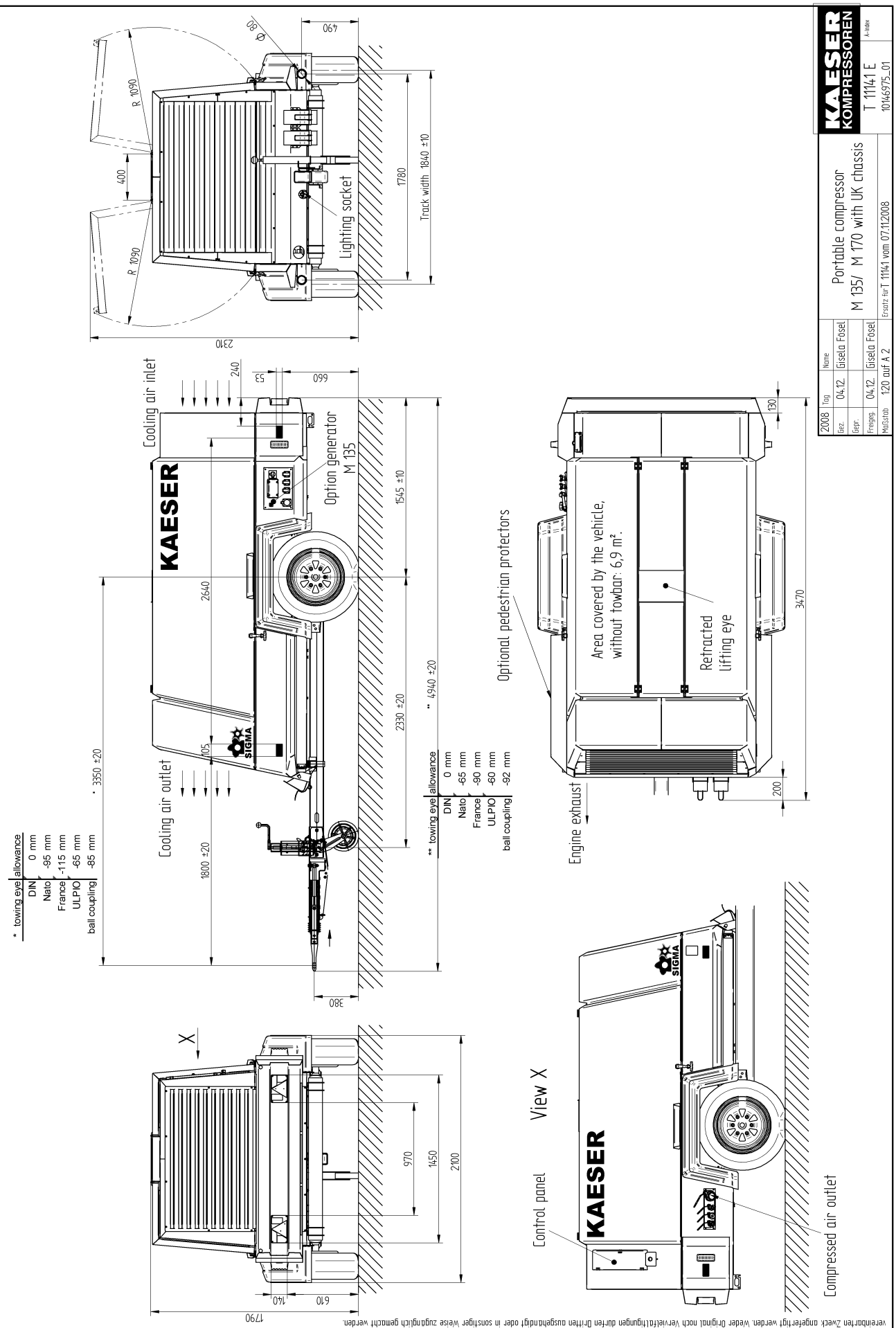
13.3.1 Option sa
Dimensional drawing, chassis with height-adjustable tow bar



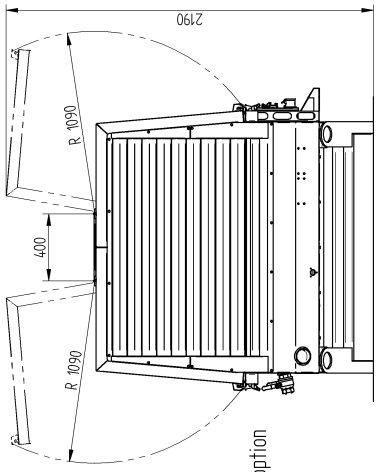
13.3.2 Option sd
Dimensional drawing, chassis with fixed height tow bar

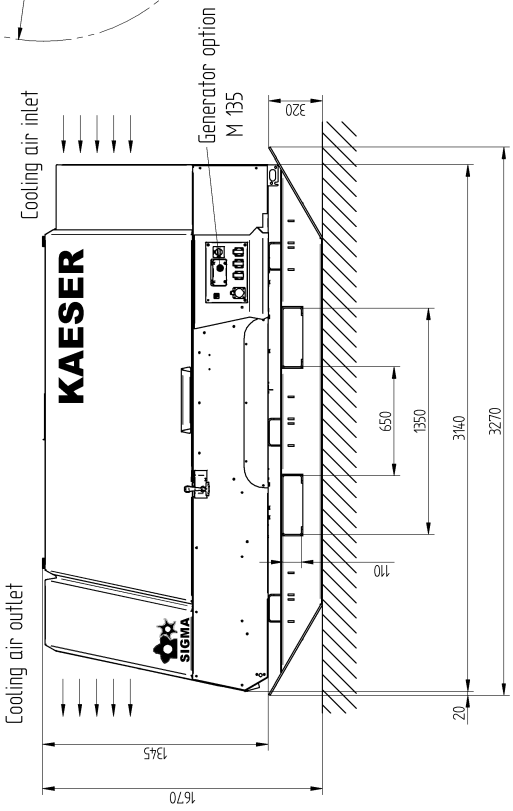


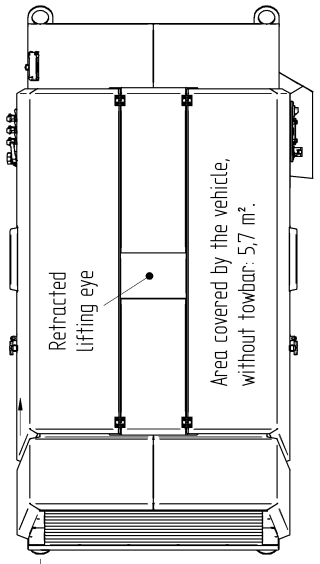
13.3.3 Option sh
Dimensional drawing, chassis without parking brake

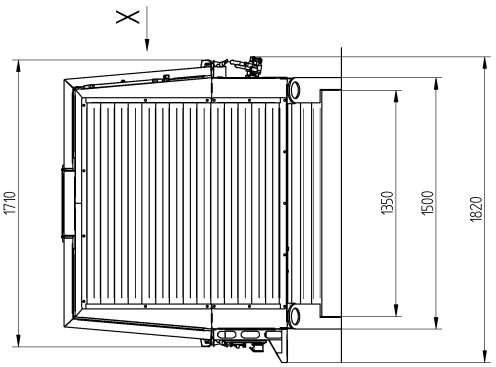


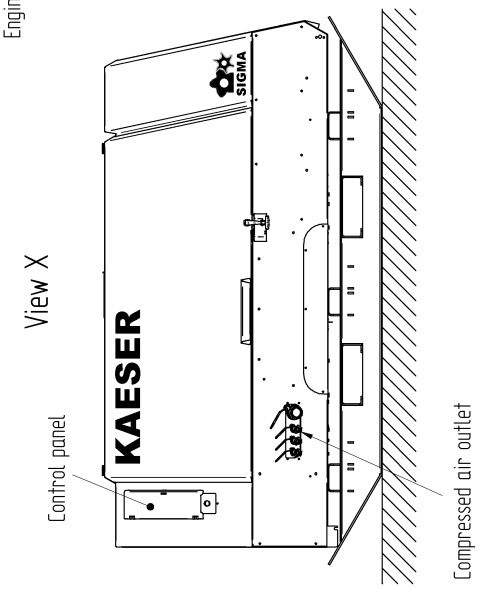
13.3.4 Option sc
Dimensional drawings of stationary machine (skids)









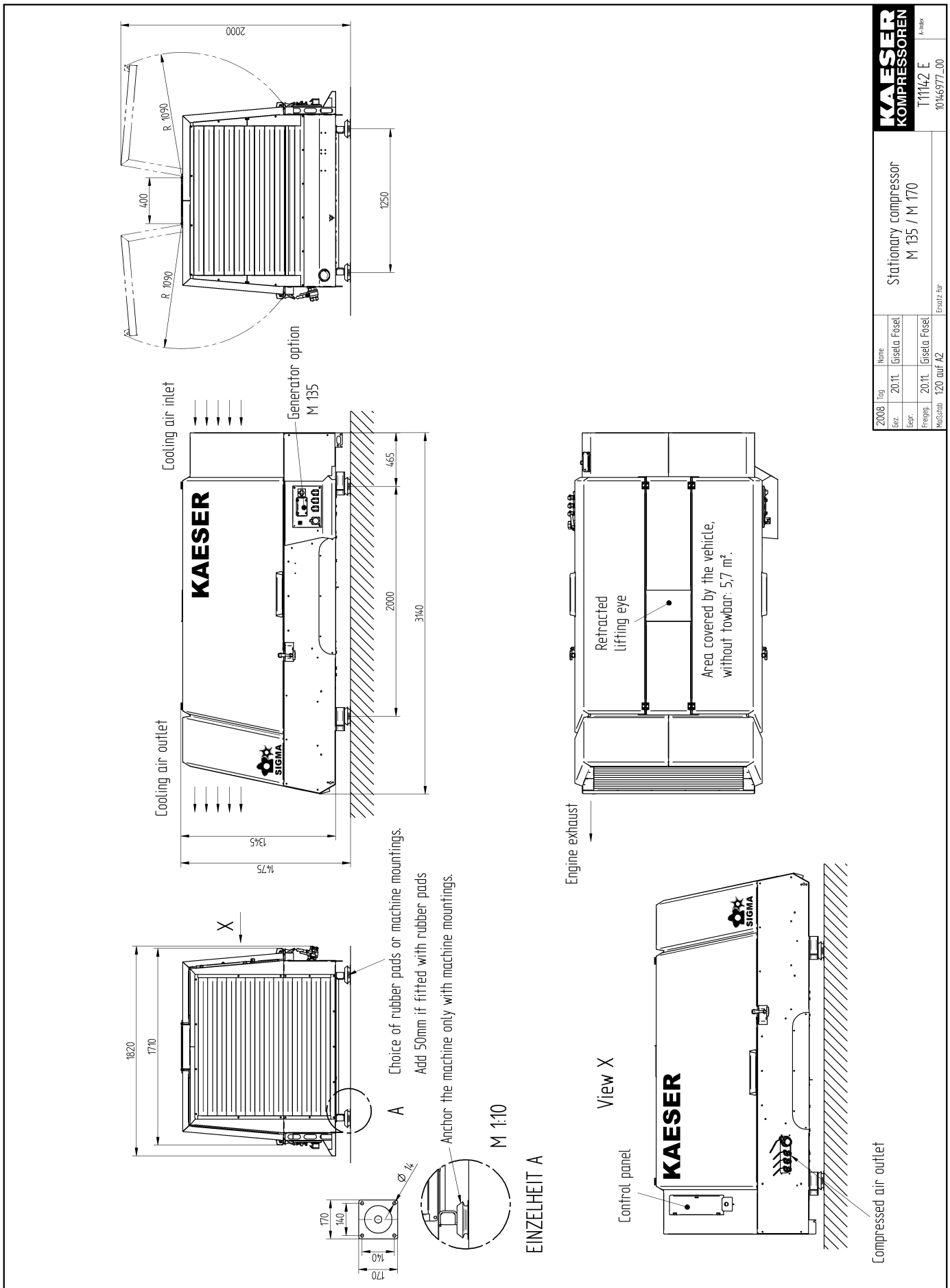


KAESER KOMPRESSOREN

Stationary compressor M 135 / M 170 on skids		T 11143 E	A-Index
		10146978_00	

2008	Tag	Name	Ersatz für
Gez.:	10.11.	Gisela Fösel	
Gepr.:			
Freigeg.:	18.11.	Gisela Fösel	
Maßstab	1:20 auf A2		

13.3.5 Option si
Dimensional drawings of stationary machine (base frame)



13.4 Wiring diagrams

13.4.1 Electrical Diagram

Electrical diagrams
MOBILAIR M123/M135/M170
DEUTZ TCD Motor with EMR III
and SIGMA CONTROL MOBIL

Manufacturer: Kaeser Kompressoren GmbH
Postfach 2143
96410 Coburg

c				Datum	07.01.2009 E		KAESER KOMPRESSOREN	Cover page MOBILAIR M123/M135/M170	=	
b				Bearb.	Weid				+	
a	Cable GEN	27.02.09	Weid	Gepr.	Weid				DFA123.SCM-01230.02	Blatt 1
A	Änderung	Datum	Name	Norm		Ersatz durch:	Ursprung: afa0123_01			Bl.

Lfd. Nr. No.	Benennung Name		Zeichnungsnummer (Kunde) Drawing No. (customer)	Zeichnungsnummer (Hersteller) Drawing No. (manufacturer)	Blatt Page	Anlagenkennzeichen Unit designation
1	Cover page			DFA123.SCM-01230.02	1	
2	List of contents			ZFA123.SCM-01230.02	1	
3	Block diagram	general instructions		UFA123.SCM-01230.02	1	
4	Block diagram	cabling		UFA123.SCM-01230.02	2	
5	Circuit diagram	Diesel motor		SFA123.SCM-01230.02	1	
6	Circuit diagram	EMR3 Motor connection		SFA123.SCM-01230.02	2	
7	Circuit diagram	EMR3		SFA123.SCM-01230.02	3	
8	Circuit diagram	Control panel		SFA123.SCM-01230.02	4	
9	Circuit diagram	SCM Power supply unit		SFA123.SCM-01230.02	5	
10	Circuit diagram	SCM sensors		SFA123.SCM-01230.02	6	
11	Circuit diagram	SCM inputs		SFA123.SCM-01230.02	7	
12	Circuit diagram	SCM inputs		SFA123.SCM-01230.02	8	
13	Circuit diagram	SCM outputs		SFA123.SCM-01230.02	9	
14	Circuit diagram	SCM outputs		SFA123.SCM-01230.02	10	
15	Circuit diagram	SCM outputs		SFA123.SCM-01230.02	11	
16	Circuit diagram	Volt-free contacts		SFA123.SCM-01230.02	12	
17	Electrical equipment identification			SFA123.SCM-01230.02	20	
18	Equipment parts list	control cabinet		GFA123.SCM-01230.02	1	
19	Terminal schedule	standard		KFA123.SCM-01230.02	1	
20	Terminal schedule	standard		KFA123.SCM-01230.02	2	
21	Terminal schedule	Automatic-start-stop		KFA123.SCM-01230.02	3	
22	Component layout	standard		AFA123.SCM-01230.02	1	
23	Component layout	Automatic-start-stop		AFA123.SCM-01230.02	2	

c				Datum	07.01.2009		KAESER KOMPRESSOREN	List of contents MOBILAIR SCM & EMR III	=
b				Bearb.	Weid				+
a				Gepr.	Weid				Blatt 1
B	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: afa0123_01	ZFA123.SCM-01230.02	Bl.

general instructions

Control voltage: 24VDC

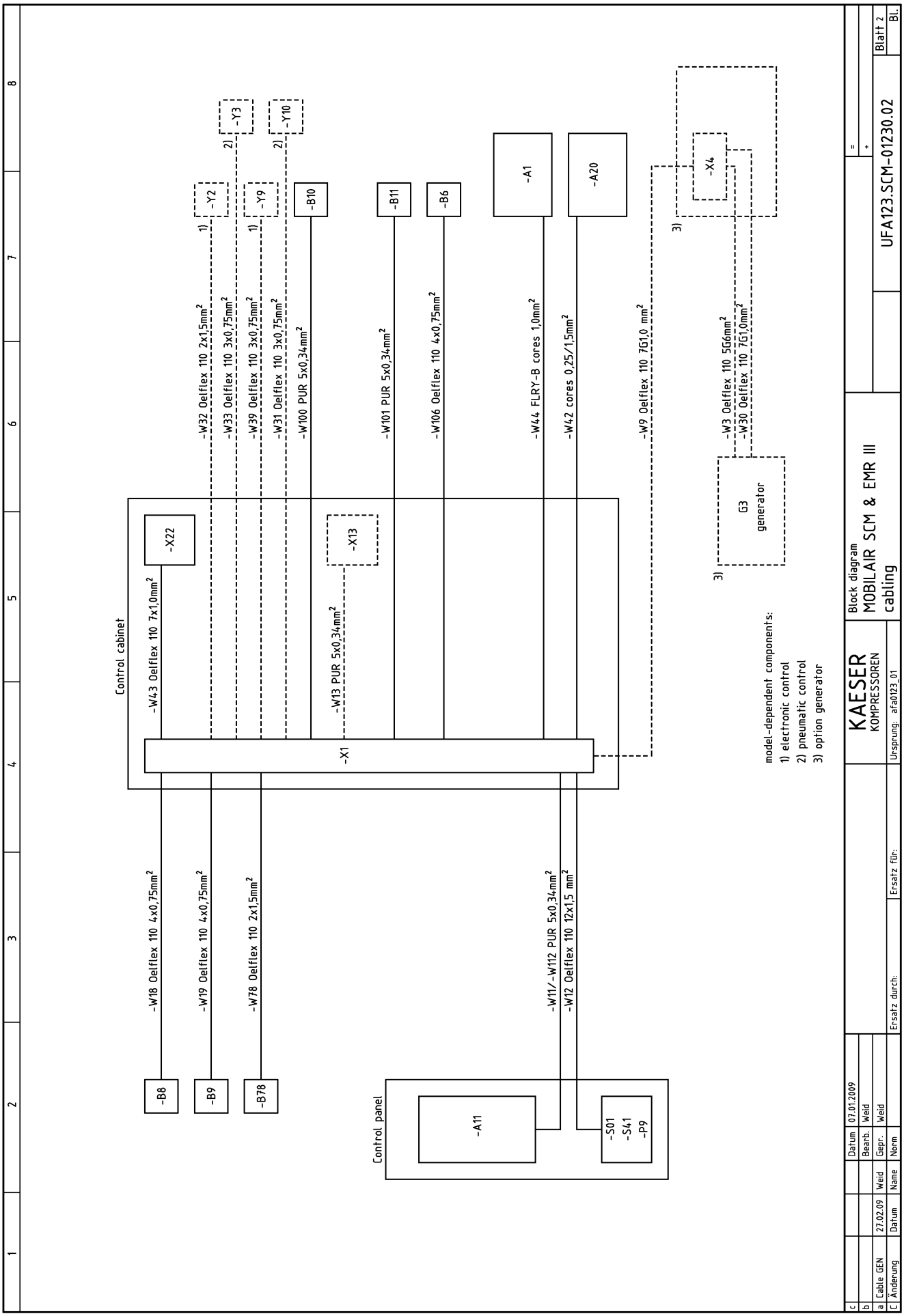
control cabinet wiring for non-designated conductors

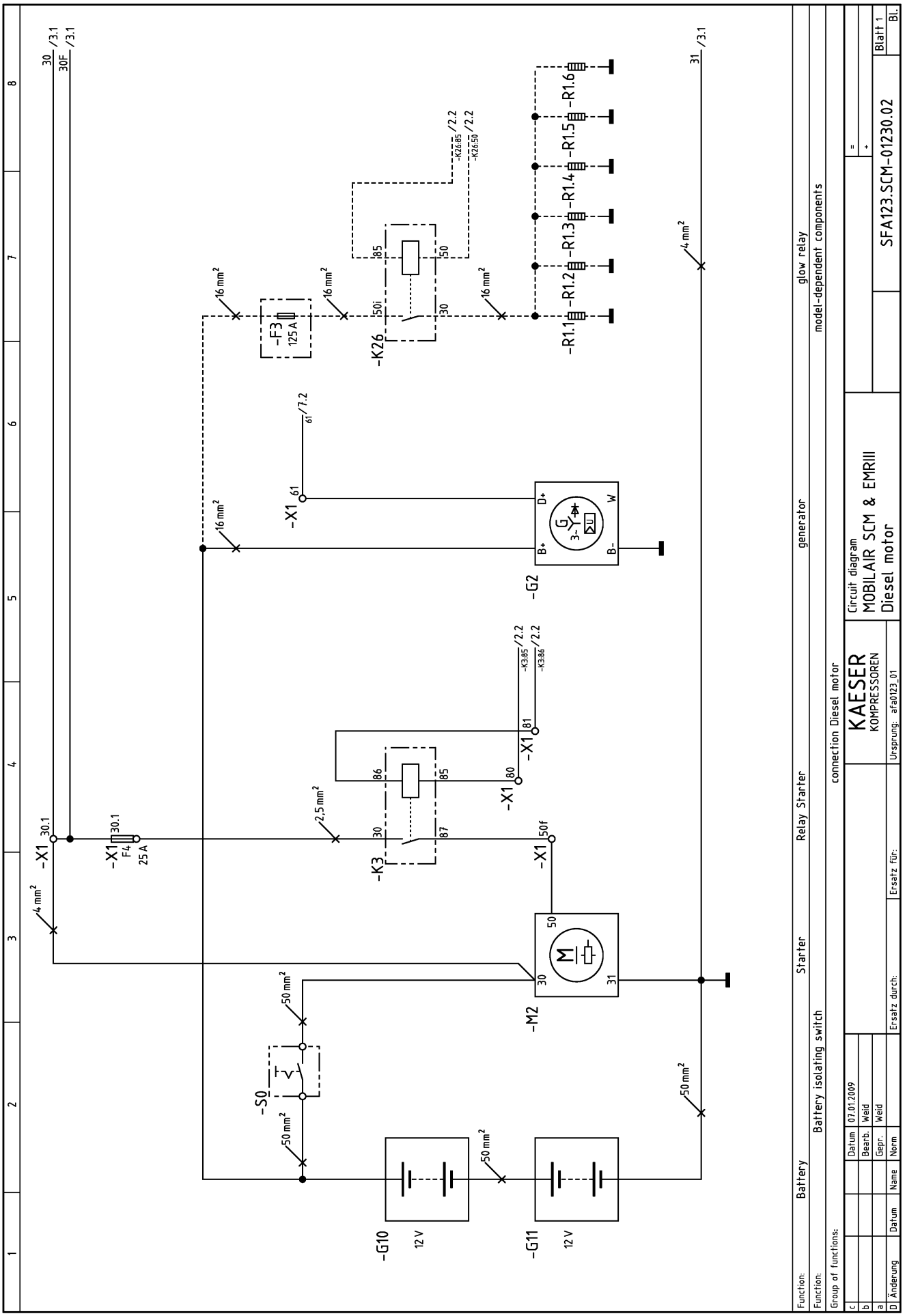
primary circuits:	black	
Control voltage DC:	1,5mm² H05V2-K/UL/CSA blue	All control lines marked a) are 1,0 mm² H05V-K/UL blue
external voltage:	1,5mm² H07V2-K/UL/CSA orange	
measuring circuits:	1,0mm² H05V2-K/UL/CSA violet	
earth conductor:	green/yellow	

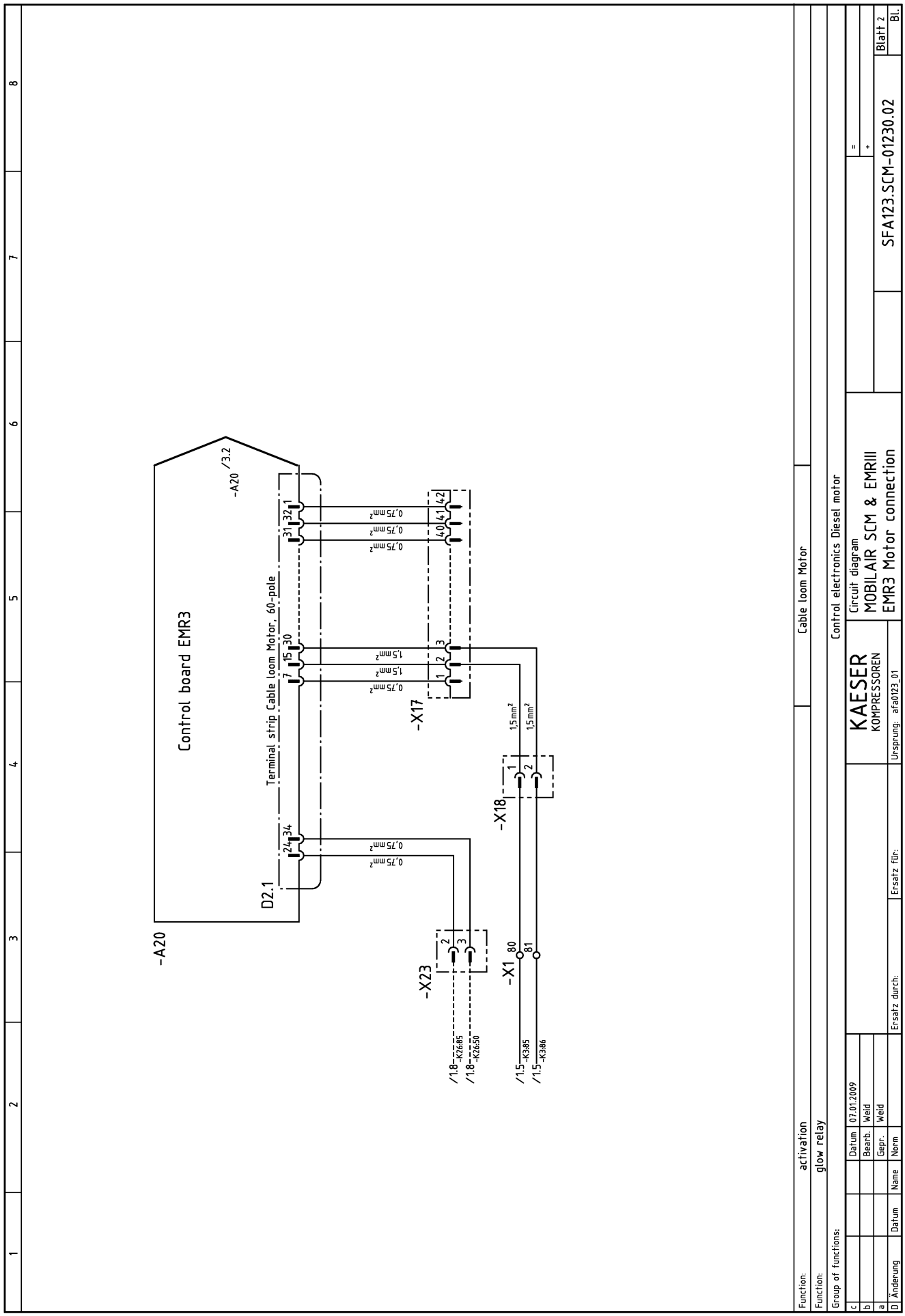
wiring colors:

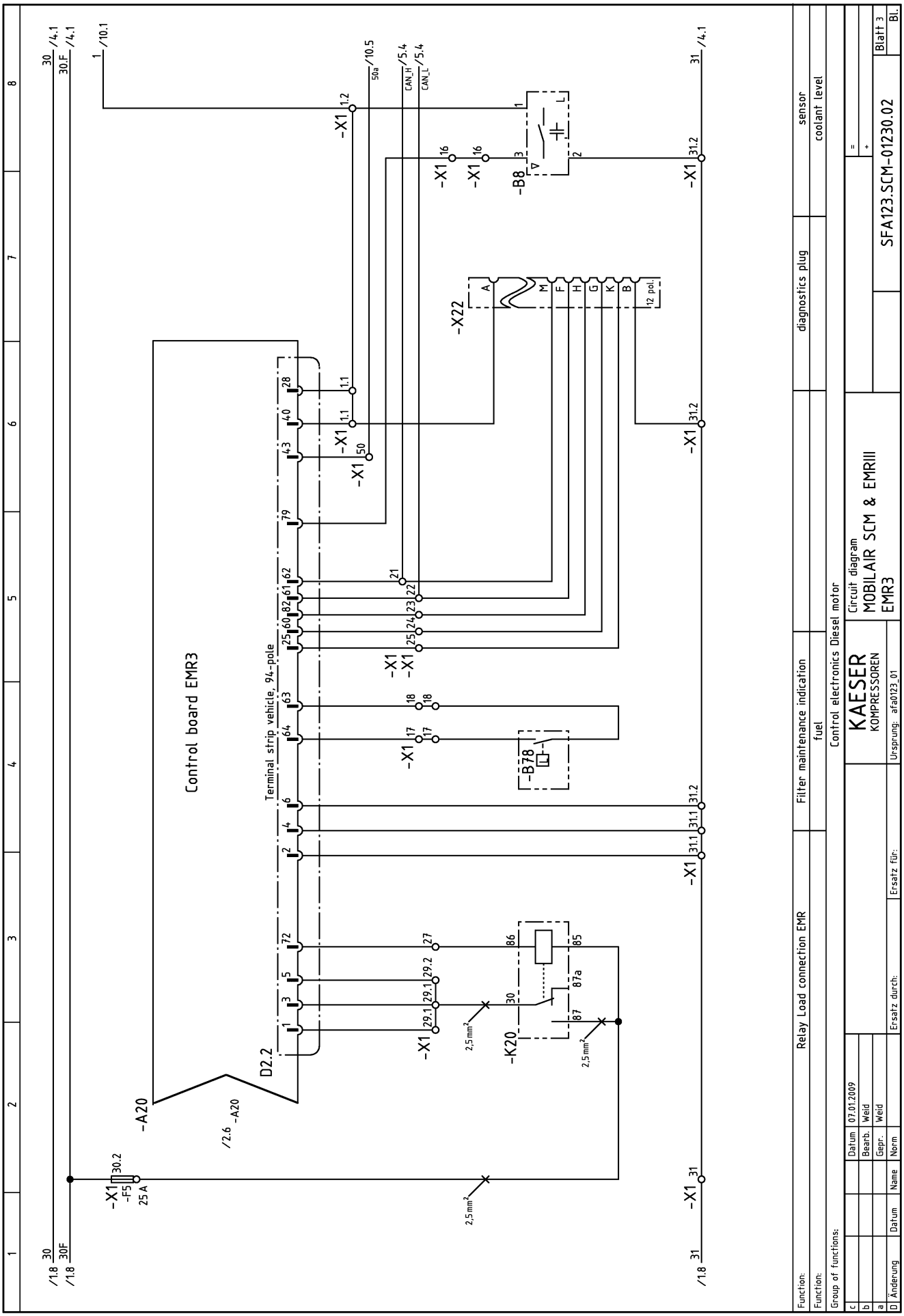
bl = blue
bn = brown
ge = yellow
gn = green
gnge = green-yellow
gr = grey
or = orange
rs = pink
rt = red
sw = black
vi = violet
ws = white

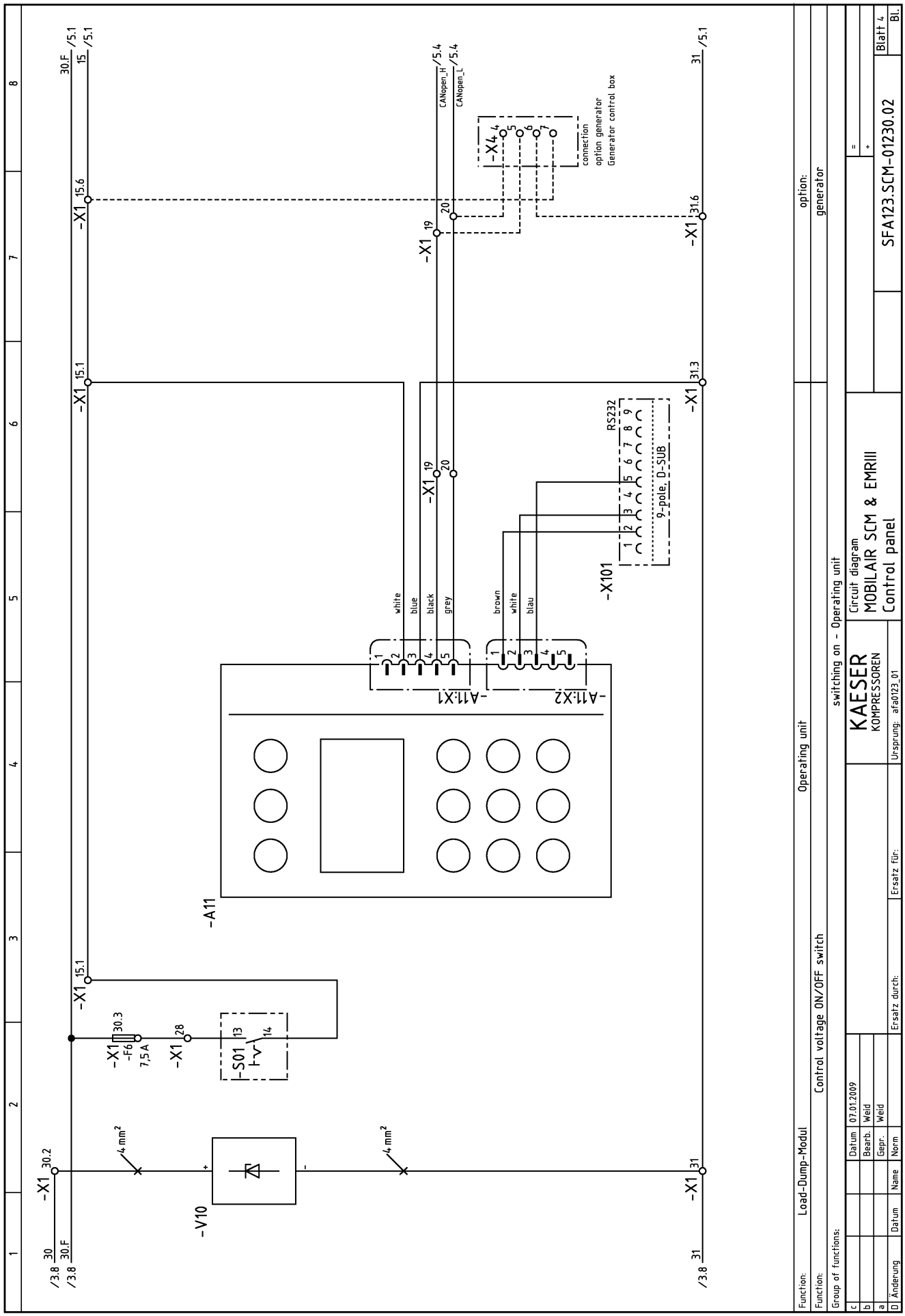
c				Datum	07.01.2009		KAESER KOMPRESSOREN	Block diagram MOBILAIR SCM & EMRIII general instructions	=
b				Bearb.	Weid				+
a				Gepr.	Weid				
C	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung:	UFA123.SCM-01230.02	Blatt 1 Bl.

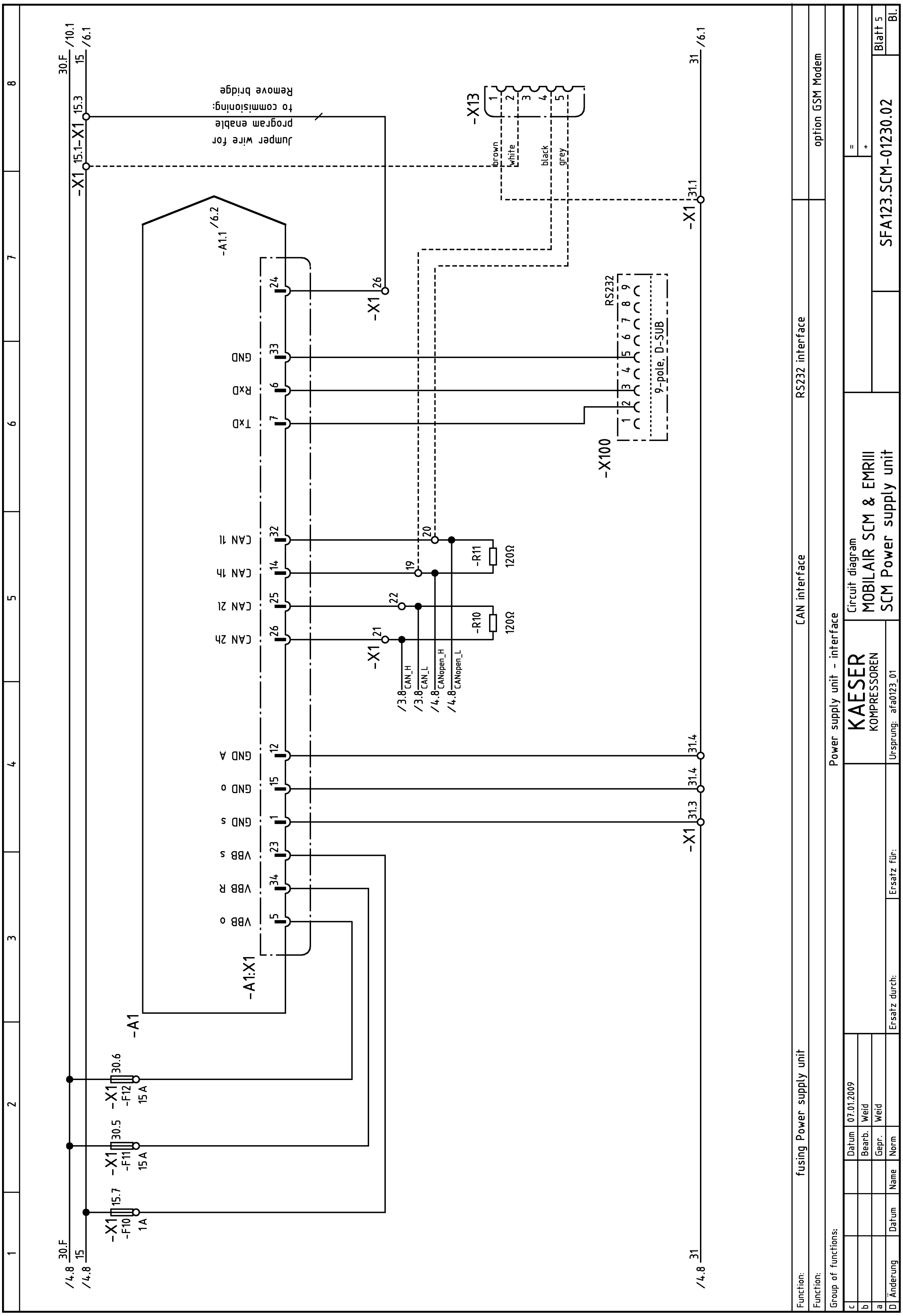

Control cabinet
-X22
-X13
-X1
-W43 Oelflex 110 7x1,0mm²
-W13 PUR 5x0,34mm²
-W32 Oelflex 110 2x1,5mm²
-W33 Oelflex 110 3x0,75mm²
-W39 Oelflex 110 3x0,75mm²
-W31 Oelflex 110 3x0,75mm²
-W100 PUR 5x0,34mm²
-W101 PUR 5x0,34mm²
-W106 Oelflex 110 4x0,75mm²
-W44 FLRY-B cores 1,0mm²
-W42 cores 0,25/1,5mm²
-W9 Oelflex 110 7G1,0 mm²
-W3 Oelflex 110 5G6mm²
-W30 Oelflex 110 7G1,0mm²
-Y2
-Y3
-Y9
-Y10
-B10
-B11
-B6
-A1
-A20
-X4
1)
2)
3)
G3
generator
-W18 Oelflex 110 4x0,75mm²
-W19 Oelflex 110 4x0,75mm²
-W78 Oelflex 110 2x1,5mm²
-W11/-W112 PUR 5x0,34mm²
-W12 Oelflex 110 12x1,5 mm²
-B8
-B9
-B78
Control panel
-A11
-S01
-S41
-P9
model-dependent components:
1) electronic control
2) pneumatic control
3) option generator
KAESER KOMPRESSOREN
Block diagram
MOBILAIR SCM & EMR III
cabling
UFA123.SCM-01230.02
Blatt 2
Bl.
Datum 07.01.2009
Bearb. Weid
Gepr. Weid
Norm
Ersatz durch:
Ersatz für:
Ursprung: afa0123_01
Cable GEN 27.02.09 Weid
Änderung Datum Name

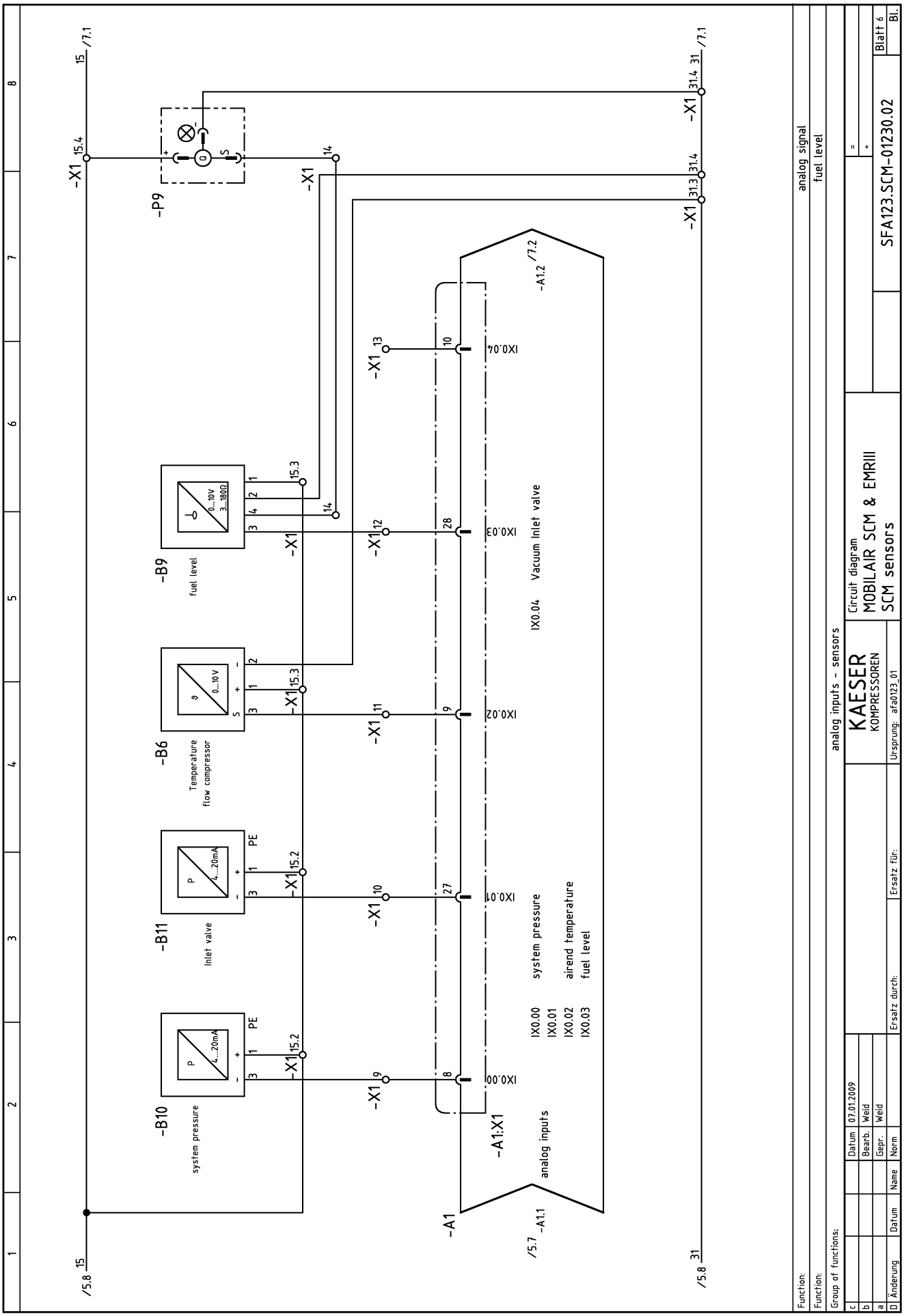

Function: Battery
Starter
Relay Starter
generator
glow relay
Function: Battery isolating switch
model-dependent components
Group of functions:
connection Diesel motor
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR SCM & EMRIII
Diesel motor
SFA123.SCM-01230.02
Blatt 1
Bl.
Datum 07.01.2009
Bearb. Weid
Gepr. Weid
Norm
Ersatz durch:
Ersatz für:
Ursprung: afa0123_01
Änderung Datum Name
-X1 30.1
-X1 F4 25 A
-F3 125 A
-K26
-K3
-S0
-M2
-G2
-G10 12 V
-G11 12 V
-R1.1 -R1.2 -R1.3 -R1.4 -R1.5 -R1.6
-X1 61
-X1 81
-X1 80
-X1 50f
4 mm²
16 mm²
2,5 mm²
50 mm²

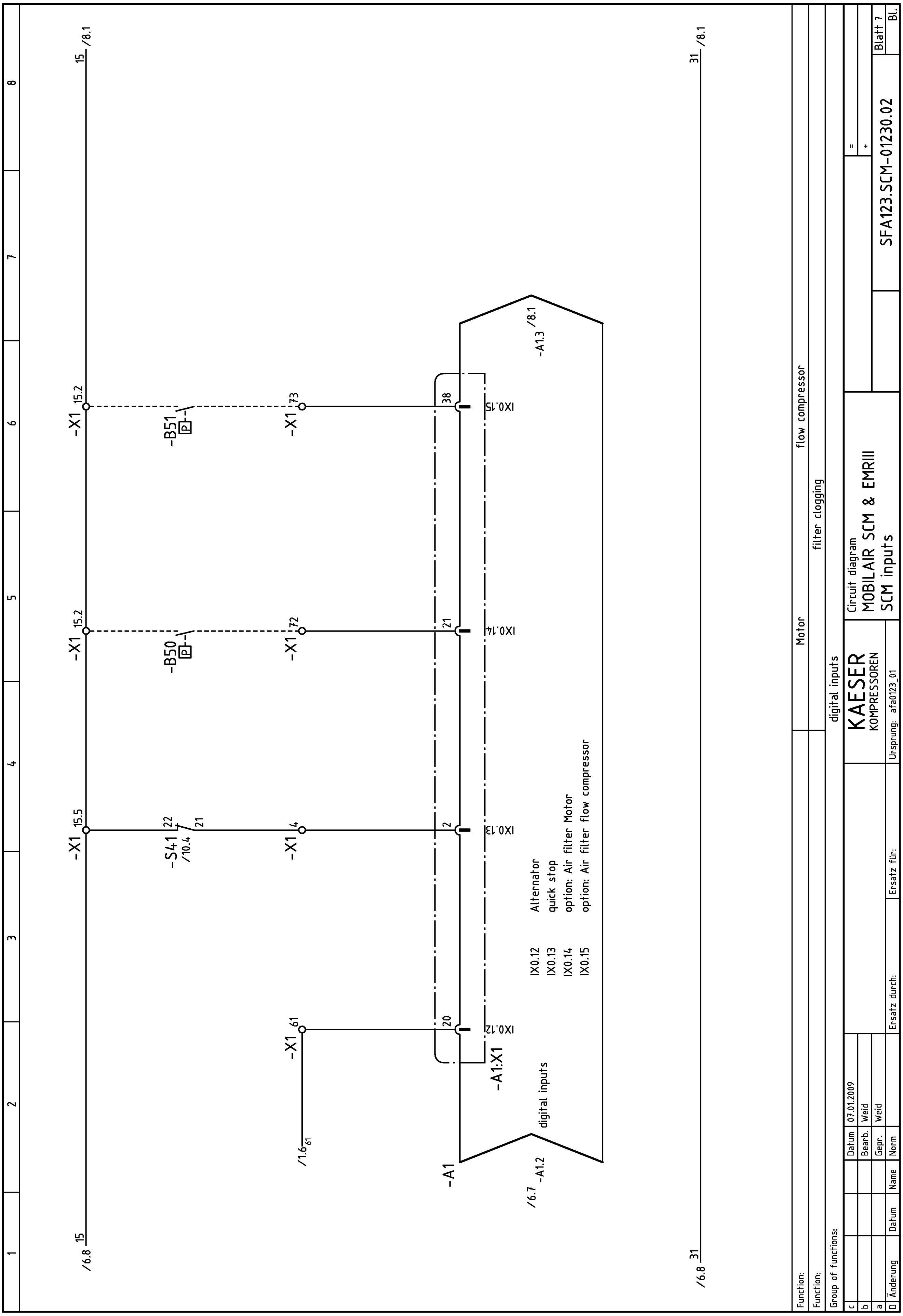

Control board EMR3
-A20
/3.2
Terminal strip Cable loom Motor, 60-pole
D2.1
-X17
-X18
-X23
-X1
0,75 mm²
1,5 mm²
1,5 mm²
/1.8 -K26:85
/1.8 -K26:50
/1.5 -K3:85
/1.5 -K3:86
Function: activation
Function: glow relay
Group of functions:
Cable loom Motor
Control electronics Diesel motor
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR SCM & EMRIII
EMR3 Motor connection
SFA123.SCM-01230.02
Blatt 2
Bl.
Datum 07.01.2009
Bearb. Weld
Gepr. Weld
Norm
Name
Datum
Änderung
Ersatz durch:
Ersatz für:
Ursprung: afa0123_01

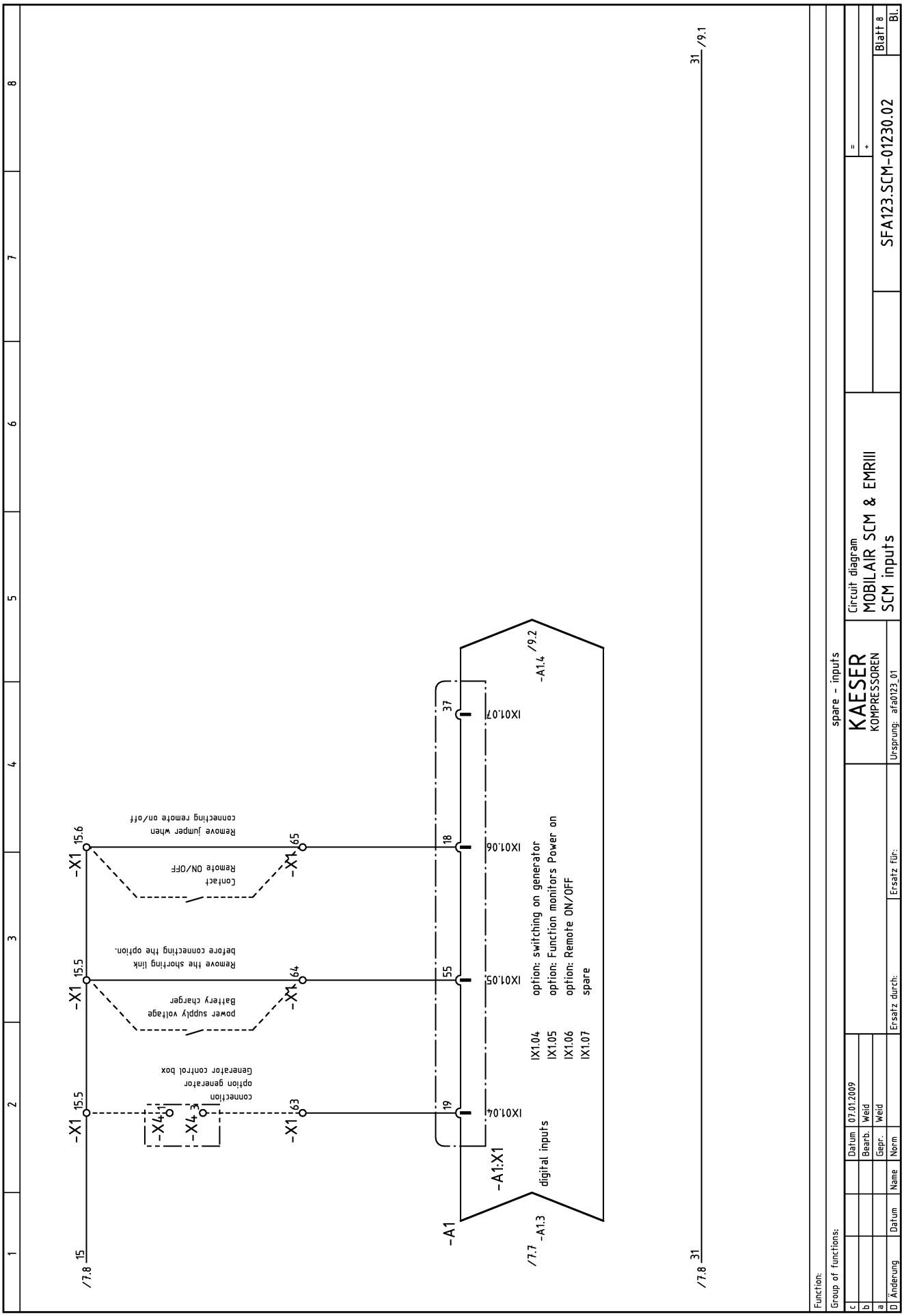

Control board EMR3
Terminal strip vehicle, 94-pole
-A20
D2.2
-X1
-X22
-K20
-B8
-B78
-F5
25 A
2,5 mm²
Function: Relay Load connection EMR
Function: Filter maintenance indication
fuel
Group of functions: Control electronics Diesel motor
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR SCM & EMRIII
EMR3
SFA123.SCM-01230.02
Blatt 3
Ursprung: afa0123_01
Ersatz durch:
Ersatz für:
Datum 07.01.2009
Bearb. Weld
Gepr. Weld
Norm
Name
Datum
Änderung
diagnostics plug
sensor
coolant level
CAN_H
CAN_L

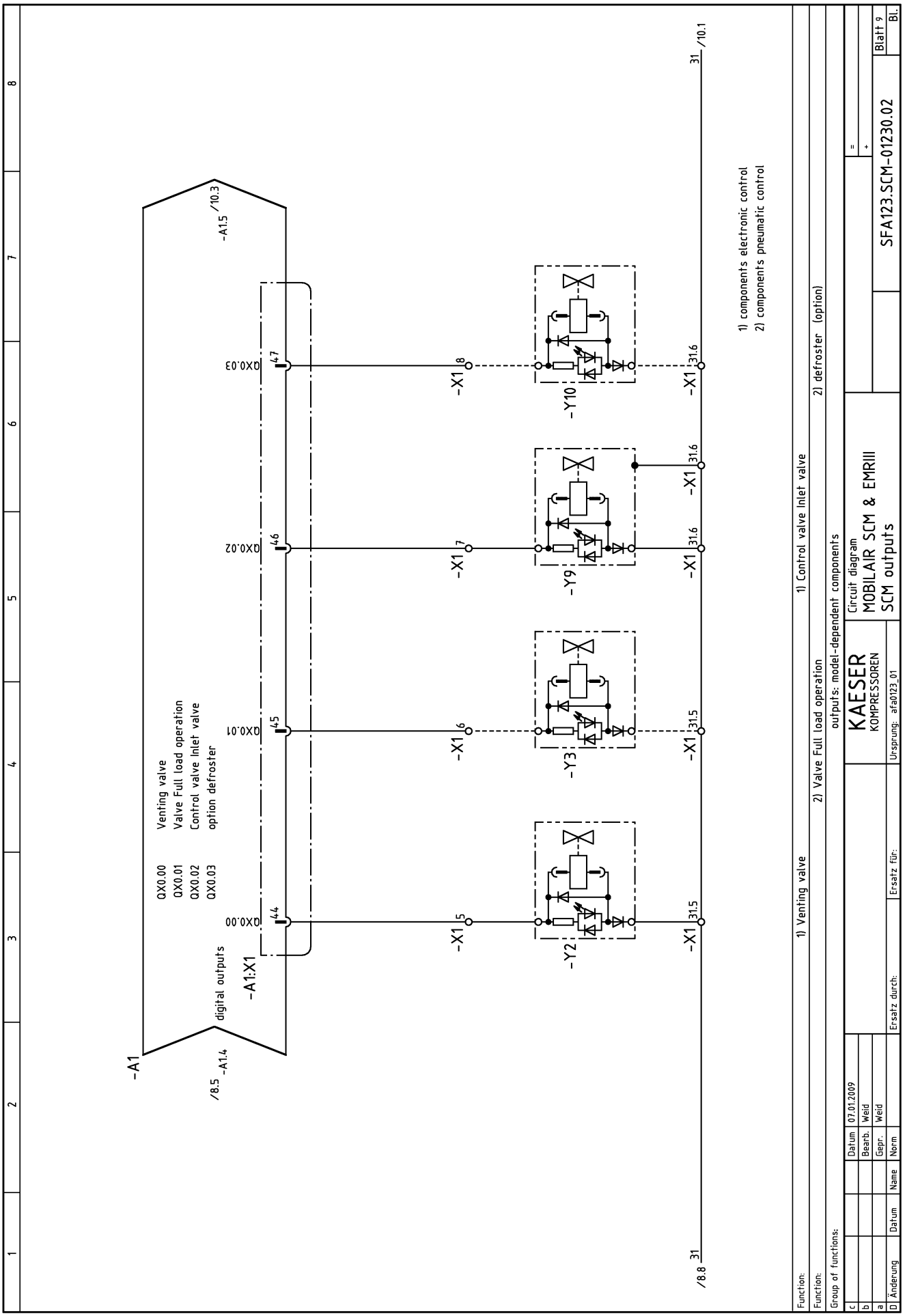

-X1 30.2
30
/3.8
30.F
/3.8
4 mm²
-V10
+
-
-X1 31
31
/3.8
-X1 30.3
-F6
7,5A
-X1 28
-S01
13
14
-X1 15.1
30.F
/5.1
15
/5.1
-X1 15.6
-X1 15.1
-X1 15.1
-A11
-A11:X1
-A11:X2
white
blue
black
grey
brown
white
blau
-X1 19
20
-X1 19
20
-X1 31.6
-X1 31.3
31
/5.1
CANopen_H
/5.4
CANopen_L
/5.4
-X4
5
6
7
connection
option generator
Generator control box
-X101
RS232
9-pole, D-SUB
Function: Load-Dump-Modul
Function: Control voltage ON/OFF switch
Group of functions:
Operating unit
switching on - Operating unit
option:
generator
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR SCM & EMRIII
Control panel
SFA123.SCM-01230.02
Blatt 4
Bl.
Datum 07.01.2009
Bearb. Weld
Gepr. Weld
Norm
Ersatz durch:
Ersatz für:
Ursprung: afa0123_01
Änderung
Datum
Name

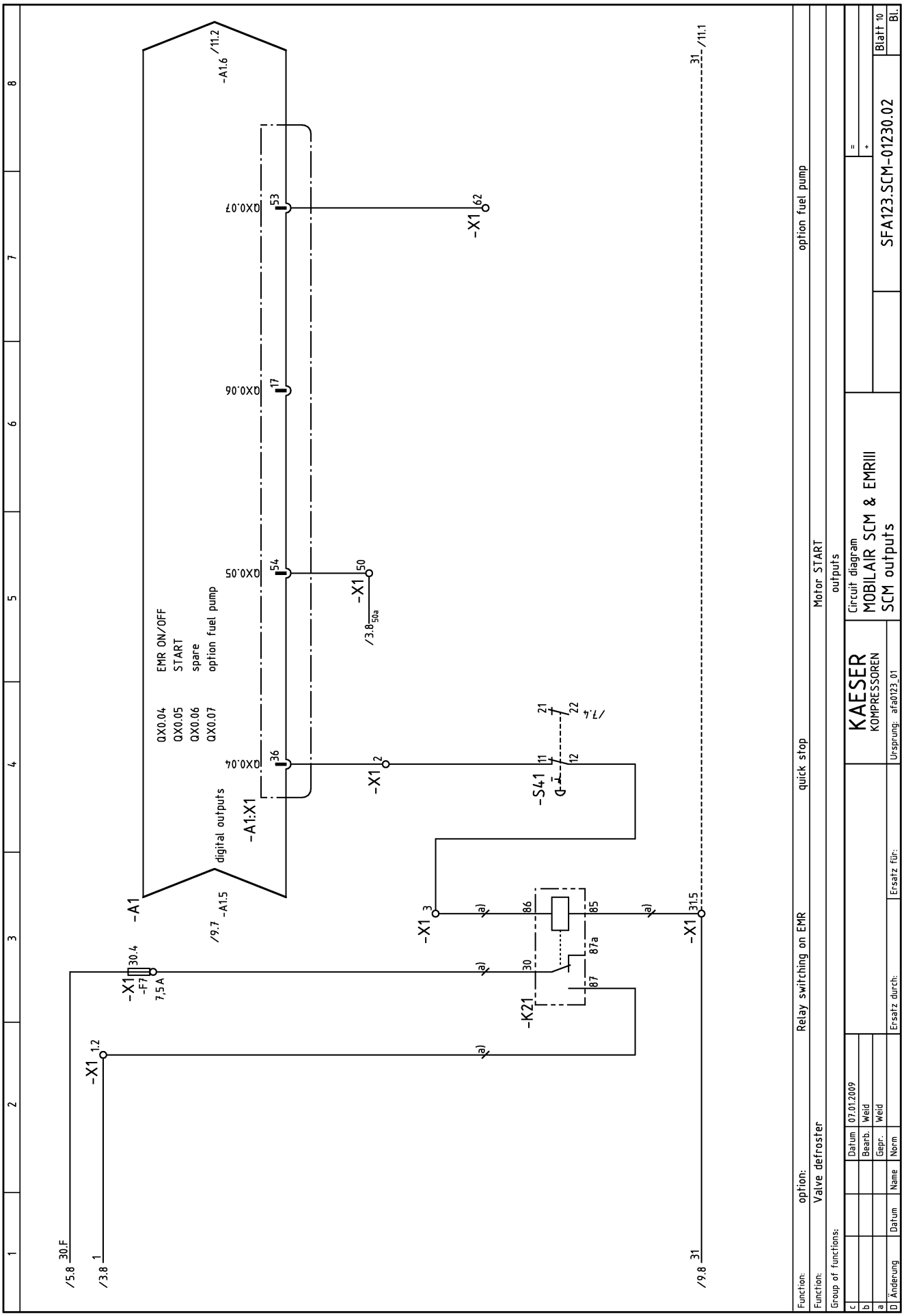

Jumper wire for program enable
to commisioning:
Remove bridge
fusing Power supply unit
CAN interface
RS232 interface
option GSM Modem
Power supply unit - interface
Circuit diagram
MOBILAIR SCM & EMRIII
SCM Power supply unit
SFA123.SCM-01230.02
Blatt 5
9-pole, D-SUB
RS232
Datum 07.01.2009
Bearb. Weid
Gepr. Weid

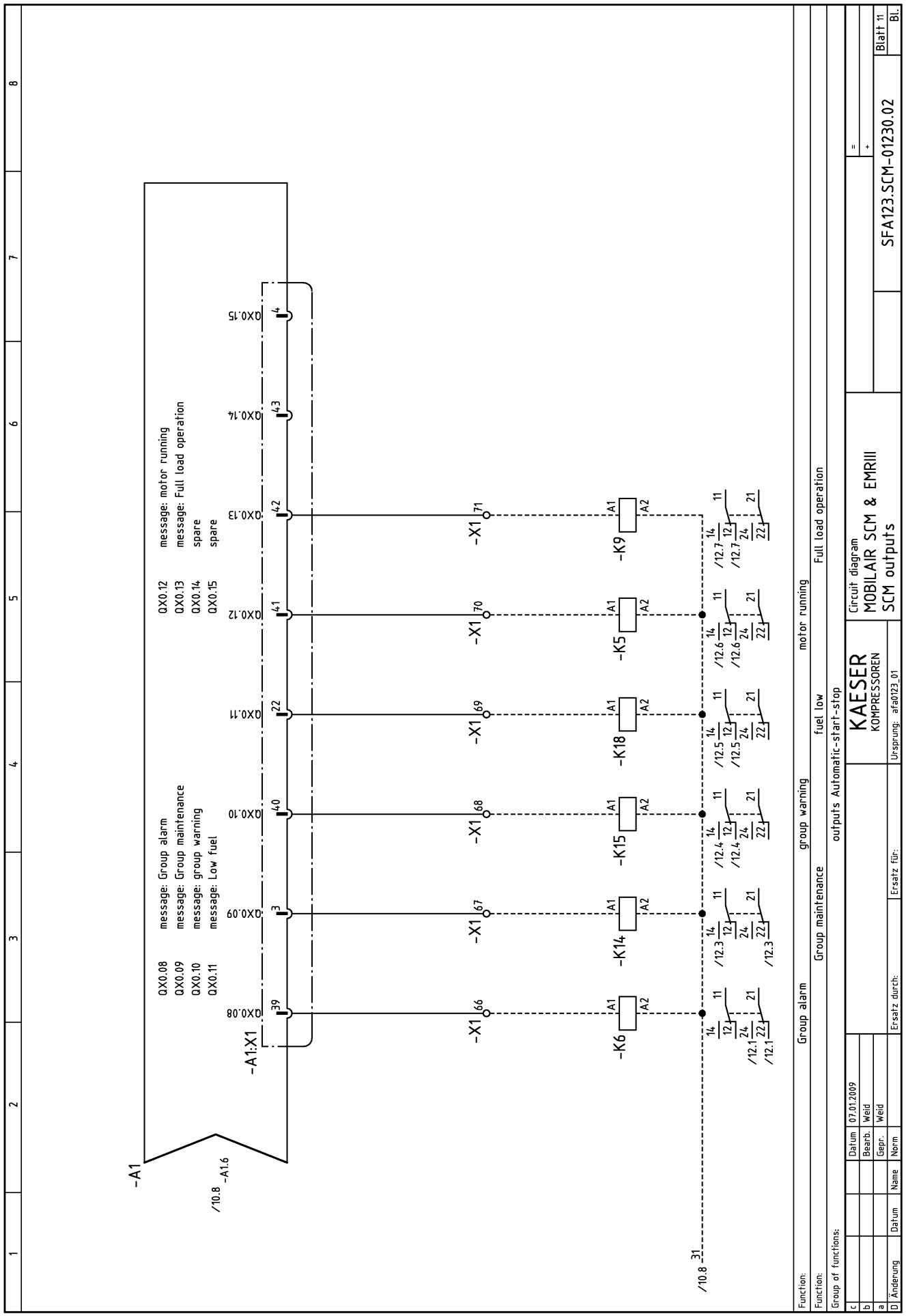

-P9
-B9
fuel level
-B6
Temperature
flow compressor
-B11
Inlet valve
-B10
system pressure
-A1
-A1:X1
analog inputs
-A1.2
IX0.04 Vacuum inlet valve
IX0.00 system pressure
IX0.01 airend temperature
IX0.02 fuel level
IX0.03
-X1
/7.1
/7.2
/5.7 -A1.1
/5.8
analog signal
fuel level
analog inputs - sensors
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR SCM & EMRIII
SCM sensors
SFA123.SCM-01230.02
Blatt 6
Bl.
Datum 07.01.2009
Bearb. Weld
Gepr. Weld
Norm
Name
Datum
Änderung
Ersatz durch:
Ersatz für:
Ursprung: afa0123_01
Function:
Group of functions:

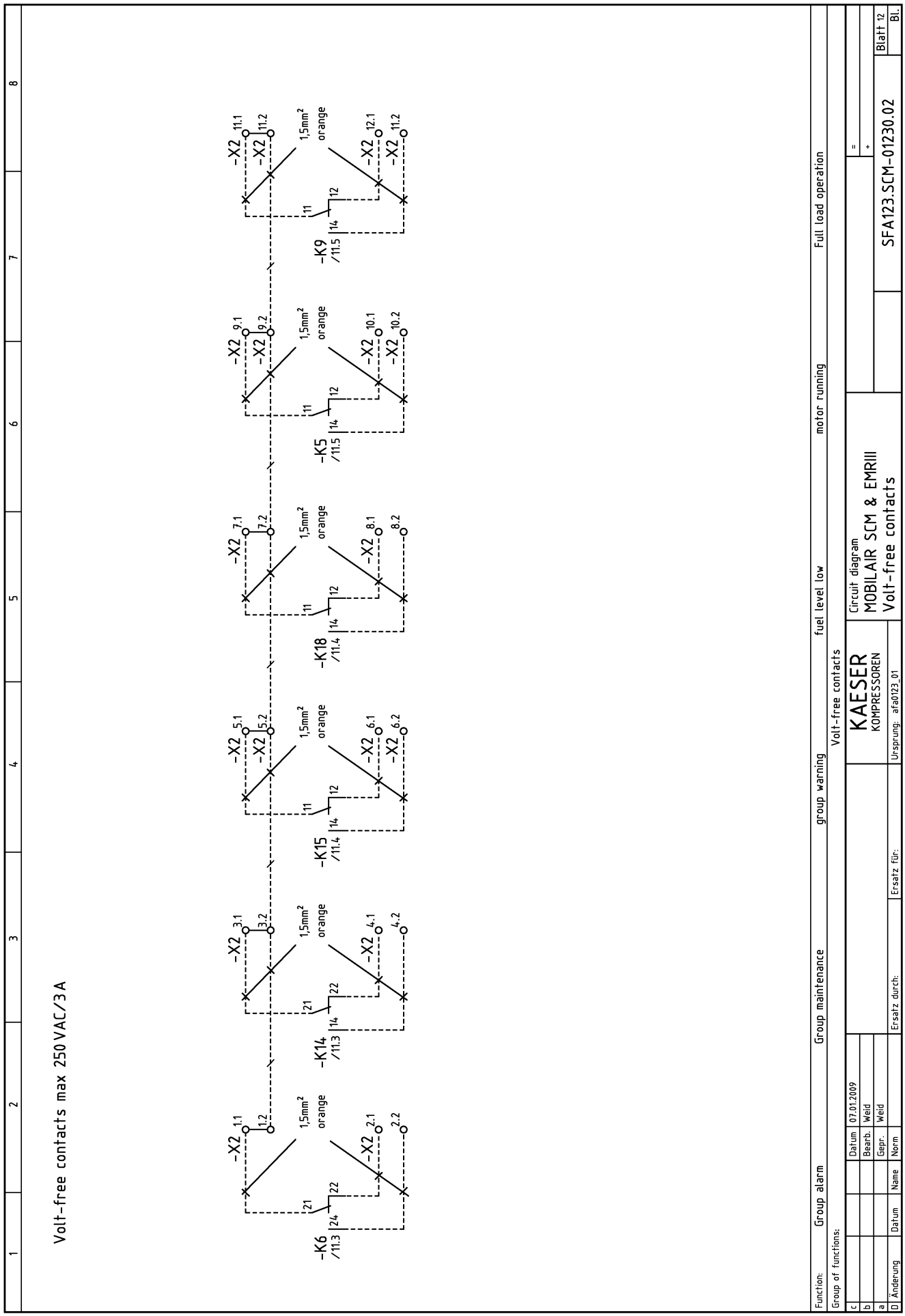

IX0.12 Alternator
IX0.13 quick stop
IX0.14 option: Air filter Motor
IX0.15 option: Air filter flow compressor
digital inputs
-A1
-A1:X1
-X1
-S41
-B50
-B51
Function: Motor
Function: filter clogging
Group of functions: digital inputs
flow compressor
Datum 07.01.2009
Bearb. Weid
Gepr. Weid
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR SCM & EMRIII
SCM inputs
SFA123.SCM-01230.02
Blatt 7
Ursprung: afa0123_01


-A1
-A1:X1
digital inputs
IX01.04
IX01.05
IX01.06
IX01.07
IX1.04 option: switching on generator
IX1.05 option: Function monitors Power on
IX1.06 option: Remote ON/OFF
IX1.07 spare
-X1 15.5
-X1 15.6
-X1 63
-X1 64
-X1 65
-X4 1
-X4 3
connection option generator Generator control box
power supply voltage Battery charger
Remove the shorting link before connecting the option.
Contact Remote ON/OFF
Remove jumper when connecting remote on/off
/7.8 15
/7.7 -A1.3
/9.2 -A1.4
/7.8 31
/9.1 31
spare - inputs
Function:
Group of functions:
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR SCM & EMRIII
SCM inputs
SFA123.SCM-01230.02
Blatt 8
Bl.
Änderung Datum Name
Norm
Gepr. Weld
Bearb. Weld
07.01.2009
Datum
Ersatz durch:
Ersatz für:
Ursprung: afa0123_01


-A1
/8.5 -A1.4
digital outputs
-A1:X1
QX0.00 Venting valve
QX0.01 Valve Full load operation
QX0.02 Control valve Inlet valve
QX0.03 option defroster
-A1.5 /10.3
-X1 5
-X1 6
-X1 7
-X1 8
-Y2
-Y3
-Y9
-Y10
-X1 31.5
-X1 31.6
/8.8 31
31 /10.1
1) components electronic control
2) components pneumatic control
Function: 1) Venting valve 1) Control valve Inlet valve
Function: 2) Valve Full load operation 2) defroster (option)
Group of functions: outputs: model-dependent components
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR SCM & EMRIII
SCM outputs
SFA123.SCM-01230.02
Blatt 9
Datum 07.01.2009
Bearb. Weid
Gepr. Weid
Norm
Ersatz durch:
Ersatz für:
Ursprung: afa0123_01
Änderung Datum Name


-A1
-A1:X1
digital outputs
QX0.04 EMR ON/OFF
QX0.05 START
QX0.06 spare
QX0.07 option fuel pump
-X1
-F7
7,5 A
-K21
-S41
-A1.6
-A1.5
option fuel pump
Relay switching on EMR
quick stop
Motor START
Valve defroster
outputs
Circuit diagram
MOBILAIR SCM & EMRIII
SCM outputs
KAESER KOMPRESSOREN
SFA123.SCM-01230.02
Blatt 10


-A1
-A1:X1
QX0.08 message: Group alarm
QX0.09 message: Group maintenance
QX0.10 message: group warning
QX0.11 message: Low fuel
QX0.12 message: motor running
QX0.13 message: Full load operation
QX0.14 spare
QX0.15 spare
-X1
-K6
-K14
-K15
-K18
-K5
-K9
Function: Group alarm group warning motor running
Function: Group maintenance fuel low Full load operation
Group of functions: outputs Automatic-start-stop
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR SCM & EMRIII
SCM outputs
SFA123.SCM-01230.02
Blatt 11
Datum 07.01.2009
Bearb. Weid
Gepr. Weid
Name Norm
Datum
Änderung


Volt-free contacts max 250 VAC/3 A
-K6 /11.3
-K14 /11.3
-K15 /11.4
-K18 /11.4
-K5 /11.5
-K9 /11.5
-X2 1.1
-X2 2.1
-X2 3.1
-X2 4.1
-X2 5.1
-X2 6.1
-X2 7.1
-X2 8.1
-X2 9.1
-X2 10.1
-X2 11.1
-X2 12.1
1,5mm²
orange
Function: Group alarm
Group maintenance
group warning
Volt-free contacts
fuel level low
motor running
Full load operation
Group of functions:
Datum 07.01.2009
Bearb. Weld
Gepr. Weld
Norm
Ersatz durch:
Ersatz für:
Ursprung: afa0123_01
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR SCM & EMRIII
Volt-free contacts
SFA123.SCM-01230.02
Blatt 12
Bl.

-A1	Control board SIGMA CONTROL MOBIL
-A11	Operating unit SIGMA CONTROL MOBIL
-A20	Control board EMR 3
-B6	sensor airend temperature
-B8	sensor coolant level
-B9	sensor fuel level
-B10	Pressure transducer system pressure
-B11	Pressure transducer package internal pressure
-B78	Filter maintenance indication fuel
-F3	Fuse preheat attachment
-F5,-F6,-F7, -F10,-F11,-F12	Fuse
-G2	Alternator
-G10,-G11	Battery
-K3	Relay Starter
-K26	glow relay
-K20,-K21	Relay
-M2	Starter
-P9	Display fuel level
-R1.1,-R1.2,-R1.3, -R1.4,-R1.5,-R1.6	preheat attachment
-R10,-R11	Resistor
-S0	Battery isolating switch
-S01	Control voltage ON/OFF switch
-S41	quick stop pushbutton
-V10	LOAD-DUMP-Modul 24 VDC
-X1	Terminal strip
-X17	Connector plug Motor
-X18	Plug connection Starter Relay
-X22	diagnostics plug
-X23	Plug connection glow relay
-X100,-X101	diagnosis-Plug PLC/HMI

components
according to machine model / Type

-B50,-B51	Pressure switch filter clogging
-K5,-K6,-K9, -K14,-K15,-K18	Relay Volt-free contacts
-Y2	Valve Venting
-Y3	Valve Full load operation
-Y9	Control valve Inlet valve
-Y10	Valve defroster
-X2	Terminal strip Volt-free contacts
-X4	Terminal strip Generator control box

c				Datum	07.01.2009		KAESER KOMPRESSOREN	Electrical equipment identification MOBILAIR SCM & EMRIII	=
b				Bearb.	Weid				+
a				Gepr.	Weid				Blatt 20
D	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung:	SFA123.SCM-01230.02	Bl.

1	2	3	4	5	6	7	8

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 kpl.:												
1	Control cabinet		400x300x155	7.3146.01610	Rittal								
1	Control	CR0020		7.9200.00010	ifm		-A1						
1	LOAD-DUMP-Modul	EC2016	24 VDC	7.9200.00100	ifm		-V10						
3	Relay	24 VDC/1W	20 401 100	8.6544.00010	Wehrle		-K3,-K20,-K21						
3	Relay socket		10 485 008	7.3411.0	Wehrle		-K3,-K20,-K21						
22	Terminal	WKF2,5D2/2/35		7.3149.01430	Wieland		-X1						
21	tiered terminals	WKF1,5E/35		7.3149.00860	Wieland		-X1						
2	Terminal	WKF4/35		7.3149.01320	Wieland		-X1						
6	Fuse terminal	ST4-FSI/C		7.3172.00240	Phönix		-X1						
2	Fuse UNIVAL		25 A	7.6411.00070	L&K		-F4,-F5						
2	Fuse UNIVAL		15 A	7.6411.00060	L&K		-F11,-F12						
2	Fuse UNIVAL		7,5 A	7.6411.00100	L&K		-F6,-F7						
1	Fuse UNIVAL		1 A	7.6411.00110	L&K		-F10						
2	Resistor		120 Ω	7.5392.00030	Bürklin		-R10,-R11						
	Control panel												
1	Operating unit	CR9022		7.9200.00020	ifm		-A11						
1	Display fuel level			8.6476.0	VDO		-P9						
1	switch Control voltage ON/OFF	26 00 00	24VDC / 7,5A	8.7045.0	Merit		-S01						
1	quick stop pushbutton	QRUV+MHT00		7.3217.0+7.3218.0	Schlegel		-S41						
	general components												
1	Battery isolating switch		24 V/500 A	7.5788.00030	Hella Marine		-S0						
1	Control board EMR3	Equipment supplied by the user Motor			DEUTZ		-A20						
1	glow relay	Equipment supplied by the user Motor			DEUTZ		-K26						
	model-dependent components												
6	Coupling relay	DC 24 V	1W	7.5495.00010	OMRON		-K5,-K6,-K9,_K14,-K15,	-K18					
6	tiered terminals	WKF1,5E/35		7.3149.00860	Wieland		-X2						

Bei Nachbestellung von Geräten und Maschinen sind alle in den stark umrandeten Spalten B und C angegebenen Daten aufzuführen. Die Daten in den Spalten D bis G sind zusätzlich unter Nennung dieser Gerätestücklisten-Nummer anzugeben, soweit sie die Beantwortung technischer Rückfragen erleichtern. Für Ersatzteilbestellung ist zusätzlich die Angabe der Serialnummer erforderlich, falls diese auf dem Typenschild des Erzeugnisses genannt ist.

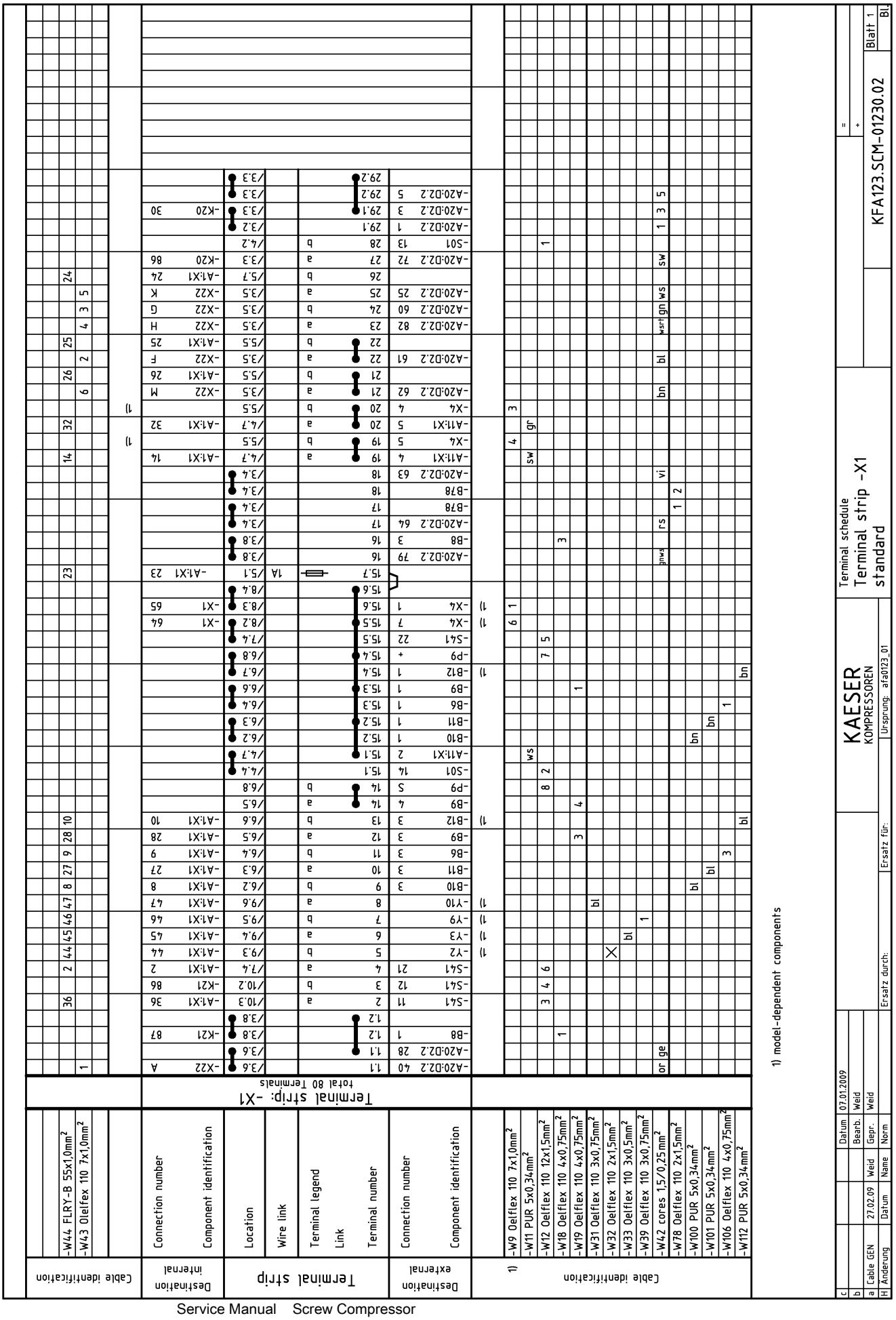
In Zweifelsfällen gilt die deutsche Fassung.

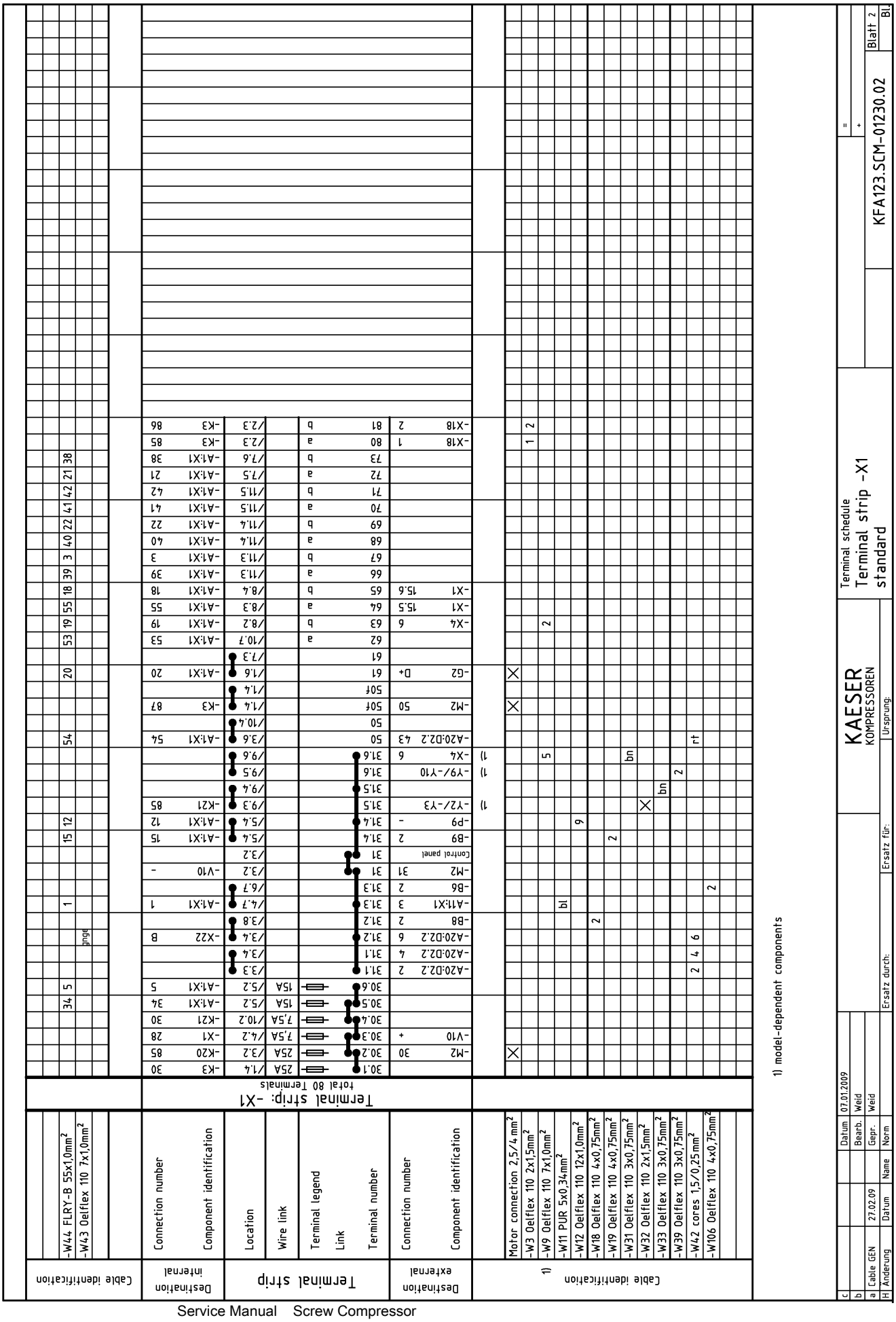
When reordering the equipment, all data enclosed by the heavy lines of columns B and C should be stated. In addition, the data in columns D to G should be given together with the No. of this list of equipment, insofar as they ar helpful in answering technical enquiries. When ordering spare parts, also quote the serial No. of the product if stated on the rating plate.

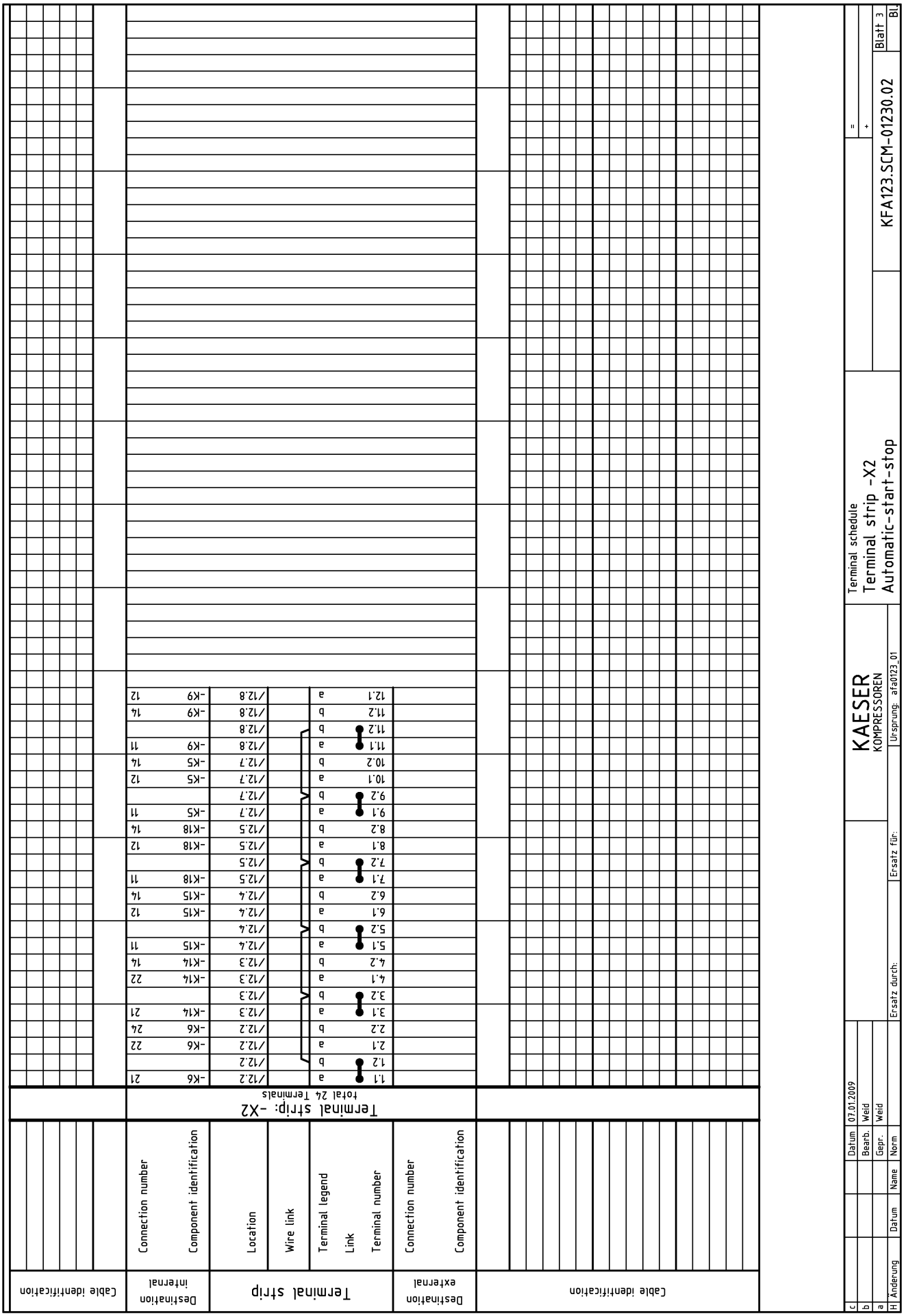
The German version applies in cases of doubt.

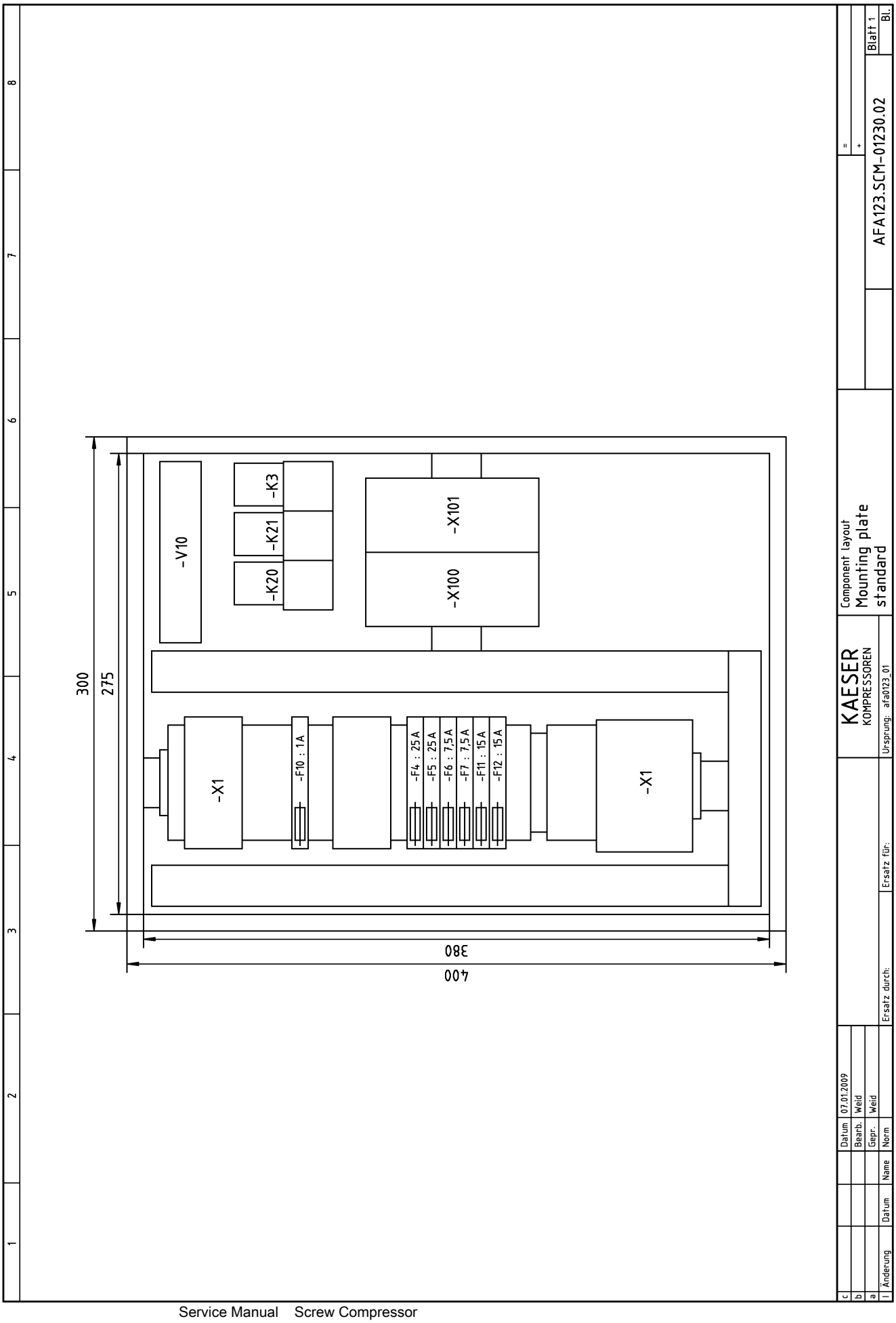
*) Versandanschrift – Kennzeichen

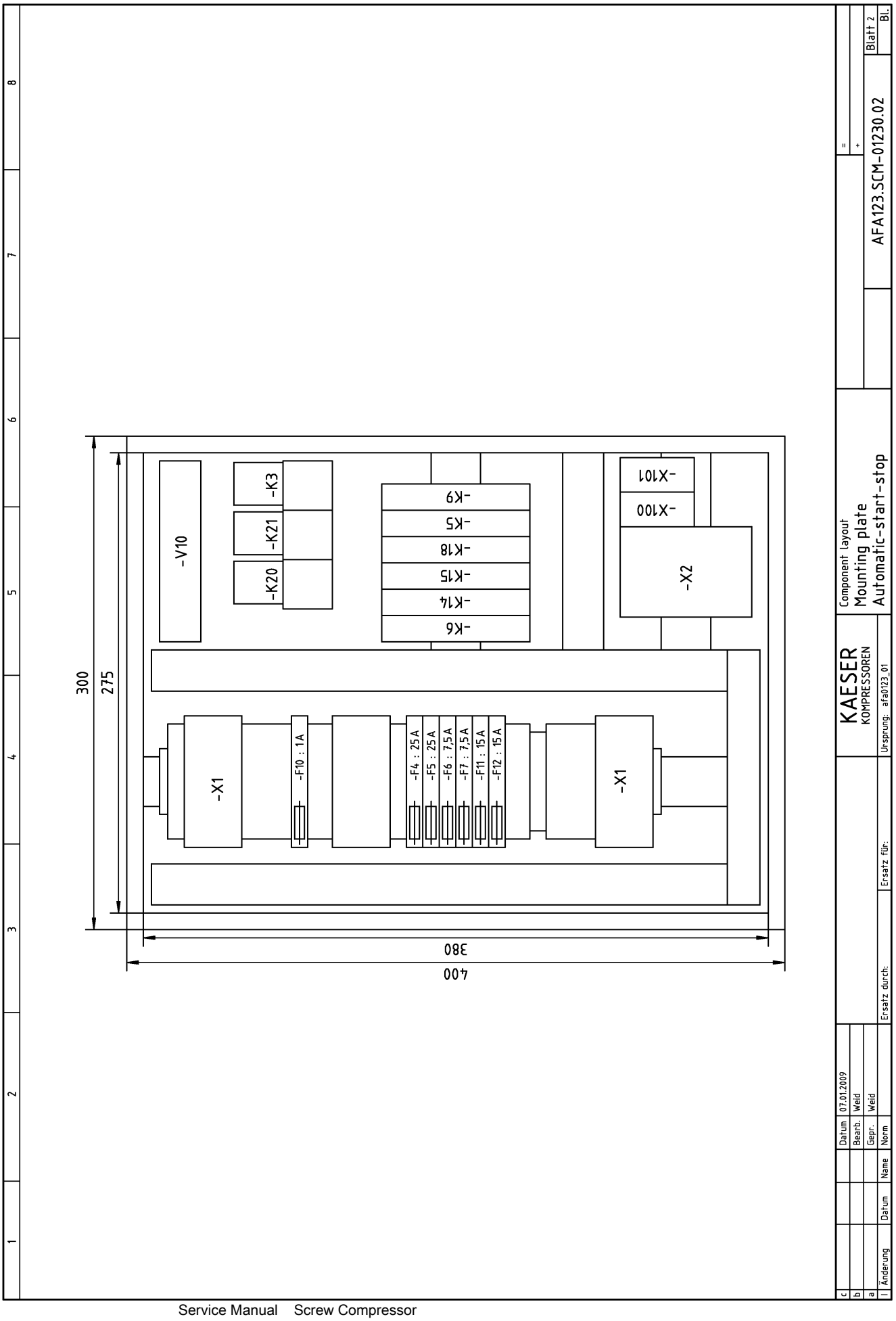
c				Datum	07.01.2009		KAESER KOMPRESSOREN	Equipment parts list MOBILAIR SCM & EMRIII control cabinet	=	
b				Bearb.	Weid				+	
a				Gepr.	Weid				GFA123.SCM-01230.02	Blatt 1
F	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: afa0123_01		Bl.


Terminal strip: -X1
total 80 Terminals
Cable identification
Destination internal
Connection number
Component identification
Location
Wire link
Terminal legend
Link
Terminal number
Destination external
Connection number
Component identification
Cable identification
1) model-dependent components
KAESER KOMPRESSOREN
Terminal schedule
Terminal strip -X1
standard
KFA123.SCM-01230.02
Blatt 1
Datum 07.01.2009
Bearb. Weid
Gepr. Weid
Ersatz durch:
Ersatz für:
Ursprung: afa0123_01
Cable GEN 27.02.09 Weid
Änderung Datum Name Norm


Terminal strip -X1
total 80 Terminals
Destination external
Component identification
Connection number
Terminal number
Link
Terminal legend
Wire link
Terminal strip
Location
Component identification
Connection number
Destination internal
Cable identification
Motor connection 2,5/4 mm²
-W3 Oelflex 110 2x1,5mm²
-W9 Oelflex 110 7x1,0mm²
-W11 PUR 5x0,34mm²
-W12 Oelflex 110 12x1,0mm²
-W18 Oelflex 110 4x0,75mm²
-W19 Oelflex 110 4x0,75mm²
-W31 Oelflex 110 3x0,75mm²
-W32 Oelflex 110 2x1,5mm²
-W33 Oelflex 110 3x0,75mm²
-W39 Oelflex 110 3x0,75mm²
-W42 cores 1,5/0,25mm²
-W106 Oelflex 110 4x0,75mm²
-W44 FLRY-B 55x1,0mm²
-W43 Oelflex 110 7x1,0mm²
1) model-dependent components
KAESER KOMPRESSOREN
Terminal schedule
Terminal strip -X1
standard
KFA123.SCM-01230.02
Blatt 2
Ersatz durch:
Ersatz für:
Ursprung:
Datum 07.01.2009
Bearb. Weld
Gepr. Weld
Name
Norm
Cable GEN 27.02.09
Änderung Datum


Terminal strip: -X2
total 24 Terminals
Destination external
Cable identification
Destination internal
Terminal strip
Connection number
Component identification
Location
Wire link
Terminal legend
Link
Terminal number
Terminal schedule
Terminal strip -X2
Automatic-start-stop
KFA123.SCM-01230.02
KAESER KOMPRESSOREN
Ersatz durch:
Ersatz für:
Ursprung: afa0123_01
Datum 07.01.2009
Bearb. Weld
Gepr. Weld
Norm
Name
Datum
Änderung
Blatt 3


-V10
-K3
-K21
-K20
-X101
-X100
-X1
-F10 : 1A
-F4 : 25A
-F5 : 25A
-F6 : 7.5A
-F7 : 7.5A
-F11 : 15A
-F12 : 15A
-X1
300
275
380
400
Component layout
Mounting plate
standard
KAESER KOMPRESSOREN
AFA123.SCM-01230.02
Blatt 1
Bl.
Datum 07.01.2009
Bearb. Weid
Gepr. Weid
Norm
Name
Datum
Änderung
Ersatz durch:
Ersatz für:
Ursprung: afa0123_01

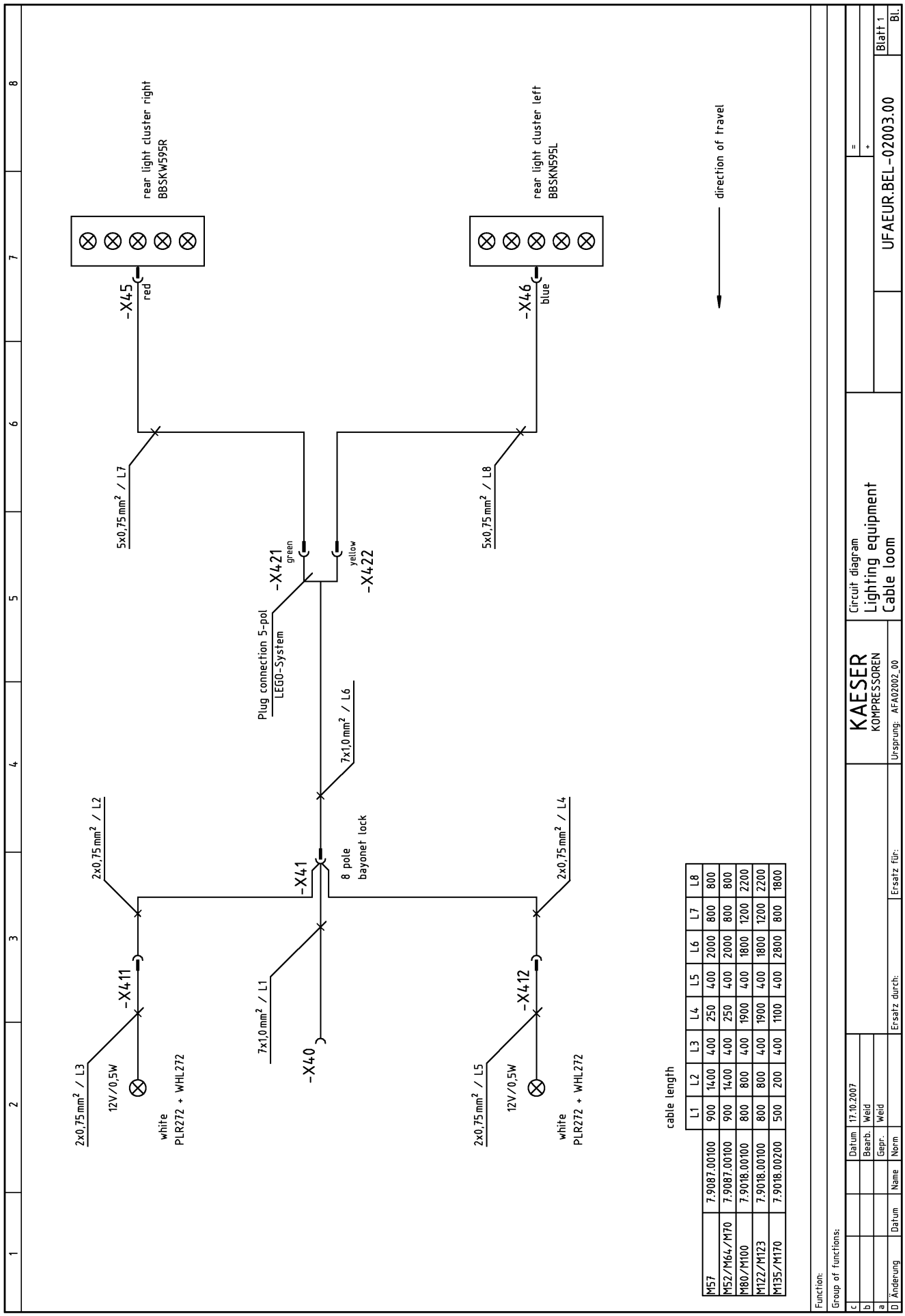

-V10
-K3
-K21
-K20
-K9
-K5
-K18
-K15
-K14
-K6
-X101
-X100
-X2
-X1
-F10 : 1A
-F4 : 25A
-F5 : 25A
-F6 : 7,5A
-F7 : 7,5A
-F11 : 15A
-F12 : 15A
-X1
300
275
380
400
KAESER KOMPRESSOREN
Component layout
Mounting plate
Automatic-start-stop
AFA123.SCM-01230.02
Blatt 2
Bl.
Ursprung: afa0123_01
Ersatz für:
Ersatz durch:
Datum 07.01.2009
Bearb. Weld
Gepr. Weld
Norm
Name
Datum
Änderung

13.4.2 Option tc
Lighting and signalling system connection

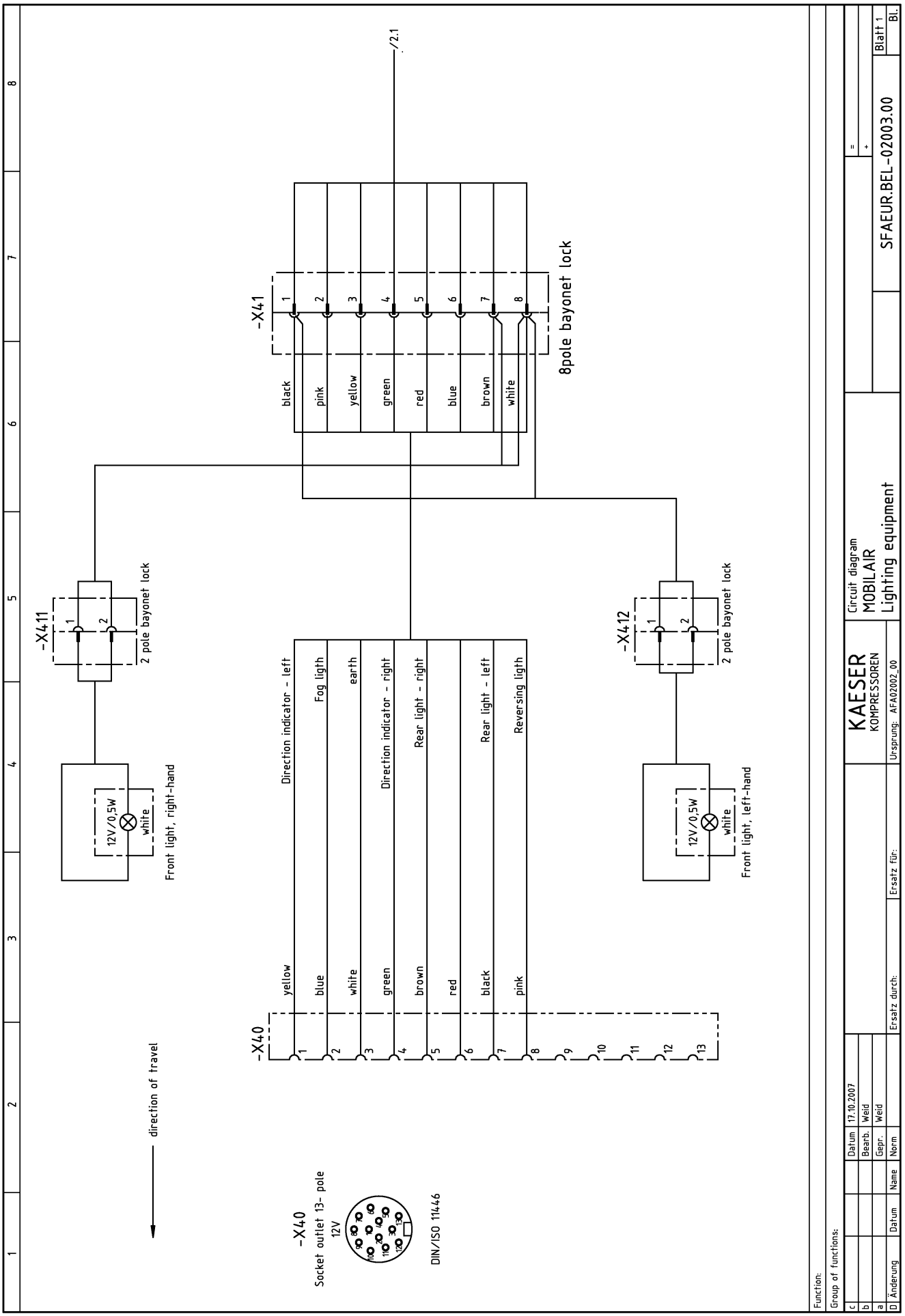
Electrical diagrams
MOBILAIR
Lighting equipment
connection 12V / 13-pole

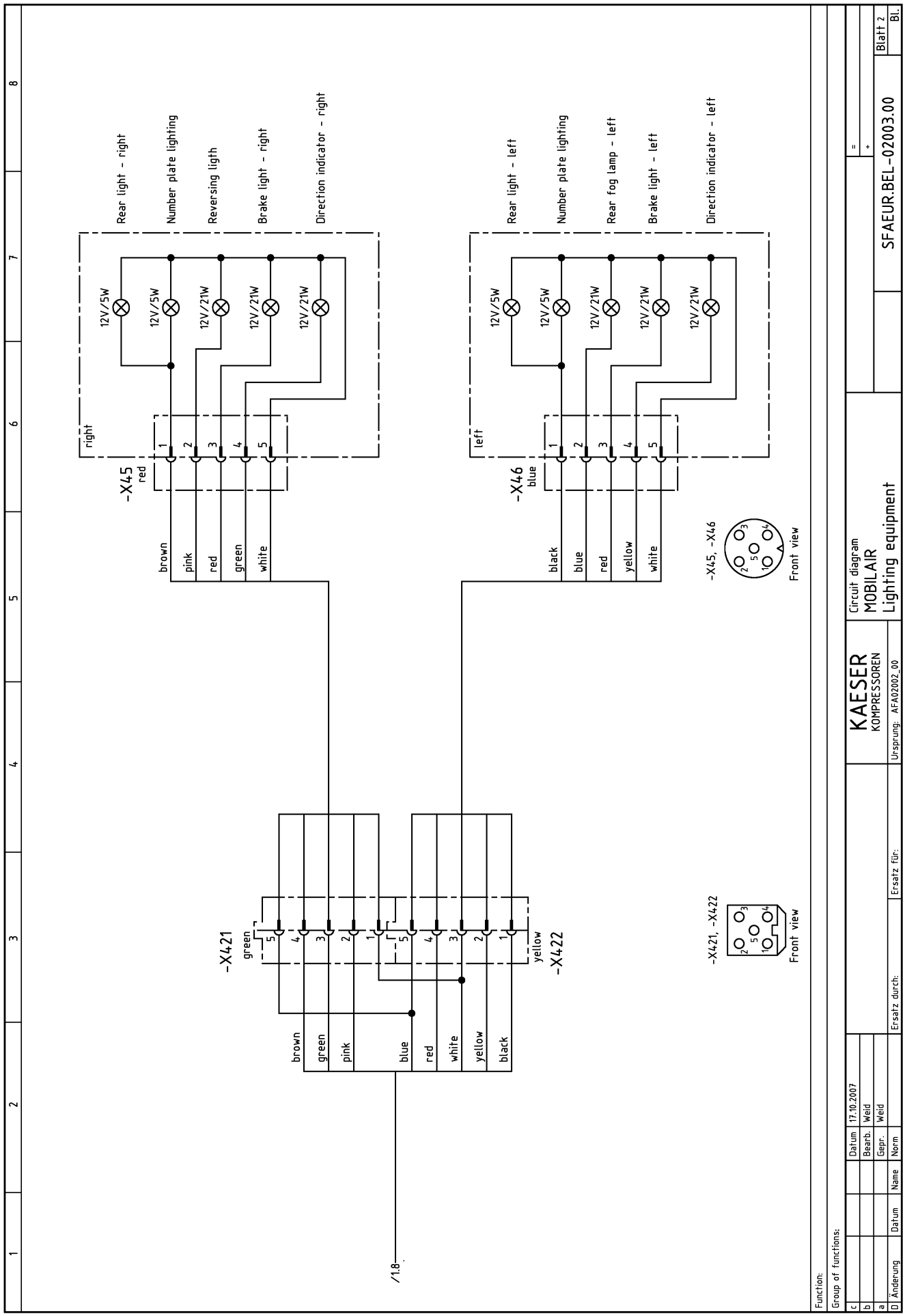
Manufacturer: Kaeser Kompressoren GmbH
Postfach 2143
96410 Coburg

c				Datum	17.10.2007 E		KAESER KOMPRESSOREN	Cover page MOBILAIR Lighting equipment	=
b				Bearb.	Weid				+
a				Gepr.	Weid				
D	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: AFA02002_00	DFAEUR.BEL-02003.00	Blatt 1 Bl.



	L1	L2	L3	L4	L5	L6	L7	L8
M57	7.9087.00100	900	1400	400	250	400	2000	800	800
M52/M64/M70	7.9087.00100	900	1400	400	250	400	2000	800	800
M80/M100	7.9018.00100	800	800	400	1900	400	1800	1200	2200
M122/M123	7.9018.00100	800	800	400	1900	400	1800	1200	2200
M135/M170	7.9018.00200	500	200	400	1100	400	2800	800	1800


-X41
8pole bayonet lock
black
pink
yellow
green
red
blue
brown
white
/2.1
-X411
2 pole bayonet lock
12V/0,5W
white
Front light, right-hand
-X412
2 pole bayonet lock
12V/0,5W
white
Front light, left-hand
-X40
Direction indicator - left
Fog ligth
earth
Direction indicator - right
Rear light - right
Rear light - left
Reversing ligth
yellow
blue
white
green
brown
red
black
pink
direction of travel
-X40
Socket outlet 13- pole
12V
DIN/ISO 11446
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR
Lighting equipment
SFAEUR.BEL-02003.00
Blatt 1
Ursprung: AFA02002_00
Ersatz durch:
Ersatz für:
Datum 17.10.2007
Bearb. Weid
Gepr. Weid
Norm
Name
Datum
Änderung
Function:
Group of functions:


Rear light - right
Number plate lighting
Reversing ligth
Brake light - right
Direction indicator - right
12V/5W
12V/21W
right
-X45
red
brown
pink
red
green
white
Rear light - left
Number plate lighting
Rear fog lamp - left
Brake light - left
Direction indicator - left
left
-X46
blue
black
blue
red
yellow
white
-X45, -X46
Front view
-X421
green
-X422
yellow
brown
green
pink
blue
red
white
yellow
black
-X421, -X422
Front view
/1.8
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR
Lighting equipment
SFAEUR.BEL-02003.00
Blatt 2
Bl.
Ursprung: AFA02002_00
Ersatz für:
Ersatz durch:
Function:
Group of functions:
Datum 17.10.2007
Bearb. Weld
Gepr. Weld
Norm
Änderung Datum Name

13.4.3 Option te
Lighting and signalling system connection

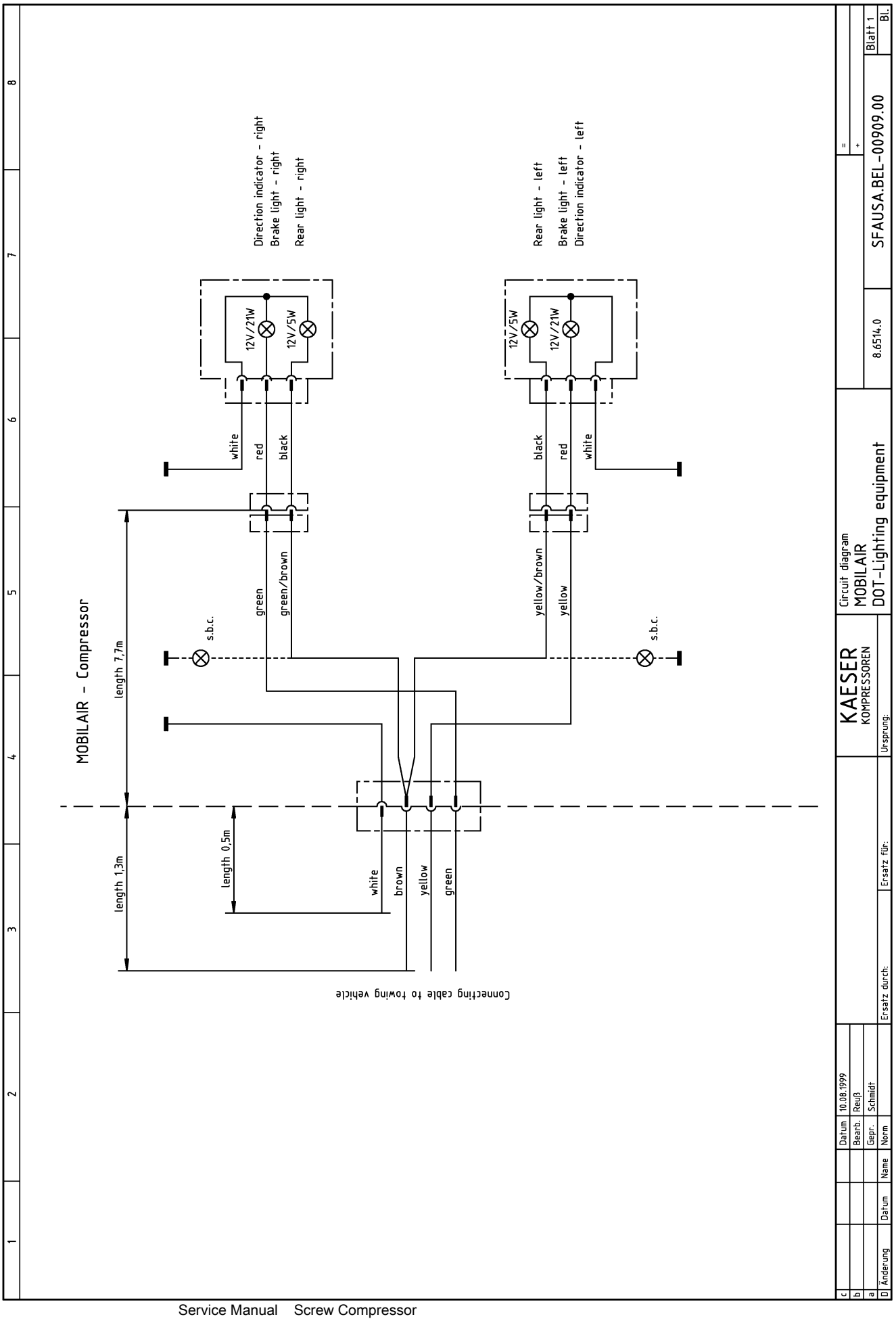
Electrical diagrams

MOBILAIR

DOT-Lighting equipment

Manufacturer: Kaeser Kompressoren GmbH
Postfach 2143
96410 Coburg

c				Datum	10.08.1999 E		KAESER KOMPRESSOREN	Cover page MOBILAIR DOT-Lighting equipment	=
b				Bearb.	Reuß				+
a				Gepr.	Schmidt				
D	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung:	8.6514.0	DFAUSA.BEL-00909.00 Blatt 1 Bl.


Direction indicator - right
Brake light - right
Rear light - right
Rear light - left
Brake light - left
Direction indicator - left
12V/21W
12V/5W
12V/5W
12V/21W
white
red
black
black
red
white
green
green/brown
yellow/brown
yellow
s.b.c.
s.b.c.
MOBILAIR - Compressor
length 7,7m
length 1,3m
length 0,5m
white
brown
yellow
green
Connecting cable to towing vehicle
KAESER KOMPRESSOREN
Circuit diagram
MOBILAIR
DOT-Lighting equipment
8.6514.0
SFAUSA.BEL-00909.00
Blatt 1
Bl.
Datum 10.08.1999
Bearb. Reuß
Gepr. Schmidt
Norm
Name
Datum
Änderung
Ersatz durch:
Ersatz für:
Ursprung:

13.4.4 Option od
Battery charger electrical diagrams

Electrical diagrams

Battery charger 12/24 VDC

Power supply:

400 V/3~/N/PE/50 Hz

230 V/1~/N/PE/50 Hz

Manufacturer: Kaeser Kompressoren GmbH
Postfach 2143
96410 Coburg

c				Datum	18.05.2009 E		KAESER KOMPRESSOREN	Cover page MOBILAIR Battery charger		=
b				Bearb.	Weid					+
a				Gepr.	Weid					
A	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: AFA01222_00	DFABLG-01225.00	Blatt 1 Bl.

Lfd. Nr. No.	Benennung Name		Zeichnungsnummer (Kunde) Drawing No. (customer)	Zeichnungsnummer (Hersteller) Drawing No. (manufacturer)	Blatt Page	Anlagenkennzeichen Unit designation
1	Cover page	Battery charger		DFABLG-01225.00	1	
2	List of contents	Battery charger		ZFABLG-01225.00	1	
3	Block diagram			UFABLG-01225.00	1	
4	Block diagram	Equipment parts list		UFABLG-01225.00	2	
5	Circuit diagram	Power supply 230V/1~/N/PE		SFABLG-01225.00	1	
6	Circuit diagram	Power supply 400V/3~/N/PE		SFABLG-01225.00	2	
7	Terminal schedule	Terminal strip -X10,-X12		KFABLG-01225.00	1	
8	Component layout	Battery charger 24VDC		AFABLG-01225.00	1	
9	Component layout	Battery charger 12VDC		AFABLG-01225.00	2	

c				Datum	18.05.2009		KAESER KOMPRESSOREN	List of contents	=
b				Bearb.	Weid			MOBILAIR	+
a				Gepr.	Weid			Battery charger	Blatt 1
B	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: AFA01222_00	ZFABLG-01225.00	Bl.

general instructions

ATTENTION !!!

Install supplies, grounding and shock protection
to local safety regulations.

Control circuits are single-end-earthed, if they are floating
they may only be used together with insulation monitoring.

Do not make or break
live plug-in connectors.

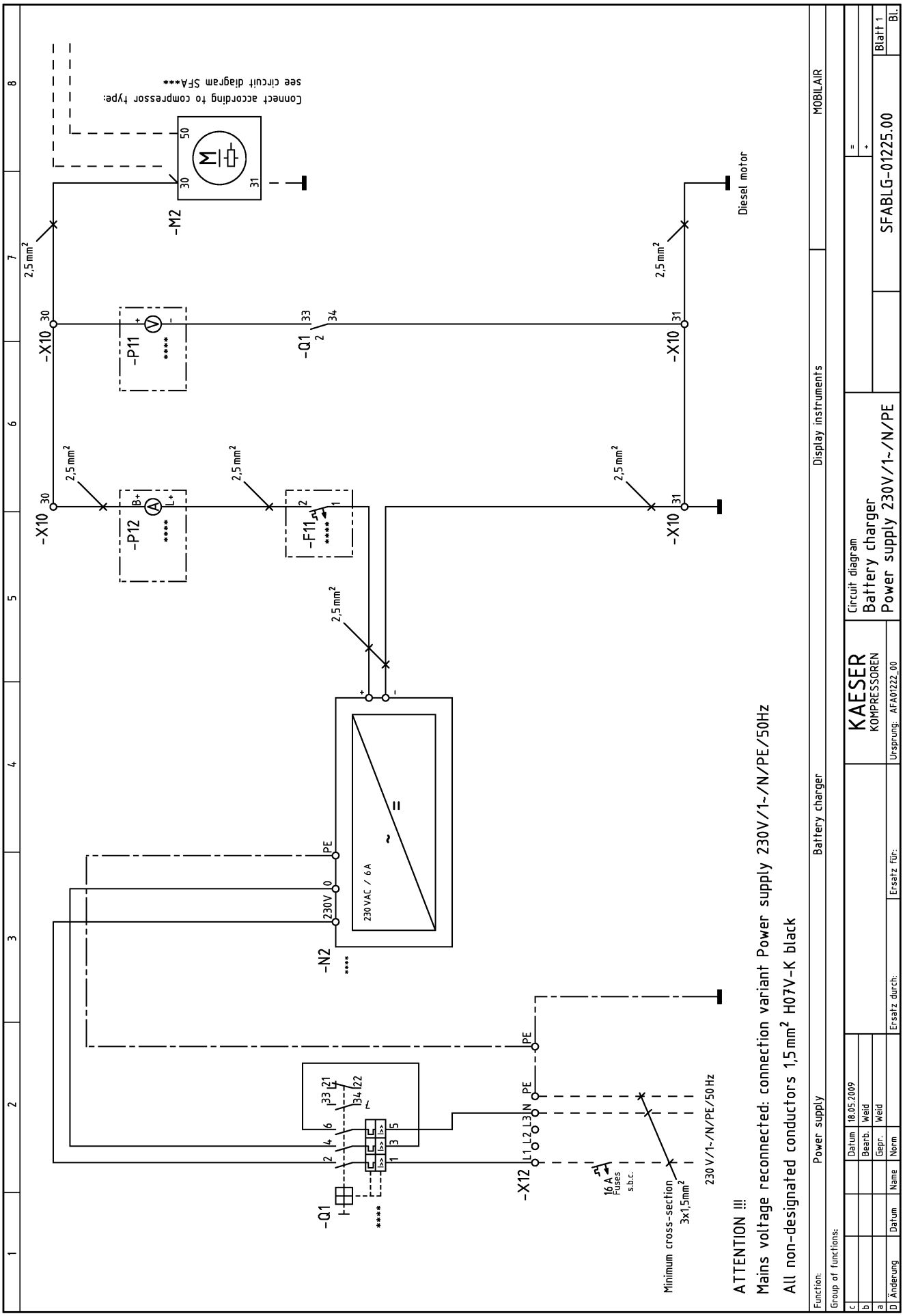
control cabinet wiring for non-designated conductors
with multi-standard stranded conductors

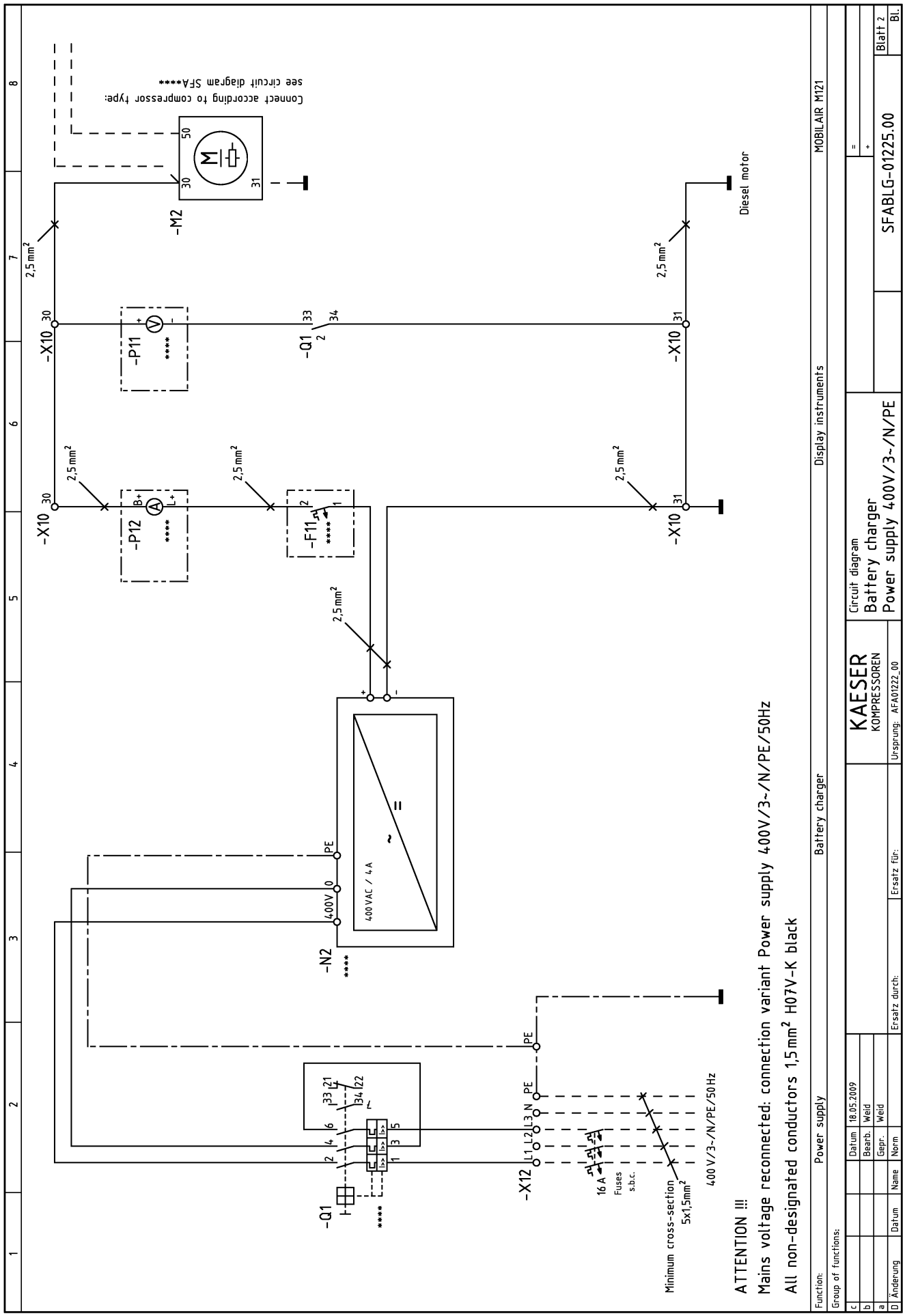
primary circuits:	black
Control voltage AC:	red 1mm² H07V-K, 18AWG UL-Style 1015, CSA-TEW
Control voltage DC:	blue 1mm² H07V-K, 18AWG UL-Style 1015, CSA-TEW
external voltage:	orange 1,5mm² H07V-K, 16AWG UL-Style 1015, CSA-TEW
measuring circuits:	violet 1mm² H07V-K, 18AWG UL-Style 1015, CSA-TEW
earth conductor:	green/yellow

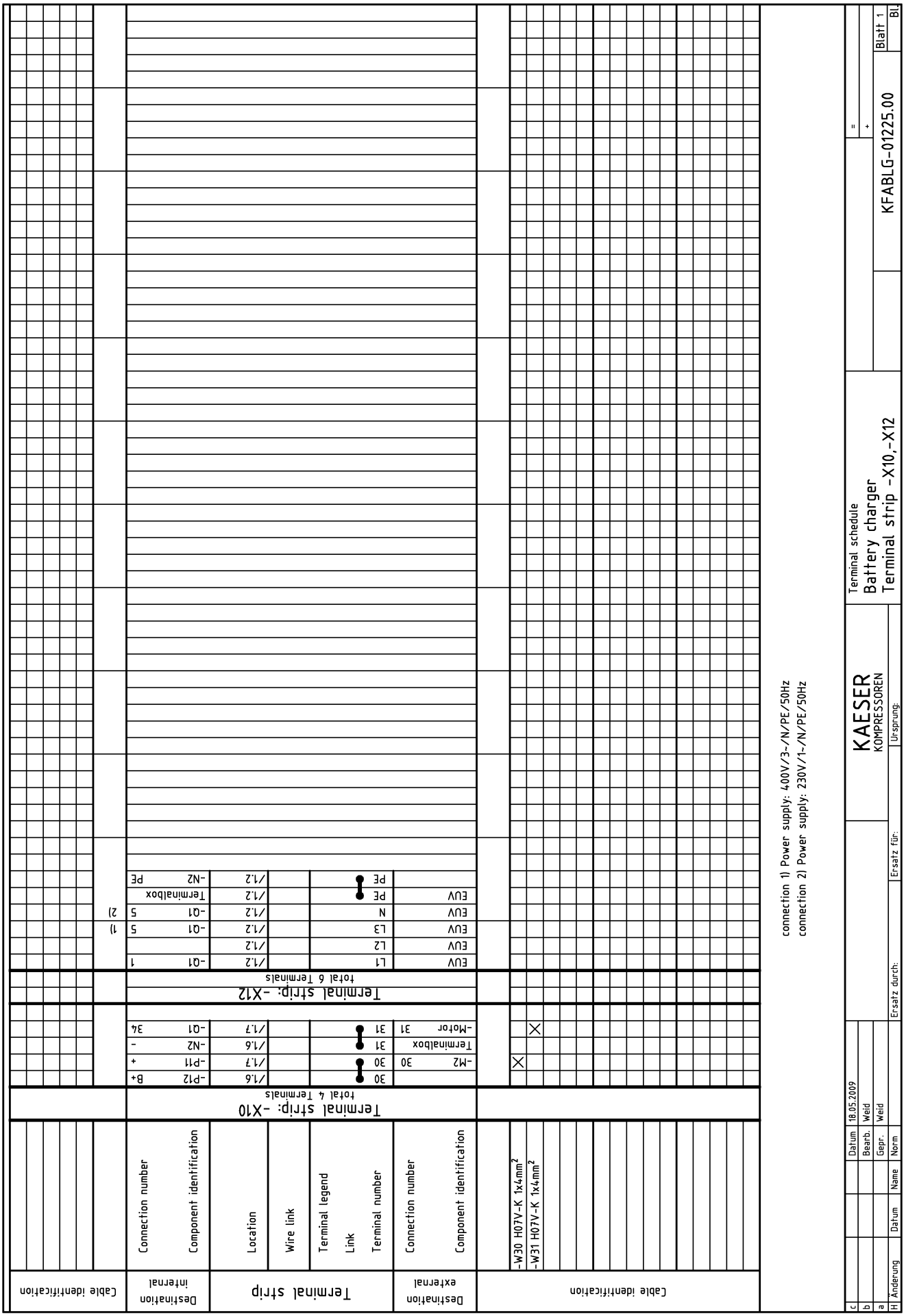
c				Datum	18.05.2009		KAESER KOMPRESSOREN	Block diagram general instructions	=
b				Bearb.	Weid				+
a				Gepr.	Weid				
C	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: AFA01222_00	UFABLG-01225.00	Blatt 1 Bl.

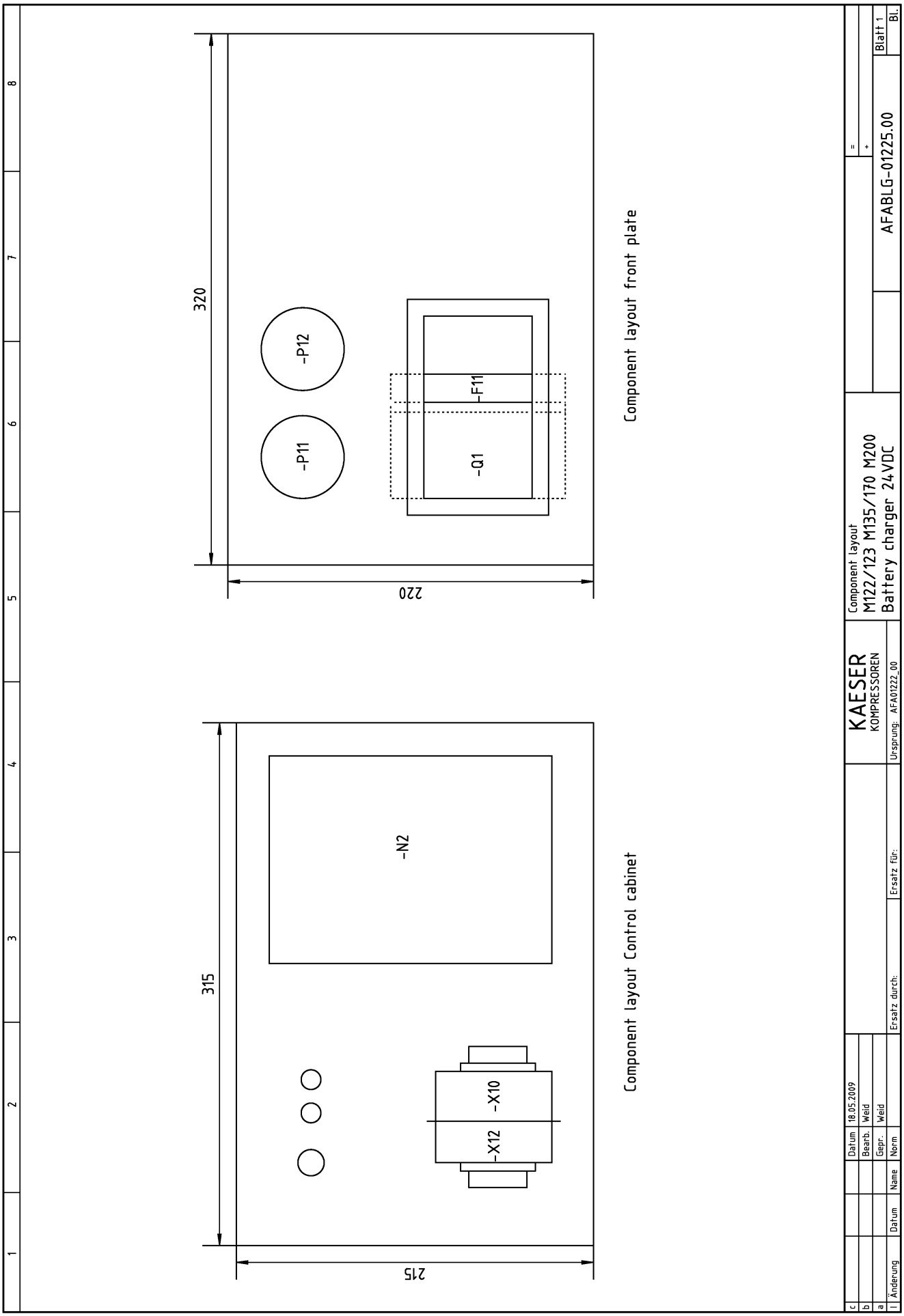
model	Equipment parts list Battery charger			
Power supply	230 V ±10 %, 50 Hz	400 V ±10 %, 50 Hz	230 V ±10 %, 50 Hz	400 V ±10 %, 50 Hz
Voltage Battery	12 VDC	12 VDC	24 VDC	24 VDC
Control cabinet				
Battery charger –N2	7.9117.00010	7.9117.00010	7.9117.0	7.9117.0
Eltroma	BGL 1024 / 12V	BGL 1024 / 12V	BGL 1024 / 24V	BGL 1024 / 24V
Overload protection switch –Q1	7.6860.00170	7.6860.00170	7.6860.00170	7.6860.00170
	3RV1011-1GA10 (4,5-6,3A)	3RV1011-1GA10 (4,5-6,3A)	3RV1011-1GA10 (4,5-6,3A)	3RV1011-1GA10 (4,5-6,3A)
Siemens	setting: 6A	setting: 4,5A	setting: 6A	setting: 4,5A
Auxiliary switch	7.3140.02210	7.3140.02210	7.3140.02210	7.3140.02210
Siemens	3RV1901-1A	3RV1901-1A	3RV1901-1A	3RV1901-1A
Cut-out –F12	7.3140.02750	7.3140.02750	7.3140.02750	7.3140.02750
	5SY6106-7 C16 A	5SY6106-7 C16 A	5SY6106-7 C16 A	5SY6106-7 C16 A
	16 A	16 A	16 A	16 A
voltmeter –P11	7.9033.00010	7.9033.00010	7.9033.0	7.9033.0
VDO	332-030-001G	332-030-001G	332-040-001G	332-040-001G
	8-16 VDC	8-16 VDC	16-32 VDC	16-32 VDC
Ammeter –P12	7.9118.0	7.9118.0	7.9118.0	7.9118.0
VDO	190-037-001G	190-037-001G	190-037-001G	190-037-001G
	-30...0...+30 A	-30...0...+30 A	-30...0...+30 A	-30...0...+30 A
front plate 6TE	7.5390.00020	7.5390.00020	7.5390.00020	7.5390.00020
Mennekes	40986	40986	40986	40986
Attachment piece 6TE	7.5395.00020	7.5395.00020	7.5395.00020	7.5395.00020
Mennekes	41431	41431	41431	41431
Terminal –X10,-X12	7.3149.01810	7.3149.01810	7.3149.01810	7.3149.01810
Wieland	WKFN4/35 4mm²	WKFN4/35 4mm²	WKFN4/35 4mm²	WKFN4/35 4mm²
PE earth terminal –X10	7.3149.01830	7.3149.01830	7.3149.01830	7.3149.01830
Wieland	WKFN4/SL/35 4mm²	WKFN4/SL/35 4mm²	WKFN4/SL/35 4mm²	WKFN4/SL/35 4mm²

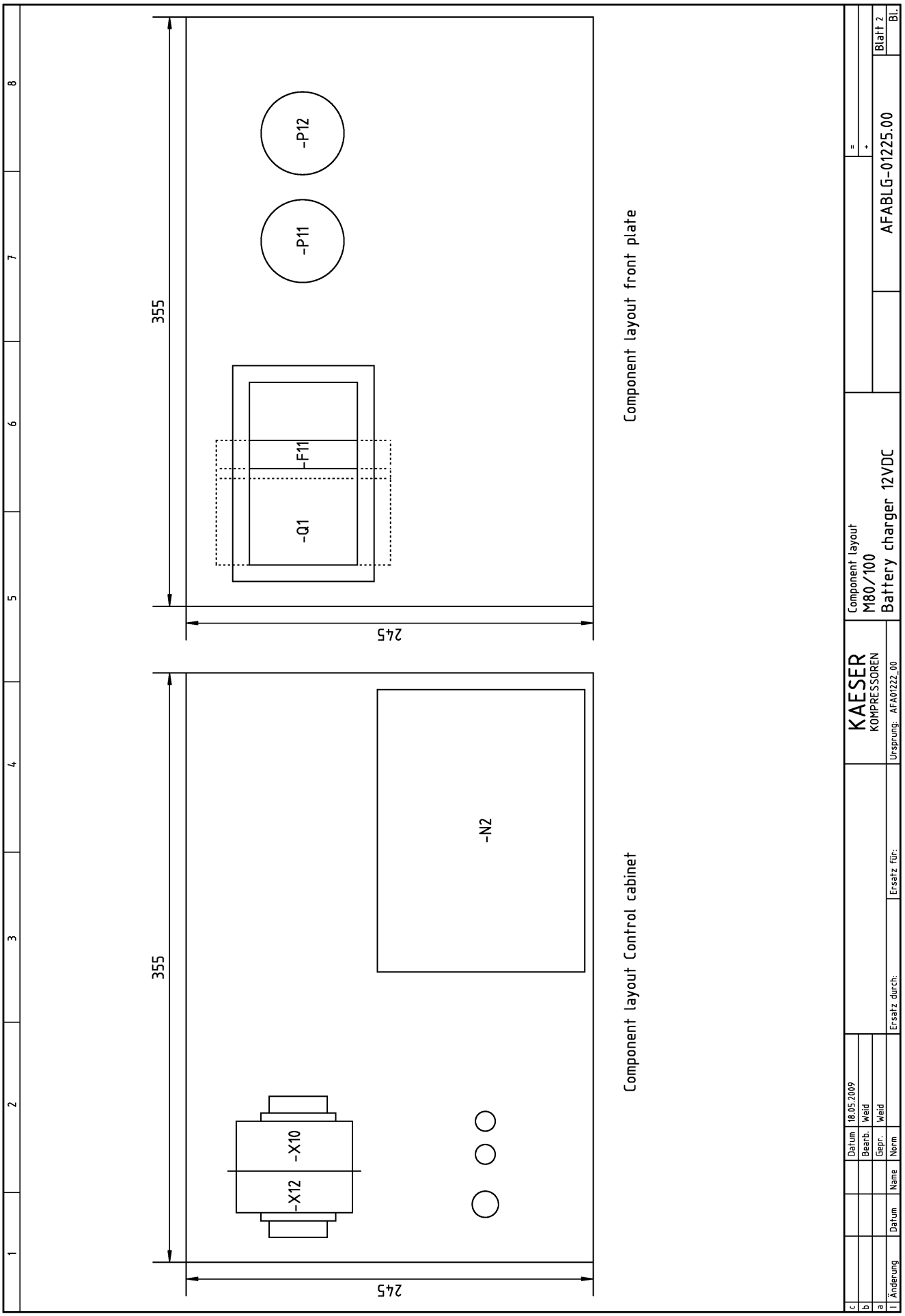
= +
Blatt 2 Bl.
UFABLG-01225.00
Block diagram
Battery charger
Equipment parts list
KAESER KOMPRESSOREN
Ursprung: AFA01222_00
Ersatz für:
Ersatz durch:
Datum 18.05.2009
Bearb. Weid
Gepr. Weid
Norm
Name
Datum
Änderung


Connect according to compressor type:
see circuit diagram SFA***
-M2
50
30
31
2,5 mm²
-X10
-P11
-Q1
33
34
-X10
Diesel motor
-P12
B+
L+
-F11
-X10
-N2
230 VAC / 6 A
230V
0
PE
-Q1
-X12
L1 L2 L3 N PE
16 A
Fuses
s.b.c.
Minimum cross-section
3x1,5mm²
230 V/1~/N/PE/50 Hz
ATTENTION !!!
Mains voltage reconnected: connection variant Power supply 230V/1~/N/PE/50Hz
All non-designated conductors 1,5 mm² H07V-K black
Function: Power supply
Group of functions: Battery charger
Display instruments
MOBILAIR
KAESER KOMPRESSOREN
Circuit diagram
Battery charger
Power supply 230V/1~/N/PE
SFABLG-01225.00
Blatt 1
Änderung
Datum
Name
Norm
Ersatz durch:
Ersatz für:
Ursprung: AFA01222_00
18.05.2009
Bearb.
Gepr.
Weld

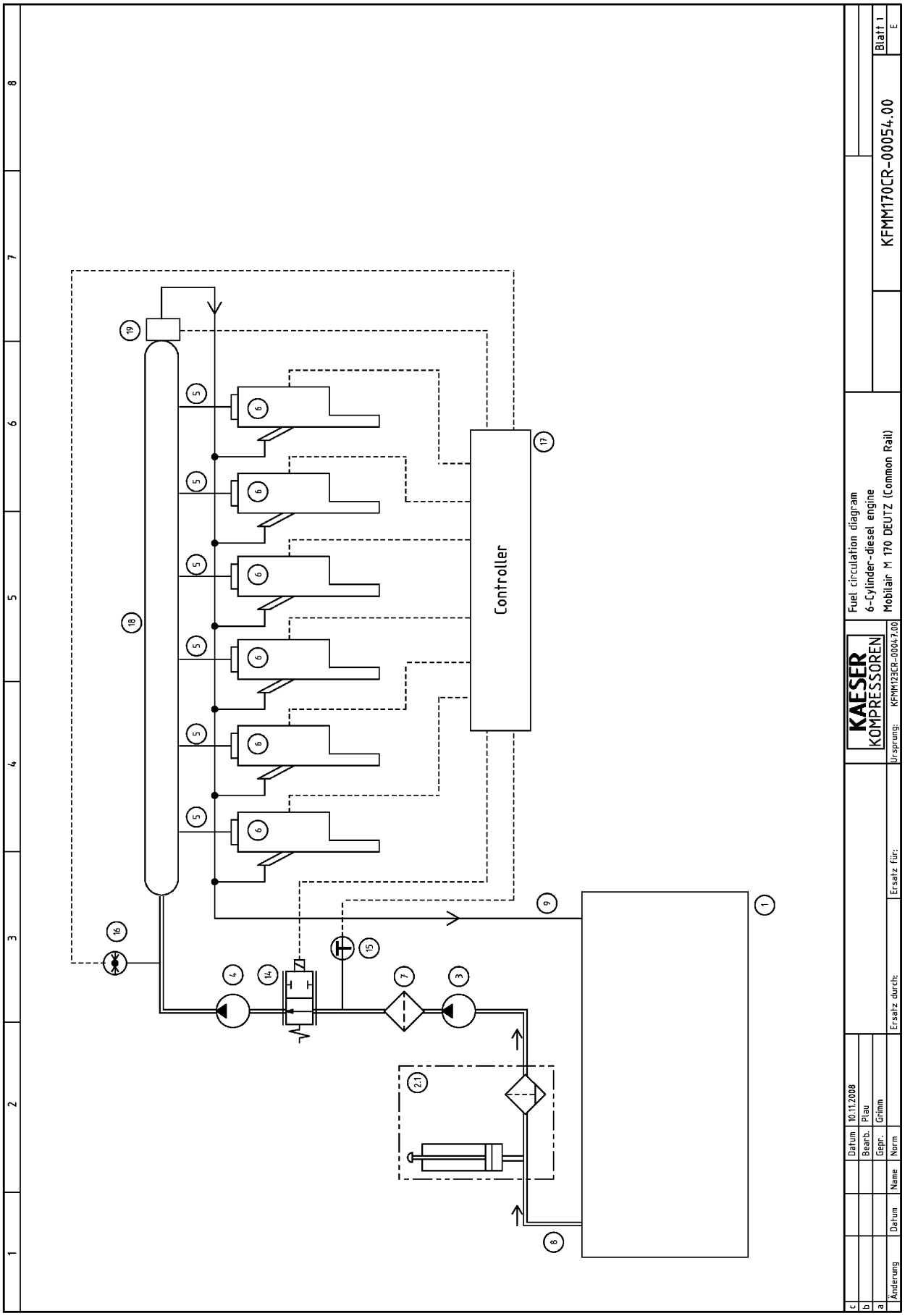

Connect according to compressor type:
see circuit diagram SFA****
-M2
-X10
-P11
-Q1
-P12
-F11
-X10
Diesel motor
2,5 mm²
-N2
400 VAC / 4 A
400V
PE
-Q1
-X12
L1 L2 L3 N PE
16 A
Fuses
s.b.c.
Minimum cross-section
5x1,5mm²
400 V/3~/N/PE/50Hz
ATTENTION !!!
Mains voltage reconnected: connection variant Power supply 400V/3~/N/PE/50Hz
All non-designated conductors 1,5mm² H07V-K black
Function: Power supply
Battery charger
Display instruments
MOBILAIR M121
Group of functions:
KAESER KOMPRESSOREN
Circuit diagram
Battery charger
Power supply 400V/3~/N/PE
SFABLG-01225.00
Blatt 2
Änderung
Datum
Name
Norm
Ersatz durch:
Ersatz für:
Ursprung: AFA01222_00
18.05.2009
Bearb.
Weld
Gepr.
Weld


Terminal schedule
Battery charger
Terminal strip -X10,-X12
KFABLG-01225.00
KAESER KOMPRESSOREN
connection 1) Power supply: 400V/3~/N/PE/50Hz
connection 2) Power supply: 230V/1~/N/PE/50Hz
Terminal strip -X10
total 4 Terminals
Terminal strip -X12
total 6 Terminals
Destination external
Destination internal
Cable identification
Terminal strip
Connection number
Component identification
Location
Wire link
Terminal legend
Link
Terminal number
-W30 H07V-K 1x4mm²
-W31 H07V-K 1x4mm²
-M2
-Motor
Terminalbox
-Q1
-N2
-P11
-P12
EUV
PE
L1
L2
L3
N
1)
2)


320
-P12
-P11
-F11
-Q1
220
Component layout front plate
315
-N2
-X10
-X12
215
Component layout Control cabinet
Component layout
M122/123 M135/170 M200
Battery charger 24VDC
KAESER KOMPRESSOREN
AFABLG-01225.00
Blatt 1
Bl.
Datum 18.05.2009
Bearb. Weld
Gepr. Weld
Norm
Name
Datum
Änderung
Ersatz durch:
Ersatz für:
Ursprung: AFA01222_00


-P12
-P11
355
-F11
-Q1
245
Component layout front plate
-N2
355
-X10
-X12
245
Component layout Control cabinet
Component layout
M80/100
Battery charger 12VDC
AFABLG-01225.00
Blatt 2
KAESER
KOMPRESSOREN
Ursprung: AFA01222_00
Ersatz durch:
Ersatz für:
Datum 18.05.2009
Bearb. Weid
Gepr. Weid
Norm
Name
Datum
Änderung

13.5 Fuel circulation diagram


Controller
Fuel circulation diagram
6-Cylinder-diesel engine
Mobilair M 170 DEUTZ (Common Rail)
KFMM170CR-00054.00
Blatt 11
KAESER KOMPRESSOREN
Ursprung: KFMM123CR-00047.00
Ersatz für:
Ersatz durch:
Datum 10.11.2008
Bearb. Plau
Gepr. Grimm
Norm
Name
Datum
Änderung

1	Fuel tank
2.1	Fuel prefilter with water separator and manual pump
3	Fuel feed pump
4	Injection pump
5	Injection pipe
6	Injection nozzle
7	Fuel filter
8	Fuel supply line
9	Fuel return line
14	Pressure regulating valve
15	Temperature sensor
16	Pressure sensor
17	Electronic control unit
18	Rail
19	Pressure limiting valve

c				Datum	10.11.2008		KAESER KOMPRESSOREN	Fuel circulation diagram 6-Cylinder-diesel engine Mobilair M 170 DEUTZ (Common Rail)
b				Bearb.	Plau			
a				Gepr.	Grimm			
	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: KFMM123CR-00047.00

KFMM170CR-00054.00 | Blatt 2 | E

13.6 SIGMA CONTROL MOBIL message codes

Further information See chapter 9.2 for measures to rectify the cause of message codes.

Construction of message codes

The following is the key to 4-digit message codes.

- Position 1 - type of message:
  - 1 – Alarm
  - 2 – Maintenance
  - 3 – Warning
- Position 2 - location of the cause:
  - 1 – Engine
  - 2 - Compressor unit
  - 3 – Controller
  - 4 – General
- Positions 3 and 4 - numbers from 00 to 99

Range 1100 - 1199: engine faults

Message code	Meaning
1100	Oil pressure fault.
1101	Oil pressure sensor defective.
1110	Coolant temperature high.
1111	Coolant level too low.
1112	Coolant temperature sensor defective.
1120	Turbo air pressure too high/low.
1121	Turbo air temperature too high.
1122	Turbo air temperature sensor defective.
1123	Turbo air temperature sensor defective.
1130	Fuel level low.
1131	Fuel temperature high.
1132	Fuel pressure low.
1133	Fuel temperature sensor defective.
1134	Fuel pressure sensor defective.
1135	Fuel pump fault..
1140	Defective alternator.
1141	Battery voltage too high/low.
1150	Engine electronics fault.
1151	Fault in the engine electronic communication - engine electronics side.
1152	Fault in the engine electronic communication - ECM side.
1160	Rail pressure sensor fault.
1161	Speed sensor fault.

Message code	Meaning
1170	Starting fault (after 3 failed attempts).

Tab. 91 Message code range 1100 – 1199: engine faults

Range 1200 - 1299: compressor unit faults

Message code	Meaning
1200	Compressor unit overheating.
1201	Compressor pressure too high.

Tab. 92 Message code range 1200 – 1299: compressor unit faults

Range 1300 - 1399: controller faults

Message code	Meaning
1300	Memory fault.
1301	Fault in bus communication with engine electronics.
1302	Fault in bus communication with display unit.
1303	Overheating.
1304	Power supply.

Tab. 93 Message code range 1300 – 1399: controller faults

Message code range 1400 – 1499: general faults

Message code	Meaning
1400	Quick stop
1410	Open circuit in the oil separator tank pressure sensor.
1411	Short circuit in the oil separator tank pressure sensor.
1412	Open circuit in the inlet valve pressure sensor.
1413	Short circuit in the inlet valve pressure sensor.
1414	Open circuit in the compressor unit temperature sensor.
1415	Short circuit in the compressor unit temperature sensor.
1416	Open circuit in fuel level sensor.
1417	Short circuit in fuel level sensor.
1420	Open circuit in the venting valve (p+e).
1421	Short circuit in the venting valve (p+e).
1422	Open circuit in the auxiliary venting valve (p)
1423	Short circuit in the auxiliary venting valve (p)
1424	Open circuit in the inlet valve control valve (e).
1425	Short circuit in the inlet valve control valve (e).
1426	Open circuit in the frost protector valve.
1427	Short circuit in the frost protector valve.
1430	Manual-stop automatic mode.

Message code	Meaning
1450	Controller block, GSM/GPS monitoring.
1470	Automatic start fault.

Tab. 94 Message code range 1400 – 1499: general faults

Range 2100 - 2199: engine maintenance

Message code	Meaning
2100	Change engine oil and filter (500h).
2101	Clean or change the engine air filter (500h).

Tab. 95 Message code range 2100 – 2199: engine maintenance

Range 2200 - 2299: compressor unit maintenance

Message code	Meaning
2200	Replace the compressor cooling oil and filter (1000h).
2201	Clean or change the compressor air filter (250h).

Tab. 96 Message code range 2200 – 2299: compressor unit maintenance

Range 3100 - 3199: engine warnings

Message code	Meaning
3100	Engine oil pressure too low.
3110	Coolant temperature high.
3121	Turbo air temperature high.
3130	Fuel level low.
3133	Fuel filter water level.

Tab. 97 Message code range 3100 – 3199: engine warnings

Range 3200 - 3299: compressor unit warnings

Message code	Meaning
3200	Compressor overheating.
3201	Compressor final pressure too high.

Tab. 98 Message code range 3200 – 3299: compressor unit warnings

Message code range 3400 – 3499: general warnings

Message code	Meaning
3400	Battery charging voltage.

Tab. 99 Message code range 3400 – 3499: general warnings

13.7 Option dd
Operating instructions for compressed air filter (combination filter)

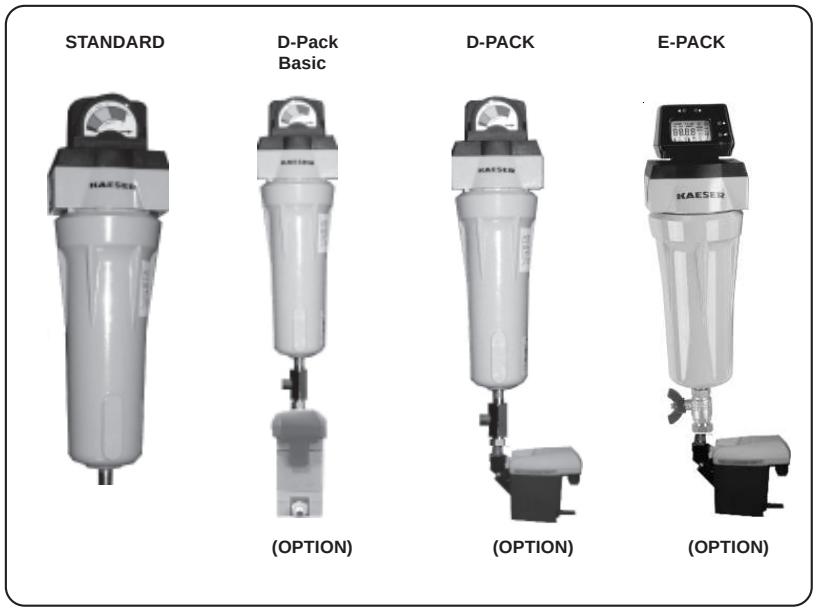
Bedienungsanleitung
Instruction Manual

Hochleistungs - Druckluftfilter

Compressed-air filters

Serie / Series

FA (D), FB (D&E), FC (D&E), FD (E), FE (D&E), FF (D&E), FG



Kaeser Kompressoren GmbH
Postfach 2143
96410 Coburg
Tel.: 09561/640-0
Fax: 09561/640130
http://www.kaeser.com

KAESER

A	Kap. 9.2, 9.3 Wartungsintervalle	04.12.08	SK
	Änd. Mittlg.	Datum	Bearb.

gültig ab 01.04.2007

D GB

F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

FILTER-FA-FG_06D E

Materialkennzeichnung

Sign of material

Filter: Standard		Filter: D-Pack		Filter: Element/Cartrigde	
Typ/Type	Nr./No.	Typ/Type	Nr./No.	Typ/Type	Nr./No.
FA-6	9.4600.0	FA-6 D	9.4600.00110	E-A-6	9.4800.0
FA-10	9.4601.0	FA-10 D	9.4601.00110	E-A-10	9.4801.0
FA-18	9.4602.0	FA-18 D	9.4602.00110	E-A-18	9.4802.0
FA-28	9.4603.0	FA-28 D	9.4603.00110	E-A-28	9.4803.0
FA-48	9.4604.0	FA-48 D	9.4604.00010	E-A-48	9.4804.0
FA-71	9.4605.0	FA-71 D	9.4605.00010	E-A-71	9.4805.0
FA-107	9.4606.0	FA-107 D	9.4606.00010	E-A-107	9.4806.0
FA-138	9.4607.0	FA-138 D	9.4607.00010	E-A-138	9.4807.0
FA-177	9.4608.0	FA-177 D	9.4608.00010	E-A-177	9.4808.0
FA-221	9.4609.0	FA-221 D	9.4609.00010	E-A-221	9.4809.0
FA-185	9.4610.0	FA-185 D	9.4610.00010	E-A-185	9.4810.0
FA-283	9.4611.0	FA-283 D	9.4611.00010	E-A-283	9.4811.0
FA-354	9.4612.0	FA-354 D	9.4612.00010	E-A-185	9.4810.0
FA-526	9.4613.0	FA-526 D	9.4613.00010	E-A-185	9.4810.0
FA-708	9.4614.0	FA-708 D	9.4614.00010	E-A-185	9.4810.0
FA-885	9.4615.0	FA-885 D	9.4615.00010	E-A-185	9.4810.0
FA-1420	9.4616.0	FA-1420 D	9.4616.00010	E-A-185	9.4810.0
FA-1950	9.4617.0	FA-1950 D	9.4617.00010	E-A-185	9.4810.0
FA-2480	9.4618.0	FA-2480 D	9.4618.00010	E-A-185	9.4810.0

D-Pack: Filter mit ECO-DRAIN /

D-Pack: Filter with ECO-DRAIN

Filter: Standard		Filter: D-Pack Basic		Filter: D-Pack		Filter: E-Pack	Filter: Element/Cartrigde	
Typ/Type	Nr./No.	Typ/Type	Nr./No.	Typ/Type	Nr./No.	Typ/Type	Typ/Type	Nr./No.
FB-6	9.4620.0	FB-6 B	9.4620.00110	FB-6 D	9.4620.00120	FB-6 E	E-B-6	9.4812.0
FB-10	9.4621.0	FB-10 B	9.4621.00110	FB-10 D	9.4621.00120	FB-10 E	E-B-10	9.4813.0
FB-18	9.4622.0	FB-18 B	9.4622.00110	FB-18 D	9.4622.00120	FB-18 E	E-B-18	9.4814.0
FB-28	9.4623.0	FB-28 B	9.4623.00110	FB-28 D	9.4623.00120	FB-28 E	E-B-28	9.4815.0
FB-48	9.4624.0	FB-48 B	9.4624.00110	FB-48 D	9.4624.00120	FB-48 E	E-B-48	9.4816.0
FB-71	9.4625.0	FB-71 B	9.4625.00110	FB-71 D	9.4625.00120	FB-71 E	E-B-71	9.4817.0
FB-107	9.4626.0	FB-107 B	9.4626.00110	FB-107 D	9.4626.00120	FB-107 E	E-B-107	9.4818.0
FB-138	9.4627.0	FB-138 B	9.4627.00110	FB-138 D	9.4627.00120	FB-138 E	E-B-138	9.4819.0
FB-177	9.4628.0	FB-177 B	9.4628.00110	FB-177 D	9.4628.00120	FB-177 E	E-B-177	9.4820.0
FB-221	9.4629.0	FB-221 B	9.4629.00110	FB-221 D	9.4629.00120	FB-221 E	E-B-221	9.4821.0
FB-185	9.4630.0	-	-	FB-185 D	9.4630.00120	FB-185 E	E-B-185	9.4822.0
FB-283	9.4631.0	-	-	FB-283 D	9.4631.00120	FB-283 E	E-B-283	9.4823.0
FB-354	9.4632.0	-	-	FB-354 D	9.4632.00120	FB-354 E	E-B-185	9.4822.0
FB-526	9.4633.0	-	-	FB-526 D	9.4633.00120	FB-526 E	E-B-185	9.4822.0
FB-708	9.4634.0	-	-	FB-708 D	9.4634.00120	FB-708 E	E-B-185	9.4822.0
FB-885	9.4635.0	-	-	FB-885 D	9.4635.00120	FB-885 E	E-B-185	9.4822.0
FB-1420	9.4636.0	-	-	FB-1420 D	9.4636.00020	FB-1420 E	E-B-185	9.4822.0
FB-1950	9.4637.0	-	-	FB-1950 D	9.4637.00020	FB-1950 E	E-B-185	9.4822.0
FB-2480	9.4638.0	-	-	FB-2480 D	9.4638.00020	FB-2480 E	E-B-185	9.4822.0

D-Pack: Filter mit Differenzdruckmanometer und ECO-DRAIN

D-Pack-Basic: Filter mit Differenzdruckmanometer und ECO-DRAIN 30

E-Pack: Filter mit Filtermonitor und ECO-DRAIN

D-pack: Filter with differential pressure gauge and ECO-DRAIN

D-pack-basic: Filter with differential pressure gauge and ECO-DRAIN 30

E-pack: Filter with filtermonitor and ECO-DRAIN

Anzahl Filterelemente siehe Kapitel 3. „Technische Daten“.

Quantity of filter cartridges see chapter 3. „Technical data“.

F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

FILTER-FA-FG_06D E

Materialkennzeichnung

Sign of material

Filter: Standard		Filter: D-Pack Basic		Filter: D-Pack		Filter: E-Pack	Filter: Element/Cartrigde	
Typ/Type	Nr./No.	Typ/Type	Nr./No.	Typ/Type	Nr./No.	Typ/Type	Typ/Type	Nr./No.
FC-6	9.4640.0	FC-6 B	9.4640.00110	FC-6 D	9.4640.00120	FC-6 E	E-C-6	9.4824.0
FC-10	9.4641.0	FC-10 B	9.4641.00110	FC-10 D	9.4641.00120	FC-10 E	E-C-10	9.4825.0
FC-18	9.4642.0	FC-18 B	9.4642.00110	FC-18 D	9.4642.00120	FC-18 E	E-C-18	9.4826.0
FC-28	9.4643.0	FC-28 B	9.4643.00110	FC-28 D	9.4643.00120	FC-28 E	E-C-28	9.4827.0
FC-48	9.4644.0	FC-48 B	9.4644.00110	FC-48 D	9.4644.00120	FC-48 E	E-C-48	9.4828.0
FC-71	9.4645.0	FC-71 B	9.4645.00110	FC-71 D	9.4645.00120	FC-71 E	E-C-71	9.4829.0
FC-107	9.4646.0	FC-107 B	9.4646.00110	FC-107 D	9.4646.00120	FC-107 E	E-C-107	9.4830.0
FC-138	9.4647.0	FC-138 B	9.4647.00110	FC-138 D	9.4647.00120	FC-138 E	E-C-138	9.4831.0
FC-177	9.4648.0	FC-177 B	9.4648.00110	FC-177 D	9.4648.00120	FC-177 E	E-C-177	9.4832.0
FC-221	9.4649.0	FC-221 B	9.4649.00110	FC-221 D	9.4649.00120	FC-221 E	E-C-221	9.4833.0
FC-185	9.4650.0	-	-	FC-185 D	9.4650.00120	FC-185 E	E-C-185	9.4834.0
FC-283	9.4651.0	-	-	FC-283 D	9.4651.00120	FC-283 E	E-C-283	9.4835.0
FC-354	9.4652.0	-	-	FC-354 D	9.4652.00120	FC-354 E	E-C-185	9.4834.0
FC-526	9.4653.0	-	-	FC-526 D	9.4653.00120	FC-526 E	E-C-185	9.4834.0
FC-708	9.4654.0	-	-	FC-708 D	9.4654.00120	FC-708 E	E-C-185	9.4834.0
FC-885	9.4655.0	-	-	FC-885 D	9.4655.00120	FC-885 E	E-C-185	9.4834.0
FC-1420	9.4656.0	-	-	FC-1420 D	9.4656.00020	FC-1420 E	E-C-185	9.4834.0
FC-1950	9.4657.0	-	-	FC-1950 D	9.4657.00020	FC-1950 E	E-C-185	9.4834.0
FC-2480	9.4658.0	-	-	FC-2480 D	9.4658.00020	FC-2480 E	E-C-185	9.4834.0

D-Pack: Filter mit Differenzdruckmanometer und ECO-DRAIN

D-Pack-Basic: Filter mit Differenzdruckmanometer und ECO-DRAIN 30

E-Pack: Filter mit Filtermonitor und ECO-DRAIN

D-pack: Filter with differential pressure gauge and ECO-DRAIN

D-pack-basic: Filter with differential pressure gauge and ECO-DRAIN 30

E-pack: Filter with filtermonitor and ECO-DRAIN

Filter: Standard		Filter: E-Pack	Filter: Element/Cartrigde	
Typ/Type	Nr./No.	Typ/Type	Typ/Type	Nr./No.
FD-6	9.4660.0	FD-6 E	E-D-6	9.4836.0
FD-10	9.4661.0	FD-10 E	E-D-10	9.4837.0
FD-18	9.4662.0	FD-18 E	E-D-18	9.4838.0
FD-28	9.4663.0	FD-28 E	E-D-28	9.4839.0
FD-48	9.4664.0	FD-48 E	E-D-48	9.4840.0
FD-71	9.4665.0	FD-71 E	E-D-71	9.4841.0
FD-107	9.4666.0	FD-107 E	E-D-107	9.4842.0
FD-138	9.4667.0	FD-138 E	E-D-138	9.4843.0
FD-177	9.4668.0	FD-177 E	E-D-177	9.4844.0
FD-221	9.4669.0	FD-221 E	E-D-221	9.4845.0
FD-185	9.4670.0	FD-185 E	E-D-185	9.4846.0
FD-283	9.4671.0	FD-283 E	E-D-283	9.4847.0
FD-354	9.4672.0	FD-354 E	E-D-185	9.4846.0
FD-526	9.4673.0	FD-526 E	E-D-185	9.4846.0
FD-708	9.4674.0	FD-708 E	E-D-185	9.4846.0
FD-885	9.4675.0	FD-885 E	E-D-185	9.4846.0
FD-1420	9.4676.0	FD-1420 E	E-D-185	9.4846.0
FD-1950	9.4677.0	FD-1950 E	E-D-185	9.4846.0
FD-2480	9.4678.0	FD-2480 E	E-D-185	9.4846.0

E-Pack: Filter mit Filtermonitor

E-Pack: Filter with filtermonitor

Anzahl Filterelemente siehe Kapitel 3. „Technische Daten“.

Quantity of filter cartridges see chapter 3. „Technical data“.

F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

FILTER-FA-FG_06D E

Materialkennzeichnung

Sign of material

Filter: Standard		Filter: D-Pack Basic		Filter: D-Pack		Filter: E-Pack	Filter: Element/Cartrigde	
Typ/Type	Nr./No.	Typ/Type	Nr./No.	Typ/Type	Nr./No.	Typ/Type	Typ/Type	Nr./No.
FE-6	9.4700.0	FE-6 B	9.4700.00110	FE-6 D	9.4700.00120	FE-6 E	E-E-6	9.4860.0
FE-10	9.4701.0	FE-10 B	9.4701.00110	FE-10 D	9.4701.00120	FE-10 E	E-E-10	9.4861.0
FE-18	9.4702.0	FE-18 B	9.4702.00110	FE-18 D	9.4702.00120	FE-18 E	E-E-18	9.4862.0
FE-28	9.4703.0	FE-28 B	9.4703.00110	FE-28 D	9.4703.00120	FE-28 E	E-E-28	9.4863.0
FE-48	9.4704.0	FE-48 B	9.4704.00110	FE-48 D	9.4704.00120	FE-48 E	E-E-48	9.4864.0
FE-71	9.4705.0	FE-71 B	9.4705.00110	FE-71 D	9.4705.00120	FE-71 E	E-E-71	9.4865.0
FE-107	9.4706.0	FE-107 B	9.4706.00110	FE-107 D	9.4706.00120	FE-107 E	E-E-107	9.4866.0
FE-138	9.4707.0	FE-138 B	9.4707.00110	FE-138 D	9.4707.00120	FE-138 E	E-E-138	9.4867.0
FE-177	9.4708.0	FE-177 B	9.4708.00110	FE-177 D	9.4708.00120	FE-177 E	E-E-177	9.4868.0
FE-221	9.4709.0	FE-221 B	9.4709.00110	FE-221 D	9.4709.00120	FE-221 E	E-E-221	9.4869.0
FE-185	9.4710.0	-	-	FE-185 D	9.4710.00120	FE-185 E	E-E-185	9.4870.0
FE-283	9.4711.0	-	-	FE-283 D	9.4711.00120	FE-283 E	E-E-283	9.4871.0
FE-354	9.4712.0	-	-	FE-354 D	9.4712.00120	FE-354 E	E-E-185	9.4870.0
FE-526	9.4713.0	-	-	FE-526 D	9.4713.00120	FE-526 E	E-E-185	9.4870.0
FE-708	9.4714.0	-	-	FE-708 D	9.4714.00120	FE-708 E	E-E-185	9.4870.0
FE-885	9.4715.0	-	-	FE-885 D	9.4715.00120	FE-885 E	E-E-185	9.4870.0
FE-1420	9.4716.0	-	-	FE-1420 D	9.4716.00020	FE-1420 E	E-E-185	9.4870.0
FE-1950	9.4717.0	-	-	FE-1950 D	9.4717.00020	FE-1950 E	E-E-185	9.4870.0
FE-2480	9.4718.0	-	-	FE-2480 D	9.4718.00020	FE-2480 E	E-E-185	9.4870.0

D-Pack: Filter mit Differenzdruckmanometer und ECO-DRAIN

D-Pack-Basic: Filter mit Differenzdruckmanometer und ECO-DRAIN 30

E-Pack: Filter mit Filtermonitor und ECO-DRAIN

D-pack: Filter with differential pressure gauge and ECO-DRAIN

D-pack-basic: Filter with differential pressure gauge and ECO-DRAIN 30

E-pack: Filter with filtermonitor and ECO-DRAIN

Filter: Standard		Filter: D-Pack Basic		Filter: D-Pack		Filter: E-Pack	Filter: Element/Cartrigde	
Typ/Type	Nr./No.	Typ/Type	Nr./No.	Typ/Type	Nr./No.	Typ/Type	Typ/Type	Nr./No.
FF-6	9.4720.0	FF-6 B	9.4720.00110	FF-6 D	9.4720.00120	FF-6 E	E-F-6	9.4872.0
FF-10	9.4721.0	FF-10 B	9.4721.00110	FF-10 D	9.4721.00120	FF-10 E	E-F-10	9.4873.0
FF-18	9.4722.0	FF-18 B	9.4722.00110	FF-18 D	9.4722.00120	FF-18 E	E-F-18	9.4874.0
FF-28	9.4723.0	FF-28 B	9.4723.00110	FF-28 D	9.4723.00120	FF-28 E	E-F-28	9.4875.0
FF-48	9.4724.0	FF-48 B	9.4724.00110	FF-48 D	9.4724.00120	FF-48 E	E-F-48	9.4876.0
FF-71	9.4725.0	FF-71 B	9.4725.00110	FF-71 D	9.4725.00120	FF-71 E	E-F-71	9.4877.0
FF-107	9.4726.0	FF-107 B	9.4726.00110	FF-107 D	9.4726.00120	FF-107 E	E-F-107	9.4878.0
FF-138	9.4727.0	FF-138 B	9.4727.00110	FF-138 D	9.4727.00120	FF-138 E	E-F-138	9.4879.0
FF-177	9.4728.0	FF-177 B	9.4728.00110	FF-177 D	9.4728.00120	FF-177 E	E-F-177	9.4880.0
FF-221	9.4729.0	FF-221 B	9.4729.00110	FF-221 D	9.4729.00120	FF-221 E	E-F-221	9.4881.0
FF-185	9.4730.0	-	-	FF-185 D	9.4730.00120	FF-185 E	E-F-185	9.4882.0
FF-283	9.4731.0	-	-	FF-283 D	9.4731.00120	FF-283 E	E-F-283	9.4883.0
FF-354	9.4732.0	-	-	FF-354 D	9.4732.00120	FF-354 E	E-F-185	9.4882.0
FF-526	9.4733.0	-	-	FF-526 D	9.4733.00120	FF-526 E	E-F-185	9.4882.0
FF-708	9.4734.0	-	-	FF-708 D	9.4734.00120	FF-708 E	E-F-185	9.4882.0
FF-885	9.4735.0	-	-	FF-885 D	9.4735.00120	FF-885 E	E-F-185	9.4882.0
FF-1420	9.4736.0	-	-	FF-1420 D	9.4736.00020	FF-1420 E	E-F-185	9.4882.0
FF-1950	9.4737.0	-	-	FF-1950 D	9.4737.00020	FF-1950 E	E-F-185	9.4882.0
FF-2480	9.4738.0	-	-	FF-2480 D	9.4738.00020	FF-2480 E	E-F-185	9.4882.0

D-Pack: Filter mit Differenzdruckmanometer und ECO-DRAIN

D-Pack-Basic: Filter mit Differenzdruckmanometer und ECO-DRAIN 30

E-Pack: Filter mit Filtermonitor und ECO-DRAIN

D-pack: Filter with differential pressure gauge and ECO-DRAIN

D-pack-basic: Filter with differential pressure gauge and ECO-DRAIN 30

E-pack: Filter with filtermonitor and ECO-DRAIN

Anzahl Filterelemente siehe Kapitel 3. „Technische Daten“.

Quantity of filter cartridges see chapter 3. „Technical data“.

F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

FILTER-FA-FG_06D E

Materialkennzeichnung

Sign of material

Filter: Standard		Filter: Element/Cartrigde	
Typ/Type	Nr./No.	Typ/Type	Nr./No.
FG-6	9.4740.0	E-G-6	9.4884.0
FG-10	9.4741.0	E-G-10	9.4885.0
FG-18	9.4742.0	E-G-18	9.4886.0
FG-28	9.4743.0	E-G-28	9.4887.0
FG-48	9.4744.0	E-G-48	9.4888.0
FG-71	9.4745.0	E-G-71	9.4889.0
FG-107	9.4746.0	E-G-107	9.4890.0
FG-138	9.4747.0	E-G-138	9.4891.0
FG-177	9.4748.0	E-G-177	9.4892.0
FG-221	9.4749.0	E-G-221	9.4893.0
FG-185	9.4750.0	E-G-185	9.4894.0
FG-283	9.4751.0	E-G-283	9.4895.0
FG-354	9.4752.0	E-G-185	9.4894.0
FG-526	9.4753.0	E-G-185	9.4894.0
FG-708	9.4754.0	E-G-185	9.4894.0
FG-885	9.4755.0	E-G-185	9.4894.0
FG-1420	9.4756.0	E-G-185	9.4894.0
FG-1950	9.4757.0	E-G-185	9.4894.0
FG-2480	9.4758.0	E-G-185	9.4894.0

Filter: Standard		Filter: D-Pack Basic		Filter: D-Pack		Filter: E-Pack
Typ/Type	Nr./No.	Typ/Type	Nr./No.	Typ/Type	Nr./No.	Typ/Type
FFG-6	9.4760.0	FFG-6 B	9.4760.00110	FFG-6 D	9.4760.00120	FFG-6 E
FFG-10	9.4761.0	FFG-10 B	9.4761.00110	FFG-10 D	9.4761.00120	FFG-10 E
FFG-18	9.4762.0	FFG-18 B	9.4762.00110	FFG-18 D	9.4762.00120	FFG-18 E
FFG-28	9.4763.0	FFG-28 B	9.4763.00110	FFG-28 D	9.4763.00120	FFG-28 E
FFG-48	9.4764.0	FFG-48 B	9.4764.00110	FFG-48 D	9.4764.00120	FFG-48 E
FFG-71	9.4765.0	FFG-71 B	9.4765.00110	FFG-71 D	9.4765.00120	FFG-71 E
FFG-107	9.4766.0	FFG-107 B	9.4766.00110	FFG-107 D	9.4766.00120	FFG-107 E
FFG-138	9.4767.0	FFG-138 B	9.4767.00110	FFG-138 D	9.4767.00120	FFG-138 E
FFG-177	9.4768.0	FFG-177 B	9.4768.00110	FFG-177 D	9.4768.00120	FFG-177 E
FFG-221	9.4769.0	FFG-221 B	9.4769.00110	FFG-221 D	9.4769.00120	FFG-221 E
FFG-185	9.4770.0	-	-	FFG-185 D	9.4770.00120	FFG-185 E
FFG-283	9.4771.0	-	-	FFG-283 D	9.4771.00120	FFG-283 E
FFG-354	9.4772.0	-	-	FFG-354 D	9.4772.00120	FFG-354 E
FFG-526	9.4773.0	-	-	FFG-526 D	9.4773.00120	FFG-526 E
FFG-708	9.4774.0	-	-	FFG-708 D	9.4774.00120	FFG-708 E
FFG-885	9.4775.0	-	-	FFG-885 D	9.4775.00120	FFG-885 E
FFG-1420	9.4776.0	-	-	FFG-1420 D	9.4776.00020	FFG-1420 E
FFG-1950	9.4777.0	-	-	FFG-1950 D	9.4777.00020	FFG-1950 E
FFG-2480	9.4778.0	-	-	FFG-2480 D	9.4778.00020	FFG-2480 E

Filterkombination bestehend aus Serie FF & FG

D-Pack: Filter mit Differenzdruckmanometer und ECO-DRAIN

D-Pack-Basic: Filter mit Differenzdruckmanometer und ECO-DRAIN 30

E-Pack: Filter Serie FF mit Filtermonitor und ECO-DRAIN

Filter combination consist of series FF & FG

D-pack: Filter with differential pressure gauge and ECO-DRAIN

D-pack-basic: Filter with differential pressure gauge and ECO-DRAIN 30

E-pack: Filter series FF with filtermonitor and ECO-DRAIN

Anzahl Filterelemente siehe Kapitel 3. „Technische Daten“.

Quantity of filter cartridges see chapter 3. „Technical data“.

F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

FILTER-FA-FG_06D E

Inhaltsverzeichnis

Contents

Wir haben den Inhalt der Bedienungsanleitung auf Übereinstimmung mit dem beschriebenen Gerät geprüft.
Dennoch können Abweichungen nicht ausgeschlossen werden, so daß wir für die vollständige Übereinstimmung keine Gewähr übernehmen.

Technische Änderungen vorbehalten.

We have examined the content of the operating instructions for conformity with the appliance described.
Inconsistencies cannot be ruled out, however, with the result that we do not guarantee complete conformity

We reserve the right to alter the specifications without prior notice

F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

FILTER-FA-FG_06D E

1. Einleitung

1.1 Allgemeines

Die in dieser Betriebsanleitung dokumentierten Druckluftfilter erfüllen alle Anforderungen, die an moderne Filtersysteme gestellt werden.
Um Sie optimal nutzen zu können, benötigt der Anwender ausführliche Informationen.

In der vorliegenden Betriebsanleitung haben wir diese Informationen möglichst vollständig und in entsprechende Kapitel gegliedert zusammengestellt.

Lesen und beachten Sie diese Informationen.
Sie helfen Ihnen auch Unfälle zu vermeiden.

1.2 Erklärung der Symbole in der Bedienungsanleitung

• Aufzählungen werden mit diesem Punkt oder Sternchen
* gekennzeichnet.

⚠ Mit diesem Symbol werden Textstellen gekennzeichnet, die unbedingt zu beachten sind.

- Wichtige Sicherheitshinweise
- Wichtige Bedienungs-/Wartungshinweise
- Warnung vor möglichen Fehlbedienungen
- Warnung vor Gefahren

⚠ Elektrisches Gefahrensymbol

Ausführende Tätigkeit.
Vom Bediener auszuführende Bedienschritte.

1.3 Erklärung der Symbole am Gerät

Automatischer Kondensatablaß / Automatic Condensate Drain

Elektroanschluß / Electrical Supply

1. Introduction

1.1 General remarks

The compressed air filters documented in these instruction manual has all requirements that can be expected from a modern filter/ -system.
In order to obtain maximum benefit from using the filters/ -system the user should have sufficient information.

These instruction manual gave the user this information which has been divided into separate sections for easy reference.

Please read carefully before installing and operating the filter/ -system.

1.2 Explanation to the symbols in the instruction manual

• Technical data or instructions.
*

⚠ Parts that require absolute attention

- Vital safety instructions
- Essential operation and maintenance instructions
- Warnings on handling or moving the dryer
- Danger areas

⚠ Electrical danger symbol

Changes sequence of operation

1.3 Symbols used in the filter

Drucklufteintritt / Compressed Air Inlet

Druckluftaustritt / Compressed Air Outlet

F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

FILTER-FA-FG_06D E

2. Sicherheitsregeln, Warnhinweise

2.1 Bestimmungsgemäßer Gebrauch

Achtung!

- Die Filter dürfen nur für die in dieser Bedienungsanleitung vorgesehenen Einsatzfälle zur Aufbereitung von Druckluft verwendet werden.
- Der einwandfreie und sichere Betrieb der Produkte erfordert sachgerechten Transport, Lagerung, Aufstellung und Montage, sowie sorgfältige Bedienung und Instandhaltung.

2.2 Sicherheitsregeln

Warnung!

- Die Filter dürfen nur von qualifiziertem Personal genutzt, bedient, gewartet oder instandgesetzt werden.
- Qualifiziertes Personal im Sinne der sicherheitsbezogenen Hinweise in dieser Dokumentation oder auf dem Produkt selbst, ist Personal das:

* im Umgang mit Einrichtungen der Druckluft vertraut und unterwiesen sowie über die damit verbundenen Gefahren unterrichtet ist.
* Den auf die Bedienung bezogenen Inhalt dieser Dokumentation kennt.
* Es besitzt als solches eine zur Inbetriebnahme und Wartung derartiger Einrichtungen befähigende Ausbildung bzw. Berechtigung.

2. Safety rules, warnings

2.1 Use of filter/ -system

Achtung!

- The filter must only be used for the purpose as designated in the instruction manual to upgrading the compressed air.
- To obtain maximum efficiency and operation of the filter/ -system ensure all sections of the manual are read carefully.

2.2 Safety rules

Warning!

- The filter/ -system must only be used, operated, inspected and repaired by trained personnel.
- Trained personnel are defined as follws:

* Operating staff who are skilled in the field of compressed air engineering and who are familiar with the filter/ -system and possible dangers in unauthorised operation or service.
* Who can interpret and action the contents of this operation instruction manual.
* Who have had the appropriate training and qualified as being competent in these fields.

F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

2. Sicherheitsregeln, Warnhinweise

2.3 Warnhinweise

Warnung!

Das (die) Filter beinhalten unter erhöhtem Druck stehende Systeme.
Vor Servicearbeiten sind sie drucklos zu machen.

Warnung!

Filtersysteme mit elektrisch gesteuerten Kondensatableitern enthalten unter elektrischer Spannung stehende Bauteile.
Vor Servicearbeiten sind diese allpolig vom elektrischen Spannungsversorgungsnetz zu trennen.
(Netzstecker ziehen, Hauptschalter ausschalten)

ACHTUNG!
Alle Arbeiten am elektrischen System dürfen nur von elektrotechnisch geschultem Fachpersonal, oder unter Aufsicht von diesem, durch Unterwiesene ausgeführt werden.

Hinweis!

Die Filter sind ausschließlich zur Aufbereitung von Druckluft einzusetzen.

ACHTUNG!
Die Verwendung in Verbindung mit brennbaren Gasen ist verboten!

ACHTUNG!

Filter/ -systeme zur Aufbereitung von Atemluft dürfen nur nach Genehmigung des Herstellers der Filter/ -systeme eingesetzt und betrieben werden.

2. Safety rules, warnings

2.3 Security-warnings

Warning!

The filter/ -system contains components under high pressure.
Before starting any service work turn off compressed air supply to the dryer and depressurise the system.

Warning!

The filter/ -systems with electrical condensate discharger contains components that are electrically live and which can cause danger to life.
Before starting any service work ensure all power is isolated from the filter/ -system, mains isolator to be off, mains plug if fitted to be removed.

ATTENTION!
Any electrical work on the dryer must only be carried out by skilled staff - qualified electricians, or persons under supervision of qualified staff.

Remark!

Use filter for compressed air applications only.

Attention!
The use of combustible gases is prohibited.

ATTENTION!

Filter/ -systems for breathing air applications must be approved from manufacturer.

F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

FILTER-FA-FG_06D E

3. Technische Daten

3. Technical data

MODELL BEZEICHNUNG / MODEL DESIGNATION		Volumenstrom Capacity	Anschluß Connection	Betriebsduck Working Pressure	Abmessungen Dimensions		Gewicht Weight	AUSTAUSCH-FILTERELEMENTE FILTER REPLACEMENT CARTRIDGE		
FILTER-GRAD / GRADE	FILTER-GEHÄUSE / HOUSING	[m³/min]	[ ]	[max]	Höhe / Hight [mm]	Breite / Width [mm]	[kg]	FILTER-GRAD / GRADE	FILTER-GEHÄUSE / HOUSING	Anzahl Quantity
MODUL-BAUWEISE / MODULAR SYSTEM										
FA	-6	0,58	3/8"	16	siehe Kapitel „Maßzeichnung"	105	siehe Kapitel „Maßzeichnung"	E-A-	-6	1
	-10	1,00	1/2"	16		105			-10	1
	-18	1,75	1/2"	16		105			-18	1
	-28	2,83	3/4"	16		133			-28	1
FB	-48	4,83	1"	16		133		E-B-	-48	1
FC	-71	7,10	1-1/2"	16	see chapter „dimensional drawing"	164	see chapter „dimensional drawing"	E-C-	-71	1
	-107	10,7	1-1/2"	16		164			-107	1
	-138	13,8	2	16		194			-138	1
FD	-177	17,7	2-1/2"	16		194		E-D-	-177	1
	-221	22,1	2-1/2"	13		194			-221	1
BEHÄLTER-BAUWEISE / PRESSURE VESSEL										
FE	-185	18,5	DN80	16	1025	350	siehe Kapitel „Maßzeichnung"	E-E-	-185	1
FF	-283	28,3	DN80	16	1045	400		E-F-	-283	2
	-354	35,4	DN80	16	1045	400			-185	2
FG	-526	52,6	DN100	16	1085	440	see chapter „dimensional drawing"	E-G-	-185	3
	-708	70,8	DN100	16	1105	535			-185	4
	-885	88,5	DN100	16	1105	535			-185	5
	-1420	142	DN150	16	1215	600			-185	8
	-1950	195	DN150	16	1245	720			-185	11
	-2480	248	DN150	16	1245	750			-185	14

- Volumenstrom m³/h bezogen auf +20°C und 1 bar absol ut, bei Betriebsüberdruck 7 bar / Air flow m³/h based on +20°C and 1 bar absolute, at working pressure 7 bar
- Größere Betriebsdrücke auf Anfrage / Contact factory for dryers with a higher working pressure
- Filtergehäuse F-185 – F-2480: Konstruktion der Behälter entspricht der EG-Richtlinie 87/404/EEC für einfache Druckbehälter und ist mit CE-Zeichen versehen / Filter bowls F-185 – F-2480: Vessel construction complies with directive 87/404/EEC, simple pressure vessels, and is marked with the EC symbol

Volumenstrom - Korrekturtabelle / Sizing

Minimaler Betriebsdruck / Minimum working pressure bar	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Korrekturfaktor / Correction factor	0,38	0,52	0,63	0,75	0,88	1,00	1,13	1,26	1,38	1,52	1,65	1,76	1,87	2	2,14

Auslegung
Bei Drücken abweichend von 7 bar berechnet sich der max. Volumenstrom wie folgt:
den Korrekturfaktor des entsprechenden minimalen Betriebsdruckes mit dem gewählten Volumenstrom aus o.g. Tabelle multiplizieren.

Based on
To find the maximum flow at pressures other than 7 bar:
multiply the flow (from table above) by the correction factor corresponding to the minimum working pressure of the filter.

Betriebsbedingungen:
Min. Betriebstemperatur: +1°C
Max. Betriebstemperatur: 66°C
Min. Betriebsdruck mit automatischem Kondensatableiter: 2,0 bar

Working conditions:
Min. Working temperature: +1°C
Max. Working temperature: 66°C
Min. working pressure with automatic condensate drain: 2,0 bar

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D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

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4. Funktionsbeschreibung

4.3 Serie FC

1-MIKRON-COALESCING-FILTER

- Zweistufige Tiefenfiltration bewirkt hervorragende Leistung und höhere Standzeiten des Filterelementes
- Entfernt 100% des Kondensats
- Entfernt Feststoffpartikel bis herunter zu 1 Mikron
- Restölgehalt < 1 ppm w/w
- Automatischer Kondensatableiter
- Differenzdruckanzeige am Filtergehäuse
- max. Flüssigkeitsbeladung: 2g/m³

Anwendungen:

- Allgemeine Filter für Werkstattluft
- Vorfilter für Hochleistungsfilter
- Nachfilter für Adsorptionstrockner
- Endstellenfiltration bei Einsatz von Nachkühlern oder Trocknern

Funktion:

Die Luft tritt von oben in das Filterelement FC ein und strömt radial durch den perforierten inneren Stützmantel zur 1. Filtrationsstufe. Diese Stufe besteht aus mehreren Lagen Glasfiber und einer stützenden Glasfasermatte. Gröbere Feststoffteilchen werden hier zurückgehalten. Die Luft gelangt nun in die 2. Filtrationsstufe, bestehend aus einer mehrlagigen Mischung von imprägnierten Glasfasern und Mikrofibern. In beiden Stufen werden Feststoffpartikel und Flüssigkeiten nach dem Prinzip der Tiefenfiltration sowie des Coalescings ausgefiltert. Die Luft tritt durch den perforierten äußeren Stützmantel aus.

4. Description of operation

4.3 Series FC

1-MICRON-COALESCING-FILTER

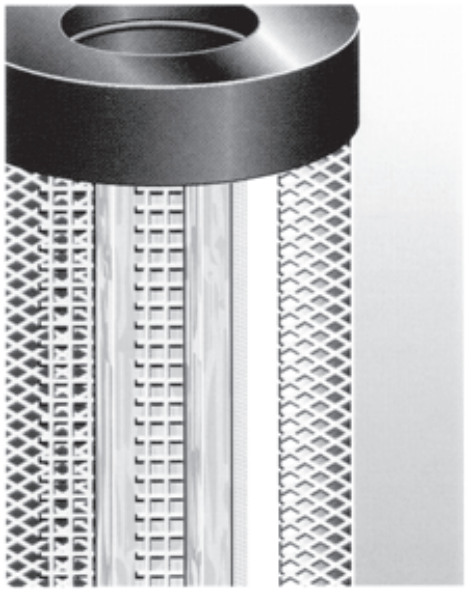
- Two in-depth filter beds offer superior performance and extended cartridge life
- Removes 100% of liquid water
- Removes solid particles down to 1 micron
- Oil content < 1 ppm w/w
- Automatic condensate drain
- Differential pressure indicater at the filter housing
- max. liquid load: 2g/m³

Application:

- General filter for shop air
- Prefilter for high efficiency filters
- Afterfilter for pressure-swing desiccant dryers
- Point-of-use filter on systems utilising aftercoolers or dryers

Operation:

Air enters the inside of the cartridge FC and flows outwardly through two in-depth beds of glass fibres. Larger particles are collected in the first bed while all remaining particles one micron and larger are collected in the second bed. A combination of large void areas and stabilized media allows heavy particulate loading and low pressure drop resulting in a long service life for the cartridge. Throughout both stages, liquid aerosols are captured and coalesced. The coalesced liquids then drain to the bottom of the cartridge for removal.



F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

FILTER-FA-FG_06D E

4. Funktionsbeschreibung

4.5 Serie FE

0,01-MIKRON-COALESCING-FILTER
(bei 0,01 ppm w/w max. Ölgehalt)

DUO-System Abscheidung
1. Stufe: flüssige Bestandteile
2. Stufe: Ölbestandteile

- Entfernt mehr als 99,99% der Öl-Aerosole
- Entfernt Feststoffpartikel bis herunter zu 0,01 Mikron
- Restölgehalt < 0,01 ppm w/w
- Automatischer Kondensatableiter
- Differenzdruckanzeige am Filtergehäuse
- max. Flüssigkeitsbeladung: 1g/m³

Anwendungen:

- Vorfilter für Membrantrockner
- Vorfilter für Adsorptionstrockner
- Endstellenfiltration (falls **geringfügige** Feuchtigkeit vorhanden ist)

Funktion:

Die Luft tritt von oben in das Filterelement FE ein und strömt durch den inneren Stützmantel, radial durch verschiedenartige Lagen Fiberglas. Dann strömt die Luft durch ein weiteres Sieb. In dieser 1. Filtrationsstufe werden größere Partikel entfernt. In der zweiten Filtrationsstufe werden Aerosole und feste Bestandteile durch eine Mehrschicht-Membranwand aus epoxidharz verstärktem Fiberglas gefiltert, daß speziell für feinste Aerosole geeignet ist. Das Filtermedium ist ein Bett aus submikrofeinen Glasfasern und wirkt nach dem Prinzip des Coalescings sowie der Tiefenfiltration. Der innere Schaumstoffmantel gleicht Luftschwankungen und Aerosolkonzentrationen aus und gewährleistet eine gleichmäßige Verteilung. Im äußeren Schaumstoffmantel werden die Öltröpfchen gesammelt, fließen durch Schwerkraft in den unteren Teil des Filters und tropfen dann in den Filterbehälter ab.

4. Description of operation

4.5 Series FE

0,01-MICRON-COALESCING-FILTER
(at 0,01 ppm w/w max. oil content)

DUO-system separation
1. Stage: liquid particles
2. Stage: oil particles

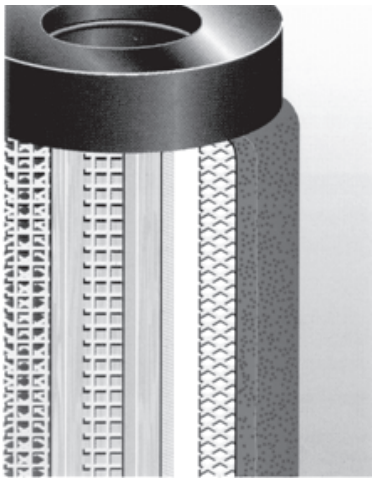
- Removes more than 99,99% of oil aerosols
- Removes solid particles down to 0,01 microns
- Oil content < 0,01 ppm w/w
- Automatic condensate drain
- Differential pressure indicater at the filter housing
- max. liquid load: 1g/m³

Application:

- Prefilter for membrane dryers
- Prefilter for pressure-swing desiccant dryers
- Point-of-use filter (may be used if light liquid load is present)

Operation:

Air enters the inside of the cartridge FE and flows through an inner foam sleeve, radially outward through various layers of glass fibers. Then the air flows through another screen. In the first stage filter section the larger solid particles are trapped. In the second stage filter section aerosols and solid particles are trapped using a multi-layered membrane wall made of epoxy resin-reinforced glass fibres which was especially designed for the finest aerosols.
The filter media is a bed of submicronic glass fibers and works to the principle of coalescing and in-depth filtration. The inner foam sleeve compensates air cycling and aerosol concentrations and maintains uniform distribution. The outer foam sleeve collects the coalesced oil droplets which then, due to gravity, travel downstream to the bottom of the sleeve and drain to the bottom of the filter bowl.



F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

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7. Montage

7.1 Montageort

Das Filter/ -system sollte in einem trockenen, frostfreien Innenraum installiert werden.
Zur Wartung ist genügend Freiraum vorzusehen.

7.2 Montage

Das Filter/ -system ist senkrecht so zu montieren, daß der Druckluft-ein- und austritt waagerecht erfolgt.

Im Filtergehäuse eingebaute Filterelemente können sich während des Transportes lösen.
Prüfen Sie den richtigen Sitz der Filterelemente vor der Inbetriebnahme.

ACHTUNG!
Achten Sie bei der Montage darauf, daß keine Zug- und Druckkräfte auf die Geräteanschlüsse übertragen werden.

Hinweis!
Bei den Standard-Filtern FB, FC, FE und FF der Größe -185 & -283 ... -2480, den D-Pack-Basic-Filtern FB, FC, FE und FF, sowie den E-Pack-Filtern FA, FB, FC, FE und FF sind die Kondensatableiter beigepackt und müssen wie in Kapitel 11. „Maßzeichnung“ angebaut werden.

7.3 Anschluß an das Druckluftnetz

Die Druckluftein und -austrittsleitung sollte für Servicezwecke mit einem Bypass versehen werden.
Die Dimensionierung der Anschlüsse entnehmen Sie bitte dem Kapitel 3. „Technische Daten“.

ACHTUNG!
Durchflußrichtung beachten.
Druckluftein- und austritt dürfen nicht vertauscht werden.

7.4 Kondensatableitung

Für die automatische Kondensatableitung ist bei den Filtern (FA, FB, FC, FE, FF) ein Anschluß vorhanden.
Die Dimensionierung des Anschlusses entnehmen Sie bitte Kapitel 5. „Kondensatableiter“.

Achten Sie bei der Montage der Kondensatableitung darauf, daß das abgeschiedene Kondensat ungehindert abfließen kann.

HINWEIS!
Bei der Entsorgung des Kondensats ist der Schmutzanteil zu berücksichtigen.
Beachten Sie die jeweils geltenden gesetzlichen Vorschriften.

Bei den Filtern FD, FG entfällt der Kondensatableitungsanschluß.

7. Mounting

7.1 Location of mounting

The filter/ -system should be installed in a dry and frost-proof room indoors.
Ample free, space should be allowed for the maintenance.

7.2 Mounting

Mount the filter/ -system so that inlet and outlet connections are horizontal (filter bowl vertical).

Cartridges installed in the filter housing may become dislodged during transport.
Make sure that the cartidge is correctly installed before use.

ATTENTION!
When installing the filter/ -system ensure all connections are even and no pressure is placed on inlet and outlet connections.

Remark!
By the standard-filter FB,FC,FE and FF with the size -185 & -283 ... -2480, by the D-pack-basic-filter FB, FC, FE, FF and by the E-pack-filter FA, FB, FC, FE and FF the condensate drains are attached and must mount as shown in chapter 11. „Dimensional drawing“.

7.3 Connection to the compressed air system

The compressed air inlet and outlet line should be equipped with a by-pass system for the maintenance.
For the sizing of the connections please see chapter 3. „Technical data“.

ATTENTION!
Pay attention to the flow direction.
Do not exchange the compressed air inlet and outlet.

7.4 Condensate drain

The filters (FA, FB, FC, FE, FF) are equipped with one connection for the automatically condensate drain.
For the sizing of the connection please see chapter 5. „Condensate discharger“.

When fitting the drains please see to it, that the condensate separated is drained off into a system that does not create a back pressure.

Instruction!
When disposing of the condensate the amount of pollution has to be taken into consideration. Please act according to the prevailing regulations of law.

Condensate drain does not exist in filters FD, FG.

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D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

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8. Inbetriebnahme, Betrieb

8.1 Bereitschaft zur Inbetriebnahme

⚠ **Druckluftfilter/ -systeme sind bereit zur Inbetriebnahme, wenn:**

- Der auf dem Typenschild angegebene Druck dem maximalen Betriebsdruck entspricht.
- Sie entsprechend Kapitel 7. „Montage“ installiert wurden.
- Alle Zu- und Ableitungen sachgerecht angeschlossen sind.
- Die erforderlichen Energien (Druckluft) verfügbar sind.
- Absperrorgane (z.B. Ventil, Kugelhahn) in der Drucklufteinund austrittsleitung geschlossen sind.
- Kondensat durch die Kondensatableitung ungehindert abfließen kann.
- Der elektrisch gesteuerte Kondensatableiter an das elektrische Spannungsversorgungsnetz mit der richtigen Betriebsspannung angeschlossen ist. (Nur bei elektrisch gesteuerten Kondensatableitern)
- Das Filter/ -system mit den richtigen Filterelementen ausgerüstet ist.

8.2 Inbetriebnahme, Betrieb

⚠ **Vor der Inbetriebnahme ist sicherzustellen, daß alle Bedingungen des Abschnittes 8.1 „Bereitschaft zur Inbetriebnahme“ erfüllt sind.**

☞ Setzen Sie das Filter/ -system durch langsames Öffnen der Drucklufteintritts- und austrittsleitung unter Druck.

☞ Schließen Sie das Absperrorgan im Bypass (falls vorhanden).

⚠ **Das Filter/ -system ist nun in BETRIEB.**

8. Start-up, operation

8.1 Preconditions for starting the dryer

⚠ **The filter/ -system is ready for starting when:**

- Check unit serial number tag to verify working pressure.
- They has been installed in accordance with section 7. „Mounting“.
- All inlet and outlet lines have been correctly connected.
- The required forms of energy (compressed-air) are available.
- The shut-off devices (e.g. ball valve) in the compressed-air inlet and outlet lines are closed.
- The condensate is able to flow through the condensate discharger without obstruction.
- The electrical condensate drain has been connected to the electric power supply system with the correct operating voltage (only electrical condensate drains).
- The filter/ -system is equipped with the right cartridges.

8.2 Start up, operation

⚠ **Before starting the dryer, ensure that all the requirements specified in section 8.1 „Preconditions for starting the dryer“ have been fulfilled.**

☞ Place filter/ -system under pressure gradually by slowly opening the compressed air inlet/outlet.

☞ Close the shut-off device in the bypass (if installed).

⚠ **The filter/ -system is now OPERATIVE.**

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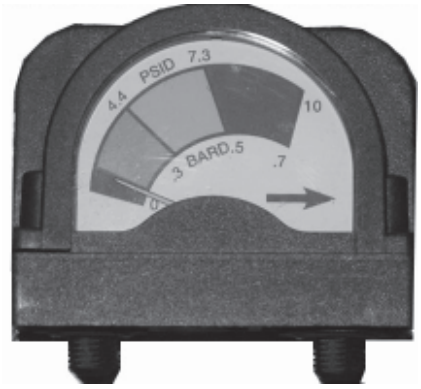
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

8. Inbetriebnahme, Betrieb

8.3 Differenzdruckanzeige-Standard und D-Pack (OPTION)



Die Differenzdruckanzeige informiert als Störanzeige über eine atypische Verschmutzung.

⚠ **Unabhängig von der Differenzdruckanzeige müssen die Filterelemente gemäß der Wartungsintervalle gewechselt werden. (Siehe Kapitel 9)**

⚠ **Das Filter FG benötigt keine Differenzdruckanzeige.**

8. Start-up, operation

8.3 Differential pressure indicator-standard and D-Pack (OPTION)

The differential pressure indicator indicates atypical contamination.

⚠ **We recommend installing a new filter cartridge according to the maintenance periods. (See chapter 9)**

⚠ **The FG filter does not require a differential pressure gauge.**

F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

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9. Wartung Austausch der Filterelemente

9.1 Standzeit der Filterelemente

Die Standzeit der Filterelemente ist abhängig von der Beladung. Mit steigender Beladung der Elemente erhöht sich der Differenzdruck über den Filter.
Die Filterelemente müssen gemäß unten stehender Tabelle gewechselt werden.

9.2 Austausch der Filterelemente

Filtergehäuse -6 bis -221

Anzahl der Filterelemente siehe Kapitel 4. „Technische Daten".

WARNUNG!

- Verwenden Sie keine Werkzeuge! (Filtergehäuse -6 bis -48)
- Öffnen und Schließen Sie das Filter nicht mit Gewalt.
- Das (die) Filter beinhaltet(n) unter erhöhtem Druck stehende Systeme.
  Vor Servicearbeiten sind sie drucklos zu machen.

Absperrvorrichtung im Druckluftein- und -austritt schließen.

Kondensatableitungsschlauch an **(1)** lösen.
(Nur bei FB, FC, FE, FF).

Rändelschraube **(1)** langsam im Uhrzeigersinn lösen.
Das Filtergehäuse wird entlüftet.

Wartungsintervalle / Maintenance-intervals

Wartungsteil Part of maintenance	Type	Anwendung Application	Wartungs-Intervall Maintenance-interval
Filter-Elemente / filter cartridges	FB, FC	Vorfilter Pre-filter	6.000 Bh, max. 1 Jahr / 6.000 Bh, max. 1 year
	FE, FF	Microfilter	3.000 Bh, max. 1 Jahr/ 3.000 Bh, max. 1 year
	FEG	Filterkombination Filter combination	3.000 Bh, max. 1 Jahr (Type FE) 3.000 Bh, max. 1 year Type (FE)
			1.000 Bh, max. 1 Jahr (Type FG) 1.000 Bh, max. 1 year Type (FG)
	FFG		1.000 Bh, max. 1 Jahr/ 1.000 Bh, max. 1 year
	FD	Nachfilter After-filter	6.000 Bh, max. 1 Jahr/ 6.000 Bh, max. 1 year
	FG	Aktivkohlefilter Act.carbon filter	1.000 Bh
Kondensatableiter / condensate drain	Service-unit	Vorfilter Pre-filter	6.000 Bh
	Service-unit	Microfilter	6.000 Bh
	Service-unit	Filterkombination Filter combination	6.000 Bh

Bh = Kompressor-Betriebsstunden / Working hours

9. Servicing, filter cartridge replacement

9.1 Serviceable life of cartridge

The cartridge's serviceable life depends upon the degree of contamination. As the cartridge becomes more contaminated, the differential pressure above the filter increases.
The filterelements must be changed according to the table below.

9.2 Replacing the cartridge

Filter housing -6 to -221

Number of cartridges see chapter 4. „Technical data".

CAUTION!

- Do not use any tools (filter housings -6 to -48)
- Do not force the filter open or closed.
- The filter(s) contain(s) systems under high pressure.
  All pressure must be let off before servicing.

Close the shut-off device in the compressed air inlet/outlet.

Loosen condensate drain hose at **(1)** (only on FB, FC, FE, FF models).

Slowly turn the knurled screw **(1)** clockwise. This will release the air from the housing.

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D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

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9. Wartung
Austausch der Filterelemente

Filtergehäuse entfernen.

- **Filtergehäuse -6 bis -48 (Bajonett-Verschluß)**
  * Das Filtergehäuse nach oben, gegen den Filterkopf drükken.
  * Dann das Filtergehäuse im Uhrzeigersinn langsam gegen den Anschlag drehen (etwa 1/8 Drehung) und nach unten abziehen.

- **Filtergehäuse -71 bis -221 (Gewinde-Verschluß)**
  * Schrauben Sie das Filtergehäuse gegen den Uhrzeigersinn (per Hand oder mit Hilfe eines Filterschlüssels) auf.

Filterelement gemäß unten stehender Skizze abziehen, bzw. wechseln.

Hinweis: Die Schaumstoffummantelung der Filterelemente Serie FE, FF und FG dürfen nicht mit den Fingern angefaßt werden.

Filtergehäuse in umgekehrter Reihenfolge zusammenbauen.

Filter durch langsames Öffnen der Absperrvorrichtung wieder mit Druck beaufschlagen.

Filtergehäuse -185 bis -2480

Anzahl der Filterelemente siehe Kapitel 3. „Technische Daten".

WARNUNG!

- Das (die) Filter beinhaltet(n) unter erhöhtem Druck stehende Systeme.
  Vor Servicearbeiten sind sie drucklos zu machen.

9. Servicing, filter cartridge replacement

Remove housing.

- **Housing -6 to -48 (bayonet-style head)**
  * Push housing upwards against the filter head.
  * Then slowly turn the housing clockwise to the stop (about 1/8 of a turn) and remove by pulling downwards.

- **Housing -71 to -221 (threaded head)**
  * Screw off the housing counter-clockwise (by hand or using a filter wrench).

Remove and replace cartridge as shown below.

Please note: Do not touch the foam sleeves of the cartridges from the FE, FF and FG series with your fingers.

Re-assemble the housing in the reverse order.

Place filter under pressure again by slowly opening the shut-off device.

Housing -185 to -2480

Number of cartridges see chapter 3. „Technical data".

CAUTION!

- The filter(s) contain(s) systems under high pressure.
  Alle pressure must be let off before servicing

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D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

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9. Wartung Austausch der Filterelemente

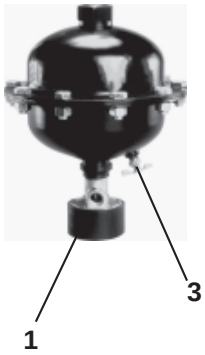
- Absperrvorrichtung im Druckluftein- und -austritt schließen.
- Kondensatableitungsschlauch an **(1)** lösen. (Nur bei FB, FC, FE, FF).
- Um das Filtergehäuse zu entlüften müssen Sie beim:
  - Kondensatableiter Nr. 30505 und Nr. 30506 die Entlüftungsschraube **(3)** entgegen dem Uhrzeigersinn lösen.
  - FG den Kugelhahn **(5)** öffnen.
- Schrauben der Flanschverbindung am Boden des Filtergehäuses vorsichtig lösen, da evtl. noch ein geringer Restdruck im System vorhanden ist.
- Schrauben bis auf eine entfernen und Flansch zur Seite schwenken.
- Filterelemente entgegen dem Uhrzeigersinn herausschrauben.
- Neue Filterelemente ohne Werkzeug „fingerfest“ einschrauben.

  Hinweis: Die Schaumstoffummantelung der Filterelemente Serie FE, FF, FG dürfen nicht mit den Fingern angefaßt werden.
- Filtergehäuse in umgekehrter Reihenfolge schließen.
- Filter durch langsames Öffnen der Absperrvorrichtungen wieder mit Druck beaufschlagen.

9. Servicing, filter cartridge replacement

- Close shut-off device in compressed air inlet/outlet.
- Loosen condensate drain hose at **(1)** (only on FB, FC, FE, FF models).
- Follow these steps to release the air from the housing:
  - for condensate drain no. 30505 and no. 30506, loosen the bleed screw **(3)** in counter-clockwise direction.
  - on FG models, open the ball valve **(5)**.
- Gently loosen the screws at the bottom flange of the housing. Caution is necessary as the system may still be under slight residual pressure.
- Remove all screws except one and swing flange to the side.
- Screw out cartridge counter-clockwise.
- Screw in new cartridge by hand until „handtight“. Do not use a wrench.

  Please note: Do not touch the foam sleeves of the cartridges from the FE, FF, FG series with your fingers.
- Close housing in reverse order.
- Place filter under pressure again by slowly opening the shut-off device.



F0507	05.03.07	KC	05.03.07	KC	F0412	
D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

FILTER-FA-FG_06D E

9. Wartung Austausch der Filterelemente

9.3 Austausch der Schwimmerableiter / ECO-DRAIN Service-unit / ECO-DRAIN Membransätze

Die Kondensatableiter / Wartungspakete sind gemäß unten aufgeführter Tabelle regelmäßig zu wechseln.

Nähere Informationen finden Sie auch im Anhang ECO DRAIN.

9. Servicing, filter cartridge replacement

9.3 Changing of Float drain / ECO-DRAIN Service-unit / ECO-DRAIN membrane set

The condensate drains / service packages must be changed according to the table below.

For more details please see annexe ECO DRAIN.

Wartungsteil **Part of maintenance**	**Wartungs-Intervall** **Maintenance-interval**
Schwimmer-Kondensatableiter/ Float drain	3.000 Bh
Service-Unit (ECO DRAIN 30/31)	6.000 Bh
ECO DRAIN Verschleißteilsatz (ECO DRAIN 13/14) ECO DRAIN wearing part set (ECO DRAIN 13/14)	6.000 Bh

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D-Name	erstellt	Name	gepr.	Name	ersetzt f.	ersetzt d.

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10. Garantiebedingungen

10.1 Allgemeines

Die Garantie erstreckt sich, im Rahmen unserer allgemeinen Lieferbedingungen, auf das gelieferte Filter/-system.

10.2 Garantieausschluß

Garantieansprüche bestehen nicht,

- wenn das Filter/ -system durch Einfluß höherer Gewalt oder durch Umwelteinflüsse beschädigt oder zerstört wird.
- bei Schäden, die durch unsachgemäße Behandlung, insbesondere Nichtbeachtung der Betriebs- und Wartungsanleitung aufgetreten sind (regelmäßige Kontrolle des Kondensatableiters / regelmäßiger Wechsel der Filterelemente).
- falls das Filter/ -system nicht seinen Bestimmungen entsprechend eingesetzt war (siehe Kapitel 3. „Technische Daten“).
- falls das Filter/ -system durch nicht hierfür autorisierte Werkstätten oder andere Personen unsachgemäß geöffnet oder repariert wurde und/oder mechanische Beschädigungen irgendwelcher Art aufweist.

10. Guarantee conditions

10.1 General

The guarantee covers the delivered device with regard to our general terms of delivery.

10.2 Exclusion from guarantee coverage

No guarantee claims shall be assertible,

- if the filter/ -system is damaged or destroyed due to force majeurs or environmental effects.
- for damage resulting from incorrect handling, in particular failure to comply with the operating and maintenance instructions (regular inspection of the condensate discharger, regular change of the filter cartridges).
- if the filter/ -system has not been used in accordance with its specifications (see section 3. „Technical data“).
- if the filter/ -system has been opened or repaired by workshops or other persons unauthorised for this purpose and/or reveals any type of mechanical damage.

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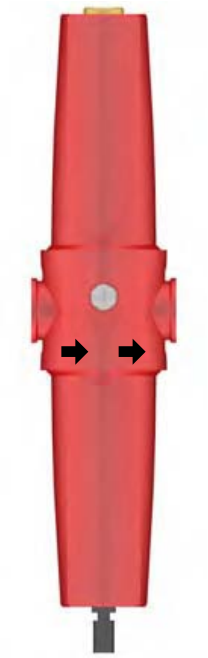
FILTER-FA-FG_06D E

13.8 Option dc
Operating instructions for compressed air filter (fresh air filter)

domnick hunter



AC010 - AC030

OIL-X EVOLUTION

Original Language (EN) **OIL VAPOUR & ODOUR REMOVAL FILTERS**

(NL) OLIEDAMP & GEUR VERWIJDERINGSFILTERS
(FR) FILTRES D'ÉLIMINATION DES ODEURS ET DES VAPEURS D'HUILE
(SV) FILTER FÖR AVLÄGSNING AV OLJEÅNGOR OCH LUKT
(DA) FILTER FÖR AVLÄGSNING AV OLJEÅNGOR OCH LUKT
(ES) FILTROS DE ELIMINACIÓN DE OLORES Y VAPORES DE ACEITE
(IT) FILTRI PER L'ELIMINAZIONE DEGLI ODORI E DEI VAPORI D'OLIO
(SK) FILTRE NA ODSTRAŇOVANIE OLEJOVÝCH VÝPAROV A ZÁPACHU
(ET) ÕLISUDU JA -HAISU EEMALDUSFILTRID
(LV) EĻĻAS TVAIKU UN AROMĀTA NOVĒRŠANAS FILTRI
(RU) ФИЛЬТРЫ ДЛЯ УСТРАНЕНИЯ ЗАПАХА И ПАРОВ МАСЛА
(TR) YAĞ BUHARI VE KOKUSU GİDERİCİ FİLTRELER
(DE) FILTER ZUM ENTFERNEN VON ÖLNEBEL UND GERÜCHEN
(FI) ÖLJYHÖYRYN JA HAJUN POISTOSUODATTIMET
(NO) OLJEDAMP- OG OLJELUKTFJERNINGSFILTRE
(EL) ΦΙΛΤΡΑ ΑΦΑΙΡΕΣΗΣ ΑΤΜΩΝ & ΟΣΜΩΝ ΛΑΔΙΟΥ
(PT) VAPOR DO ÓLEO E FILTROS DE REMOÇÃO DOS CHEIROS
(PL) FILTRY DO USUWANIA OPARÓW I ZAPACHU OLEJU
(CS) OLEJOVÉ A PROTIPACHOVÉ FILTRY
(HU) OLAJGŐZ- ÉS SZAGELTÁVOLÍTÓ SZŰRŐK
(LT) ALYVOS GARŲ IR KVAPO ŠALINIMO FILTRAI
(SL) FILTRI ZA ODSTRANJEVANJE OLJNIH HLAPOV IN VONJAV
(MT) FILTRI LI JNEĦĦU L-FWAR TAŻ-ŻJUT U L-IRWEJJAĦ

1 FILTER-DH-OIL-XEVOLUTION 01

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Warning

- Highlights actions or procedures, which if not performed correctly, may lead to personal injury or death.
- Benadrukt de acties of procedures die, indien niet juist uitgevoerd, lichamelijk letsel of de dood kunnen veroorzaken.
- Weist auf Aktionen oder Verfahren hin, die bei fehlerhafter Durchführung zu Verletzungen und tödlichen Unfällen führen können.
- Met en relief les actions ou procédures qui, si elles ne sont pas exécutées correctement, peuvent entraîner des dommages corporels ou la mort.
- Osoittaa toimenpiteitä tai menettelytapoja, jotka väärin suoritettuina saattavat aiheuttaa henkilövahingon tai kuoleman.
- Anger åtgärder och metoder som kan orsaka personskador eller dödsfall om de inte utförs korrekt.
- Fremhever handlinger eller prosedyrer som kan føre til personskade eller dødsfall hvis de ikke utføres på korrekt måte.
- Fremhæver handlinger eller fremgangsmåder, som kan medføre personskade eller dødsfald, hvis de ikke udføres korrekt.
- Επισημαίνει τις ενέργειες ή τις διαδικασίες, οι οποίες αν δεν πραγματοποιηθούν σωστά, μπορεί να οδηγήσουν σε τραυματισμό προσωπικού ή σε θάνατο
- Destaca acciones o procedimientos que, de no realizarse correctamente, pueden ocasionar daños personales o la muerte.
- Realça as acções ou procedimentos que, se não forem executados correctamente, poderão provocar danos pessoais ou morte.
- Segnala azioni o procedure che, se non eseguite correttamente, comportano il rischio di infortuni o morte.
- Wskazuje działania i procedury, które w razie niewłaściwego wykonania mogą prowadzić do obrażeń ciała lub śmierci.
- Zvýrazňuje činnosti alebo postupy, ktoré môžu v prípade nesprávneho vykonania viesť zraneniu alebo usmrteniu.
- Upozorněnní na činnosti nebo postupy, jejichž nesprávné provádění může vést ke zranění nebo usmrcení osob.
- Tõstab esile toimingud või protseduurid, mis väära teostamise korral võivad põhjustada kehavigastusi või surma.
- Olyan műveleteket vagy eljárásokat jelöl, amelyek nem megfelelő módon történő végrehajtása súlyos vagy végzetes személyi sérülést okozhat.
- Uzsver darbības vai procedūras, kuru rezultātā, ja tās neveic pareizi, var izraisīt ievainojumus vai nāvi.
- Žymi veiksmus ar procedūras, kuriuos atlikus neteisingai, galima susižeisti ar mirti.
- Указывает на действия, ненадлежащее выполнение которых может привести к нанесению вреда здоровью или смерти
- Označuje dejanja ali postopke, ki lahko ob nepravilnem izvajanju poškodujejo človeka ali povzročijo smrt.
- Doğru bir şekilde yerine getirilmediği takdirde bu ürüne hasar verebilecek işlem ve süreçleri vurgular.
- Tissottolinea l-azzjonijiet jew il-proċeduri, li jekk ma jsirux kif suppost, jista' jkun hemm korriment jew mewt

Caution

- Highlights actions or procedures, which if not performed correctly, may lead to damage to this product.
- Benadrukt de acties of procedures die, indien niet juist uitgevoerd, schade kunnen berokkenen aan dit product.
- Weist auf Aktionen oder Verfahren hin, die bei fehlerhafter Durchführung zu Schäden am Gerät führen können.
- Met en relief les actions ou procédures qui, si elles ne sont pas exécutées correctement, peuvent endommager ce produit.
- Osoittaa toimenpiteitä tai menettelytapoja, jotka väärin suoritettuina saattavat vaurioittaa tätä laitetta.
- Anger åtgärder och metoder som kan orsaka skador på den här produkten om de inte utförs korrekt.
- Fremhever handlinger eller prosedyrer som kan føre til skade på produktet hvis de ikke utføres på korrekt måte.
- Fremhæver handlinger eller fremgangsmåder, som kan medføre beskadigelse af dette produkt, hvis de ikke udføres korrekt.
- Επισημαίνει τις ενέργειες ή τις διαδικασίες, οι οποίες αν δεν πραγματοποιηθούν σωστά, μπορεί να προκαλέσουν ζημιά στο προϊόν αυτό
- Destaca acciones o procedimientos que, de no realizarse correctamente, pueden ocasionar el deterioro del producto.
- Realça as acções ou procedimentos que, se não forem executados correctamente, poderão danificar este produto.
- Segnala azioni o procedure che, se non eseguite correttamente, comportano il rischio di danneggiare il prodotto.
- Wskazuje działania i procedury, które w razie niewłaściwego wykonania mogą powodować uszkodzenie produktu.
- Zvýrazňuje činnosti alebo postupy, ktoré v prípade nesprávneho vykonania môžu viesť k poškodeniu tohto výrobku.
- Upozorněnní na činnosti nebo postupy, jejichž nesprávné provádění může vést k poškození tohoto výrobku.
- Tõstab esile toimingud või protseduurid, mis väära teostamise korral võivad käesolevat toodet kahjustada.
- Olyan műveleteket vagy eljárásokat jelöl, amelyek nem megfelelő módon történő végrehajtása a termék károsodásához vezethet.
- Uzsver darbības vai procedűras, kuru rezultātā, ja tās neveic pareizi, var sabojāt šo izstrādājumu.
- Žymi veiksmus ar procedūras, kuriuos atlikus neteisingai, galima sugadinti šį gaminį.
- Указывает на действия, ненадлежащее выполнение которых может привести к повреждениям данного изделия
- Označuje dejanja ali postopke, ki lahko ob nepravilnem izvajanju poškodujejo izdelek.
- Doğru bir şekilde yerine getirilmediği takdirde yaralanma ya da ölüme yol açabilecek işlem ve süreçleri vurgular
- Tissottolinea l-azzjonijiet jew il-proċeduri, li jekk ma jsirux kif suppost, tista' ssir ħsara lil dan il prodott

- Suitable gloves must be worn.
- Geeignete Schutzhandschuhe tragen.
- Käytettävä asianmukaisia käsineitä.
- Bruk egnede hansker.
- Απαιτείται να φοράτε κατάλληλα γάντια
- Devem ser utilizadas luvas adequadas.
- Należy zakładać odpowiednie rękawice
- Kohustuslik kanda sobivaid kaitsekindaid
- Jāvalkā piemēroti cimdi.
- Работы должны проводиться в соответствующих перчатках
- Uygun eldiven giyilmelidir
- Altijd geschikte handschoenen dragen.
- Le port de gants adaptés est obligatoire.
- Använd lämpliga handskar.
- Der skal anvendes egnede handsker.
- Se deben llevar puestos guantes apropiados.
- Indossare guanti di protezione.
- Je nutné použít vhodné rukavice.
- Viseljen megfelelő védőkesztyűt.
- Reikia mūvėti tinkamas pirštines.
- Uporabiti je treba ustrezne rokavice.
- Għandhom jintlibsu ingwanti adatti

- Highlights the requirements for disposing of used parts and waste.
- Benadrukt de vereisten voor het weggooien van gebruikte onderdelen en afval.
- Weist auf die Anforderungen zur Entsorgung gebrauchter Teile und Abfall hin.
- Met en relief les consignes de mise au rebut des pièces usagées et des déchets.
- Osoittaa käytettyjen osien ja jätteen hävittämistä koskevia vaatimuksia.
- Anger de krav som ställs på bortskaffande av gamla delar och avfall.
- Fremhever kravene for avhending av brukte deler og avfall.
- Fremhæver kravene til bortskaffelse af udtjente dele og affald.
- Επισημαίνει τις απαιτήσεις απόρριψης των χρησιμοποιημένων εξαρτημάτων και των απορριμμάτων
- Destaca los requisitos para desechar las piezas usadas y los residuos.
- Realça os requisitos para eliminar as peças utilizadas e os desperdícios.
- Segnala i criteri per lo smaltimento di componenti usati e rifiuti.
- Wskazuje wymagania dotyczące usuwania zużytych części i odpadów.
- Zvýrazňuje požiadavky pre zneškodňovanie použitých dielov a odpadu.
- Upozorněnní na požadavky týkající se likvidace použitých dílů a odpadu.
- Tõstab esile kasutatud osade ja jääkide utiliseerimisele esitatavad nõuded
- A használt alkatrészek és a hulladék megfelelő módon történő elhelyezésére hívja fel a figyelmet.
- Uzsver prasības tam, kā atbrīvoties no lietotajām detaļām un atkritumiem.
- Žymi panaudotų dalių ir atliekų išmetimo reikalavimus.
- Указывает на требования по уничтожению использованных деталей и отходов
- Označuje zahteve za odlaganje rabljenih delov in odpadkov.
- Kullanılmış parçaların ve atıkların atılmasına ilişkin gereklilikleri vurgular
- Tissottolinea l-kundizzjonijiet biex wieħed jarmi l-partijiet użati u l-iskart

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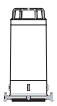
- Pressure.
- Paine.
- Πίεση
- Ciśnienie
- Nyomás alatt.
- Tlak
- Druk
- Tryck
- Presión.
- Tlak..
- Spiediens.
- Basınç
- Druck.
- Trykk
- Pressão.
- Tlak.
- Slėgis.
- Pressjoni
- Pression.
- Tryk
- Pressione.
- Surve.
- Давление

- Release Pressure.
- Évacuation de pression.
- Avlast trykk
- Despresurizar.
- Ciśnienie spustowe
- Surve väljalase
- Išleiskite slėgį.
- Basıncı Kaldırın
- Druk aflaten.
- Vapauta paine.
- Aflast tryk
- Liberta Pressão.
- Uvoľnite tlak.
- Engedje ki a nyomást.
- Стравить давление
- Neħħi l-pressjoni
- Druck ablassen.
- Tryckutsläpp.
- Εκτόνωση πίεσης
- Scaricare la pressione.
- Uvolnění tlaku.
- Pazeminiet spiedienu.
- Sprostitev tlaka.

- Replace every year
- Remplacer tous les ans.
- Skift ut hvert år
- Sustituir anualmente
- Należy wymieniać raz w roku
- Asendage igal aastal
- Keiskite kartą per metus
- Her yıl değiştirin
- Elk jaar vervangen
- Vaihda vuosittain.
- Udskift en gang om året
- Substituir todos os anos
- Każdý rok vymieňajte
- Évente cserélje
- Заменять каждый год.
- Ibdel kull sena
- Jährlich austauschen
- Byt varje år
- Αντικατάσταση κάθε χρόνο
- Sostituire ogni anno
- Nutná výměna každý rok.
- Nomainiet reizi gadā
- Zamenjajte vsako leto.

- Filter housing / Model
- Logement du filtre/modèle.
- Filterhus/-modell
- Caja de filtro/modelo.
- Obudowa filtra / model.
- Filtri korpus/mudel
- Filtro korpusas / modelis
- Filtre muhafazası / Model
- Filterhuis / Model
- Suodatinkotelo/-malli
- Filterhus/modell
- Caixa / Modelo do filtro
- Kryt filtra / Model
- Szűrőház / típus
- Корпус фильтра / модель
- Kontenitur tal-filtru - Mudell
- Filtergehäuse / Modell
- Filterhus/modell
- Υποδοχή/μοντέλο φίλτρου
- Corpo del filtro / Modello
- Kryt filtru / Model
- Filtra korpuss / modelis
- Ohišje filtra / Model

- High efficiency filter element
- Hochleistungsfilterelement
- Tehokas suodatinelementti
- Høyeffektivt filterelement
- Φίλτρο υψηλής απόδοσης
- Elemento do filtro de elevado rendimento
- Wysokowydajny wkład filtra
- Vysoce účinný filtrační prvek
- Nagy hatékonyságú szűrőelem
- Labai efektyvus filtravimo elementas
- Visoko učinkovit filtrirni element
- Element tal-filtru b'effiċjenza kbira
- Zeer efficiënt filterelement
- Cartouche filtrante haute efficacité.
- Högeffektivt filterelement
- Högeffektivt filterelement
- Elemento filtrante de gran eficiencia.
- Elemento filtrante ad alta efficienza
- Vysoko účinný filtračný článok
- Kõrgtootlik filterelement
- Augstas produktivitātes filtra elements
- Высокоэффективный фильтрующий элемент
- Yüksek etkinlikli filtre öğesi



- Adsorption filter cartridge - Granular carbon
- Adsorptionsfiltereinsatz - Granulatkohle
- Adsorptiosuodatinelementti – rakeinen hiili
- Adsorpsjonsfilterpatron – Karbon i kornform
- Φυσίγγιο φίλτρου προσρόφησης - Κοκκώδης άνθρακας
- Cartucho do filtro de absorção - Carvão granular
- Adsorpcyjny wkład filtrujący z węgla ziarnistego
- Adsorpční filtrační prvek – granulovaný uhlík
- Adszorpciós szűrőbetét – granulált szén
- Adsorbcinio filtro kasetė – anglies granulės
- Kaseta adsorpcijskega filtra – zrnasti ogljik
- Kaxxa assorbenti tal-filtru – Karbonju mrammel
- Adsorptiefilter cartridge - korrelvormige actieve kool
- Cartouche filtrante d'adsorption - Charbon en granulés.
- Adsorptionsfilterkassett – Kornigt kol
- Adsorptionsfilterkassett – Kornigt kol
- Cartucho filtrante de adsorción, gránulos de carbón.
- Filtro a cartuccia ad adsorbimento - granuli di carbone
- Adsorpčná filtračná kazeta – Granulovaný uhlík
- Adsorptsioonfiltri kassett – teraline süsi
- Absorbējoša filtra kasetne – graudains ogleklis
- Адсорбционный фильтрующий элемент – гранулированный уголь
- Adsorpsiyon filtresi kartuşu – Taneli karbon

- Adsorption filter element - Wrapped carbon cloth
- Adsorptie filterelement - gewikkelde koolstofdoek
- Adsorptionsfilterelement - eingewickeltes Filtertuch aus Kohlenstoff
- Cartouche filtrante d'adsorption - Charbon entouré de tissu.
- Adsorptiosuodatinelementti – kääritty hiilikangas
- Adsorptionsfilterelement – Veckad kolfiberduk
- Adsorpsjonsfilterelement – Innpakket karbonstoff
- Adsorptionsfilterelement – Veckad kolfiberduk
- Φίλτρο προσρόφησης - Τυλιγμένο ύφασμα άνθρακα
- Elemento filtrante de adsorción, capas de tejido de carbón.
- Elemento do filtro de absorção - Pano revestido de carvão
- Elemento filtrante ad adsorbimento - tessuto al carbone con struttura ad avvolgimento
- Wkład adsorpcyjny filtra ze zwijanej tkaniny z włókna węglowego
- Adsorpčný filtračný článok – Zabalená uhlíková tkanina
- Adsorpční filtrační prvek – zabalená uhlíková tkanina
- Adsorptsioonfiltri element – isoleeritud süsinikriie
- Adszorpciós szűrőelem – göngyölt szénszövet
- Absorbējošs filtra elements – satīta oglekļa drāniņa
- Adsorbcinis filtravimo elementas – susuktas anglies audinys
- Адсорбционный фильтрующий элемент – ткань из углеродистого волокна
- Adsorpcijski filtrirni element – navita ogljikova krpa
- Adsorpsiyon filtresi öğesi - Sarılı karbon kumaş
- Element tal-filtru li jassorbixxi - Xoqqa tal-karbonju mgeżwra

- Ensure coorrect tool is used
- Zorg dat het juiste gereedschap wordt gebruik
- Vérifier que les outils adéquats sont utilisés.
- Se till att rätt verktyg används.
- Sørg for at benytte korrekt værktøj
- Asegúrese de que se utiliza la herramienta adecuada
- Assicurarsi di utilizzare l'utensile corretto
- Uistite sa, že používate správny nástroj
- Tagage õige tööriista kasutamine
- Izmantojiet tikai atbilstošus darbarīkus
- Убедитесь, что используется правильный инструмент
- Doğru alet kullanılmasını sağlayın
- Stellen Sie sicher, dass Sie das richtige Werkzeug verwenden.
- Käytettävä oikeaa työkalua
- Pass på at korrekt verktøy brukes
- Βεβαιωθείτε ότι χρησιμοποιείται το σωστό εργαλείο
- Certifique-se de que é utilizada a ferramenta correcta
- Należy używać odpowiedniego narzędzia.
- Zkontrolujte použití správného nástroje
- Mindig a célnak megfelelő szerszámot használja
- Įsitikinkite, kad naudojamas reikiamas įrankis
- Poskrbite, da boste uporabili ustrezno orodje
- Kun żgur li tintuża l-għodda t-tajba

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Warning!
This product must be installed and maintained by competent and authorised personnel only, under strict observance of these operating instructions, any relevant standards and legal requirements where appropriate.

Retain this user guide for future reference

Waarschuwing!
Dit product mag alleen geïnstalleerd en onderhouden worden door deskundig en bevoegd personeel met strikte inachtneming van deze bedieningsinstructies en de betreffende normen en wettelijke vereisten indien van toepassing.

Bewaar deze handleiding als naslag.

Warnung!
Das Produkt darf ausschließlich von autorisiertem Fachpersonal unter strikter Befolgung dieser Betriebsanleitung, ggf. relevanter Normen sowie gesetzlicher Vorschriften installiert und gewartet werden.

Bewahren Sie die Bedienungsanleitung zu Referenzzwecken auf.

Attention !
Ce produit doit être installé et entretenu exclusivement par un personnel compétent et autorisé, dans le respect le plus strict de ce mode d'emploi et des normes applicables et exigences légales éventuelles.

Conserver ce guide de l'utilisateur à titre de référence future

Varoitus!
Tämän tuotteen saa asentaa ja huoltaa vain pätevä ja valtuutettu henkilöstö, noudattaen tarkasti näitä käyttöohjeita, kaikkia asiaankuuluvia normeja ja tarpeen vaatiessa lain asettamia vaatimuksia.

Säilytä tämä käyttöohje tulevaa tarvetta varten.

Varning!
Produkten får endast installeras och underhållas av utbildad och behörig personal, som följer denna bruksanvisning och eventuella tillämpliga normer och lagföreskrifter noga i förekommande fall.

Behåll denna användarhandbok som referens

Advarsel!
Dette produktet må bare installeres og vedlikeholdes av kompetent og autorisert personale, i streng overholdelse av disse betjeningsanvisningene, alle relevante standarder og rettslige krav der det passer.

Ta vare på denne brukerveiledningen for senere bruk

Advarsel!
Dette produkt må kun installeres og vedligeholdes af autoriseret personale, under nøje overholdelse af disse driftsinstruktioner, relevante standarder og lovgivningsmæssige krav, hvor dette er aktuelt.

Gem denne vejledning til senere reference.

Προειδοποίηση!
Η εγκατάσταση και συντήρηση αυτού του προϊόντος πρέπει να γίνεται μόνο από κατάλληλα εκπαιδευμένο και εξουσιοδοτημένο προσωπικό, με αυστηρή τήρηση των οδηγιών χειρισμού, των εφαρμοζόμενων προτύπων και των νομικών απαιτήσεων όπου απαιτείται.

Φυλάξτε αυτό το εγχειρίδιο χρήσης για μελλοντική αναφορά

Advertencia
La instalación y mantenimiento de este producto debe ser efectuada únicamente por personal competente y autorizado, respetándose de forma estricta estas instrucciones de funcionamiento, así como cualquier norma y requerimiento legal que sean aplicables.

Conserve esta guía del usuario para poder consultarla en el futuro.

Advertência!
A instalação e a manutenção deste produto só deve ser realizada por pessoal autorizado e competente, sob estrita observância destas instruções de utilização e de quaisquer normas e requisitos legais relevantes, quando adequado.

Conserve este guia do utilizador para referência futura

AC010 - AC030

MT

Rakkomandazzjonijiet għall-Installazzjoni

Nirrakkomandaw li l-arja kompressata tiġi trattata qabel ma tidħol fis-sistema ta' distribuzzjoni kif ukoll fil-punti ċ l-applikazzjonijiet kritiċi ta' l-użu.

L-installazzjoni ta' tagħmir li jnixxef l-arja kumpressata fuq sistema li kienet imxarrba jista' jirriżulta f'aktar tagħbija ta' ħmieġ għall-filtri li jintużaw f'punt wieħed, għall-perjodu sakemm is-sistema ta' distribuzzjoni tinxef. L-elementi tal-filtri jista' jkollhom bżonn li jinbidlu aktar spiss matul dan il-perjodu.

Għal installazzjonijiet fejn jintużaw kumpressuri mingħajr żejt, xorta jkun hemm preżenti ajrusols u partijiet ta' l-ilma, għalhekk xorta għandhom jintużaw gradi bi skop ġenerali u b'effiċċjenza kbira.

Filtru għal skopijiet ġenerali għandu dejjem jiġi installat biex jipproteġi l-filtru ta' effiċjenza kbira mill-volum kbir ta' ajrusols likwidi u partijiet solidi.

Installa tagħmir ta' purifikazzjoni fl-aktar temperatura baxxa possibbli imma b'mod li ma jkunx hemm iffriżar, preferibbilment aktar 'l isfel mill-aftercoolers u mir-riċevituri ta' l-arja.

Tagħmir tal-purifikazzjoni fil-punt ta' l-użu għandu jiġi installat kemm jista' jkun qrib tal-post fejn għandu japplika.

It-tagħmir ta' purifikazzjoni m'għandux jiġi installat aktar 'l isfel mill-valvs li jifthu malajr u għandu jkun protett minn possibilità ta' fluss b'lura jew kundizzjonijiet oħra stressanti.

Naddaf il-pajps kollha li jwasslu għat-tagħmir ta' purifikazzjoni qabel tinstalla u l-papjs kollha wara li tinstalla t-tagħmir ta' purifikazzjoni u qabel ma tqabbad ma' l-applikazzjoni finali.

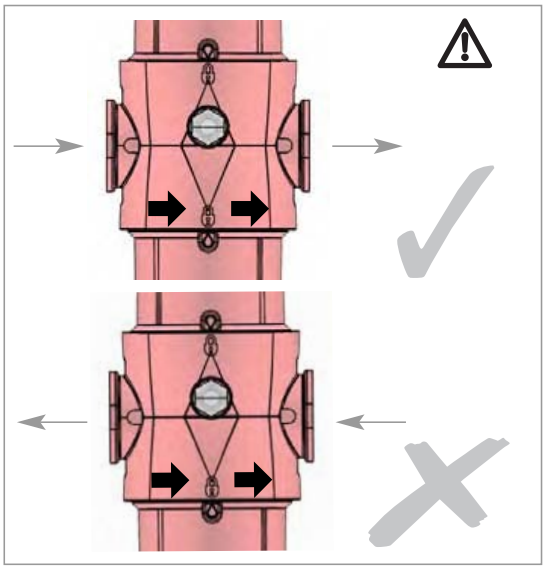
Jekk tiffittja linji ta' by-pass madwar it-tagħmir ta' purifikazzjoni, kun żgur li hemm biżżejjed filtrazzjoni ffittjata mal-linja tal-by-pass biex ma thallix li jkun hemm kontaminazzjoni tas-sistema aktar 'l isfel.

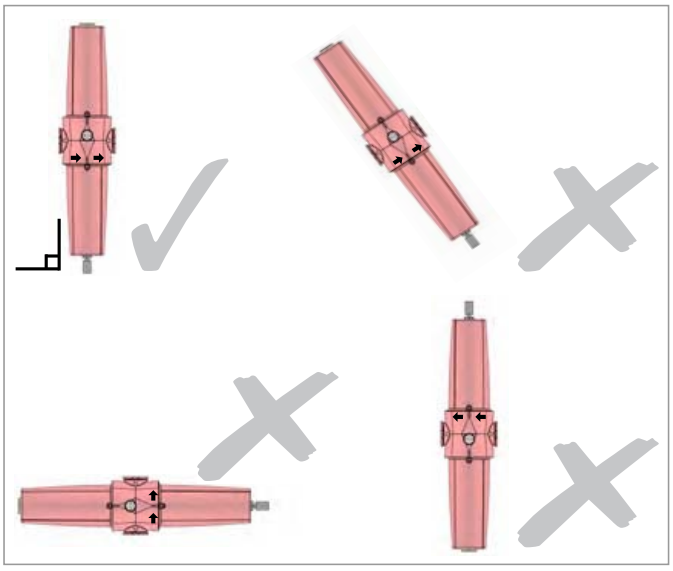
Ipprovdi faċilità biex tiddrejnja l-likwidi li jinġabru mit-tagħmir tal-purifikazzjoni. Il-likwidi li jinġabru għandhom jiġu trattati u mormija b'mod risponsabbli.

Iż-żmien kemm idumu jservu l-elementi tal-filtru li jneħħi l-fwar taż-żjut huwa affettwat mill-konċentrazzjoni taż-żejt tad-dħul, l-umdità relattiva u t-temperatura tas-sistema ta' l-arja kumpressata. L-elementi li jneħħu l-fwar taż-żjut ikollhom bżonn jinbidlu aktar ta' sikwit mill-element shih ekwivalenti.

Mudelli AC010□□□I - AC030□□□I huma ffittjati b'indikatur tal-volum taż-żejt. Kemm l-elementi tal-filtru kif ukoll l-indikatur għandhom jinbidlu jekk l-indikatur isir ta' kulur blu.

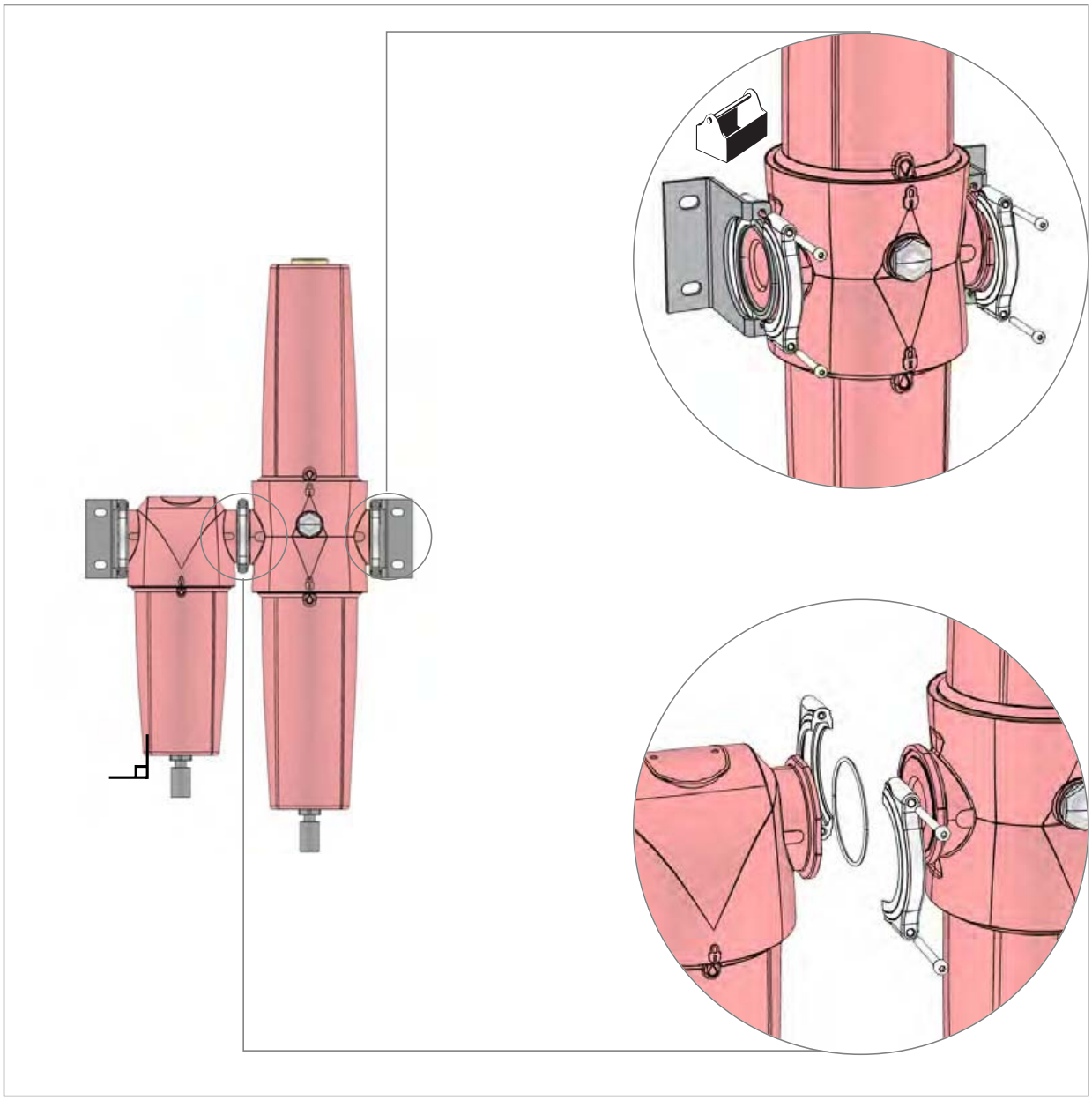
Jekk Jogħġbok Innota - Dan hu indikatur tal-volum taż-żejt u ma jindikax iż-żmien li jdum iservi l-element tal-filtru.

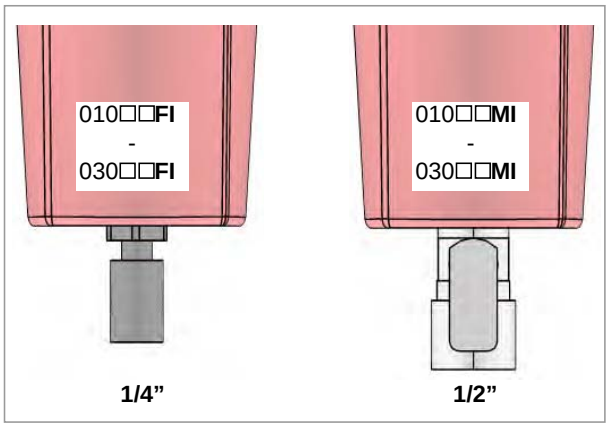




5 FILTER-DH-OIL-XEVOLUTION 01

20





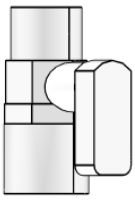
6 FILTER-DH-OIL-XEVOLUTION 01

5. Spare Parts (Service Kits)

Reserve-onderdelen (servicekits) • Ersatzteile (Service-Kits) • **Pièces de rechange (nécessaires d'entretien)** • Varaosat (Huoltopakkaukset) • **Reservdelar (servicesatser)** • Reservedeler (service-sett) • **Reservedele (Servicekit)** • Ανταλλακτικά (Πακέτα τεχνικής υποστήριξης) • **Piezas de repuesto (kits de mantenimiento)** • Peças Sobressalentes (Kit de Reparação) • **Ricambi (kit per l'assistenza)** • Części zamienne (zestawy serwisowe) • Náhradné diely (Servisná súprava) • Náhradní díly (Sady pro údržbu) • Varuosad (hooldekomplektid) • Pótalkatrészek (szervizkészletek) • Rezerves daļas (apkopes komplekti) • Atsarginės dalys (priežiros detalių komplektai) • Запасные части (ЗИП) • Nadomestni deli (servisni kompleti) • **Yedek parça (Servis kitleri)** • Partijiet Ghat-Tibdil (Kitts tas-Servizz)

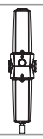
EF1

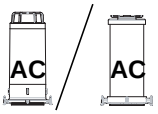
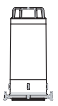
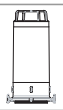
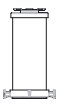
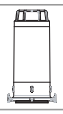
- **AUTOMATIC DRAIN**
- **AUTOMATISCHER ABLAUF**
- **VIDANGE AUTOMATIQUE**
- **AUTOMISCHAFTAPPEN**
- **DRENAJE AUTOMATICO**
- **SCARIO AUTOMATICO**
- **AUTOMATISK AFLØB**
- **DRENO AUTOMÁTICO**
- ΑΥΤΟΜΑΤΗ ΑΠΟΣΤΡΑΓΓΙΣΗ
- **AUTOMATDRÄNERING**
- **AUTOMAATTINEN**
- **TYHJENNYSKAPPALE**
- DREN AUTOMATYCZNY
- AUTOMATICKÉ VYSUŠENIE
- AUTOMATICKÉ VYPOUŠTĚNÍ
- AUTOMAATNE VÄLJALASE
- AUTOMATIKUS LEERESZTÉS
- AUTOMĀTISKA IZTECINĀŠANA
- AUTOMATINIS IŠLEIDIMAS
- АВТОМАТИЧЕСКИЙ ДРЕНАЖ
- SAMODEJNI ODTOK
- **OTOMATİK SÜZDÜRÜCÜ**
- **DREJN AWTOMATIKU**

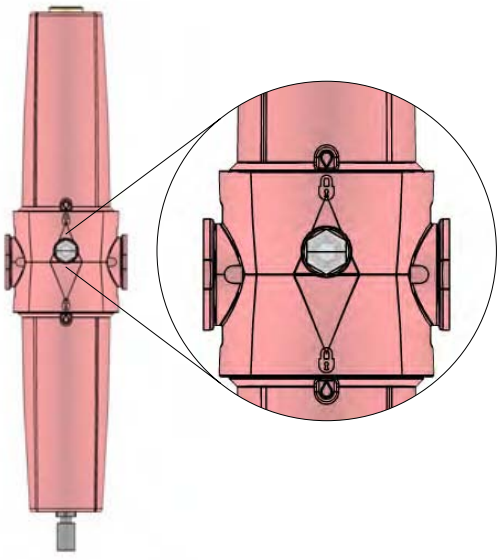


EM1

- **MANUAL DRAIN**
- **MANUELLER ABLAUF**
- **VIDANGE MANUELLE**
- **MANUEEL AFTAPPEN**
- **DRENAJE MANUAL**
- **SCARIO MANUALE**
- **MANUELT AFLØB**
- **DRENO MANUAL**
- ΧΕΙΡΟΚΙΝΗΤΗ ΑΠΟΣΤΡΑΓΓΙΣΗ
- **MANUELL DRÄNERING**
- **KÄSIKÄYTTÖINEN**
- **TYHJENNYSKAPPALE**
- DREN RĘCZNY
- RUČNÉ VYSUŠENIE
- RUČNÍ VYPOUŠTĚNÍ
- KÄSITSI VÄLJALASE
- KÉZI LEERESZTÉS
- MANUĀLA IZTECINĀŠANA
- RANKINIS IŠLEIDIMAS
- ДРЕНАЖ ВРУЧНУЮ
- ROČNI ODTOK
- **ELLE KULLANILACAK SÜZDÜRÜCÜ**
- **DREJN MANWALI**


010 A
010 B
010 C
015 B
015 C
020 C
020 D
020 E
025 D
025 E
030 E
030 F
030 G

 AA	 AC / AC
010AA	010AC 
015AA	015AC 
020AA	020AC 
025AA	025DAC 
025AA	025EAC 
030AA	030AC 

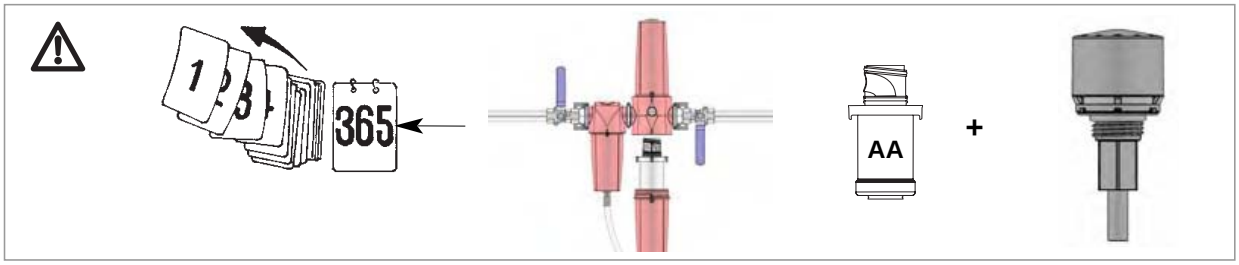


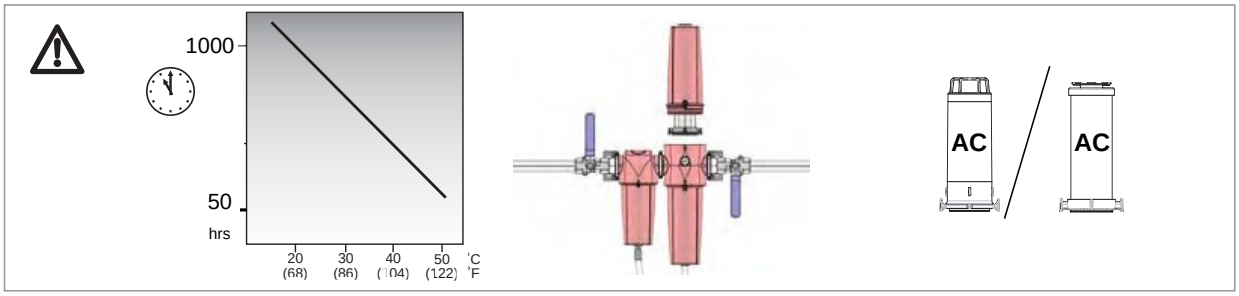
BOIE1
AC010 □□□ I - AC030 □□□ I

AC010 - AC030

6. Maintenance

Onderhoud • Wartung • **Entretien** • Kunnossapito • **Underhåll** • Vedlikehold • **Vedligeholdelse** • Συντήρηση • **Mantenimiento** • Manutenção • **Manutenzione** • Konserwacja • Údržba • Údržba • Hooldus • Karbantartás • Tehniskā apkope • Techninė priežiūra • Обслуживание • Vzdrževanja • **Bakım** • Manutenzjoni





Models AC010□□□I - AC030□□□I are fitted with a bulk oil indicator. Both filter elements and indicator should be changed if indicator is blue in colour.

Please Note - This is a bulk oil indicator, it does not indicate filter element life.

Modellen AC010□□□I - AC030□□□I zijn uitgerust met een bulk olie indicator. Zowel de filterelementen als de indicator moeten vervangen worden als de indicator blauw van kleur is.

N.B. - Dit is een bulk olie indicator, het is geen indicator voor de levensduur van het filterelement.

Die Modelle AC010□□□I - AC030□□□I sind mit einer Ölanzeige ausgestattet. Sowohl die Filterelemente also auch die Anzeige sollte ausgetauscht werden, wenn sich die Anzeige blau färbt.

Bitte beachten - Es handelt sich hier um eine Ölanzeige. Diese gibt keinen Hinweis auf die Lebensdauer des Filterelements.

Les modèles AC010□□□I - AC030□□□I sont fournis avec un indicateur de présence massive d'huile. Lorsque l'indicateur est bleu, il est nécessaire de remplacer les cartouches et l'indicateur.

Remarque : Il s'agit d'un indicateur de présence massive d'huile, et non pas de la durée de vie des cartouches.

Malleissa AC010□□□I – AC030□□□I on öljynilmaisin. Sekä suodatinelementit että ilmaisin on vaihdettava, jos ilmaisin on sininen.

Huomautus – Tämä on öljynilmaisin. Se ei ilmaise suodatinelementin ikää.

Modell AC010□□□I - AC030□□□I har en indikator för större mängder olja. Både filterelement och indikator ska bytas om indikatorn har blå färg.

Observera –- indikatorn visar oljeförekomst, den indikerar inte filterelementets livslängd.

Modell AC010□□□I - AC030□□□I er montert med bulkvolum oljeindikator. Både filterelementer og indikator skal skiftes når indikatoren er blå.

Merk – Dette er en bulkvolum oljeindikator, den indikerer ikke filterelementets levetid.

Modell AC010□□□I - AC030□□□I har en indikator för större mängder olja. Både filterelement och indikator ska bytas om indikatorn har blå färg.

Observera –- indikatorn visar oljeförekomst, den indikerar inte filterelementets livslängd.

Τα μοντέλα AC010□□□I - AC030□□□I διαθέτουν ένα δείκτη παρουσίας λαδιού. Όταν ο δείκτης είναι μπλε πρέπει να αλλάζονται τόσο τα φίλτρα όσο και οι δείκτες.

Παρακαλούμε σημειώστε ότι - Αυτός είναι ένας δείκτης παρουσίας λαδιού, δεν υποδεικνύει τη διάρκεια ζωής του φίλτρου.

Los modelos AC010□□□I - AC030□□□I disponen de un indicador de presencia de aceite. Si el indicador se vuelve azul deben cambiarse tanto los elementos filtrantes como el indicador.

Nota importante: se trata de un indicador de presencia de aceite. No indica la vida del elemento filtrante.

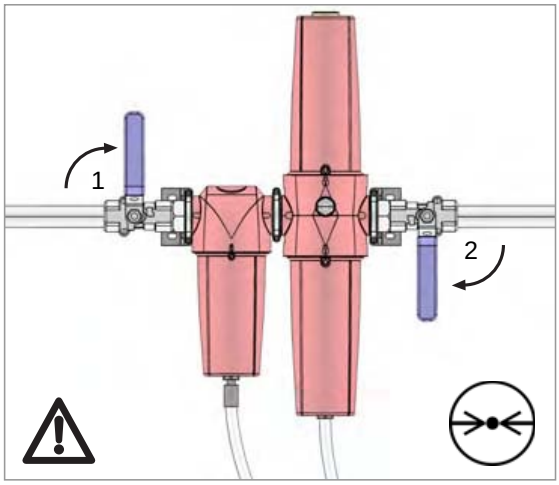
Modelos AC010□□□I - AC030□□□I são instalados com um indicador do óleo em bruto. Ambos os elementos do filtro e o indicador deverão ser mudados se o indicador estiver azul.

Nota - Este é um indicador do óleo em bruto, não indica a vida útil do elemento do filtro.

I modelli AC010□□□I - AC030□□□I sono provvisti di un indicatore degli oli misti. Sostituire gli elementi filtranti e l'indicatore quando il secondo assume una colorazione blu.

Nota - L'indicatore segnala la presenza di oli misti, ma non la durata dell'elemento filtrante.

1



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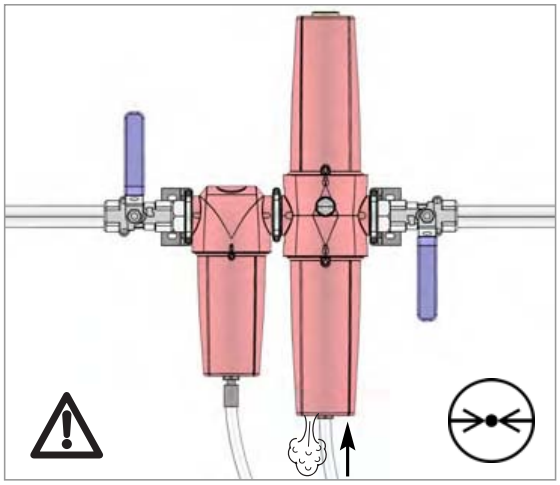

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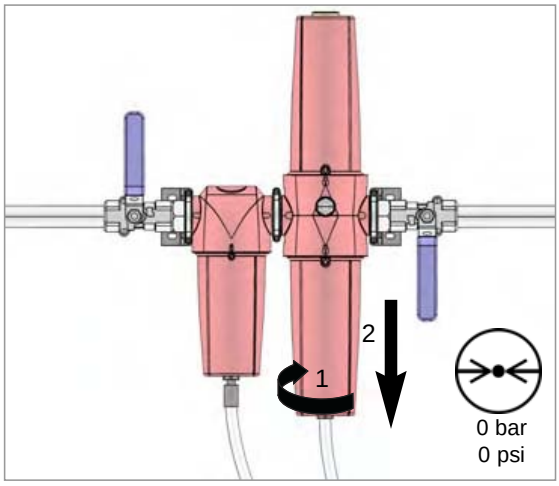

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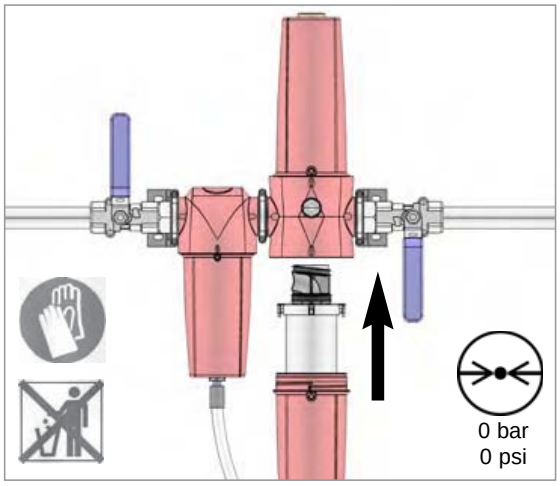

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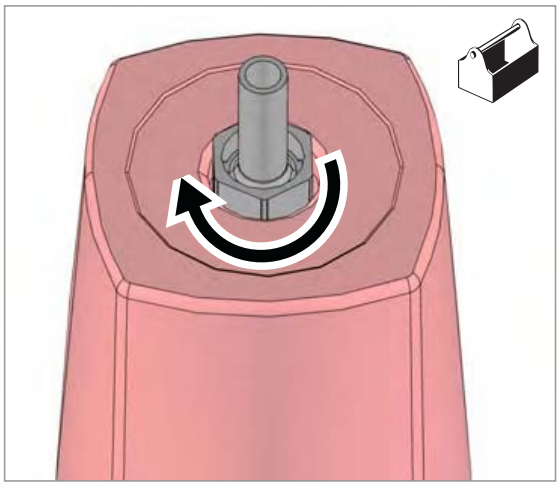

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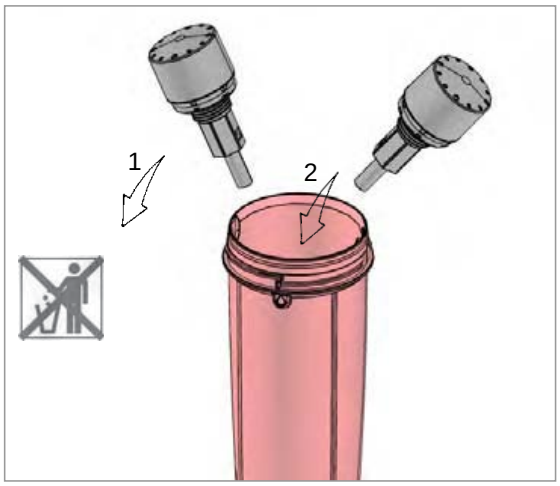
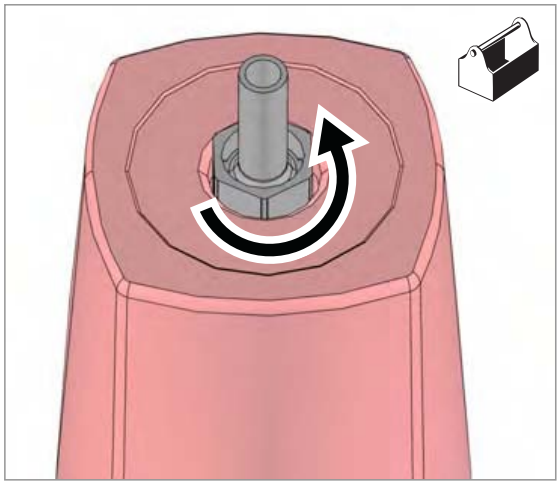


9 FILTER-DH-OIL-XEVOLUTION 01

7



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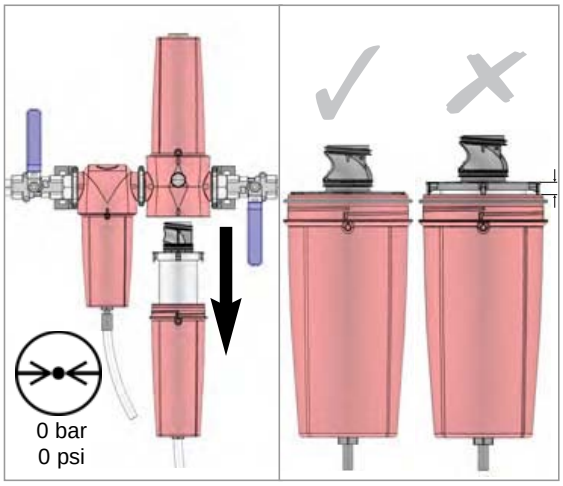

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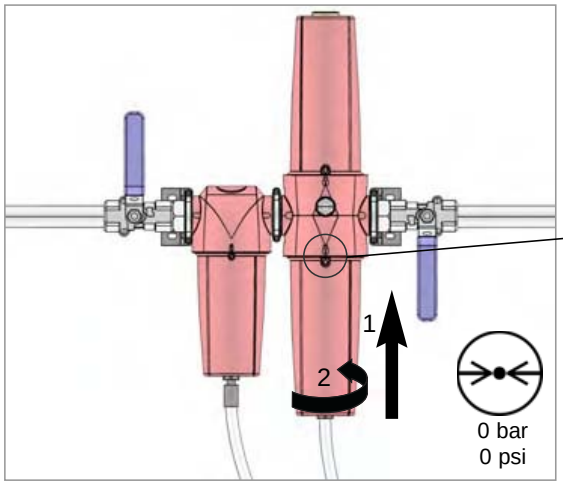

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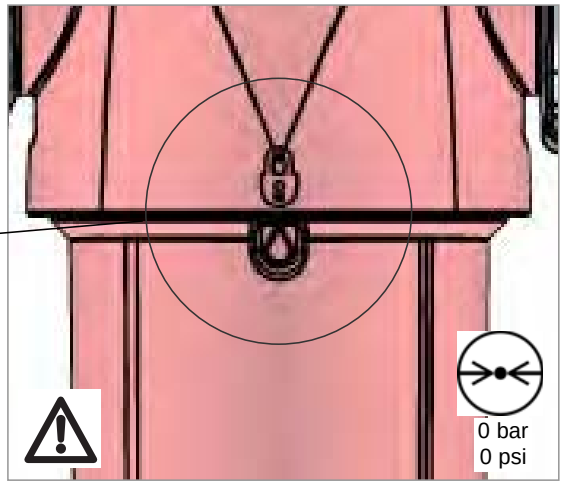

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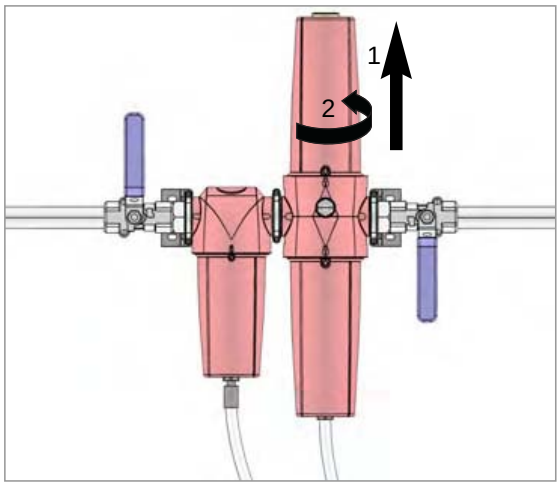

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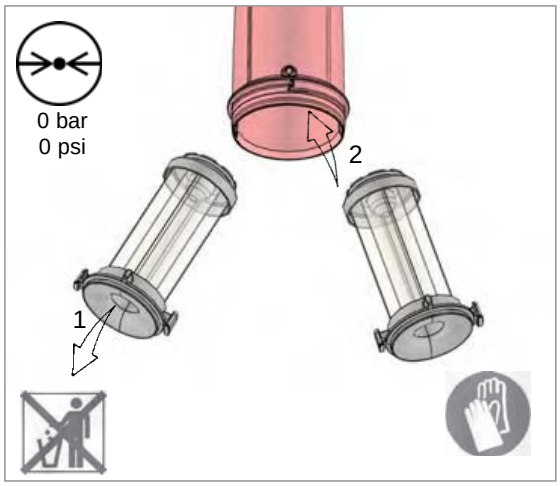
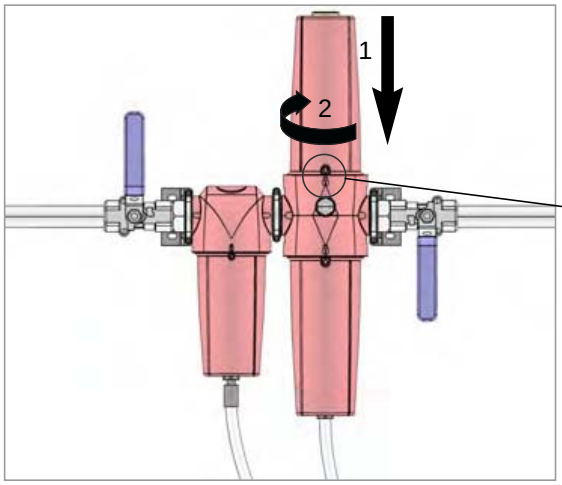


10 FILTER-DH-OIL-XEVOLUTION 01

13



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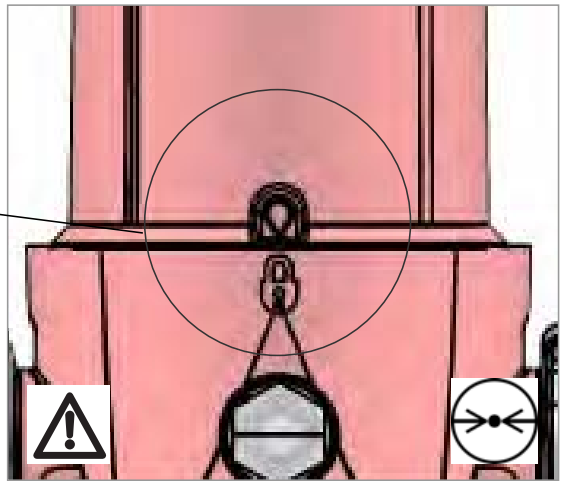

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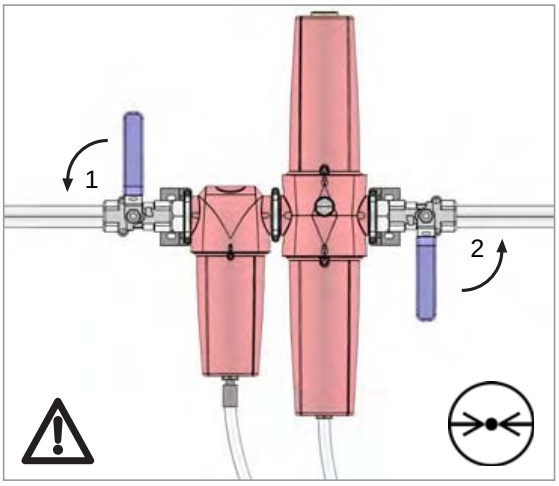

Declaration of Conformity — EN

domnick hunter
Dukesway, TVTE, Gateshead, Tyne & Wear, NE11 0PZ. UK

AC010, 015, 020 025, 030

Directives	97/23/EC,
Standards used	Generally in accordance with ASMEVIII Div 1 : 2004.
PED Assesment Route :	Article 3.3 (AC 010, 015, 020, 025) Module A (AC 030)
Notified body for PED:	N/A
EC Type-examination Certificate:	N/A
Authorised Representative	Barry Wade Business Systems Improvement Manager domnick hunter ltd

Declaration

I declare that as the authorised representative, the above information in relation to the supply / manufacture of this product, is in conformity with the standards and other related documents following the provisions of the above Directives.

Signature: **Date:** 28 / 09 / 05

Declaration Number: 0001/280905

Verklaring van Conformiteit — NL

domnick hunter
Dukesway, TVTE, Gateshead, Tyne & Wear, NE11 0PZ. GB

AC010, 015, 020 025, 030

Richtlijnen	97/23/EC,
Gehanteerde normen	Gewoonlijk volgens ASMEVIII Div 1 : 2004.
PED-beoordelingstraject:	Artikel 3.3 (AC 010, 015, 020, 025) Module A (AC 030)
Aangemelde instantie voor PED:	N/A
EC Type onderzoekscertificaat:	N/A
Bevoegde vertegenwoordiger	Barry Wade Manager Bedrijfssysteemverbetering domnick hunter ltd

Verklaring

Als bevoegde vertegenwoordiger verklaar ik dat bovenstaande informatie met betrekking tot de levering / vervaardiging van dit product overeenstemt met de normen en andere bijbehorende documentatie volgens de bepalingen van bovengenoemde richtlijnen.

Handtekening: **Datum:** 28 / 09 / 05

Verklaringnummer: 0001/280905

Konformitätserklärung — DE

domnick hunter
Dukesway, TVTE, Gateshead, Tyne & Wear NE11 0PZ GROSSBRITANNIEN

AC010, 015, 020 025, 030

Richtlinien	97/23/EC,
Angewandte Normen	Allgemein in Übereinstimmung mit ASMEVIII Div 1 : 2004.
Beurteilungsroute der Druckgeräterichtlinie:	Artikel 3.3 (AC 010, 015, 020, 025) Modul A (AC030)
Benannte Stelle für die Druckgeräterichtlinie:	N/A
EG-Baumusterprüfbescheinigung:	N/A
Bevollmächtigter Vertreter	Barry Wade Business Systems Improvement Manager domnick hunter ltd

Erklärung

Hiermit erkläre ich als bevollmächtigter Vertreter die Konformität der oben aufgeführten Informationen in Bezug auf die Lieferung/Herstellung dieses Produkts mit den Normen und anderen zugehörigen Dokumenten gemäß den Bestimmungen der oben genannten Richtlinien.

Unterschrift: **Datum:** 28 / 09 / 05

Nummer der Erklärung: 0001/280905

Déclaration de conformité — FR

domnick hunter
Dukesway, TVTE, Gateshead, Tyne & Wear, NE11 0PZ GB

AC010, 015, 020 025, 030

Directives	97/23/EC,
Normes utilisées	Généralement conforme à ASMEVIII div. 1 : 2004.
Méthode d'évaluation de la directive d'équipements de pression :	Article 3.3 (AC010, 015, 020, 025, 030) Module A (AC030)
Organisme de notification pour la directive d'équipement sous pression :	N/A
Certificat d'examen de type CE :	N/A
Représentant agréé	Barry Wade Business Systems Improvement Manager domnick hunter ltd

Déclaration

Je déclare à titre de représentant agréé que les informations ci-dessus liées à la fourniture/fabrication de ce produit sont en conformité avec les normes et autres documents liés déclarés selon les dispositions des directives susmentionnées.

Signature : **Date :** 28 / 09 / 05

N° de déclaration : 0001/280905

Vaatimustenmukaisuusvakuutus — FI

domnick hunter
Dukesway, TVTE, Gateshead, Tyne & Wear NE11 0PZ ISO-BRITANNIA

AC010, 015, 020 025, 030

Direktiivit	97/23/EC,
Käytetyt standardit	Yleensä seuraavan standardin mukaisesti: ASMEVIII Div 1: 2004.
PED-arviointimenettely:	Artikla 3.3 (AC010, 015, 020, 025, 030) Moduuli A (AC030)
PED-säännösten ilmoitettu laitos:	N/A
EY-tyyppihyväksynnän sertifikaatti:	N/A
Valtuutettu edustaja	Barry Wade Yritysjärjestelmien kehityspäällikkö domnick hunter ltd

Vakuutus

Valtuutettuna edustajana vakuutan, että yllä olevat tiedot, jotka liittyvät tämän tuotteen toimittamiseen tai valmistamiseen, ovat standardien ja muiden asiaan liittyvien asiakirjojen mukaisia ja noudattavat yllä mainittuja direktiivejä.

Allekirjoitus: **Päiväys:** 28 / 09 / 05

Vakuutuksen numero: 0001 /280905

Försäkran om överensstämmelse — SV

domnick hunter
Dukesway, TVTE, Gateshead, Tyne & Wear, NE11 0PZ, Storbritannien

AC010, 015, 020 025, 030

Direktiv	97/23/EC,
Använda standarder	Generellt i enlighet med ASMEVIII Div 1: 2004.
Fastställningsväg för PED:	Artikel 3.3 (AC010, 015, 020, 025, 030) Modul A (AC030)
Anmält organ för PED:	N/A
EG-intyg om typprovning:	N/A
Auktoriserad representant	Barry Wade Business Systems Improvement Manager domnick hunter ltd

Försäkran

Jag försäkrar, i egenskap av auktoriserad representant, att ovannämnda information avseende leverans/tillverkning av denna produkt överensstämmer med standarder och övriga relaterade dokument enligt villkoren i ovanstående direktiv.

Underskrift: **Datum:** 28 / 09 / 05

Försäkran nummer: 0001/280905