SERVICE MANUAL USE

Screw Compressor

Model: M 121

GL – Nr.: 1_9968_00230 – 00 01

Serial No.: .....

KAESER COMPRESSORS

Table of Contents

Chapter – Page

Table of Contents

Chapter – Page

1 Technical Specification

1.1 Compressor Unit

Model	M 121	
Maximum working pressure	100	psig
Free air delivery at max. working pressure	406,1	cfm
Temperature at the airend discharge port (at 68°F ambient)	185	°F
Weight, empty	3870	lbs
Weight, operational	4103	lbs
Maximum gross weight (axle load)	4190	lbs
Tongue weight (dep. on adjustment)	154–165	lbs
Permissible weight at tow–bar coupling	265	kg
Tires	195 R 14 C	
Recommended tire pressure	65	psi
Wheel nuts	M16 x 1,5	
Torque see chapter 1.8.		
Air outlet valves	3x G 3/4	
	1x G 1 1/2	

Drawings:

Dimensional diagram	T10233.00
P & I flow diagram (Pipework and instrument flow diagram)	FFMM121ST–00437.00
Compressed air option	FFMM121DLAO–00439.00
Electrical diagram	SFA121–01210.01
Lighting and signalling system connection diagram	SFAUSA.BEL–00909.00
Fuel circulation schematic diagram	KFMM121TD–00024.00

1.2 Compressor

Single stage screw compressor with oil injection	Sigma 29 G	
Total volume of oil in circulation	9,8	gal
Oil carryover in the air at the discharge port	approx. ca. 5	ppm

1.3 Engine

Make/Model	Deutz / BF4M 2012C	
Rated power	115,6	HP
Speed under full–load running	2200	rpm
Speed under idle running	1600	rpm
Fuel consumption under full–load running	5,5	gal/h
Diesel fuel tank capacity	33	gal
Quantity of coolant in the engine cooling system	4,2	gal

1.4 Battery

Voltage . . . . . 24 V (2 x 12V)

Capacity . . . . . 88 Ah

Cold test current . . . . . 395 A

1.5 Setting Value of the Safety Relief Valve

Blow–off pressure . . . . . 125 psig

1.6 Installation Requirements

Max. altitude above sea level of the place of use . . . . . 3000 ft.

Min. ambient temperature* . . . . . 14 ˚F

Max. ambient temperature . . . . . 122 ˚F

*When operating the compressor at temperatures generally below 32 ˚F, observe the points detailed in chapter 8.6!

1.7 Recommended Oils

Assembly	Contents	For ambient temperatures from	Product / Make
Engine	ca. 2,1 gal	5˚F to 32˚F 32˚F to –4˚F 14˚F to 122˚F 68˚F to 122˚F –4˚F to 86˚F	SAE 10 W SAE 20 W Synthetic SAE 15W/40 SAE 40 Synthetic SAE 5W/30
Compressor	9,8 gal	5˚F to 32˚F 32˚F to 122˚F	KAESER SIGMA S–320 Compressor Oil KAESER SIGMA S–460 Compressor Oil
Conserving oil for long term compressor shut-down			Shell ENSIS Motor oil 30
Chassis			lithium enriched multi–purpose grease non–corroding oil

Note regarding engine oil:

The above oils are recommended in addition to the oils recommended in the engine service manual.

The engine is filled with SAE 5W/30 synthetic oil at the factory before delivery.

Check the engine oil level and the oil separator oil level daily.

Notes regarding compressor oil filled at the factory:

KAESER screw compressors are filled with the following cooling oil. This oil is highly suited for operation in KAESER compressors:

KAESER SIGMA S – 460 Compressor Oil

This oil is also recommended for unsuitable operating conditions such as minor gaseous contamination of the inlet air and for high ambient temperatures.

Topping off the oil:

Always use the same manufacture and type of oil (see label on the oil separator tank).

Oil change and changing type of oil:

The compressor unit must be completely drained of all oil before an oil change or changing the type of oil. Remove all scale and deposits by hand. For hard to reach areas, an appropriate compressor flush is recommended. It is possible that the oil separator cartridge will need to be changed soon after changing the oil. This is due to the new oil's ability to clean up existing oil deposits.

A Material Safety Data Sheet covering this cooling oil can be requested from KAESER.

1.8 Torque

Tightening torque for wheel fixing:

	Thread	**Socket size**	**Torque [Nm]**
Wheel bolts	M14 x 1,5	SW 19	150
Wheel nuts	M16 x 1,5	SW 22	240
Wheel nuts	M18 x 1,5	SW 24	300

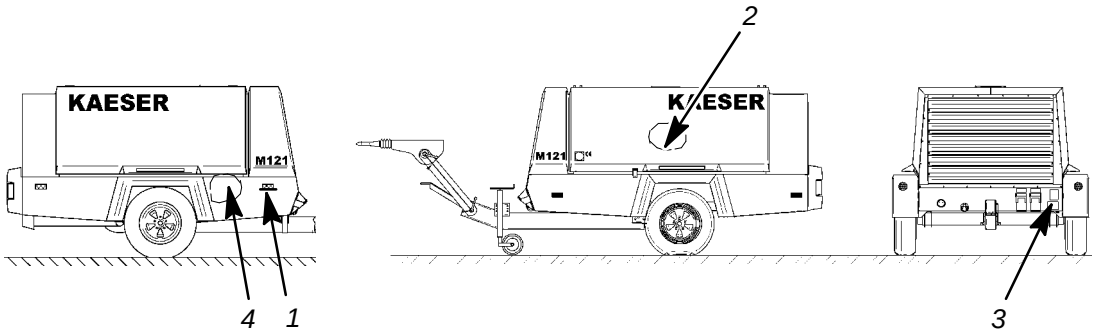
Standard values for hexagon bolts with a strenght factor of 8.8:

Thread size	M6	M8	M10	M12	M14	M16	M18
Torque value (Nm)	9	23	46	80	125	205	240

1.9 Sound Pressure Level

Noise level to US EPA at 7 m distance . . . . . 76 dB (A)

1.10 Identification



1 *Chassis serial number *)*
(below reflector)

2 *Engine serial number*
(see nameplate on engine block)

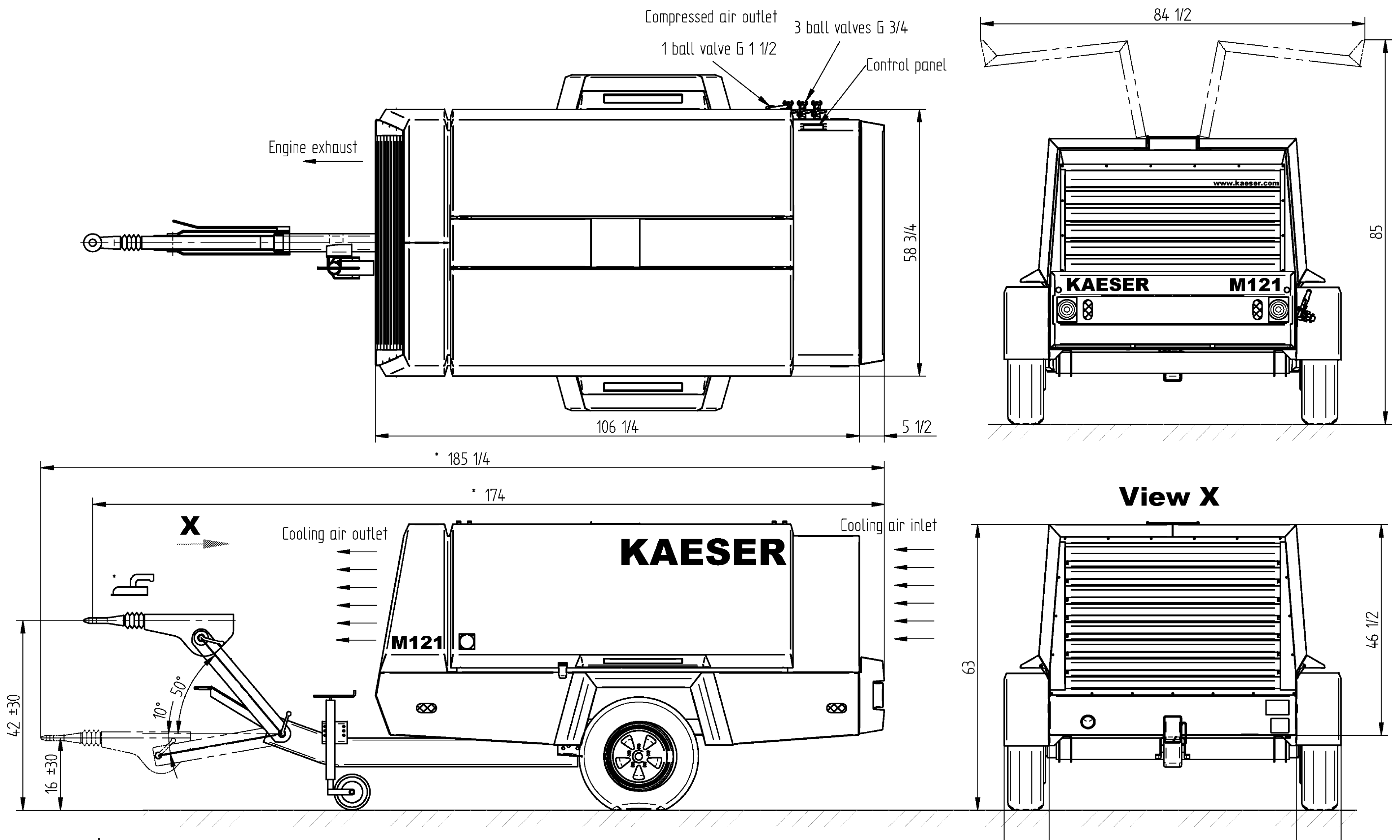
3 *Portable compressor serial number*
(see nameplate)

4 *Airend serial number*
(see nameplate on airend)

**)* German portable compressors only

1.11 Dimensional Diagram

(see following page)



* Zugöse	Abmaß
DIN	0
Nato	-¾
Frankreich	-1 ½
Italien	-1 ½
Kugelkupplung	+¾

All dimensions are in inchs

2003	Tag	Name
Gez.	31.01.	Friedenstab
Gepr.		
Freigeg.		Friedenstab
Maßstab	1:20 auf A3	

Portable compressor M 121

Ersatz für

KAESER KOMPRESSOREN

T 10233 USE

10022394_01

A-Index 000

2 Safety Regulations

Read this service manual and the engine service manual carefully and observe cautionary references before putting this mobile compressor unit into operation and before carrying out any maintenance on the unit.

2.1 Explanation of Symbols and References

This symbol is placed before all references to safety where danger to life and limb can occur during work . It is especially important that these rules are observed and that extreme care is taken in these cases. For their own protection, inform all other users of these safety rules. Observe all general safety and accident prevention regulations as well as the safety rules laid down in this service manual.

Attention! **This symbol identifies recommendations, regulations, references and correct sequence of work to prevent damage and/or destruction of the compressor unit and/or other equipment.**

This symbol identifies environmental concerns.

☞ **This symbol indicates operations and actions to be carried out by the operator or service technician.**

- **This bullet identifies listings.**

Explanation of prohibiting and warning notices on the compressor unit:

Prohibiting:
Do not operate the portable compressor unit with the canopy or panels open.
Hood can close unexpectedly!

Warning:
Hot or dangerous gases exhaust into the normal work area.
Only use in well ventilated areas or only operate compressor outdoors.

Warning:
Do not touch hot surfaces.


WARNING
DEATH OR SERIOUS INJURY CAN OCCUR FROM INHALING COMPRESSED AIR WITHOUT USING PROPER SAFETY EQUIPMENT.
SEE OSHA STANDARDS ON SAFETY EQUIPMENT.
5.4885.0

Optional:


WARNING
CONNECT AIR HOSES ONLY IN FULL COMPLIANCE WITH OSHA STANDARD 29 CFR 1926,302 (bX7).
THE REQUIRED SAFETY DEVICES SHOULD BE TESTED IN ACCORDANCE WITH THEIR MANUFACTURER'S RECOMMENDATIONS TO VERIFY THAT THEY REDUCE PRESSURE IN CASE OF HOSE FAILURE AND WILL NOT NUISANCE TRIP WITH THE HOSE AND TOOL COMBINATIONS IN USE.
5.4884.0


WARNING
Do not operate without fan guard in place.
5.4882.0


WARNING
Keep clear of unguarded moving parts.
5.4881.0

2.2 General Instructions Concerning Accident Prevention Regulations

During installation, operation, maintenance and repair of the compressor unit, OSHA Standards or any applicable Federal, State and Local codes, standards and regulations must be complied with.

Users of compressor units are obliged to comply with the safety and accident prevention regulations concerning the compressor unit that are valid in the country of use. If necessary, corresponding measures must be taken to ensure compliance with these national regulations before the compressor unit is put into operation.

The following instructions must also be observed:

- Never operate the portable compressor in enclosed spaces because exhaust gases contain carbon monoxide, a deadly gas! If, for exceptional reasons, the compressor must be operated in an enclosed space then the exhaust gases must be fed to the open air through a pipe of suitable diameter (at least 4" dia.)!
- Fire hazard! –
  Never refuel the portable compressor with the engine running!
  Keep diesel fuel away from hot components such as air outlet pipes or engine exhaust pipes. If the compressor is refilled with an automatic pump, a ground cable must be connected to the portable compressor to discharge static electricity. Never allow fuel, oil, coolant or cleaning fluids to overflow or leave the remains in the compressor unit.
- Allow no open flames and flying sparks at the place of installation.
- While welding on or near the compressor unit, ensure that sparks, open flames, or high temperatures cannot cause fire or explosion.
- Ensure that the compressor unit is fed with clean intake air. Operation of the unit in environments containing ammonia or other harmful gases may damage the unit and should be avoided.
- Do not operate the unit in ambient temperatures exceeding those outlined in chapter 1.6. For operation in higher ambient temperatures, please consult the manufacturer.

- Ensure that the compressor unit cannot be inadvertently started before carrying out any repair work. Remove the starter battery or place insulating caps over the battery terminals. A notice with the words *''This machine is under repair, do not start!''* must be attached to the compressor unit.
- Change the oil at the recommended interval (see chapter LEERER MERKER) or once a year, whichever occurs first.
- Do not mix cooling oils of different types. Be careful not to accidentally add compressor oil to the engine, or engine oil to the compressor.
- During operation, maintain the proper operating temperature as stipulated in the manufacturer's specifications to avoid build–up of condensate in the oil circulation (because low or high operating temperatures can cause damage to the unit).
- Use only cooling oils as recommended by the manufacturer.
- If maintenance work is carried out on any part of the oil circulation system, remember to refill the oil in the separator tank to the maximum level. Run the compressor and keep it under constant observation for a short period. Re–check the oil level again and add oil if necessary.
- Re–use of the filter cartridge located inside the oil separator tank is permitted as long as the pressure drop across the filter is below 15 psi. Check the pressure drop regularly.
- To reduce strain at the compressor outlet valves, do not connect accessories such as lubricators, water separators, etc. to the outlet valves. Do not pull on the air hoses when they are connected to the outlet valves.

2.3 Regular Check of Hoisting gear

Attention! **It is recommended that the hoisting gear on the compressor package is checked at least annually.**

2.4 Road Traffic Act Regulations

Attention! **Observe all Federal, State, and Local laws while towing this equipment.**

The maximum permissible trailer weight for the towing vehicle and the maximum permissible weight at the trailer coupling may not be exceeded! See rated limit in tow vehicle Operator's Manual and review its instructions and other requirements for safe towing.

The speed limit for towed vehicles as prescribed by Federal, State, and Local laws shall not be exceeded.

Use wheel chocks to secure the compressor unit against possible movement before uncoupling from the towing vehicle.

This equipment may be tongue heavy.
DO NOT attempt to raise or lower the drawbar by hand if the weight is more than you can safely handle.

2.5 General References

Work on power driven systems may only be carried out by trained or specialized personnel.

Splashing oil can cause injuries and fires.

☞ Check all pipes, hoses and screw fittings for leaks and visible damage every three to four weeks. Repair any damage immediately!

Inspect the electrical equipment of the compressor unit every three to four weeks. Defects, such as loose connections and/or overheated cable should be repaired immediately.
Carry out the following precautions before working on the electrical system:

Disconnect the battery, the ground cable first and then the positive cable.
When reconnecting the battery, attach the positive cable first, then the ground cable.

☞ Check all screw connections and cables of the electrical system. Repair any faults, such as loose connections and/or overheated cable immediately.

Attention! **Any alterations or reconstruction performed without the previous written consent of KAESER COMPRESSORS may void the warranty.**

2.6 Environmental Protection

Maintenance materials/wear items/replacement parts

Ensure that all wear items,maintenance and replacement parts accumulating during operation of the compressor unit are disposed of according to environmental regulations!

2.7 Spare Parts

Safe and reliable operation of the compressor unit is guaranteed only with KAESER original spare parts and KAESER SIGMA compressor oil.

3 General

Attention! **The service manual must be kept with the compressor at all times.**

This service manual refers to portable screw compressors only.

Kaeser Compressors, Inc., reserves the right to change specifications affecting this service manual without notification.

If the compressor package is operated in an air distribution network, the maximum network pressure may not exceed 232 psig.

3.1 Operation According to Regulations

This compressor unit is intended solely for the purpose of compressing air. Any other use of this purpose is not recommended and may violate safety regulations. The manufacturer cannot accept liability for any damage caused by such incorrect use; the user alone is liable for any risks incurred.

Use of the compressor according to regulations also encompasses adherence to the installation, removal, commissioning, operational and maintenance conditions laid down by the manufacturer.

3.2 Improper Use

Never direct compressed air toward persons. Compressed air is a concentrated form of energy which may cause injury or death.

DO NOT use air from this compressor for respiration (breathing) except in full compliance with OSHA Standards 29 CFR 1920 and any other Federal, State or Local codes or regulations.

Death or serious injury may occur from inhaling compressed air without using proper safety equipment.

Attention! **Inlet air may not contain any explosive or chemically unstable gas or vapour.**

3.2.1 Temperature--dependent operation of the compressor

Attention! **The compressor is designed for an ambient temperature range from 14˚F to 122˚F.**
The compressor may not be operated in ambient temperatures outside this range.

3.3 Compressed Air Treatment

Never use compressed air from oil injected compressor units for breathing purposes or production methods where the air has direct contact with food, without subjecting the compressed air to additional treatment.

3.4 Copyright

4 Transport

4.1 Transport of the Mobile Compressor Unit as a Towed Vehicle on the Road

Attention! **When towing the compressor unit with a towing vehicle observe the road traffic regulations (see chapter 2.4).**

Precautions to be taken before towing the compressor unit:

☞ Check that the compressor unit is shut down and secured against accidental restarting. If necessary, carry out the following:

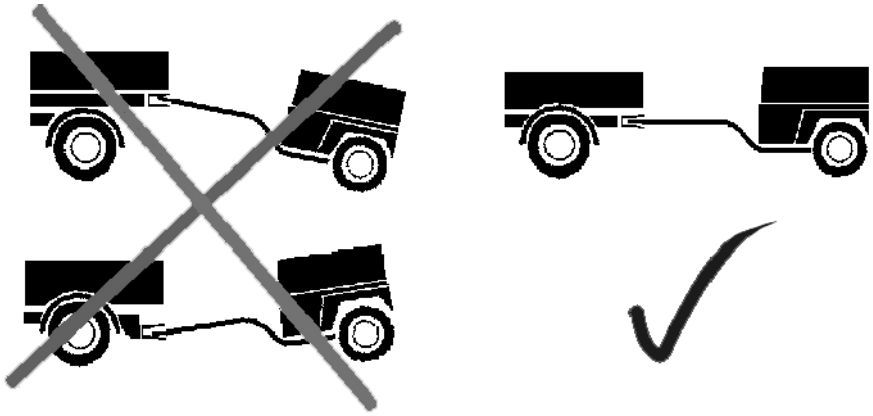
☞ Loosen and remove all connecting lines to the compressor unit.

☞ Close and lock the canopy.

☞ Hook up the compressor unit to the towing vehicle.

Attention! **Check that the towing vehicle coupling is compatible with the compressor towing eye or coupling.**
The compressor drawbar must be horizontal when towing.
If the compressor tilts forward or backward the dynamics of towing can lead to damage.

☞ Place the compressor drawbar in horizontal position to the towing vehicle coupling.



☞ Adjust the height of the drawbar to suit the towing vehicle coupling so that it is horizontal when towing.

See chapter 6.2.1 for height adjustment of the towbar.

Attention! **After hooking up the portable compressor, check that the safety lock on the tow-bar coupling is engaged.**

☞ Check that the teeth in the swivel joint are correctly engaged, that the clamp is tightened and that the splitpin is correctly inserted.

☞ Crank up the jockey wheel.

☞ Check that the wheel nuts are tight and the tyres are in good condition.

☞ Check the tyre pressures.

☞ Connect the cable for the lighting and indicator systems and carry out a functional check.

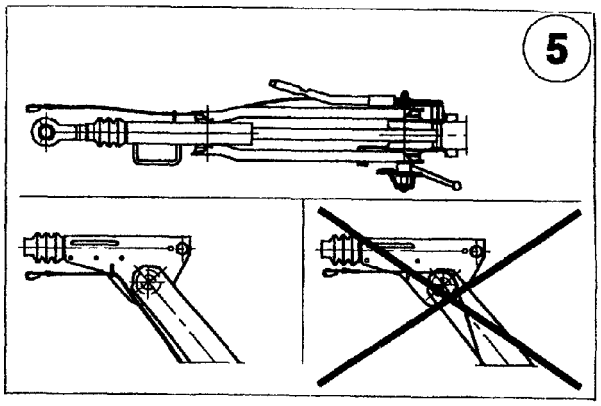
Emergency brake operation:

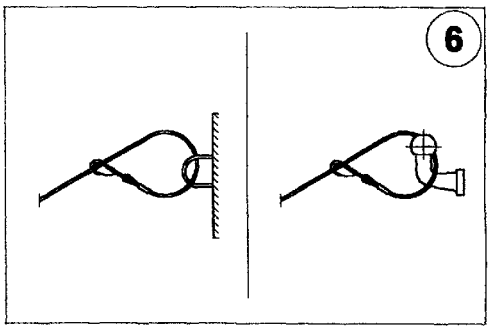
Attention! **If the portable compressor should accidentally break away from the towing vehicle, the breakaway cable tightens and activates the compressor's braking system (emergency braking). To ensure that this emergency brake functions perfectly, the breakaway cable must be fed through the cable guide.**

☞ Feed the breakaway cable through the welded eye (guide) (fig. 5 / item 1) and clip the snap hook into the eye provided on the towing vehicle.

Make sure that cable is not too short , i.e. when driving through a curve in the road. Otherwise, the brake could operate. If there is no eye provided, hang the cable on the towball and clip the snap hook onto the cable itself.

☞ Release the parking brake and remove the support chocks from under the wheels.





Attention! **The portable compressors are designed for a maximum road speed of 55 mph.**
The regulations of the road traffic act specific to the country of use must be observed.

4.2 Removing the Compressor Unit from Towing Vehicle

Work to be done after transporting the mobile compressor unit as a towed vehicle on the road:

☞ Remove the lighting and direction indicator cable.

☞ Apply the hand brake.

☞ Remove the emergency brake actuating wire.

☞ Lower and secure the support.

Attention! **When uncoupling on a slope or hill secure the compressor unit against movement:**

1. Place supporting chocks behind the wheels.

2. Pull the hand brake up to the stop to tension the pneumatic spring fully.
The pneumatic spring adjusts the brake automatically when rolling backwards or when parked on a slope.

☞ Place the support chocks behind the wheels.

☞ Pull up the hand brake to the stop.

☞ Uncouple the compressor unit from the towing vehicle.

4.3 Transporting with a Crane

Attention! **Always comply with the safety regulations concerning load suspension devices and lifting appliances when transporting a portable compressor unit by means of a crane.**

Do not stand beneath a hanging load.

Do not exceed the maximum permissible compressor weight (see chapter 1.1).

Do not lift or lower the compressor unit with a jerk because of the danger of damage to components.

Do not tamper with the fixing points of the lifting eye.

A lifting eye is provided for transport with a crane.
This lifting eye is accessed by lifting the cover in the centre of the canopy (see illustration in chapter 5.3 for the lifting eye).

- ☞ Check that the compressor is shut down and secured against accidental restarting. Carry out this measure, if necessary.
- ☞ Release and remove all connection lines from the uncoupled compressor unit.
- ☞ Open the left door.
- ☞ Unclamp the cover from inside and lift up.
- ☞ Close and lock the access panels.
- ☞ Hook the crane hook into the lifting eye.

4.4 Packaging and shipping as freight

The transport route is a deciding factor for the type of packaging and for securing. KAESER KOMPRESSOREN always tries to transport goods directly to the customer. Our packaging and securing methods are always selected such that, assuming proper handling, the goods arrive in perfect condition at the customer's premises.

Dispose of the packaging according to environmental regulations and where possible, recycle.

Attention! **The freight is to be secured against rolling, tipping and slipping.**

Chocks, restraints or squared timber must be used for securing freight. If required, guys should be tightened across the chassis and the towbar. It is not permitted to tighten guys or straps across the bodywork!

On rented, hired or trade fair packages the transport restraints should be used again for the return journey.

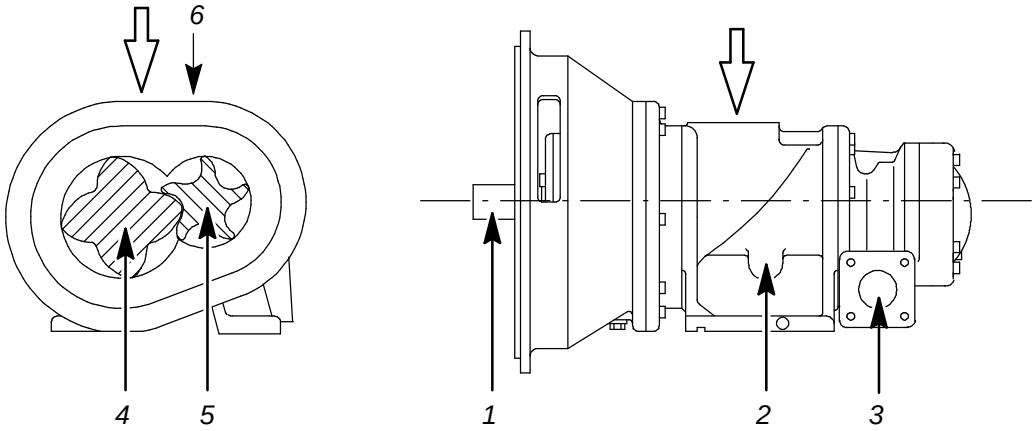
KAESER KOMPRESSOREN will be pleased to answer any queries with regard to transport and securing of equipment. KAESER KOMPRESSOREN can accept no liability whatsoever for damages arising through incorrect transport methods or insufficient or wrong securing of freight.

Always observe valid accident and safety regulations when transporting equipment!

5 Construction and Operation

5.1 Principle of Compression

The **Mobilair** compressor unit is fitted with a single stage, oil injected airend. Two rotors, the driven male rotor and the female rotor, both mounted in roller bearings, are fitted into the airend. As the rotors rotate, air is drawn into the upper side through the inlet and is compressed on the lower side. The oil that is injected into the lower side absorbs heat generated by compression, prevents metallic contact between the rotors, seals the rotors and the housing from each other and also lubricates the roller bearings. The compressed air and oil mixture leaves the airend via the discharge outlet.



1 Drive shaft
2 Oil injection
3 Discharge port
4 Male rotor
5 Female rotor
6 Air inlet port

5.2 Brief Description

The airend is driven by a water–cooled four cylinder turbodiesel engine via integrated gearing and a flexible coupling (see chapter 1.3).

An oil separator cartridge providing practically oil–free compressed air is built into the oil separator tank.

Compressor cooling oil is unsuitable for the lubrication of tools. If necessary, a tool lubricator should be fitted for this purpose.

The compressor control system ensures that the air generated is matched to the actual compressed air demand.

A safety shutdown system protects the engine and compressor airend by automatically stopping the diesel engine if important systems fail.

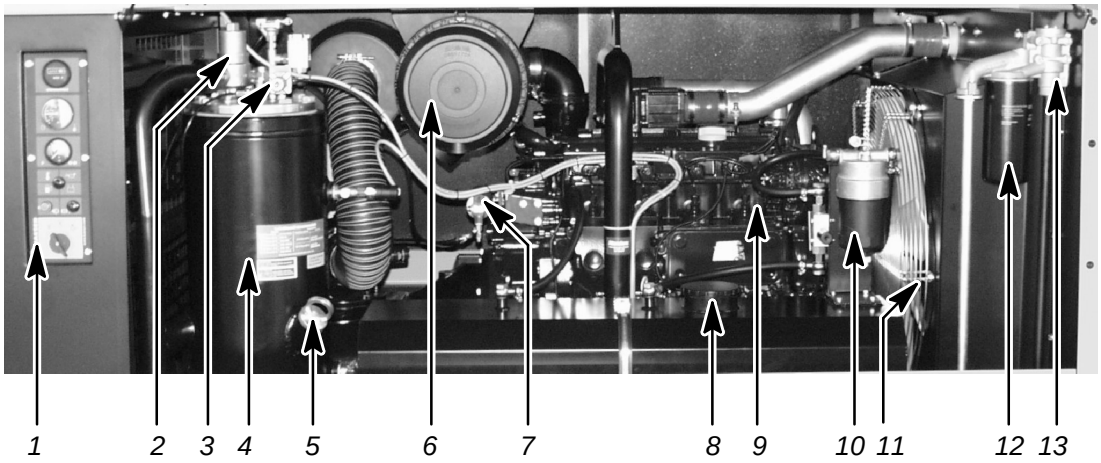
When the canopy is closed the cooling fan ensures optimum cooling of all components.

The chassis is provided with a rubber–sprung axle.

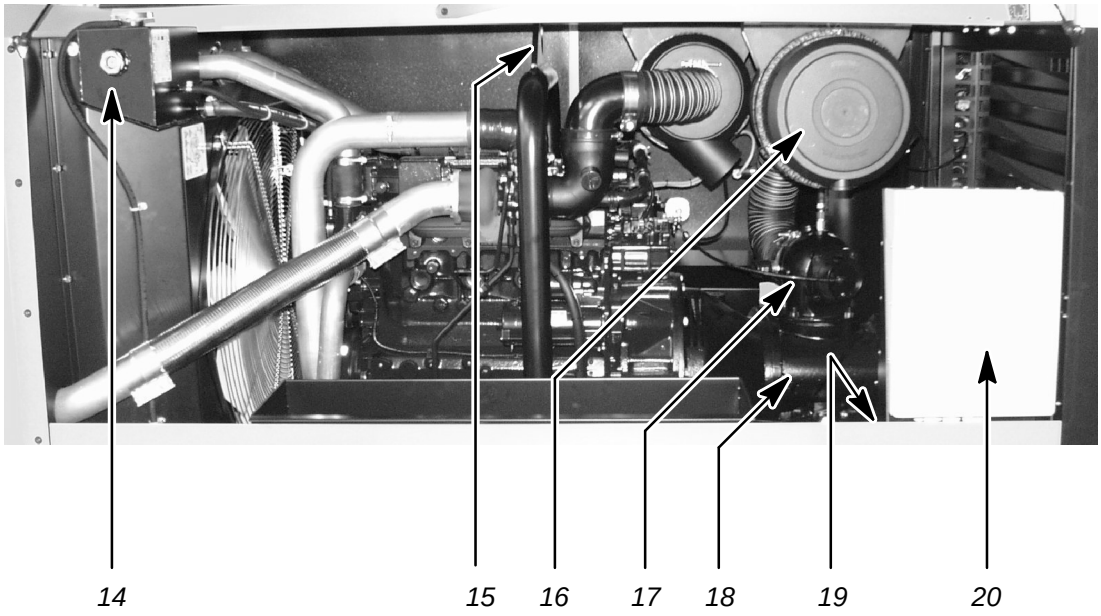
A lifting eye is provided for transport with a crane (see chapter 4.3).

5.3 Identification of the Components

Position details in ( ) correspond with the Pipe and Instrument Flow Diagram (P & I Diagram)



1 *Instrument panel*
2 *Minimum pressure/check valve (37)*
3 *Proportional controller (23)*
4 *Oil separator tank (5)*
5 *Oil filler with dipstick (11)*
6 *Engine air filter (24)*
7 *Engine speed adjustment cylinder (26)*
8 *Fuel tank*
9 *Motor*
10 *Fuel filter with water separator*
11 *Fan (28)*
12 *Compressor oil filter (21)*
13 *Combination valve (19)*

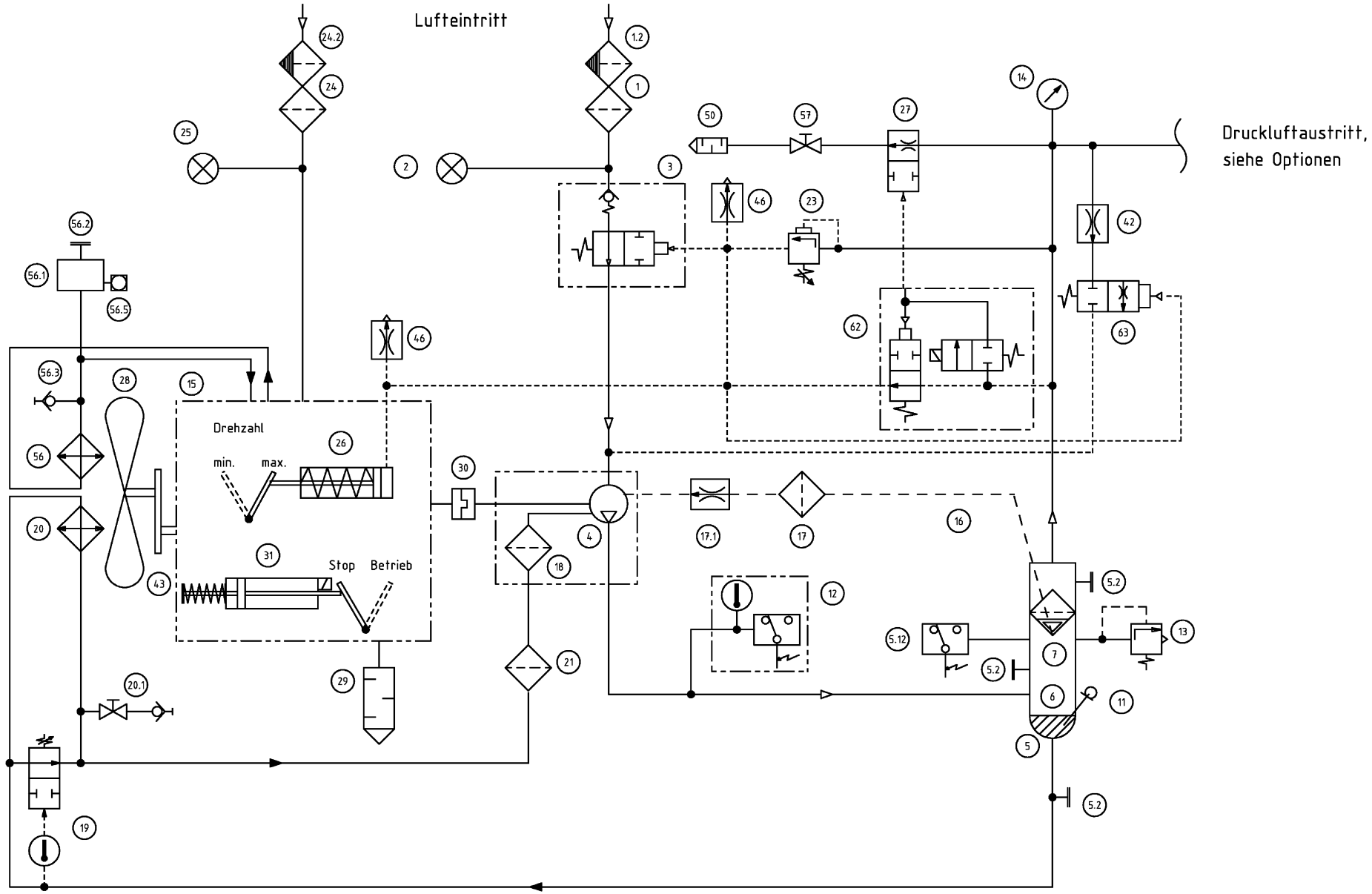


14 *Cooling fluid expansion tank (56.1)*
15 *Lifting eye*
16 *Compressor air filter (1)*
17 *Inlet valve (13)*
18 *Airend*
19 *Batteries*
20 *Electrical control cubicle*

5.4 Piping and Instrument Flow Diagram (P & I Diagram)

(see following pages)

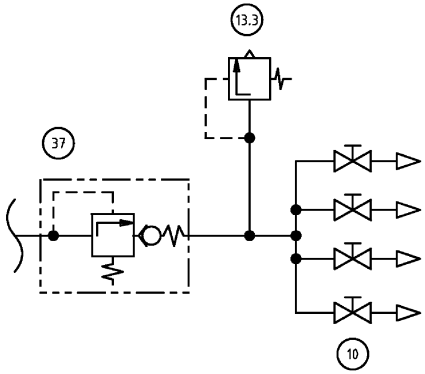
1. P & I Diagram, machine
2. P & I Diagram, compressed air outlet



c				Datum	19.11.2002		KAESER KOMPRESSOREN	RI-Fließbild Mobilair M 121		
b				Bearb.	Plau					
a	5688			Gepr.	Markowski				FFMM121ST-00437.00	Blatt 1
	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: FFMM121SO-00422.00			D

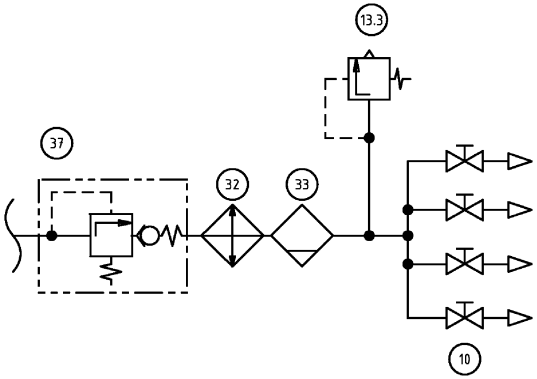
1	Kompressor - Luftfilter
1.1	Vakuumschalter
1.2	Staubsammelbehälter
2	Verschmutzungsanzeiger, Kompressor -Luftfilter
3	Einlaßventil
4	Schraubenkompressorblock
5	Ölabscheidebehälter
5.2	Verschlußschraube
5.12	Druckschalter - Gegendruck
6	Ölvorrat
7	Ölabscheidepatrone
11	Öleinfüllstutzen mit Ölmeßstab
12	Kontakt-Fernthermometer + Anzeige
13	Sicherheitsventil
14	Manometer Druckluft - Bedienungstafel
15	Dieselmotor
16	Ölrückführleitung
17	Schmutzfänger
17.1	Düse
18	Siebfilter
19	Kombiventil - Öltemperaturregler
20	Ölkühler
20.1	Absperrhahn mit Schlauchkupplung - Ölablaß
21	Ölfilter
23	Proportionalregler (Option: einstellbar)
24	Motor - Luftfilter
24.2	Staubsammelbehälter
25	Verschmutzungsanzeiger, Motor - Luftfilter
26	Motordrehzahl - Verstellzylinder
27	Entlüftungsventil
28	Lüfter
29	Abgasschalldämpfer
30	Kupplung
31	Motor-Abstellzylinder
42	Düse
43	Keilriemen
46	Düse (Sekundärseite Proportionalregler)
50	Schalldämpfer
56	Wasserkühler
56.1	Kühlwasserausgleichsbehälter
56.2	Wassereinfüllstutzen mit Verschlußschraube
56.3	Schlauchkupplung - Wasserablaß
56.5	Kühlwasserschauglas
57	Absperrhahn - Entlüftungsleitung
62	kombiniertes Steuerventil
63	Regelventil (Umluftventil)

c				Datum	19.11.2002		KAESER KOMPRESSOREN	Legende RI-Fließbild Mobilair M 121		
b				Bearb.	Plau					
a	5688			Gepr.	Markowski				FFMM121ST-00437.00	Blatt 2
	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: FFMM121SO-00422.00			D



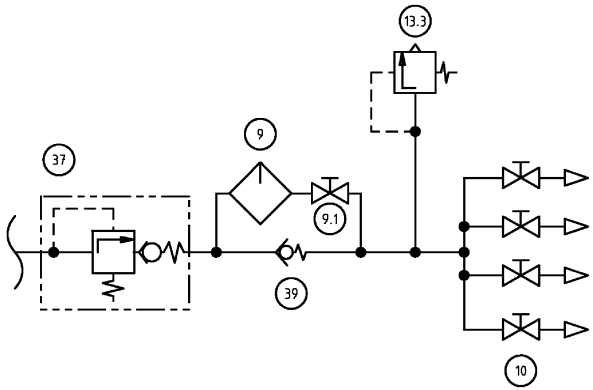
Compressed air outlet

Standard



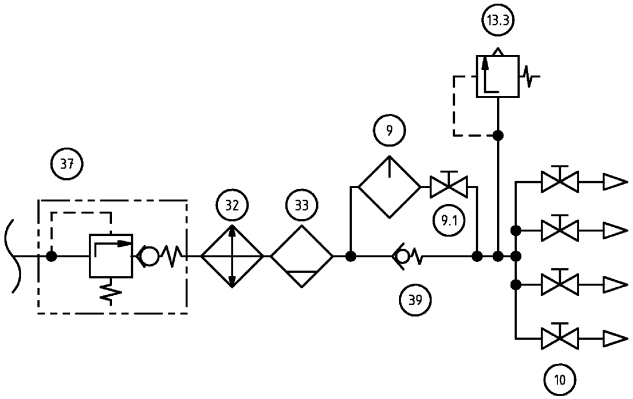
Compressed air outlet

Option A1



Compressed air outlet

Option E



Compressed air outlet

Option A2

9	Tool lubricator
9.1	Shut-off valve
10	Compressed air distributor
13.3	Pressure relief valve
	(optional, only with ajustable proportional regulator)
32	Air cooler
33	Centrifugal separator
37	Minimum pressure check valve
39	Check valve

c				Datum	19.11.2002		KAESER KOMPRESSOREN	P&I Diagram	
b				Bearb.	Plau			Mobilair M 121	
a				Gepr.	Markowski			Compressed air outlet-options	
	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung:	FFMM121DLAO-00439.00 Blatt 1 E

5.5 Description of the Piping and Instrument Flow Diagram

Details in ( ) correspond to the component identification number on the P & I Diagram.

5.5.1 Air Circulation

Atmospheric air flows in through the inlet air filter (1) of the compressor, the inlet valve (3) and is compressed in the airend (4).

The oil injected into the compression chamber absorbs the heat generated during compression, seals the gap between the rotors and the airend casing and lubricates the bearings of the rotors.

The air and oil mixture is forced into centrifugal movement by a 90˚ deflector in the oil separator tank (5). Initial separation of oil and air takes place under the influence of centrifugal force and the force of gravity. The remaining oil in the compressed air is filtered out by the oil separator cartridge (7). The oil thus accumulating in the oil separator tank (5) is returned to the compressor airend (4).

The compressed air then passes to the compressed air distributor (10) via the minimum pressure/check valve (37). The minimum pressure/check valve also ensures the minimum pressure of 15 – 17,5 psi in the oil separator tank (5) needed to maintain the oil supply to the airend (4).

5.5.2 Oil Circulation

The oil flows from the oil separator tank (5) to the combination valve (19). The thermostatic piston in the combination valve by–passes cool oil around the oil cooler via the oil filter (21) and feeds it directly to the compressor airend (4). If the oil is hot, this by–pass closes and all the oil flows through the oil cooler (20).

Contaminants in the oil are filtered out by the oil filter (21) and the screen filter (18) of the compressor airend. Subsequently, the oil is injected into the airend again.

The oil accumulating in the oil separator cartridge (7) is returned to the compressor air–end via the oil return line (16) and the dirt trap with jet (17).
(The oil is forced to circulate throughout the compressor by the pressure produced by the airend. Therefore, a separate oil pump is not required).

5.5.3 Safety Chain

Pressure relief valve:

A pressure relief valve prevents excessive compression. If a defect causes pressure to increase to 30 psi above maximum working pressure (see chapter 1.1 for value) then the pressure relief valve opens to blow off air. The activating pressure (see chapter 1.5) is preset on the pressure relief valve. Changes to the setting are not allowed!

Temperature gauge switch:

The temperature gauge switch shuts down the compressor if the airend discharge temperature reaches 248˚F.

Engine oil pressure switch:

If the oil pressure in the diesel engine falls below the required minimum (approximately 15 psi), the compressor shuts down.

Coolant thermostat:

If the temperature of the engine coolant rises above 221˚F, the compressor shuts down.

5.5.4 Modulating control

Description of the operating modes

Full Load:

As long as the working pressure is around 7,5 psi below maximum (see chapter 1.1 for the value), the compressor runs under full load. The pressure in the control line to the inlet valve (3) downstream of the proportional controller (23) is so low that the inlet valve is open and the motor speed adjustment lever is in the “max. speed” position.

If the air demand is higher than the maximum FAD of the compressor, the working pressure will settle at a level that lies below the pressure mentioned above. However, the minimum pressure/check valve (37) ensures that even if the outlet valves are fully opened, the pressure in the oil separator tank (5) cannot fall below 15 psi. This minimum pressure is necessary to ensure sufficient lubrication of the airend (4).

Part load:

If the air consumption is less than the maximum air delivery of the compressor the pressure in the oil separator tank rises so that the pressure in the control line from the proportional controller (23) also rises. Firstly, the increased pressure in the control line activates the engine speed adjusting cylinder (26), and then the piston in the inlet valve (3). Thus, if the air demand reduces, engine speed is initially reduced and then the air drawn into the compressor is reduced. This cascade type control ensures minimum fuel consumption during the partial loading.

No load:

If air consumption reduces to zero, the pressure in the control line to the inlet valve rises even further, the proportional controller (23) sets the engine speed adjusting cylinder (26) to the “min. speed” position and closes the the inlet valve (3). The control valve (63) opens and directs the compressed air from the oil separator tank back to the inlet of the airend (4) again.

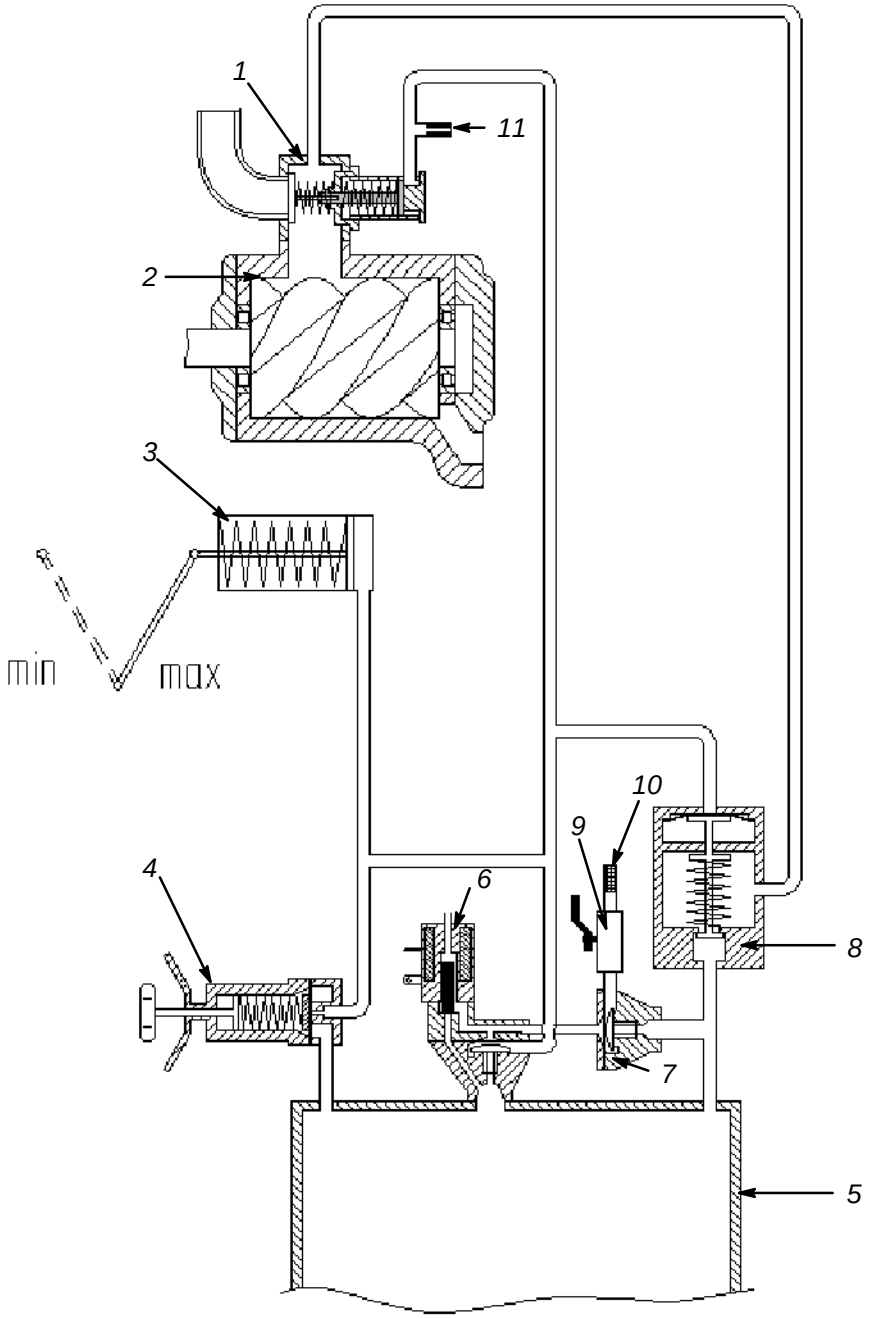
Starting procedure (engine warm-up phase):

The engine starts and the inlet valve is open because there is no control air pressure. Pressure immediately builds up in the oil separator tank, setting the engine speed adjusting cylinder to “min speed” via the combined load–unload valve (62), the engine runs at idling speed and the inlet valve closes. When the engine has run up to operating temperature in the unloaded state (after 1– 2 minutes), the compressor can be switched to “air delivery” with the full load button [–S7]. The combined load–unload valve (62) changes over and the engine speed adjusting cylinder changes to “max. speed”. The inlet valve opens and the pneumatic venting valve (27) closes. The pressure in the control line from the proportional controller (23) to the inlet valve (3) is still so low that the inlet valve is open.

Stop procedure:

The combined load–unload valve (62) sets the engine speed adjusting cylinder to the “min. speed” position and takes control pressure off the inlet valve. The pneumatic venting valve (27) opens and the compressor package is vented. The fuel stop device [–Y1] activates the engine stop lever and the engine (15) stops shortly after.

Modulating control (Standstill)



1 *Inlet valve (3)*
2 *Screw compressor (4)*
3 *Engine speed adjusting cylinder (26)*
4 *Proportional controler (23)*
5 *Oil separator tank (5)*
6 *Combined control valve (Changeover valve) (62)*
7 *Vent valve (27)*
8 *Air circulation valve (63)*
9 *Shut–off valve – Vent line (57)*
10 *Silencer (50)*
11 *Nozzle (46)*

6 Installation

6.1 Setting Up Instructions

Observe the following instructions when setting up the compressor unit:

- Maintain sufficient distance (at least 5 ft.) to building trenches, banks, ramps, etc.
- Locate the compressor unit on a flat, horizontal surface (max. 15˚ slope in the longitudinal or cross direction!).
- Do not set up the compressor unit so that the wind blows in the direction of the cooling air outlet.
- Do not allow exhaust gases and heated cooling air to be sucked into the compressor.

See chapter 1.6 for ambient temperatures required for operation of the compressor unit.

See chapter 4.2 for setting up instructions after transport of the compressor unit.

6.2 Chassis Assembly Instructions

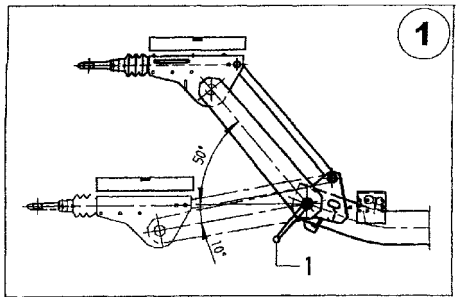
6.2.1 Towbar height adjustment

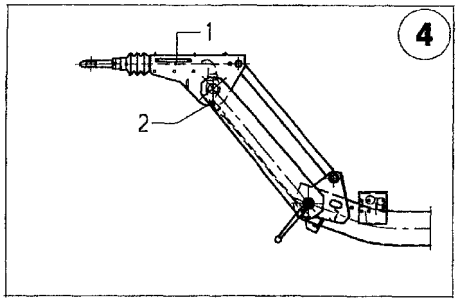
The portable compressor is fitted with a height–adjustable towbar.

Attention! **Always place chocks behind the wheels when adjusting towbar height.**

☞ Place the chocks behind the wheels.

☞ Release the parking brake.





Adjustment:

☞ Remove the safety pin and unscrew the locking clamp (fig 1 / item 1) to the stop.

☞ “release any residual left and right side plate adhesion by pushing them sharply upwards and outwards.

Attention! **Adjust the height with the handle only because of the danger of injury.**

☞ Adjust the towbar with the handle (fig 4 / item 1) so that it is horizontal to the coupling on the towing vehicle.

The intermediate piece can now be adjusted upwards by 50˚ and downwards by 10˚ to the stops.

☞ Tighten the locking clamp again and secure with a stroke from a hard rubber hammer.

☞ Replace the safety pin.

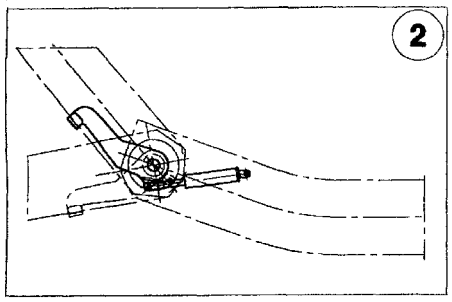
☞ Check that the teeth in the swivel joint are correctly engaged, that the clamp is tightened and that the safety pin is correctly inserted.

Tighten the clamp again after 30 miles.

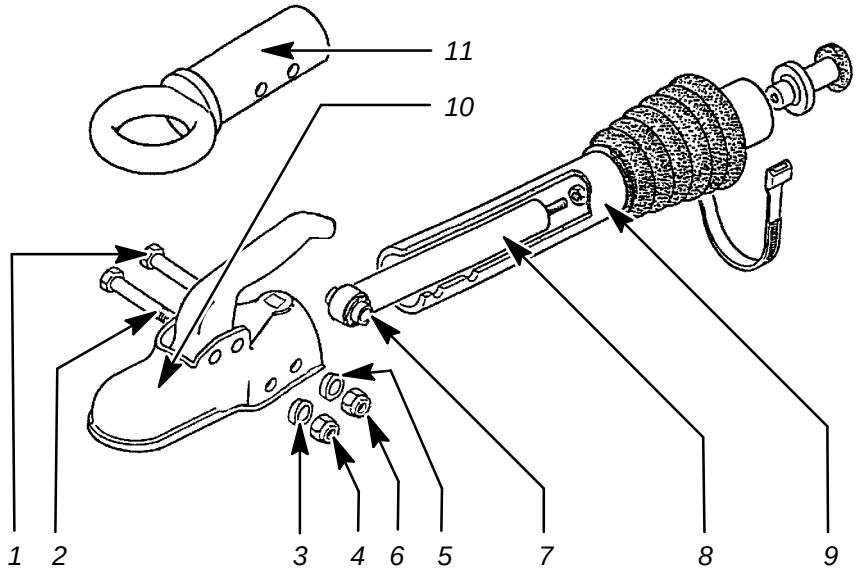
The the parallel (control rod) adjustment ensures that the overrun brake stays in its basic horizontal position (fig 1).

Adjustment aid:

The towbar is provided with an adjustment aid (fig 2). It allows an easy and effortless adjustment to the coupling height. The integrated gas springs hold components such as the overrun brake and adjuster more or less in balance.



6.2.2 Changing the Towing Eye



1	*Hex. head screws*	*7*	*Shock absorber fixing eye*
2	*Hex. head screws*	*8*	*Shock absorber*
3	*Washer*	*9*	*Towbar tube*
4	*Hexagonal nut*	*10*	*Ball coupling*
5	*Washer*	*11*	*Towing eye*
6	*Hexagonal nut*		

The towbar can be used with various towing eyes or couplings. The towing eye is changed in the following manner:

☞ Pull up the parking brake

☞ Remove the nuts (4 and 6) and bolts (1 and 2) and remove the coupling (10) or towing eye (11) from the towbar (9).

Attention! **When the bolts (1 and 2) are removed, the shock absorber piston (8) will run out as this is under tension when assembled.**

☞ Fit the new towing eye (11) or coupling (10) to the towbar (9)

☞ Insert the fixing bolt (2) through the front hole in the eye or coupling and fasten with the washer (3) and nut (4).

In order to insert the rear screw, the overrun brake must be pushed in so that the shock absorber runs back again. Then, the eye or coupling, together with the towbar is jerked forward again. As the shock absorber follows this movement slowly a screwdriver can be inserted from the side through the hole for the fixing bolt and the fixing eye in the shock absorber. This blocks the shock absorber and the fixing bolt can be pushed through from the opposite side.

☞ Push the towing eye (11) or coupling (10) back so that the overrun brake is pushed together.

☞ Jerk the towing eye or coupling together with the towbar forward quickly and push a screwdriver through the fixing hole to catch the shock absorber fixing eye as it moves slowly forward to follow the movement.

☞ Having aligned the holes with the screwdriver, the fixing bolt (1) can be pushed through the corresponding hole in the towing eye or coupling and secured with a washer (5) and nut (6).

☞ Tighten the nuts (4 and 6).

7 Putting into Operation

7.1 Points to be Observed before Putting into Operation

Every compressor unit is test run in the factory and carefully checked before shipment. The test run confirms that the compressor unit conforms to the specification data and runs perfectly. However, independent of the checks made at the factory, the compressor unit could be damaged during transport. For this reason, we recommend that the compressor unit is examined for such possible damage. Observe the compressor unit carefully during the first hours of operation for any possible malfunction.

Attention!

Important functional components in the compressor unit (such as safety relief valve and inlet valve) are properly adjusted at the factory to meet safety regulations.
Do not make alterations to the safety relief valve or inlet valve without first consulting the manufacturer.

The safety relief valve and inlet valve are spring loaded.

DO NOT use air at pressures higher than 30 psig for cleaning purposes, and then only with effective chip guarding and personal protective equipment per OSHA Standard 29 CFR 1910.242(b) or any applicable Federal, State and Local codes, standards and regulations.

7.2 Points to be Observed before Starting the Compressor:

NON--OBSERVANCE OF THESE OR OTHER INSTRUCTIONS (WARNING; ATTENTION) CAN LEAD TO ACCIDENTS CAUSING INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

It is not allowed to operate the compressor within an enclosed space because of the danger of toxic exhaust gases.

Do not operate the compressor with the open doors because of the dangers associated with hot surfaces, rotating parts, electrical shock hazards. Open doors will also adversely affect the compressor's cooling system.

☞ Remove all packing material, tools and transport securing devices on and in the compressor.

- It is expected that the operator employs safe working techniques and that all lawful operating and safety regulations are followed when operating this compressor.
- The user of this compressor is responsible for its safe operating condition.
- Do not operate this compressor in environments where heavy dust conditions, toxic or flammable gases could exist.

Before starting the unit, check the following:

☞ Check the oil level in the oil separator tank (see chapter 9.3.1).

☞ Check the engine oil level (see engine service manual).

☞ Check the engine coolant level (see chapter 9.3.10).

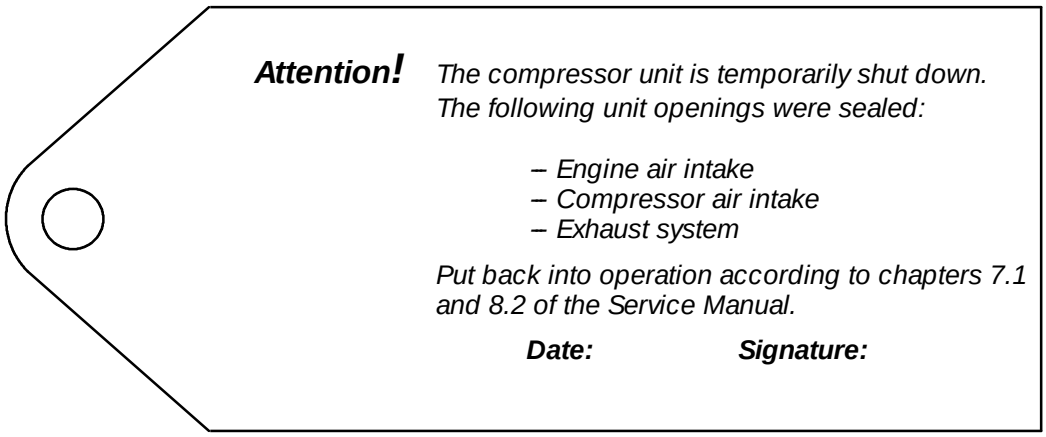
☞ Check the fuel level (see engine service manual).

7.3 Storage

7.3.1 Short term storage (less than four months)

- ☞ Disconnect the battery (first the negative cable, then the positive cable).
- ☞ Seal the air intake openings of the engine, the air intake openings of the compressor and the engine exhaust with plastic foil and moisture resistant adhesive tape.
- ☞ Secure a warning notice on the instrument panel stating the actions taken to store the unit and the date.

.



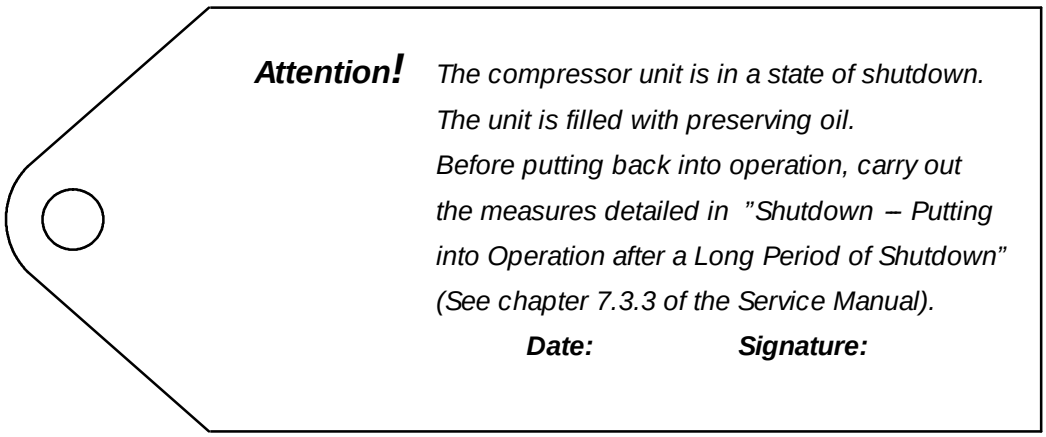
Example of a warning notice informing of temporary shutdown measures

7.3.2 Long term storage (more than four months)

- ☞ Check the engine coolant (see chapter 9.3.10).
- ☞ Drain the engine oil, the oil in the oil separator tank and the oil in the oil cooler with the compressor at operating temperature (see chapter 9.3.2 and the engine service manual).
- ☞ Fill the engine and the oil separator tank with preserving oil (see engine service manual and chapter 1.7, 'Oil Recommendations').
- ☞ Fill up the fuel tank to the filler neck with fuel together with approximately 10% preserving oil (see chapter 1.7 for the type of oil).
- ☞ Run the compressor for approximately 10 minutes to distribute a film of oil (see chapter 8.2 for starting and stopping the compressor).
- ☞ Disconnect the battery (first the negative cable and then the positive cable).
- ☞ Check the level of electrolyte in the battery (see chapter 9.3.9 for battery maintenance).
- ☞ Check the battery charge monthly and recharge if necessary. Otherwise there is danger of the electrolyte freezing under cold conditions.
- ☞ Clean the battery connections and grease with acid resistant grease.
- ☞ Close the air discharge valves.
- ☞ Place a bag of desiccant (silica gel) in the air intake filter opening and secure with adhesive tape if necessary.

- ☞ Seal the air intake openings of the engine, the air intake openings of the compressor and the engine exhaust with plastic foil and moisture resistant adhesive tape.
- ☞ Clean the bodywork and then treat with a preserving agent.
- ☞ Secure a warning notice on the instrument panel informing of the shutdown measures taken.

.



Example of a warning notice informing of shutdown measures

Store the compressor unit in a dry environment subject to consistent temperatures.

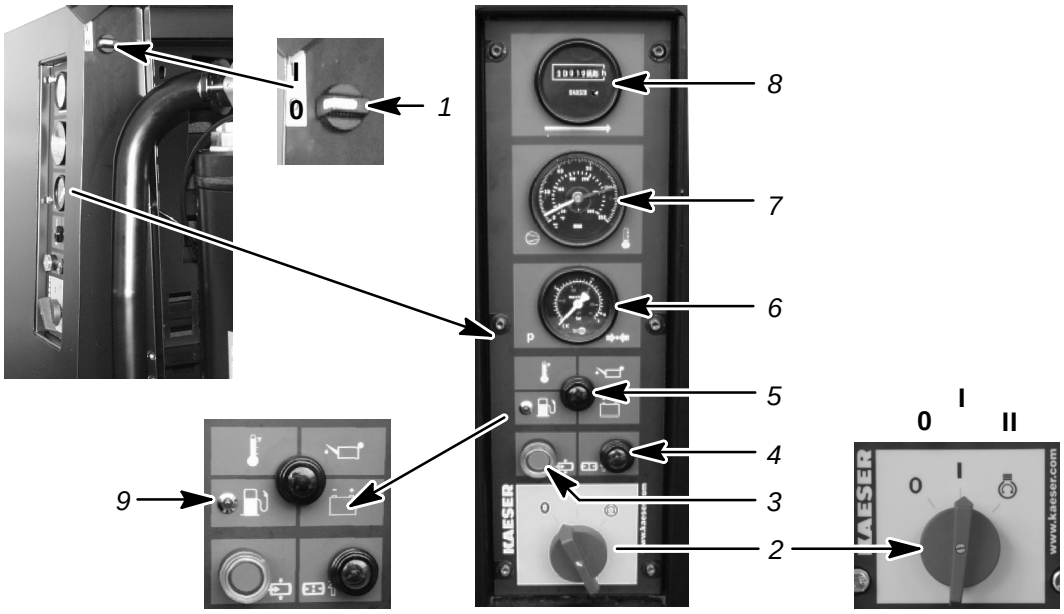
7.3.3 Putting into operation after a long period of shutdown

- ☞ Check the tyre pressures (see chapter 1.1 for tyre pressures).
- ☞ Clean the bodywork with a grease and dirt cleaning solvent.
- ☞ Remove the plastic foil and adhesive tape from the inlet air opening of the engine, air inlet opening of the compressor and the engine exhaust.
- ☞ Remove the desiccant (silica gel) bag from the opening of the air filters of motor and compressor.
- ☞ Drain the preserving oil from the engine (see engine service manual).
- ☞ Carry out a visual inspection of the air and oil filters.
  Replace, if necessary (see engine service manual and chapters 9.3.5 and 9.3.3).
- ☞ Fill with engine oil (see engine service manual).
- ☞ Fill with compressor oil (see chapter 9.3.2).
- ☞ Check the engine coolant level (see chapter 9.3.10).
- ☞ Check the state of battery charge.
  Recharge, if necessary (see chapter 9.3.9).
- ☞ Reconnect the battery / batteries (first the plus pole, then the minus pole).
- ☞ Check all fuel lines, engine oil lines and compressor oil lines for leaks, loose connections, wear and damage.
- ☞ Repair any faults immediately!
- ☞ Put the compressor into operation as described in chapter 7.1 and 8.2.
- ☞ Check the function of the lights and direction indicators.

8 Operation

Details in ( ) correspond to the component identification number on the P & I Diagram.

8.1 Operating Controls



1 *"Control ON" switch*
2 *Starter switch*
- *0 STOP / off*
- *I ON*
- *II Start*

3 *"Full load mode ON" pushbutton with integrated full load mode control lamp*
4 *Back pressure control lamp*
5 *Charging lamp (group alarm lamp)*
6 *Compressed air outlet pressure gauge*
7 *Temperature gauge switch*
8 *Operating hours counter*
9 *Low fuel control lamp*

8.2 Starting and Stopping the Compressor Unit

8.2.1 Starting

☞ Open the right–hand access door.

☞ Turn the "Control ON" switch inside the compressor to "I".

☞ Turn the starter switch to the "0" position The charging lamp must illuminate (red)

Starting:

Attention! **Never turn the starter switch when the engine is running. Do not turn and hold the starter switch for longer than 30 seconds. Wait for a few minutes after each attempt to start the engine. Return the ignition switch to the "0" (vertical) position before any attempt to restart because of the built–in repeated start inhibit.**

☞ Turn the starter switch to the ''II'' position (right stop) and hold. The starter turns.

Release the switch as soon as the engine starts. During the start phase additional fuel is injected into the engine. When the engine starts and runs normally, the charging lamp should extinguish after a few seconds.

Attention! **If the charging lamp does not extinguish, there is a fault! (see chapters 8.7.7)**

Attention! **If the "Back Pressure" lamp (orange) illuminates when the starter switch is turned to position "II" then there is still back pressure within the compressor system and the compressor cannot be started. The compressor can be only started when the pressure in the system has fallen enough to allow this lamp to extinguish.**

To protect the engine and extend service life, the compressor should not be switched to "Full load mode ON" until the engine has warmed up in idling mode (1 – 2 minutes, depending on season).

If the air outlet shut--off valves are open when the "Full load mode ON" pushbutton is pressed a dangerously strong jet of air will be momentarily discharged.

☞ Check that the compressed air outlet valves are closed, if not, close them.

☞ As soon as the engine has reached operating temperature, press the "Full Load ON" button.

When the full load valve operates, the control lamp integrated in the "Full Load ON" pushbutton illuminates. The engine runs up to maximum speed (full load).

☞ Close the access door again.

The portable compressor is operational and compressed air is available.

8.2.2 Shutting down

☞ Turn the starter switch to the "0" position

Complete shutdown:

☞ Open the right–hand access door.

☞ Secure the compressor against unauthorized starting by turning the control switch inside the portable compressor counterclockwise to the "0" position.

☞ Close the access door again.

8.3 Monitoring fuel level

If the fuel level falls below the set minimum a relay is energised that, after a set time delay, activates the fuel shut–off device. This actuates the engine shut–off lever and the engine comes to a stop.

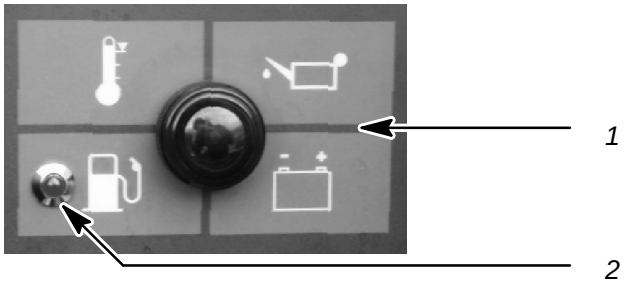
The alarm is registered and the indicator lamp ”Fuel level low” on the instrument panel illuminates.

When the compressor is stopped in this condition it cannot be restarted.

☞ Refuel the compressor.

When the refuelled machine is re–started the alarm is automatically reset.

The compressor is ready for operation again.



1 Part control panel
2 Control lamp”Low fuel” (LED red)

8.4 Function of the safety device

If during machine operation one of the series–connected, normally–closed contacts ”Engine oil pressure”, ”Coolant temperature” or ”Airend discharge temperature” opens, the fuel shut–off device is activated.
The engine comes to a stop and the venting valve opens to vent the compressor.

8.5 Checks during Operation

Open the maintenance panels during operation for a short period only, e.g. to carry out checks.

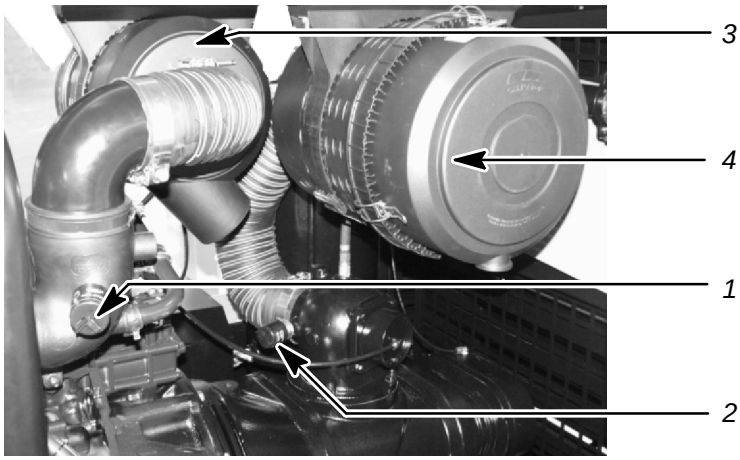
There is danger of injury to personnel due to heated surfaces, rotating components or shock hazards due to electrical components!

The constructional soundproofing measures are without function when the maintenance panels are opened and the compressor unit is running.
Protective ear muffs must be worn.

☞ Check the air intake filter maintenance indicator. If the red cylinder is visible in the window, clean or renew the filter cartridge (see chapter 9.3.5 and 9.3.6).

Attention!

The pressure generated by the compressor unit should never exceed the stated maximum working pressure (see chapter 1.1 for the value) under any operational condition.
The maximum temperature of the compressed air at the discharge port may not be exceeded (see chapter 1.1 for the value).



1 Maintenance indicator for engine air filter
2 Maintenance indicator for compressor air filter
3 Engine air filter
4 Compressor air filter

8.6 Measures for Freezing Conditions (Winter Operation)

The electrical system starts the unit without problem at temperatures down to 17,6˚F.

Attention! **If the compressor is operated at ambient temperatures below 32˚F, then the following points must be observed:**

- Use winter engine oil (see service manual for the engine).
- Use low viscosity compressor oil (see chapter 1.7).
- Use winter diesel fuel.
- Fit a heavy duty winter battery (see chapter 9.3.9).

Attention! **The pneumatic control of the compressor unit can defect under ambient temperatures below 32˚F.**
This could be caused by small particles of ice forming in the control and regulation devices.

Attention! **To ensure faultless regulation allow the compressor to run up to operational temperature with the discharge valves open.**

8.6.1 Temperature--dependent operation of the compressor

Attention! **The compressor is designed for an ambient temperature range from 14˚F to 122˚F.**
The compressor may not be operated in ambient temperatures outside this range.

8.6.2 Starting help (starter battery discharged)

If the starter battery is discharged, the compressor unit can be started with the help of the starter battery in another vehicle or another portable compressor.

Attention!

Pay attention to safety requirements of batteries

Connect batteries of the same voltage only. (see chapter 1.4 for the voltage).

Only use standardized battery jumper cables of sufficient cross-sectional area and with insulated pole clamps.

Pay attention to instructions for use of battery jumper cables.

Arrange the jumper cables so that they cannot be caught up by rotating parts of the compressor unit or the assisting vehicle.

Connecting the battery jumper cables:

☞ Park the assisting vehicle as near to the battery in the portable compressor as possible.

☞ Stop the engine.

☞ Switch off all unnecessary power consumers.

☞ Connect the first jumper cable to the "+" terminal of the discharged battery and the "+" terminal of the battery in the assisting vehicle.

Attention!

Do not connect the jumper cable to the "-" terminal of the discharged battery as well as the body of the portable compressor.

☞ Connect one end of the second jumper cable to the "–" terminal of the battery in the assisting vehicle and the other end to the earth rail of the engine in the portable compressor.

Starting the engine:

☞ Start the engine of the assisting vehicle and run at high speed.

☞ Start the engine of the portable compressor.

When the portable compressor has successfully started, allow both the portable compressor and the assisting vehicle to run with the jumper cables still connected for approximately 3 minutes.

Removing the jumper cables:

☞ Remove the jumper cable from the "–" terminal of the battery in the assisting vehicle and from the metal part of the engine in the portable compressor.

☞ Remove the jumper cable from the "+" terminal of the battery in the portable compressor and the "+" terminal of the battery in the assisting vehicle.

8.7 Trouble shooting

When attempting to repair a malfunction, the instructions in the 'Safety' chapter and the appropriate local safety regulations (see chapter 2) must be complied with!

Re--starting after a malfunction:

See chapter 7.2 'Putting into Operation' and chapter 8.2.1 'Starting'.

Explanation of symbols for the following fault finding help:

∗1 – have checked by a specialist.

∗2 – call KAESER authorized distributor.

∗3 – see motor service manual.

8.7.1 Engine refuses to start or turn

See also engine service manual.

Possible cause:	Remedy:
Defective starter.	Replace; ∗1.
Fuel shut–off device not opened.	Repair, replace if necessary; ∗2.
Fuel tank empty.	Refill.
Airlock in the fuel line between fuel tank and injector pump.	Bleed the fuel line; see chapter 9.3.11; ∗3.
Fuel filter clogged.	Clean or replace.
Fuel line broken.	Replace; ∗1.
Defective control fuse or relay.	Replace; ∗1 or ∗2.
Defective temperature gauge switch giving no enable signal.	Replace; ∗2.
Defective start switch.	Replace; ∗1 or ∗3.
Connections and/or conductor in electrical wiring loose or broken.	Tighten or replace as necessary; ∗1.
Battery voltage too low.	Service battery, see chapter 9.3.9.
Oil pressure switch indicating insufficient oil pressure.	Check the engine oil pressure. Have the engine repaired or replaced; ∗3 or ∗1.

8.7.2 Engine does not reach full speed

See also engine service manual.

Possible cause:	Remedy:
Airlock in the fuel line between fuel tank and injector pump.	Bleed the fuel line; see chapter 9.3.11; ∗3.
Fuel filter clogged.	Clean, replace, if necessary; ∗3.
Fuel line fractured.	Replace; ∗1.
Speed adjustment cylinder maladjusted or defective.	Repair, replace if necessary; ∗2.

8.7.3 Working pressure too high

Possible causes:	Remedy:
Proportional controller maladjusted or defective.	Check the diaphragm, clean the nozzle, replace proportional controller if necessary ⁎2.
Inlet valve not closing.	Repair, replace if necessary.
Pressure gauge giving false reading.	Replace ⁎2.
Venting valve does not blowing off.	Check the connections and function, repair or replace as necessary ⁎2.

8.7.4 Working pressure too low

Possible causes:	Remedy:
Proportional controller maladjusted or defective.	Check the diaphragm, clean the nozzle, replace proportional controller if necessary ⁎2.
Inlet valve not opening or only opening partially.	Repair or replace if encessary ⁎2.
Pressure gauge giving false reading.	Replace ⁎2.
Pressure relief valve blowing off.	Leaky or maladjusted, replace if necessary⁎2.
Venting valve blowing off.	Check the connections and function, repair or replace as necessary ⁎2.
Engine not running at full speed.	see chapter 8.7.2.
Engine air filter clogged.	Clean or replace, see chapter 9.3.6.
Compressor air filter clogged.	Clean or replace, see chapter 9.3.5.
Oil separator cartridge clogged.	Replace, see chapter 9.3.4.

8.7.5 Safety relief valve blowing

Possible cause:	Remedy:
Oil separator cartridge heavily contaminated.	Replace, see chapter 9.3.4.
Inlet valve not closing.	Check the controller, control line and inlet valve, replace if necessary; ⁎2.
Safety relief valve maladjusted or leaky.	Replace; ⁎2.

8.7.6 Compressor unit overheating

Possible cause:	Remedy:
Low oil level.	Top off, see chapter 9.3.1.
Compressor unit fan wheel damaged or malfunctioning.	Replace blades or the complete fan wheel; ⁎2.
Compressor oil cooler surface contaminated.	Clean the surface, see chapter 9.3.7.
Working element of the combination valve faulty.	Replace; ⁎2.

Possible cause:	Remedy:
Working pressure too high (proportional controller maladjusted).	Reset to the permissible value or replace; ⁎2.
Compressor oil separator cartridge contaminated.	Measure the differential pressure, if it is higher than 15 psig, replace (see chapter 9.3.4.)
Compressor oil filter cartridge contaminated.	Replace, see chapter 9.3.3.
Leaky oil pipes.	Seal the pipes or replace; ⁎1 oder ⁎2.
Ambient temperarture too high.	See installation requirements, chapter 1.6.

8.7.7 Control lamp always illuminated

Possible cause:	Remedy:
Connections or cable in the electrical wiring loose or open circuit.	Tighten or replace if necessary; ⁎1.
Defective engine generator.	Replace if necessary; ⁎3 oder ⁎1.
Defective engine voltage regulator.	Replace if necessary; ⁎3 oder ⁎1.
Engine oil level low.	⁎3 or ⁎1.

8.7.8 High concentration of oil in the compressed air

Possible fault:	Remedy:
Scavenger line of the oil separator cartridge blocked.	Clean the filter screen in the dirt trap of the oil separating cartridge and check the nozzle, replace if necessary (see chapter 9.3.4); otherwise ⁎2
Oil separator cartridge of the compressor fractured.	Replace, see chapter 9.3.4.
Compressor oil level too high.	Reduce to max. level, see chapter 9.3.1.

8.7.9 Oil runs out of the compressor air filter after switching off

Possible fault:	Remedy:
Check function of the inlet valve defective.	Repair, replace if necessary; ⁎2
Wrong type of oil (excess foaming).	Drain the oil and refill with oil conforming to the oil recommendations (see chapter 1.7 for oil types).

9 Maintenance

9.1 Observe the following rules during all maintenance and servicing:

Only specialized or trained personnel may work on power driven equipment.

Before starting work, disconnect the negative terminal of the battery to prevent an inadvertent start of the compressor unit.

DO NOT remove caps, plugs, and/or other components when compressor is running or pressurized. Stop compressor and relieve all internal pressure before doing so.

Before starting the compressor unit, ensure that:

1. No maintenance personnel are working on the compressor unit.

2. All protective guards and cover panels are screwed back on.

3. All tools are removed from the compressor unit.

☞ See chapter 8.2 to start the compressor unit.

9.2 Regular Maintenance

Interval	Maintenance work	see chapter
Daily	check the oil level in the oil separator tank check the engine oil level check the maintenance indicators on the air filters (compressor and engine) check the electrolyte level in the batteries and the connectors fill the fuel tank check the engine air filter, clean if necessary	9.3.1 engine SM 8.5 9.3.9 engine SM 9.3.6
50 h after initial start–up	check the engine coolant replace the compressor oil filter change the engine oil and engine oil filter check the valve clearance Tighten the following bolts on the engine: oil sump, engine mounts, intake and exhaust manifolds	9.3.10 9.3.3 engine SM engine SM engine SM
Weekly	check the engine coolant	9.3.10

Interval	Maintenance work	see chapter
every 125 h	clean the compressor air filter*	9.3.5
	clean the oil cooler*	9.3.7
	clean the engine cooling fins*	engine SM
	check the wheel nuts for tightness	
	check the tyre pressures	1.1
	grease the regulating rod	
every 250 h	check all accessible screw connections, pipes and clamps for wear and tightness	
	check the engine fan belt tension	
	Check V–belt tension	engine SM
		engine SM
every 500 h	change the compressor oil filter*	9.3.3
	change the engine oil; oil filter*	engine SM
	change the compressor air filter*	9.3.5
	check the differential pressure of the oil separator cartridge (max. 1.0 bar)	
	check the valve clearance	engine SM
	grease the brake rods	9.3.14
every 1000 h	have the air inlet and exhaust manifold mountings checked	engine SM
	change engine oil (at least once annually)*	9.3.2
	clean or replace all fuel filters	engine SM
	have the safety relief valve checked	9.3.16
every 1500 h	have the starter motor and alternator checked	
	change the oil separator cartridge in the oil separator*	9.3.4
every 3000 h	have the fuel injectors checked	engine SM

* The maintenance intervals given are recommended intervals and could shorten considerably under unsuitable ambient or operational conditions.

Engine SM ⇒ refers to separate engine service manual.

We urgently recommend that a record is kept of all maintenance carried out. A sample maintenance record form is shown in chapter 11.4.

9.3 Maintenance Instructions

The maintenance instructions for the diesel engine are found in the diesel engine service manual!

☞ Before starting repair work or maintenance clean the compressor unit, especially connections and screw joints of all oil, diesel fuel or protective agents (preservation grease, etc).

☞ Do not use aggressive cleaning materials! Use non–fibrous cloth!

Attention! **Always tighten down any screw connections that have been loosened during maintenance work.**

Ensure that waste operational and maintenance materials, replaced parts, etc. are disposed of according to environmental regulations!

9.3.1 Check/top off the oil in the oil separator tank

Check the oil level daily before starting the compressor unit.

Carry out the check with the compressor unit standing horizontally, with the compressor unit switched off and with the oil separator tank vented.

Oil level check:

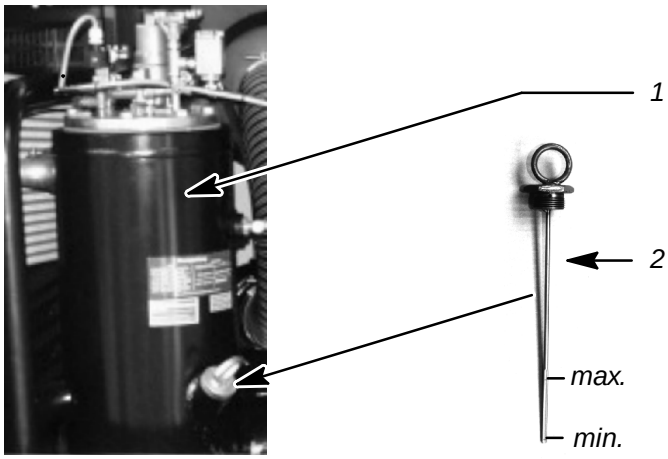
☞ Shut down the compressor unit (see chapter 8.2).

☞ Wait until the compressor has automatically vented (check that the pressure gauge indicates zero psig)!

☞ Open the right–hand access door.

☞ Disconnect the minus pole of the battery.

☞ Uncouple all consumers and open the discharge valve.



1 Oil separator tank
2 Oil filler plug with measuring stick

Detail:
max. maximum oil level
min. minimum oil level

☞ Unscrew the oil filler plug and remove together with the plug or cap with dipstick. Clean the dipstick with non–fibrous cloth and screw in the filler plug again completely.

☞ Unscrew the filler plug again and read off the oil level on the dipstick.

The oil level must be between the markings on the dipstick. If the level is below the lower mark, immediately top off with compressor oil!

Top off the oil:

Attention! **The oil should never exceed the normal quantity otherwise operational malfunctions could occur. If too much oil is added, oil will enter the air control valve upon restarting, cause malfunctioning regulation and enrichment of the compressed air with excess oil.**

Attention! **Always use the same type of oil (see label on the oil separator tank, or chapter 1.7).**
Contrary to the diesel motor, a mixture of different oils for compressor lubrication may never be used!

☞ Top off with oil to the maximum mark using an oil funnel.

☞ Check the oil level again.

☞ Check the sealing ring of the oil filler plug and then screw in tightly.

☞ Connect the negative cable of the battery again.

Exact check of oil level and for leaks:

There is a danger of injury through contact with:
-- very hot surfaces.
-- rotating parts.
-- electrically conductive components.

The sound proofing measures are ineffective when the maintenance panels are open!
Hearing protection should be worn.

☞ Start the compressor unit and allow to run until the operating temperature (see chapter 1.1) is reached (the oil circulation is then in operation).

Check the oil level again as follows:

☞ Run the compressor in ‘off load’ (with no consumers connected) and close the outlet valves (maximum system pressure).

☞ Shut down the compressor (see chapter 8.2).

☞ Wait until the compressor has automatically vented (check that the pressure gauge reads zero psig).

Check the oil level (see ‘Oil Level Check’, chapter 9.3.1).

☞ Top off the oil if necessary.

☞ Carry out a visual test for leaks.

☞ Close the maintenance panel.

9.3.2 Compressor oil change (oil separator tank and oil cooler)

Change the oil after approximately 1000 operating hours, depending on the degree of pollution of the intake air, but at least once annually.

Change the oil with the compressor unit at operational temperature.

The compressor oil can get very hot, beware of scalding!

☞ Shut down the compressor unit (see chapter 8.2).

☞ Wait until the compressor has automatically vented (check that the pressure gauge indicates zero psig)!

☞ Open the right–hand access door.

☞ Disconnect the minus pole of the battery.

☞ Uncouple all consumers and open the discharge valve.

☞ Unscrew the oil filler plug.

Capture the used oil in a suitable container and dispose according to environmental regulations!

☞ Drain the oil separator tank by unscrewing the oil drain plug, located on the underside of the tank (accessible from underneath through the access hole in the floor panel).

☞ Drain the oil cooler by unscrewing the separate drain plug, located on the bottom left of the oil collection box (accessible from underneath through the access hole in the floor panel).

Attention! **Drain the oil from the oil separator tank, oil cooler and the oil pipelines completely.**

☞ Change the oil filter cartridge if necessary (see chapter 9.3.3).

☞ Fit new ring seals on both drain plugs and screw them back in again.

☞ Top off with new oil using a funnel (see label on the oil separator tank or chapter 1.7 for the type of oil used).

Attention! **Never exceed the maximum oil quantity, otherwise damage may occur.**

☞ Check the oil level (see chapter 9.3.1).

☞ Screw in the oil filler plug again and tighten down.

☞ Reconnect the negative cable of the battery.

Exact check of oil level and for leaks:

There is a danger of injury through contact with:
-- very hot surfaces.
-- rotating parts.
-- electrically conductive components.

The sound proofing measures are ineffective when the maintenance panels are open!
Hearing protection should be worn.

☞ Start the compressor unit and allow to run until the operating temperature (see chapter 1.1) is reached (the oil circulation is then in operation).

Check the oil level again as follows:

☞ Run the compressor in ‘off load’ (with no consumers connected) and close the outlet valves (maximum system pressure).

☞ Shut down the compressor (see chapter 8.2).

☞ Wait until the compressor has automatically vented (check that the pressure gauge reads zero psig).

Check the oil level (see ‘Oil Level Check’, chapter 9.3.1).

☞ Top off the oil if necessary.

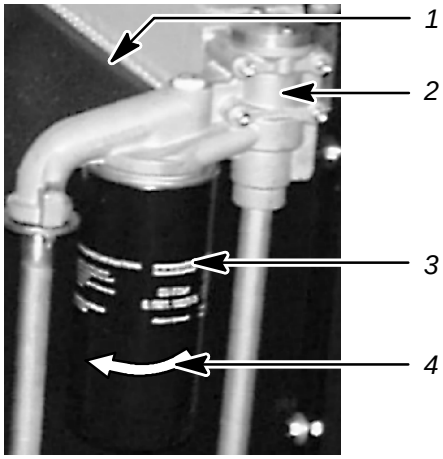
☞ Carry out a visual test for leaks.

☞ Close the maintenance panel.

9.3.3 Compressor oil filter cartridge change

Replace the oil filter cartridge after approximately 50 operating hours. It is recommended that the oil filter cartridge is then changed every 500 operating hours.

The compressor oil can get very hot, beware of scalding!



1 Oil cooler
2 Combination valve
3 Oil filter
4 Direction of rotation for oil filter removal

☞ Shut down the compressor unit (see chapter 8.2).

☞ Wait until the compressor has automatically vented (check that the pressure gauge indicates zero psig)!

☞ Open the right–hand access door.

☞ Disconnect the minus pole of the battery.

☞ Uncouple all consumers and open the discharge valve.

Dispose of the old oil filter and any used, accumulated oil according to environmental regulations!

☞ Unscrew the contaminated oil filter cartridge counter–clockwise and dispose of (if the filter cartridge is seized, use an appropriate tool to remove).

☞ Capture and dispose of any leaking oil.

☞ Carefully clean sealing surfaces using non–fibrous cloth.

Lightly oil the sealing gasket of the new oil filter cartridge, using fresh oil.

☞ Use your fingers to apply a light coat of fresh oil to the seal of the new cartridge.

Attention! **Do not use a filter wrench when installing a new oil filter cartridge. Hand--tighten only!**

☞ Screw on the new oil filter cartridge by hand until the gasket is firmly seated.

☞ Firmly hand–tighten the new cartridge.

☞ Check the oil level in the oil separator tank (see chapter 9.3.1).

☞ Reconnect the negative cable of the battery.

Exact check of oil level and for leaks:

There is a danger of injury through contact with:
-- very hot surfaces.
-- rotating parts.
-- electrically conductive components.

The sound proofing measures are ineffective when the maintenance panels are open!
Hearing protection should be worn.

☞ Start the compressor unit and allow to run until the operating temperature (see chapter 1.1) is reached (the oil circulation is then in operation).

Check the oil level again as follows:

☞ Run the compressor in 'off load' (with no consumers connected) and close the outlet valves (maximum system pressure).

☞ Shut down the compressor (see chapter 8.2).

☞ Wait until the compressor has automatically vented (check that the pressure gauge reads zero psig).

Check the oil level (see 'Oil Level Check', chapter 9.3.1).

☞ Top off the oil if necessary.

☞ Carry out a visual test for leaks.

☞ Close the maintenance panel.

9.3.4 Oil separator cartridge change

References to numbers in ( ) refer to the numbers in the following illustration.

Replace the oil separator cartridge at the latest every 1500 operating hours, or after a maximum of 2 years. The differential pressure across the cartridge may not exceed 15 psig.

☞ Shut down the compressor unit (see chapter 8.2).

☞ Wait until the compressor has automatically vented (check that the pressure gauge indicates zero psig)!

☞ Open the right–hand access door.

☞ Disconnect the minus pole of the battery.

☞ Uncouple all consumers and open the discharge valve.

☞ Unscrew the union nut (4) on the oil return line (5) and remove the plastic piping.

☞ Remove the dirt trap (3).

☞ Loosen the oil scavenge line (14) complete and pull it out.

☞ Remove the control line (2) by unscrewing the union nut (1).

☞ Remove the control line (2a) on the proportional controller by unscrewing the union nut (1a).

☞ Unscrew the air hose (20) on the control valve (7).

☞ Unscrew the fixing screw in the plug on the solenoid valve (21)
(coming from the combined control valve) and carefully pull out the plug.

☞ Unscrew the pipe connection (9) to the minimum pressure/check valve (8) and unscrew the valve.

☞ Unscrew the cover plate bolts (6) and remove.

☞ Carefully remove the cover plate (16) and put to one side.

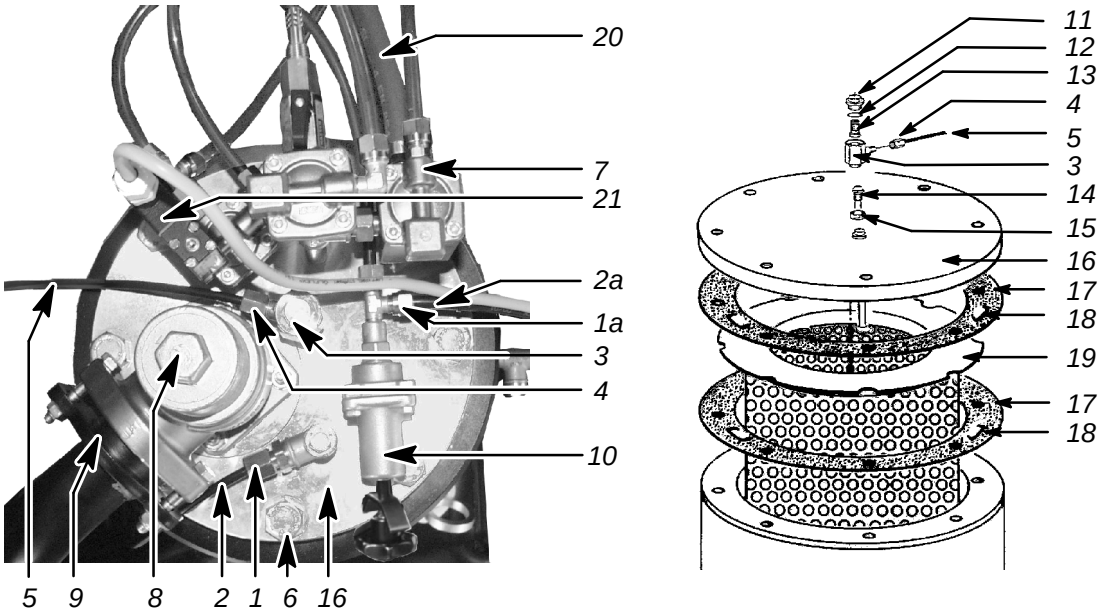
☞ Extract the used oil separator cartridge (19) with gaskets (17) and clean the sealing surfaces.

Attention! **When cleaning the sealing surfaces take care that no foreign bodies (dirt particles) fall into the oil separator tank.**

The used oil separator cartridge cannot be cleaned and must be disposed of according to environmental regulations.

- ☞ Dispose of the used oil separator cartridge.
- ☞ Insert the new oil separator cartridge (19), with new gaskets (17).
- ☞ Carefully slide the cover plate (16) on to the oil separator tank again and align. Screw in and tighten the cover plate bolts (6).
- ☞ Change the strainer (13) and the O ring (12) in the dirt trap together with the oil separator cartridge.
- ☞ Reassemble in the reverse order.

The metal parts of the oil separator cartridge must be at earth potential so that electrically conductive gaskets are needed. The gaskets (17) are fitted with metal clips (18) that fulfil this requirement and provide an electrical path to the oil separator tank and to the frame of the package.
Do not remove the metal clips!



1 Control air line union nut
1a Control air line union nut
2 Control air line
2a Control air line
3 Dirt trap (17)
4 Union nut for the oil return line
5 Oil return line
6 Cover plate bolts
7 Control valve (air circulation valve) (63)
8 Minimum pressure/check valve (37)
9 Pipe connection
10 Proportional controller (23)
11 Locking screw
12 O–ring
13 Strainer
14 Oil return line, complete
15 Union nut for the dirt trap
16 Cover
17 Gasket
18 Metal clip
19 Oil separator cartridge (7)
20 Compressed air hose
21 Solenoid valve on the combined control valve

Exact check of oil level and for leaks:

There is a danger of injury through contact with:
-- very hot surfaces.
-- rotating parts.
-- electrically conductive components.

The sound proofing measures are ineffective when the maintenance panels are open!
Hearing protection should be worn.

☞ Start the compressor unit and allow to run until the operating temperature (see chapter 1.1) is reached (the oil circulation is then in operation).

Check the oil level again as follows:

☞ Run the compressor in 'off load' (with no consumers connected) and close the outlet valves (maximum system pressure).

☞ Shut down the compressor (see chapter 8.2).

☞ Wait until the compressor has automatically vented (check that the pressure gauge reads zero psig).

Check the oil level (see 'Oil Level Check', chapter 9.3.1).

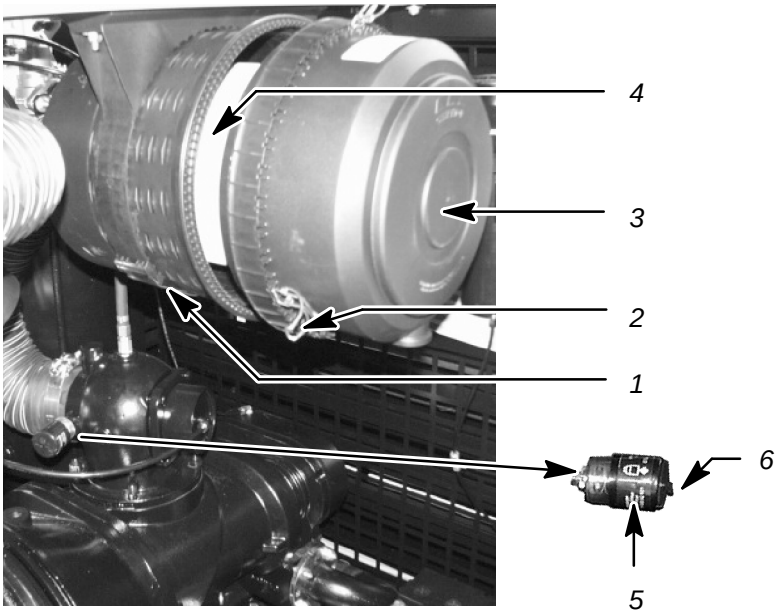
☞ Top off the oil if necessary.

☞ Carry out a visual test for leaks.

☞ Close the maintenance panel.

9.3.5 Clean / replace the compressor air intake filter

Clean the compressor air intake filter at least every 125 operating hours, at the latest when the maintenance indicator activates (see chapter 8.5).



1 *Filter housing, open*
2 *Retaining clamp*
3 *Filter cap*
4 *Air filter element*
5 *Maintenance indicator*
6 *Reset knob for the maintenance indicator*

☞ Shut down the compressor (see chapter 8.2.2).

☞ Open the left–hand door.

To open the filter housing:

☞ Undo the spring clamp on the cap. Remove the cap and gently pull out the air filter cartridge.

☞ Clean the filter housing, cap and sealing surfaces.

Cleaning the air filter cartridge by tapping:

☞ Tap the air filter cartridge several times on the front with the ball of the hand so that the dust falls out.

Attention! **Do not use force, otherwise the the air filter cartridge may be damaged.**

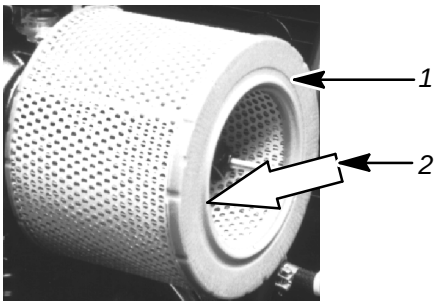
☞ Clean the seating surfaces of the gaskets.

Cleaning the air filter cartridge with compressed air:

☞ Blow dry compressed air at a pressure of not more than 73 psi at a slant from the inside to the outside of the air filter cartridge surfaces.

⚠ **Do not direct compressed air toward any person. Compressed air is contained energy and as such, dangerous to life.**

Attention! **Do not clean the air filter cartridge with fluids. If the air filter cartridge is heavily contaminated or has been cleaned several times (max. five times, at the latest after a period of one year) then it must be renewed.**



1 Air intake filter cartridge
2 Direction of blow out (from the inside to the outside!)

Resetting the maintenance indicator:

☞ When filter maintenance is finished, press the reset button of the maintenance indicator.

The maintenance indicator is ready for operation again.

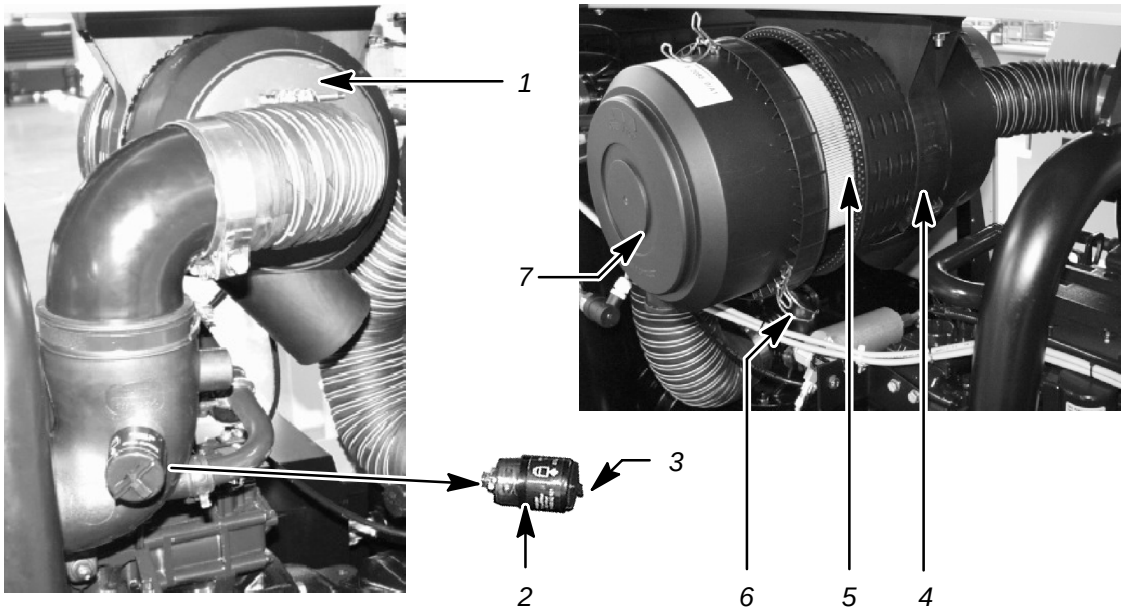
☞ Insert the cleaned or new air filter cartridge into the filter housing.

☞ Reassemble the air filter in the reverse order of opening (see ‘‘To open the filter housing’’).

☞ Close the maintenance panel.

9.3.6 Clean/replace the engine air intake filter

Clean the engine air filter at least every 125 operating hours, at the latest when the maintenance indicator activates.



1	*Engine air filter, rear*	*5*	*Air filter element*
2	*Maintenance indicator*	*6*	*Retaining clamp*
3	*Reset knob for the maintenance indicator*	*7*	*Filter cap*
4	*Filter housing, open*		

☞ Shut down the compressor (see chapter 8.2.2).

☞ Open the doors.

To open the filter housing:

☞ Undo the spring clamp on the cap. Remove the cap and gently pull out the air filter cartridge.

☞ Clean the filter housing, cap and sealing surfaces.

Cleaning the air filter cartridge by tapping:

☞ Tap the air filter cartridge several times on the front with the ball of the hand so that the dust falls out.

Attention! **Do not use force, otherwise the the air filter cartridge may be damaged.**

☞ Clean the seating surfaces of the gaskets.

Cleaning the air filter cartridge with compressed air:

☞ Blow dry compressed air at a pressure of not more than 73 psi at a slant from the inside to the outside of the air filter cartridge surfaces.

⚠ **Do not direct compressed air toward any person. Compressed air is contained energy and as such, dangerous to life.**

Attention! **Do not clean the air filter cartridge with fluids. If the air filter cartridge is heavily contaminated or has been cleaned several times (max. five times, at the latest after a period of one year) then it must be renewed.**

Resetting the maintenance indicator:

☞ When filter maintenance is finished, press the reset button of the maintenance indicator.

The maintenance indicator is ready for operation again.

☞ Insert the cleaned or new air filter cartridge into the filter housing.

☞ Reassemble the air filter in the reverse order of opening (see ‘‘To open the filter housing’’).

☞ Close the maintenance panel.

9.3.7 Cleaning the cooler

Check the oil cooler for clogging at least every 125 operating hours, as bad clogging can cause excessive temperatures in the oil circulation system.

☞ Shut down the compressor (see chapter 8.2.2) and allow to cool.

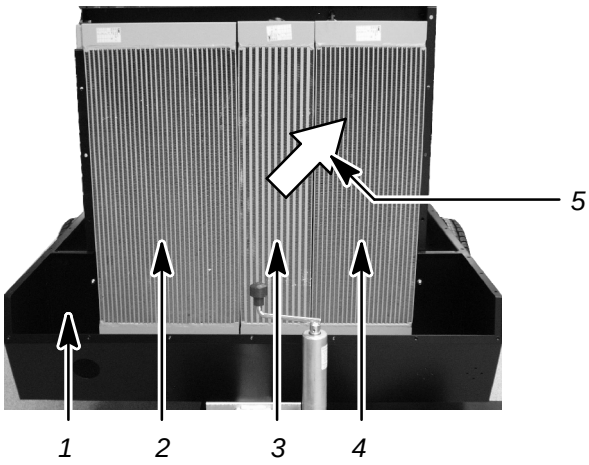
☞ Open both doors.

☞ Disconnect the battery, see chapter 9.3.9).

☞ Seal off the air intakes of the engine and compressor air filters before cleaning the cooler (see chapter 7.3.1).

☞ Cover up electrical components such as the switching cubicle, starter and instruments.

☞ Unscrew and remove the soundproofing from the air outlet.



1 Front end of compressor, sound insulation (radiator grill) removed
2 Oil cooler air outlet
3 Air outlet of the turbocharger cooler
4 Air outlet of the coolant fluid cooler
5 Cleansing direction of the impacting water or steam jet (from outside to inside)

Do not direct compressed air, water or steam jets toward any person. These represent contained energy and as such may cause injury or death.

The soiled cooler may be cleaned with water or steam jet only in washing areas with oil separators suited for such purpose only!

Attention! **Do not direct water or steam jets directly at sensitive components such as the generator, starter or the instruments.**

- ☞ Clean the cooler with compressed air, water or steam jet in the opposite direction to the cooling air flow.
- ☞ Screw on the soundproofing again.
- ☞ Open the inlets of the air filters again.
- ☞ Reconnect the battery.
- ☞ Close the maintenance panel.
- ☞ Put the compressor into operation (see chapter 8.2.1) and run up to operating temperature so that any accumulated water evaporates.

9.3.8 Maintenance of rubber sealing strips

The rubber sealing strips between the lower body and the access panels serve as both soundproofing and protection against weather.

Care of the rubber sealing strips is especially necessary during the winter months to prevent the strips from sticking and thus tearing when the maintenance panels are opened.

- ☞ Grease the rubber sealing strips regularly with silicon oil.

9.3.9 Battery maintenance

When working on the batteries, observe the following points:

1. **Fire, sparks, open flames and smoking are forbidden.**
2. **Eye protection must be worn.**
3. **Keep children well away from batteries or acid.**
4. **Batteries contain corrosive acid.**

   Wear appropriate protective clothing including acid--proof rubber gloves.
   Do not tip the batteries as acid can escape from vent holes.
5. **Observe the battery manufacturer's instructions.**
6. **Explosion hazard.**

   Take particular care when the battery has been in service for a long time or has just been charged as highly explosive gas is emitted.
   Ensure adequate ventilation.

Do not remove battery terminal covers unnecessarily.
Do not lay tools on the battery if the terminals are uncovered because of the danger of a short circuit resulting in heat build--up and battery explosion.

Danger sticker on battery

Winter operation:

Be advised that the available battery power is lower during the winter. Only a fraction of the original starting energy is available at low temperatures.

Attention! **A discharged battery is endangered by freezing temperatures and could freeze at a temperature of 14 °F.**

☞ Check the battery charge with a hydrometer before the start of the cold season and recharge, if required. At the same time, clean and grease the poles with acid–proof grease, if necessary.

In extreme cases, the use of a high performance cold–start battery or an additional battery is recommended.

Shutdown of the compressor unit for several weeks under freezing conditions:

☞ Remove the battery and store in a warm place to prevent the battery freezing!

Battery removal:

Never short circuit the battery (e.g. with a tool) because the battery heats excessively under short circuit conditions and could explode.

Attention! **Do not disconnect the battery with the engine running otherwise the regulator and the generator diodes could be destroyed.**
If the battery discharges for no apparent reason, check the charging system.

☞ First disconnect the negative cable and then the positive cable, then unscrew the battery clamping system.

☞ Reassemble in the reverse order.

Battery replacement:

If the battery must be replaced, fit a new battery of equal capacity, current rating and shape as the original battery.

Dispose of the old battery according to environmental regulations!

9.3.10 Checking the Engine Coolant

Check the engine coolant daily before putting the compressor into operation.

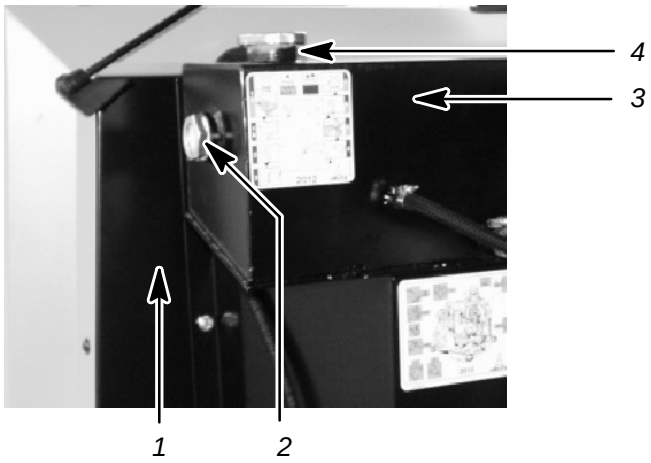
The coolant is a mixture of water, antifreeze and corrosion inhibitor. The anti–freeze and corrosion inhibitor must remain in the cooling system year round. The coolant must be replaced every two years to provide proper corrosion protection to increase the boiling point and to ensure proper engine protection.

☞ Shut down the compressor (see chapter 8.2)

☞ Wait until the compressor has automatically vented (the pressure gauge must show zero psig!)

See chapter 1.3 for the quantity of coolant.

The expansion tank is located directly above the radiator.



1 Cooler
2 Coolant level eye glass
3 Coolant expansion tank
4 Filler cap

☞ Open the left–hand door.

Attention!

Never unscrew the filler cap on the engine cooling system unless the coolant temperature has fallen below 194˚F; beware of scalding.

Protect your eyes and skin against engine coolant, there is danger of acid burns. If the eyes are affected rinse immediately with running water.

☞ Turn the filler cap to the first stop, allow pressure to escape.

☞ Remove the filler cap

Checking the coolant level / topping up:

The antifreeze/corrosion inhibitor agent in the coolant should not fall below 40 vol.–% (protection down to approx. –13˚F).

When topping up (after loss of coolant) ensure that the antifreeze/corrosion inhibitor proportion is at least 50 vol.–% (protection down to approx. –34˚F).

There should not be more than 55 vol.–% (protection down to approx.–49˚F, = max. protection), because below this ratio the antifreeze properties are reduced and heat dissipation worsens.

Make sure that there is sufficient room for expansion when the coolant is hot.
The coolant must be visible in the level glass, but should not be higher than 1,2 inch below the filler neck.

☞ Check the level of the coolant.

☞ Mix a quantity of antifreeze and top up to the mark.

☞ Screw on the filler cap.

☞ Start the engine and run for approx. one minute.

☞ Stop the engine

☞ Turn the filler cap to the first stop, allow pressure to escape

☞ Remove the filler cap

☞ Top up the coolant to the mark again.

Checking the antifreeze/corrosion inhibitor in the coolant:

The antifreeze protection must be –34˚F throughout the whole year.

☞ Check the component of antifreeze agent in the coolant with an antifreeze tester.

If the antifreeze component is below 40% then top up with pure antifreeze agent or change the coolant.

☞ To drain the coolant see engine service manual.

The drain plug is located at the bottom of the radiator on the left.

☞ Close the access door again.

9.3.11 Bleeding the fuel system

Attention! **Never allow the fuel tank to empty as this can allow air into the fuel system and cause starting difficulties.**

If the fuel tank is empty, air can enter the fuel system during a fuel filter change or when carrying out work on the fuel lines.
If there is fuel in the tank but the engine refuses to start, bleed the fuel system.

The manual fuel pump must be operated in order to bleed the fuel system.

☞ Place a suitable container under the filter housing and pressure retaining valve.

☞ Loosen the venting screw on the fuel filter.

☞ Loosen the pressure retaining valve.

☞ Work the manual pump until the fuel flowing from the filter and the valve is free of air bubbles.

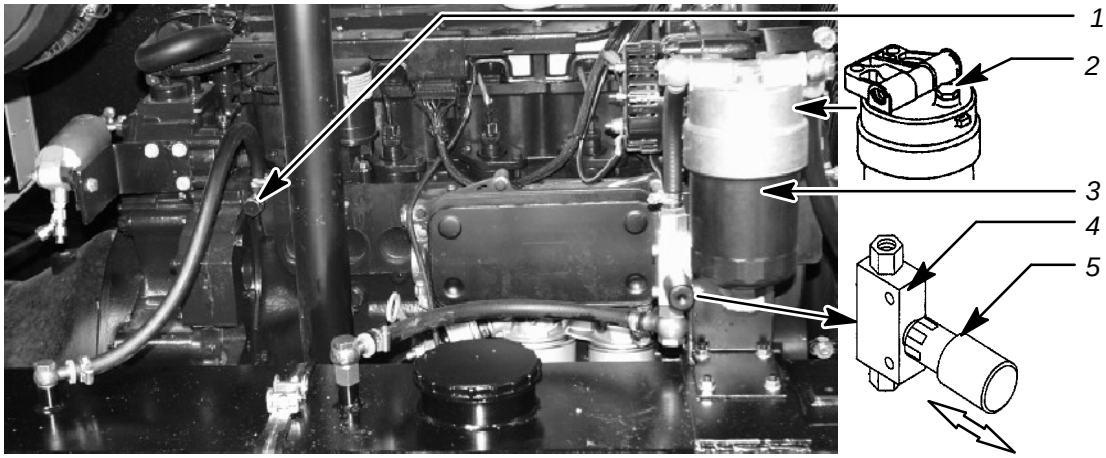
Catch escaping fuel and dispose of in accordance with environmental regulations.

☞ Catch escaping fuel and dispose of in accordance with environmental regulations.

☞ Re–tighten the venting screw.

☞ Re–tighten the pressure retaining valve.

☞ See chapter 8.2for compressor starting.



1 Pressure retaining valve
2 Fuel filter venting screw
3 Fuel filter
4 Manual fuel pump
5 Pump plunger

9.3.12 Fuel Filter Maintenance

Cleaning

The fuel filter should be cleaned when necessary.

☞ Shut down the compressor (see chapter 8.2).

☞ Wait until the compressor has automatically vented. (the pressure gauge must read zero psig)

☞ Open the doors.

☞ Loosen the venting screw in the top of the filter cover.

Escaping fuel must be caught and disposed of according to environmental regulations.

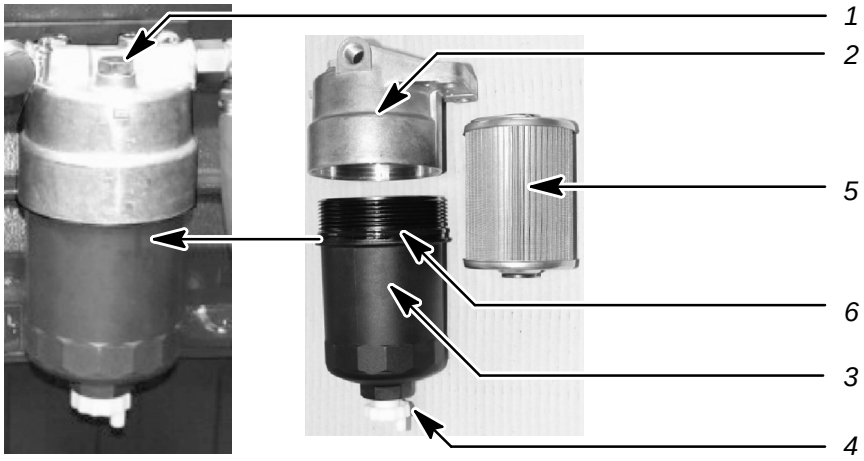
☞ Place a container under the drain screw.

☞ Loosen the drain screw in the underside of the filter element and allow separated water and dirt particles to run out.

☞ Catch escaping fuel and dispose of in accordance with environmental regulations.

☞ Re–tighten the drain screw and venting screw.

☞ Close the doors.



1	*Venting screw*	*4*	*Drain screw*
2	*Filter upper part*	*5*	*Filter element*
3	*Filter lower part*	*6*	*Sealing ring*

Changing the filter element

The filter element should be renewed as necessary but at least once a year.

The filter lower part is loosened and tightened with an appropriate hand tool.

☞ Shut down the compressor (see chapter 8.2).

☞ Wait until the compressor has automatically vented. (the pressure gauge must read zero psig)

☞ Open the doors.

Drain the fuel from the filter as described above.

Any contaminated fuel must be collected and disposed of, along with the old filter element, in accordance with local environmental regulations.

- ☞ Allow the filter to empty.
- ☞ Unscrew and remove the filter lower part.
- ☞ Remove the old filter element.
- ☞ Clean the sealing face in the filter upper part.
- ☞ Insert a new filter element.
- ☞ Check the sealing ring on the lower part.
  Renew if necessary.
- ☞ Smear some clean fuel on the sealing ring.
- ☞ Screw on the filter lower part hand – tight.
- ☞ Tighten up the lower part.
- ☞ Bleed the fuel system (see chapter 9.3.11).

Leakage check

There is danger of injury through contact with:
-- very hot surfaces
-- rotating parts
-- live components

Soundproofing measures are ineffective when the door is open.
Use hearing protection.

- ☞ Start the compressor and run for about one minute.

See chapter 8.2for compressor starting.

- ☞ Visually check the fuel system for leaks.
- ☞ Shut down the compressor (see chapter 8.2).
- ☞ Tighten fittings as necessary.
- ☞ Close the doors again.

9.3.13 Engine oil change

Change the engine oil, depending upon the contamination of the intake air, approximately every 500 operating hours, or at least annually.

Carry out the first oil change after approx. 50 operating hours.

Change the engine oil with the engine at normal operating temperature.

Engine oil can get very hot, beware of scalding.

- ☞ Shut down the compressor (see chapter 8.2.2).
- ☞ Open the doors.
- ☞ Disconnect the negative terminals on the batteries.

Catch the used oil in a suitable container and dispose of according to environmental regulations.

A square drip tray with a drainage opening is located in the floor panel directly below the oil drain plug. Place a suitable container beneath this opening to catch the used oil.

☞ Position the container.

☞ Carry out the oil change as described in the engine service manual.

☞ Reconnect the negative terminals to the batteries.

☞ Close the doors.

9.3.14 Chassis maintenance

⇒ For further instructions see separate manual for “Chassis Maintenance”, and ALKO–Fahrzeugtechnik Operating instructions.

Wheels:

Check the wheels after the first stress run and after each wheel change.
Check the wheels for tightness, condition and tyre pressures every 200 service hours.

☞ Check the tightness of the wheel nuts and the condition of the tyres.

☞ Check the tyre pressures with a tyre pressure gauge (see chapter 1.1 for the tyre pressure values).

Towbar:

Clean and oil sliding and bearing parts every 500 service hours or at least annually.

☞ Clean all sliding and bearing parts and then lubricate with oil.

☞ Check the towbar for correct function (breakaway cable).

If the height–adjustable towbar is kept at the same coupling height for a long period of time, so–called “seating rust” can build up.
The result is seizure of the serrated elbow joints.

To prevent this, clean the serrated joints and grease them with water repellent grease every six months.

☞ Clean and grease the serrated joints (see chapter 1.7 for the type of grease).

Overrun brake:

Check and service the overrun brake every 500 operating hours, but at least annually.

Checking the overrun brake shock absorber:

☞ Loosen one end of the transfer cable (fig 4 / item 2)

☞ Push in the shock absorber vigorously.

A damping force will react to the motion.

Have the shock absorber replaced if:

– the reactive damping force is very low

– if air pockets are apparent

– if the absorber can be pulled back easily

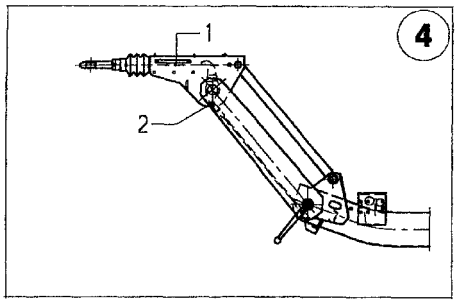
– if oil is leaking

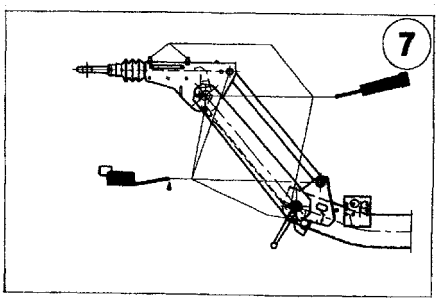
Servicing the overrun brake:

☞ Oil and/or grease all hinged joints and sliding surfaces.

Pump in grease until fresh grease escapes from the bearing points.

See fig 7 for grease points, see chapter 1.7 for grease.





Brake actuating rod:

Grease the brake actuating rod every 500 operating hours or at least annually.

☞ Grease the brake rod (see chapter 1.7 for grease).

9.3.15 Checking engine fan belt tension

Check the belt tension after 50 operating hours and then every 250 operating hours.

Stop the engine before checking, tensioning or changing engine V-belts. Do not tension or loosen the belts as long as they are hot.

☞ Shut down the compressor (see chapter 8.2).

☞ Wait until the compressor has automatically vented.
(The pressure gauge must read zero psig)

☞ Open the access panels.

☞ Remove the belt guard, if necessary. See engine service manual for removal.

☞ Check the belts thoroughly for cracks, fraying or stretching.

Replace damaged belts. See engine service manual for removal and replacement.

Checking the tension of the V-belts:

Check belt tension when they are hot.

Use a belt tension measuring device.
Carry out the check as described in the engine service manual.

If no belt tension measuring device is at hand, they can be checked manually.

There should be a play of about 0,4 to 0,6 inchs when the belt is pressed in.

☞ Press with the thumb on the the belt midway between the pulleys.

See engine service manual for tensioning the V–belts.

☞ Reassemble the belt guard.

☞ Close the access panels.

9.3.16 Checking the Safety Relief Valve

To check the operating pressure of the safety relief valve / valves the final pressure of the compressor package must be increased above the adjusted maximum working pressure.

See chapter 1.5 for the operating pressure.

Attention! **The pressure relief valve must be checked by an authorized KAESER service agency when the interval quoted in the regular maintenance table (see chapter 9.2) has expired.**

10 Spare Parts and After Sales Service

10.1 Service parts and expendable parts

Name	Quantity	Part no.
Compressor parts:		
Air filter element	1	6.3564.0
Oil filter	1	6.3464.0
Oil separator cartridge set	1	6.3668.0
Complete set, comprising:		
Separator cartridge	1	6.4507.0
Gasket	2	5.2769.0
Dirt trap strainer	1	2.8699.0
O−ring	1	5.1517.0
Cooling oil:		
KAESER SIGMA FLUID MOL	20 l	9.0920.0
Deutz engine parts:		
Air filter element	1	6.2085.0
Fuel filter element (prefilter)	1	8.9375.00010
Fuel filter element	1	8.9379.0
Oil filter	1	8.9377.0
Sealing ring for the oil drain plug	1	8.9382.0
Fuel injection valve, complete	1	8.9380.0
Injector	1	8.9383.0
Injector seal	1	8.9385.0
V−belt	1	8.9386.0
complete Gasket kit	1	8.9389.0

Please state the following data for all inqueries and spare parts orders (see also the nameplate):

- Compressor unit, model
- Serial number of the compressor unit
- Name of the part
- Order number of the part

In case of warranty, state the following information:

- Date of first putting into operation
- Serial number of the compressor unit
- Serial number of the engine

Important: Enter the data on the nameplate on the unit in the following illustrated nameplate!

KAESER COMPRESSORS

Package type: . . . . . .
Serial no.: . . . . . .
Part no.: . . . . . .
Vehicle ID no.: . . . . . .
Total weight: . . . . . **lbs**
Permissible axle loading: . . . . . **lbs**
Working pressure (g): . . . . . **psi**
Vessel capacity: . . . . . **gal**
Motor speed: . . . . . **rpm**
Constr. year: . . . . . .

Attention! **Do not use inferior parts. Always order original spare parts from the compressor manufacturer to avoid lower quality spare parts in your own compressor unit.**

We must point out that service parts not delivered by Kaeser Compressors, Inc. are also not tested and cleared by us. The fitting and/or use of such products can, under certain circumstances, change constructional and conditional characteristics of the compressor unit negatively and therefore affect the active and/or passive safety of the unit.

KAESER COMPRESSORS is released from all liabilities and warranties for damages caused by the use of non–original KAESER COMPRESSORS parts and accessories.

10.2 Motor Servicing

A booklet giving the addresses and telephone numbers of authorized dealers providing service and spare parts is enclosed with the technical documents for the motor.

11 Appendix

11.1 Wiring Diagram

Electrical diagrams

Mobilair M121

Water cooled, 24VDC

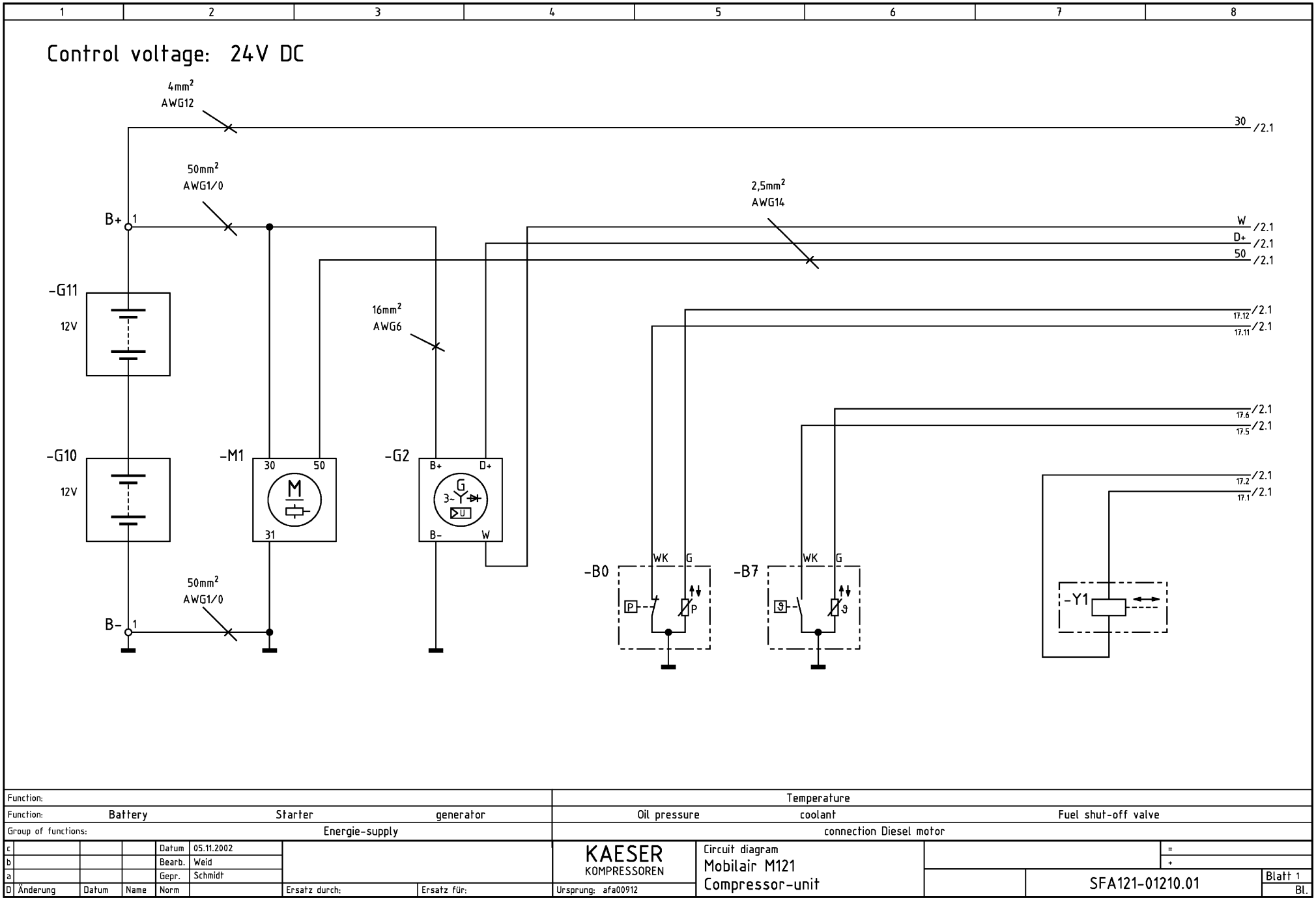
with Ignition switch

Manufacturer: Kaeser Kompressoren GmbH
Postfach 2143
96410 Coburg

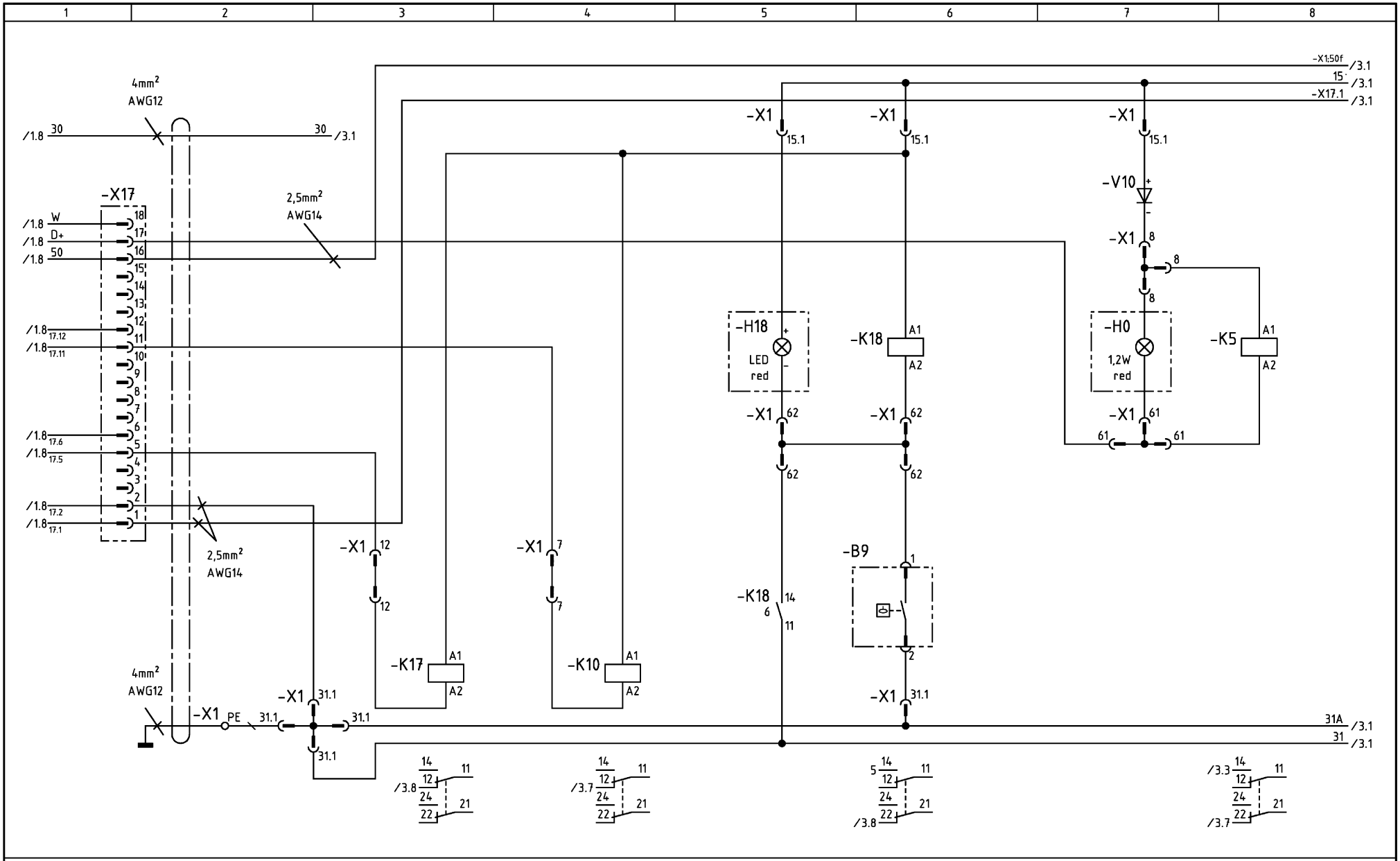
c				Datum	05.11.2002 E		KAESER KOMPRESSOREN	Cover page Mobilair M121		=
b				Bearb.	Weid					+
a				Gepr.	Schmidt					
A	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: afa00912	DFA121-01210.01	Blatt 1 Bl.

Lfd. Nr. No.	Benennung Name		Zeichnungsnummer (Kunde) Drawing No. (customer)	Zeichnungsnummer (Hersteller) Drawing No. (manufacturer)	Blatt Page	Anlagenkennzeichen Unit designation
1	Cover page			DFA121-01210.01	1	
2	List of contents			ZFA121-01210.01	1	
3	Circuit diagram	Compressor-unit		SFA121-01210.01	1	
4	Circuit diagram	connection Diesel motor		SFA121-01210.01	2	
5	Circuit diagram	switching on		SFA121-01210.01	3	
6	Circuit diagram	Control		SFA121-01210.01	4	
7	Electrical equipment identification			SFA121-01210.01	5	
8	Equipment parts list	control cabinet		GFA121-01210.01	1	
9	Terminal schedule	Terminal strip -X1		KFA121-01210.01	1	
10	Terminal schedule	Terminal strip -X1, -X31		KFA121-01210.01	2	
11	Component layout	Mounting plate		AFA121-01210.01	1	
12	Component layout	Control panel		AFA121-01210.01	2	

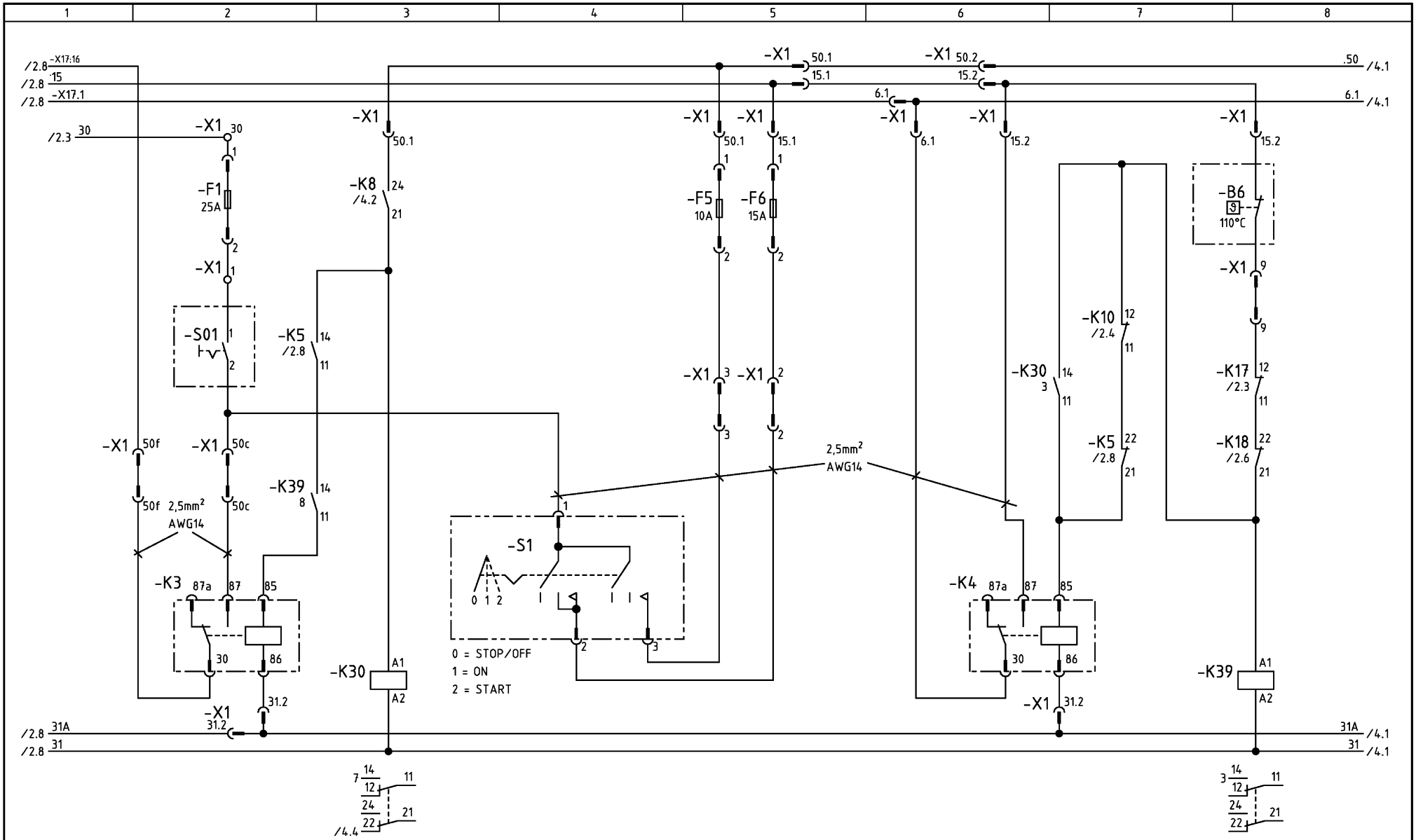
c				Datum	05.11.2002		KAESER KOMPRESSOREN	List of contents Mobilair M121		=
b				Bearb.	Weid					+
a				Gepr.	Schmidt				ZFA121-01210.01	Blatt 1
B	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: afa00912			Bl.



Function:								Temperature		
Function:	Battery			Starter		generator		Oil pressure	coolant	Fuel shut-off valve
Group of functions:				Energie-supply				connection Diesel motor		
c				Datum	05.11.2002		KAESER KOMPRESSOREN	Circuit diagram		=
b				Bearb.	Weid			Mobilair M121		+
a				Gepr.	Schmidt			Compressor-unit		
D	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: afa00912	SFA121-01210.01	Blatt 1 Bl.

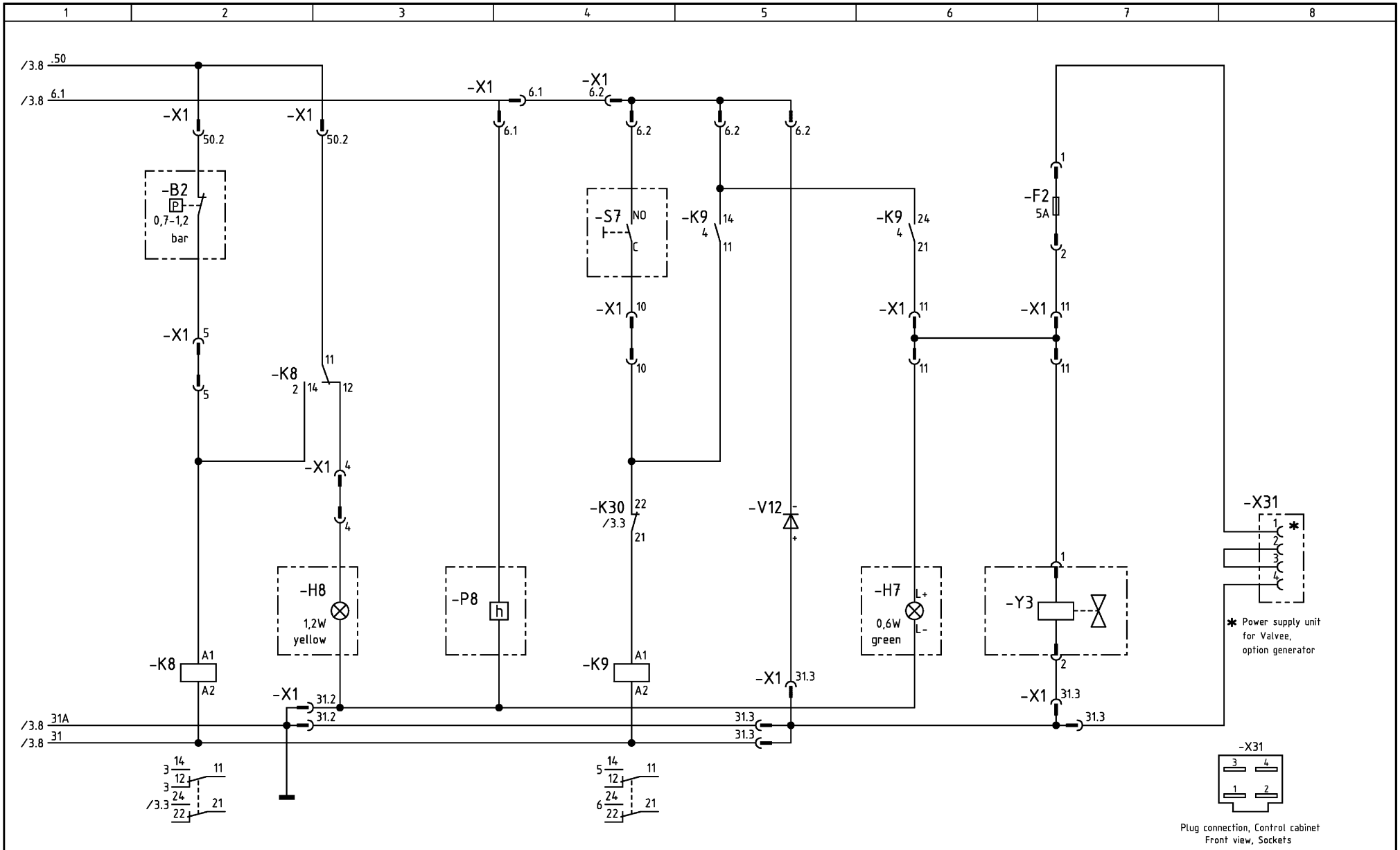


Function:						coolant temperature	Oil pressure		tank empty	Charging control lamp	motor running
Group of functions:											
c				Datum	05.11.2002		KAESER KOMPRESSOREN	Circuit diagram		=	
b				Bearb.	Weid			Mobilair M121		+	
a				Gepr.	Schmidt			connection Diesel motor			
D	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: afa00912		SFA121-01210.01	Blatt 2 Bl.



Function:	Starter - Relay	Control ON/START		shutdown ALARM	start inhibit relay
Group of functions:		switching on			

c				Datum	05.11.2002		KAESER KOMPRESSOREN	Circuit diagram Mobilair M121 switching on		=	
b				Bearb.	Weid					+	
a				Gepr.	Schmidt						
D	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: afa00912		SFA121-01210.01	Blatt 3 Bl.



Function:	Back pressure
	Valve Full load operation, Venting
Group of functions:	Preselection Full load operation

c				Datum	05.11.2002		KAESER KOMPRESSOREN	Circuit diagram Mobilair M121 Control	=
b				Bearb.	Weid				+
a				Gepr.	Schmidt				
D	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: afa00912	SFA121-01210.01 Blatt 4 Bl.

-B0	Oil pressure switch
-B2	Pressure switch, Back pressure
-B6	Distance temperature gauge/Compressor airend
-B7	Thermostat, coolant
-B9	fuel level switch
-F1,-F2-F5,-F6	Control fuse
-G10, -G11	Battery
-G2	Three-phase generator
-H0	Charging control lamp
-H7	Control lamp Full load operation
-H8	Control lamp, Back pressure
-H18	Control lamp, Low fuel
-K3,-K4	Relay
-K5,-K8,-K9,-K10, -K17,-K18,-K30,-K39	Auxiliary relay
-M1	Starter-Motor
-P8	Hour meter
-S01	"Control On" switch
-S1	Ignition switch 0-1-2-3
-S7	Button, Preselection Full load operation
-V10,-V12	Diode
-X1	Terminal strip, Control
-X17	Plug connection, Diesel-Motor
-X31	Plug connection, Valvee
-Y1	Fuel shut-off valve
-Y3	Solenoid valve, Full load operation, Venting
15	switched plus + (unit ON)
30	+ terminal (Battery)
31	- terminal (Battery), earth
50	Starter-Control

c				Datum	05.11.2002		KAESER KOMPRESSOREN	Electrical equipment identification Mobilair M121		=
b				Bearb.	Weid					+
a				Gepr.	Schmidt					
E	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: afa00912		SFA121-01210.01	Blatt 5 Bl.

1	2	3	4	5	6	7	8

A Stück-zahl Qty.	B Benennung und Verwendung Description and function	C Fabrikatsbezeichnung Typ; Bestell-Nr.; Unterlagen-Nr.; Normkurzbezeichnung notwendige techn. Daten, z.B. Steuerspannung, Frequenz, Einstellbereich Identification data Type; order No.; document No.; equipment code No.; basic technical data				D Lfd. Nr. Item	E Betriebsmittel-Kennz. nach DIN 40719, Teil 2 Identifying symbol of device	F Stromlaufplan Planabschnitt Circuit diagramm 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	E - Box		400x300x120	7.3146.01160	Rittal								
1	Mounting plate			7.3146.01170	Rittal								
8	Coupling relay	DC 24V	2 Changeover contacts	7.6495.00010	Omron		-K5,-K8,-K9,-K10,						
8	Relay-socket		P2RF-08-E	7.5496.0	Omron		-K15,-K17						
2	Relay	DC 24V	023948.0	8.6544.00010	Compres. S.A.		-K3,-K4						
24	Terminal	WK5-10 S/U		7.3968.0	Wieland		-X1						
2	Terminal	WKF4/35		7.3149.01320	Wieland		-X1						
1	PE earth terminal	WKF4SL/35		7.3149.00920	Wieland		-X1						
2	End plate	AP5S		7.3969.0	Wieland								
2	Diode	SB 540 (40V 5A)		7.4780.00030	Hofmann		-V10						
1	Fusing element		4 pole	7.6407.00010	MTA		-F1,-F7						
1	Fuse		25A	7.6411.00070	L&K		-F1						
1	Fuse		15A	7.6411.00060	L&K		-F6						
1	Fuse		10A	7.6411.00050	L&K		-F5						
1	Fuse		5A	7.6411.00040	L&K		-F2						
1	KFZ - plug connection 4 pole	172133		7.6589.00010	AMP								
	Control panel												
1	Indicator light	24V yellow		7.4741.0			-H8						
1	Indicator light	24V red		7.4740.0			-H0						
2	Lamp	24V 1,2W		7.4743.0			-H0,-H8						
1	Indicator light	24V red		7.9036.0			-H18						
1	Push button green	A165		7.9027.0	Omron		-S7						
1	Lamp	A16-24		7.9027.00020	Omron		-H7						
1	Ignition switch	47.14.08		7.2097.00020			-S1						
1	Control voltage ON/OFF switch			8.7045.0			-S01						

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 Fabriknummer 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 columnes B and C should be stated. In addition, the data in columnes 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	05.11.2002		KAESER KOMPRESSOREN	Equipment parts list Mobilair M121 control cabinet	=	
b				Bearb.	Weid				+	
a				Gepr.	Schmidt					
F	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: afa00912	GFA121-01210.01	Blatt 1 Bl.

Terminal strip: -X1
total 73 Terminals

Terminal number	Terminal legend	Location	Destination internal: Component identification	Destination internal: Connection number	Destination external: Component identification	Destination external: Connection number	Cable identification
PE	gn/ge	/2.2			-G10	B-	Motor Cable loom: X
1		/3.2	-F1	2	-S01	1	-W23: 1
2		/3.5	-F6	2	-S1	2	-W23: 2
2		/3.5					
2		/3.5					
3		/3.5	-F5	2	-S1	3	-W23: 3
3		/3.5					
3		/3.5					
4		/4.3	-K8	12	-H8		-W22: 5
4		/4.3					
4		/4.3					
5		/4.2	-K8	A1	-B2		-W12: X
5		/4.2					
5		/4.2					
6.1		/3.6	-K4	30	-X17	1	Motor Cable loom: X
6.1		/3.6			-P8		-W22: 6
6.1		/4.3					
6.2		/4.5	-K9	14	-S7	NO	-W22: 3
6.2		/4.5					
6.2		/4.6			-V12	-	
7		/2.4	-K10	A2	-X17	11	Motor Cable loom: X
7		/2.4					
7		/2.4					
8		/2.6	-K5	A1	-H0		-W22: 2
8		/2.6					
8		/2.6			-V10	-	
9		/3.8	-K17	12	-B6		-W22: 8
9		/3.8					
9		/3.8					
10		/4.5	-K30	22	-S7	C	-W22: 4
10		/4.5					
10		/4.5					
11		/4.6	-K9	21	-H7	L+	-W22: 7
11		/4.6	-F2	2	-Y3	1	-W33: X
11		/4.7					
12		/2.3	-K17	A2	-X17	5	Motor Cable loom: X
12		/2.3					
12		/2.3					
13							
13							
13							
15.1		/2.5	-F6	1	-H18	+	-W22: 11
15.1		/2.6	-K18	A1			
15.1		/3.5			-V10	+	
15.2		/3.7	-K4	87	-B6		-W22: 9
15.2		/3.7					
15.2		/3.8					
30		/3.2	-F1	1	-G11	B+	Motor Cable loom: X
31.1		/2.2			-X17	2	Motor Cable loom: X
31.1		/2.2	-K18	11	-B9		-W19: X
31.1		/2.2					
31.2		/3.2	-K3	86	-H8		-W22: gnge
31.2		/3.2	-K4	86			
31.2		/4.3					
31.3		/4.5	-K9	A2	Control panel		-W23: gnge
31.3		/4.5	-X31	4	-Y3	2	-W33: X
31.3		/4.7			-V12	+	

Cable identification:
- -W12 Oelflex 190 3x1,5 mm²
- -W19 Oelflex 190 3x1,5 mm²
- -W22 Oelflex 190 12x1,5 mm²
- -W23 Oelflex 5x2,5 mm²
- -W33 Oelflex 190 3x1,5 mm²
- Motor Cable loom

c			Datum	07.11.2002
b			Bearb.	Weid
a			Gepr.	Schmidt
H Änderung	Datum	Name	Norm	

Ersatz durch: | Ersatz für: | Ursprung: afa00912

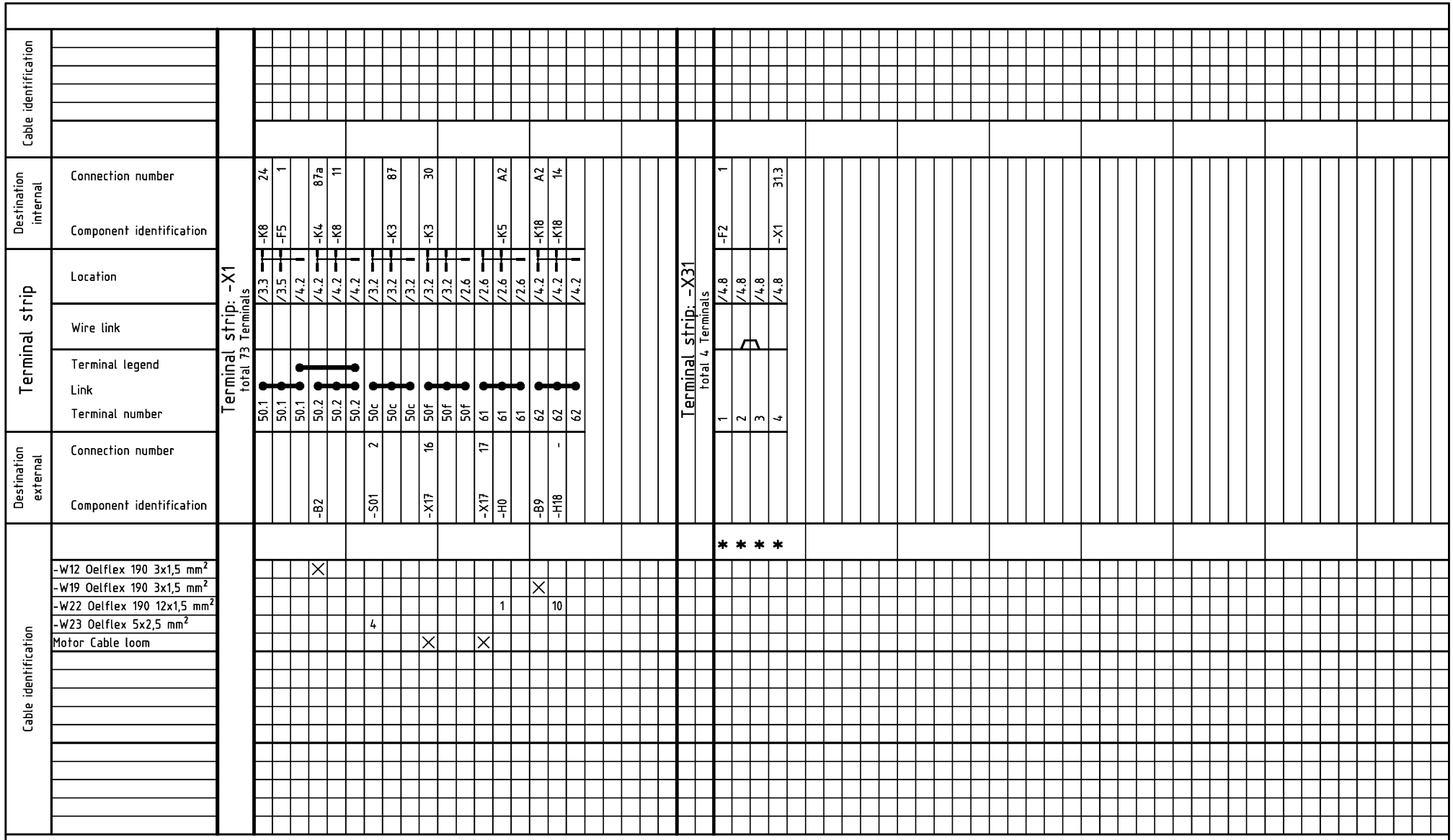
KAESER KOMPRESSOREN

Terminal schedule
Mobilair M121
Terminal strip -X1

=
+

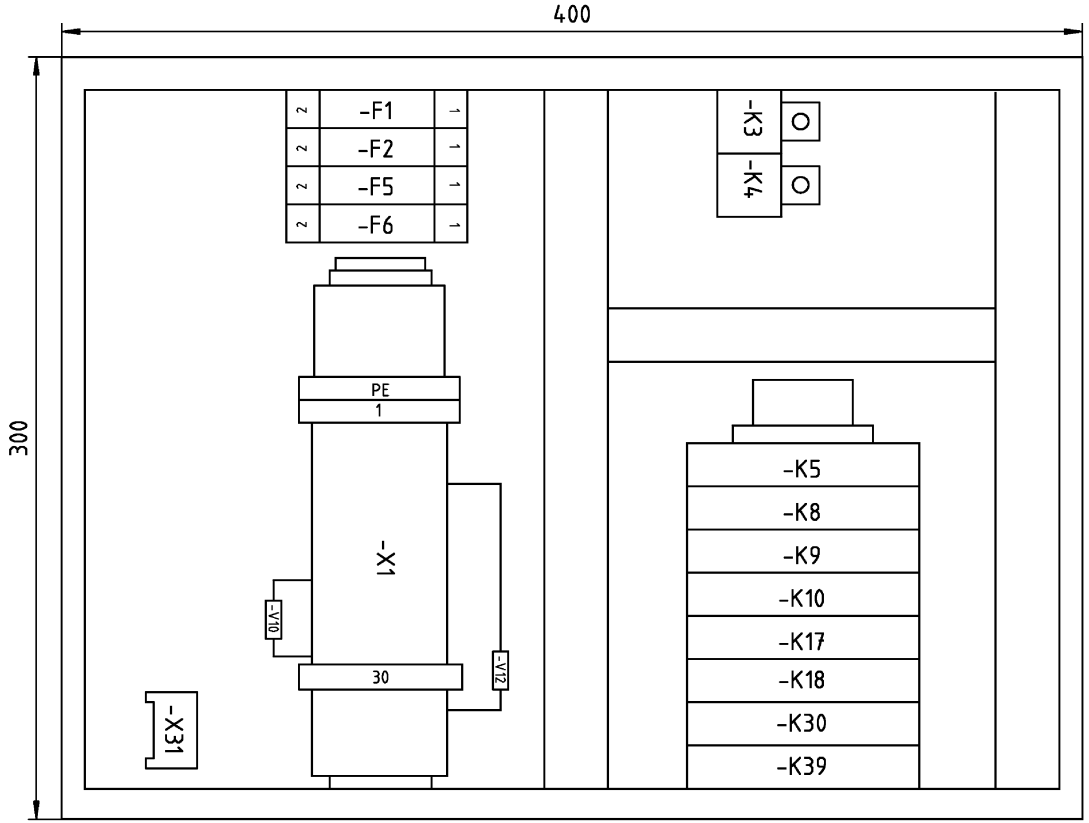
KFA121-01210.01

Blatt 1
Bl.

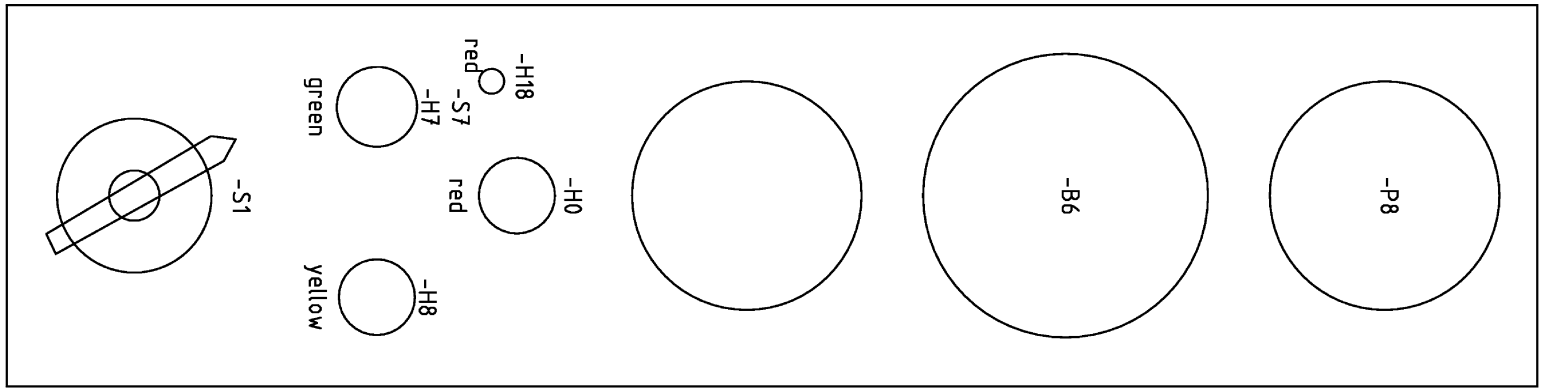


* connection by option generator

c				Datum	07.11.2002		KAESER KOMPRESSOREN	Terminal schedule		=	
b				Bearb.	Weid			Mobilair M121		+	
a				Gepr.	Schmidt			Terminal strip -X1, -X31		KFA121-01210.01	Blatt 2
H	Änderung	Datum	Name	Norm		Ersatz durch:	Ersatz für:	Ursprung: afa00912			BL



c				Datum	05.11.2002		KAESER KOMPRESSOREN	Component layout		=
b				Bearb.	Weid			Mobilair M121		+
a				Gepr.	Schmidt			Mounting plate	AFA121-01210.01	Blatt 1
l	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: afa00912			Bl.



Function:

Group of functions:

c				Datum	05.11.2002		KAESER KOMPRESSOREN	Component layout Mobilair M121 Control panel	=	
b				Bearb.	Weid				+	
a				Gepr.	Schmidt					
l	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung: afa00912		AFA121-01210.01	Blatt 2 Bl.

11.2 Lighting and signalling system diagram

1	2	3	4	5	6	7	8

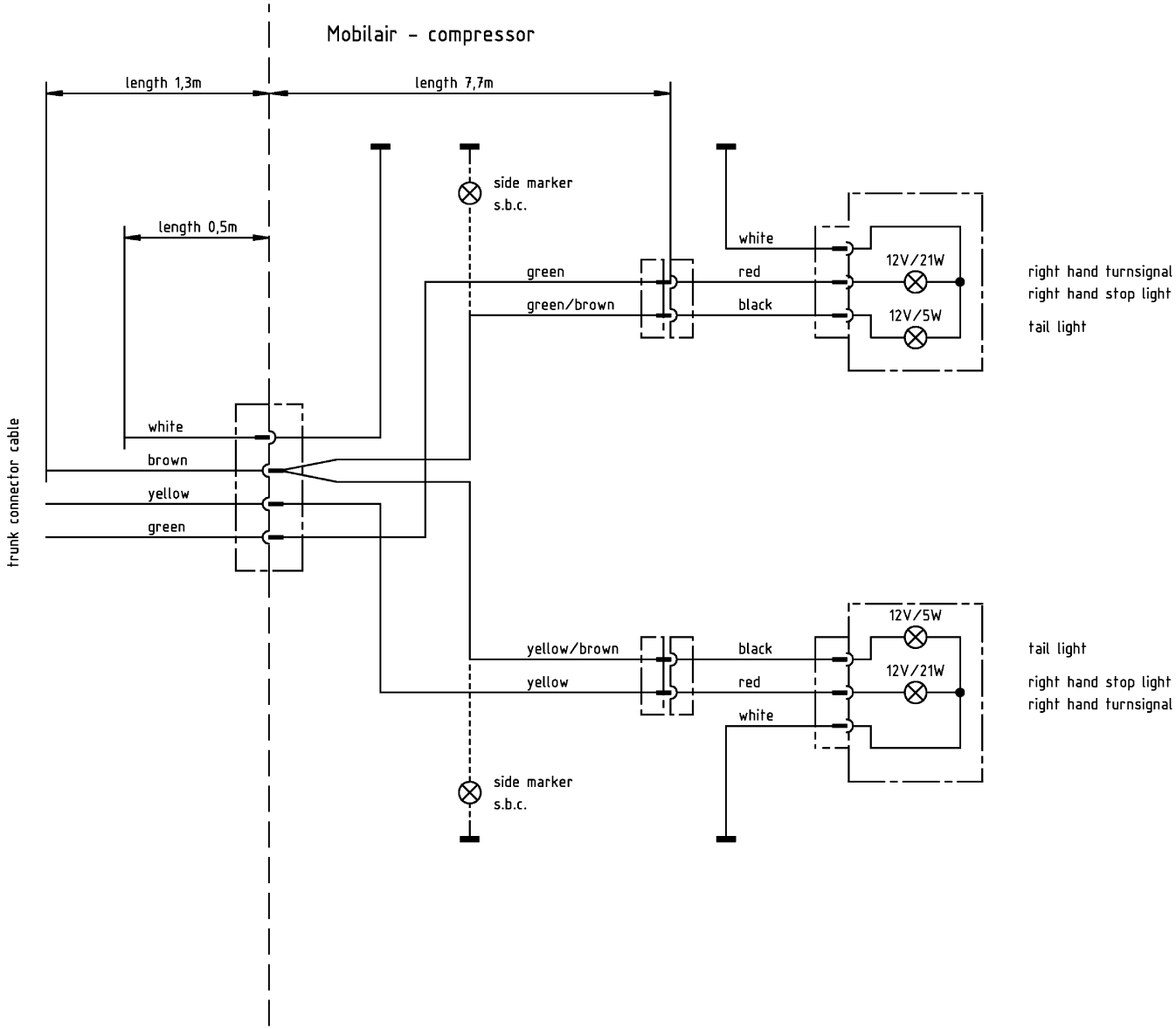
Wiring Diagram

Mobilair

US trailer light kit

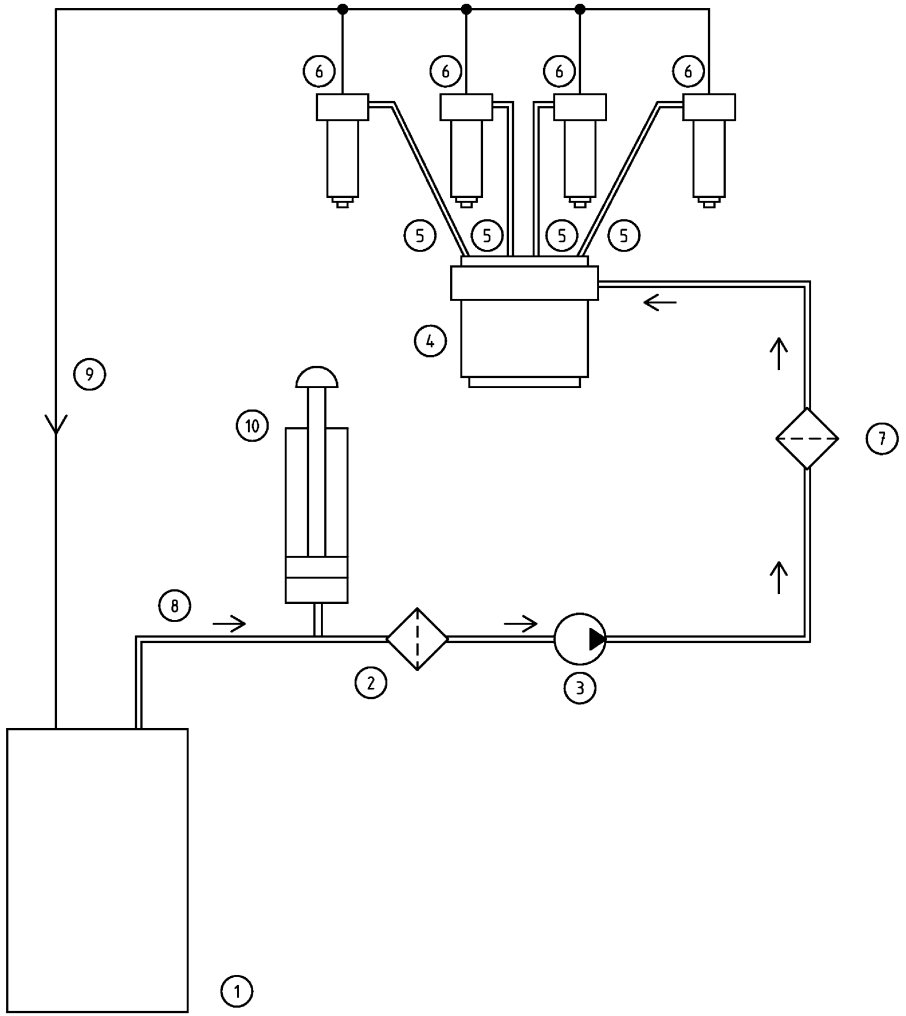
manufacturer: Kaeser Kompressoren GmbH
Postfach 2143
96410 Coburg

c				Datum	10.08.1999 USE		KAESER KOMPRESSOREN	cover page Mobilair US trailer light kit		=
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.



c				Datum	10.08.1999		KAESER KOMPRESSOREN	wiring diagram Mobilair US trailer light kit	=
b				Bearb.	Reuß				+
a				Gepr.	Schmidt				
D	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung:	8.6514.0	SFAUSA.BEL-00909.00	Blatt 1 Bl.

11.3 Fuel circulation schematic diagram



c				Datum	27.03.2001		KAESER KOMPRESSOREN	Fuel circulation diagram 4-Cylinder-diesel engine Mobilair M 121 T (Deutz)	
b				Bearb.	Martin				
a				Gepr.	Grimm				
	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung:	KFMM121TD-00024.00	Blatt 1 E

1	Fuel tank	6	Injection nozzle
2	Fuel filter	7	Fuel filter
3	Fuel feed pump	8	Fuel supply line
4	Injection pump	9	Fuel return line
5	Injection pipe	10	Oil cooler motor

c				Datum	27.03.2001		KAESER KOMPRESSOREN	Fuel circulation legend 4-Cylinder-diesel engine Mobilair M 121 T (Deutz)	
b				Bearb.	Martin				
a				Gepr.	Grimm				
	Änderung	Datum	Name	Norm		Ersatz durch: / Ersatz für:	Ursprung:		KFMM121TD-00024.00 Blatt 2 E

11.4 Maintenance Schedule

Model: **Serial number of the compressor unit:**			
Date	Description of work	Operating hours	Signature