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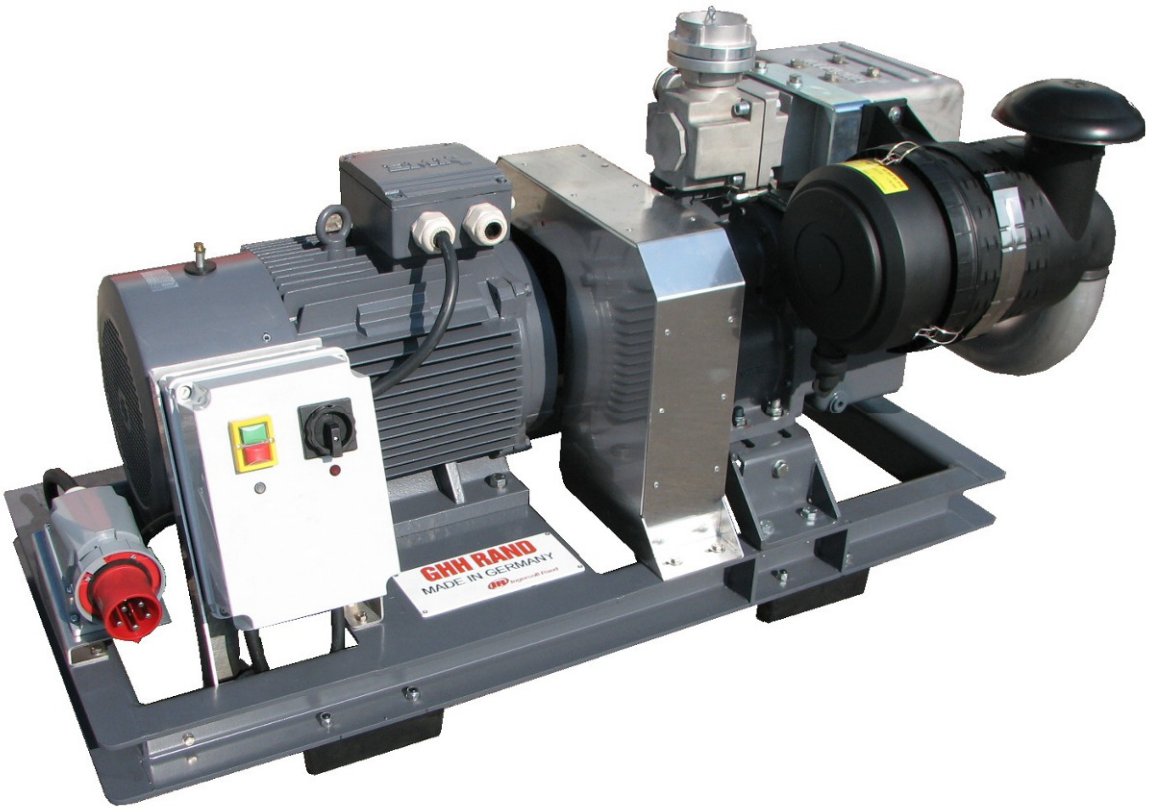
Operating Instructions

Compressor Unit with Electric Motor

CG 600 EP-belt NON EU



Ingersoll Rand
Industrial Technologies

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Foreword

Please read these operating instructions carefully before setting
up and commissioning the compressor unit with electric motor. They provide essential information which are to be observed to ensure trouble-free operation and a long service life.

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1 General

1.1 Purpose

GHH RAND build and supply the compressor unit with motor SILU CG600 ready for operation. These units are used to handle bulk material pneumatically owing to their ability to compress atmospheric air free of oil. They can either be installed in a stationary unit or mounted on silo-type trucks.

1.2 Manufacturer's address

GHH RAND Schraubenkompressoren GmbH
Max-Planck-Ring 27
D-46049 Oberhausen
Germany

1.3 Identification

The serial no. can be found on the name plate.

Serial No.:

1.4 Technical data - compressor unit with motor

Type: CG600 EP-belt

Dimensions:	165x65x75cm
Weight:	500kg
Protection class:	IP 55

1.5 Technical data electric motor

see chapter 7

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1.6 Technical data compressor CG 80

Operating instructions:	(see CG 80)
Operating gauge pressure:	2.0 bar (g)
Suction pressure, abs.:	1.0 bar
Suction temperature:	20 C°
Suction temperature max.:	40 C°
Suction volume flow:	470 m³/h (at 2.0 bar(g))
Maximum temperature:	190 C°
Power:	30 kW
Speed compressor:	3170 rpm
Weight:	110 kg
Oil capacity:	9 liter

Important !!

The function of the non-return valve installed in the compressor unit is to prevent the compressor, after having been switched off, from running in reverse at high speed for a long time as a result of residual pressure that exists in the discharge lines of the pneumatic system.

To avoid an unintended return blow of material into the compressor, it is mandatory that at least one further non-return valve is installed in the pneumatic system of the silo arrangement.

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1.7 Installation procedure

In addition to the general technical operating instructions per the regulations of the local authorities, special attention is drawn to the following guidelines:

- Use a suitable hoist which fulfills the local safety regulations for handling of the compressor unit. Securely fasten all loose or swinging parts prior to handling. Do not stand in the danger area of a lifted load.

- Remove all blank flanges, plugs and caps prior to installation of the piping. Ensure that the distribution pipes and pipe connections are of the correct size and suitable for the respective operating pressure.

- Install the unit in a place where the ambient air is as cool and clean as possible. If needed, provide for a suction duct. Never block the air inlet. The sucked-in air must not contain any flammable vapors or gases which might cause a fire or an explosion.

- Do not remove or modify any safety devices, protective covering or lagging. Protect any pressure tanks or accessory installed outside the compressor unit for storing compressed air by means of separate safety valves.

- The electrical connections must fulfill the local regulations. The compressor units must be grounded and protected against short circuits by means of fuses.

- If operation by remote control is provided for, a clearly visible sign must be attached to the unit reading the following:

Caution !!

This unit is operated by remote control and might start without prior warning.

Make sure that the electrical connection is interrupted when conducting maintenance and/or repair work.

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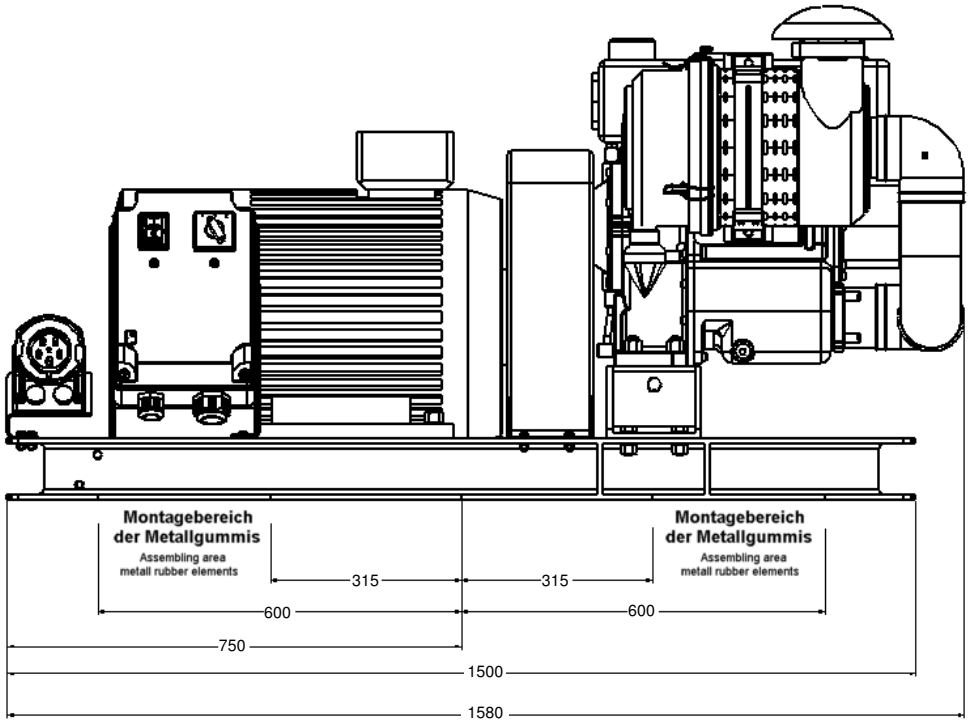
1.8 Mounting instruction



The mounting area of the vibration dampers can be between 316 mm and 600 mmm from the centre line on each side.

The position of the vibration dampers must be symmetrical to the centre line.

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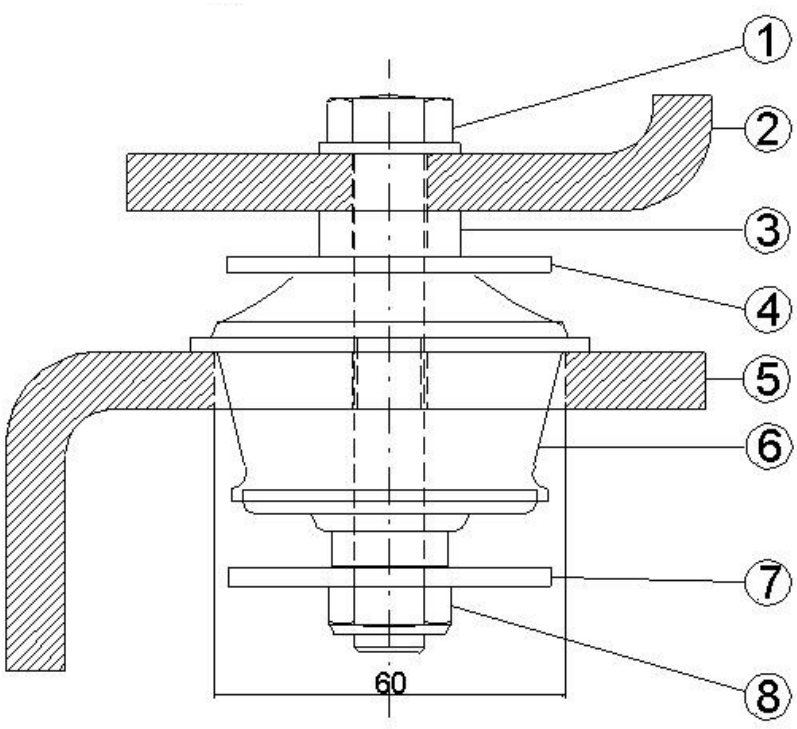
1.9 Installation procedure – vibration dampers

After defining the mounting positions of the vibration dampers in the supporting frame, cut a hole of 60 mm diameter in each vibration damper by means of a hole saw. (please see drawing)

Vibration damper



1. Screw M12 x 90
2. Compressor baseframe
3. Spacer 8mm
4. Lock washer above
5. Chassis baseframe
6. Metallgummi
7. Lock washer below
8. Lock nut

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2 Safety

2.1 General

These operating instructions provide important information which must be observed during operation and maintenance. The skilled personnel / operator / user therefore is required to read these operating instructions before commissioning. Furthermore, the instructions must be at hand where the machine is used at all times.

2.2 Skilled personnel

Work on the compressor unit must be conducted by authorized personnel only according to the safety rules in force.

2.3 Safety information

The operator / user is responsible for ensuring that the compressor unit is always in an operationally safe condition. Damaged parts must be replaced at once. If flammable goods are handled with the compressor, take appropriate precautions to avoid that the spontaneous-ignition temperature of a dust-and-air mixture that may arise is not reached.

2.4 Impermissible applications

The compressor unit may not be used under other conditions than those specified in the chapter “Technical data“ unless with authorization by GHH RAND Schraubenkompressoren GmbH.

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3 Commissioning

3.1 Set-up

Mount the compressor unit in horizontal position, if possible. If the unit is not mounted horizontally, please observe the specified limit values.

Important !!

Maximum permissible angles of tilt during operation:
forward and backward: 10°
to the right and left: 10°

Electrical connection:

The standard electrical connection is realized by means of a junction box with feeder clamps.

As an option, the unit can be delivered with a CEE connector plug installed.

Attention !!

Work on the heavy current unit must be conducted by specially authorized experts only.

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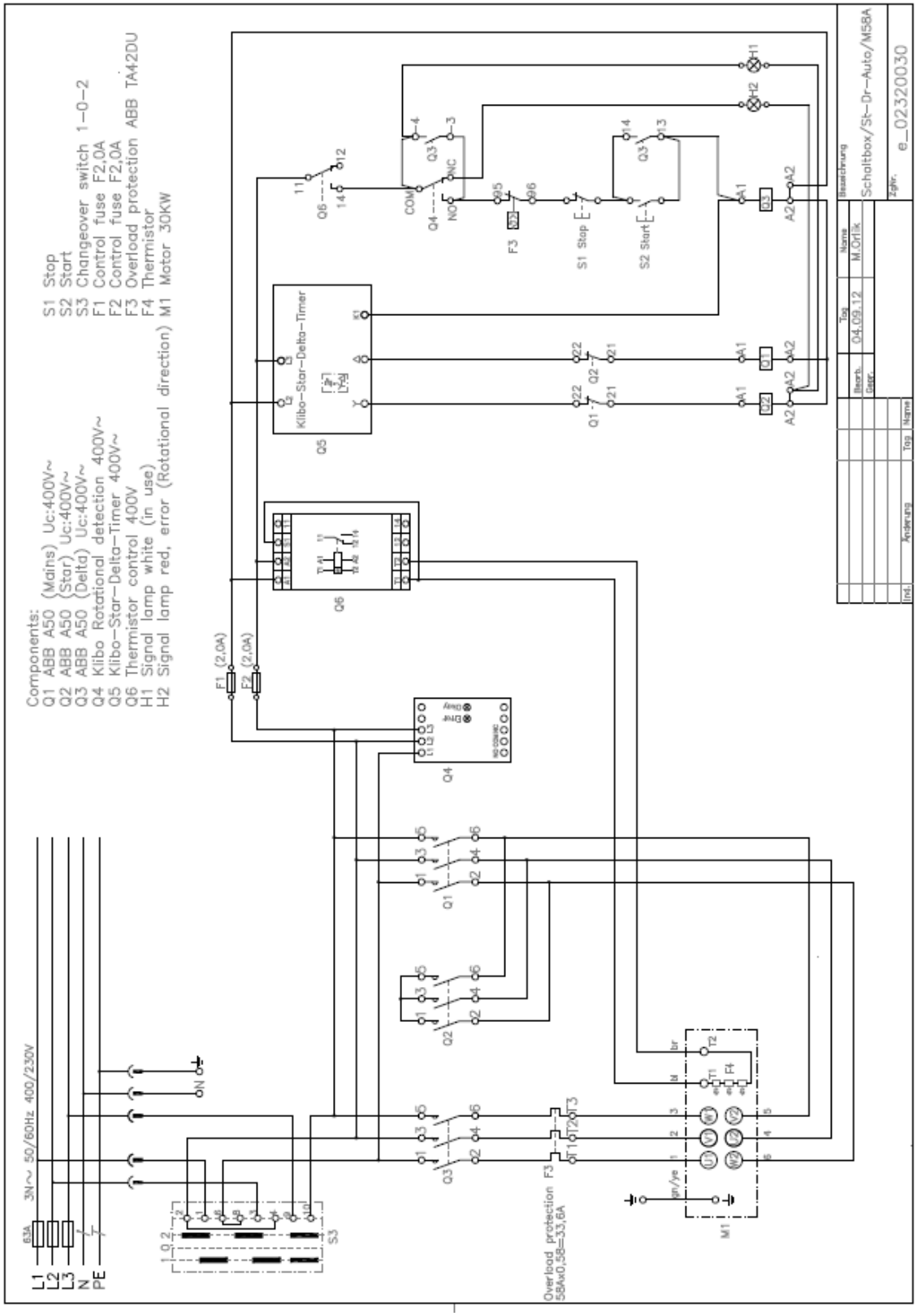
3.2 Electric Circuit Diagrams

3.2.1 Circuit diagram 30kW/50Hz



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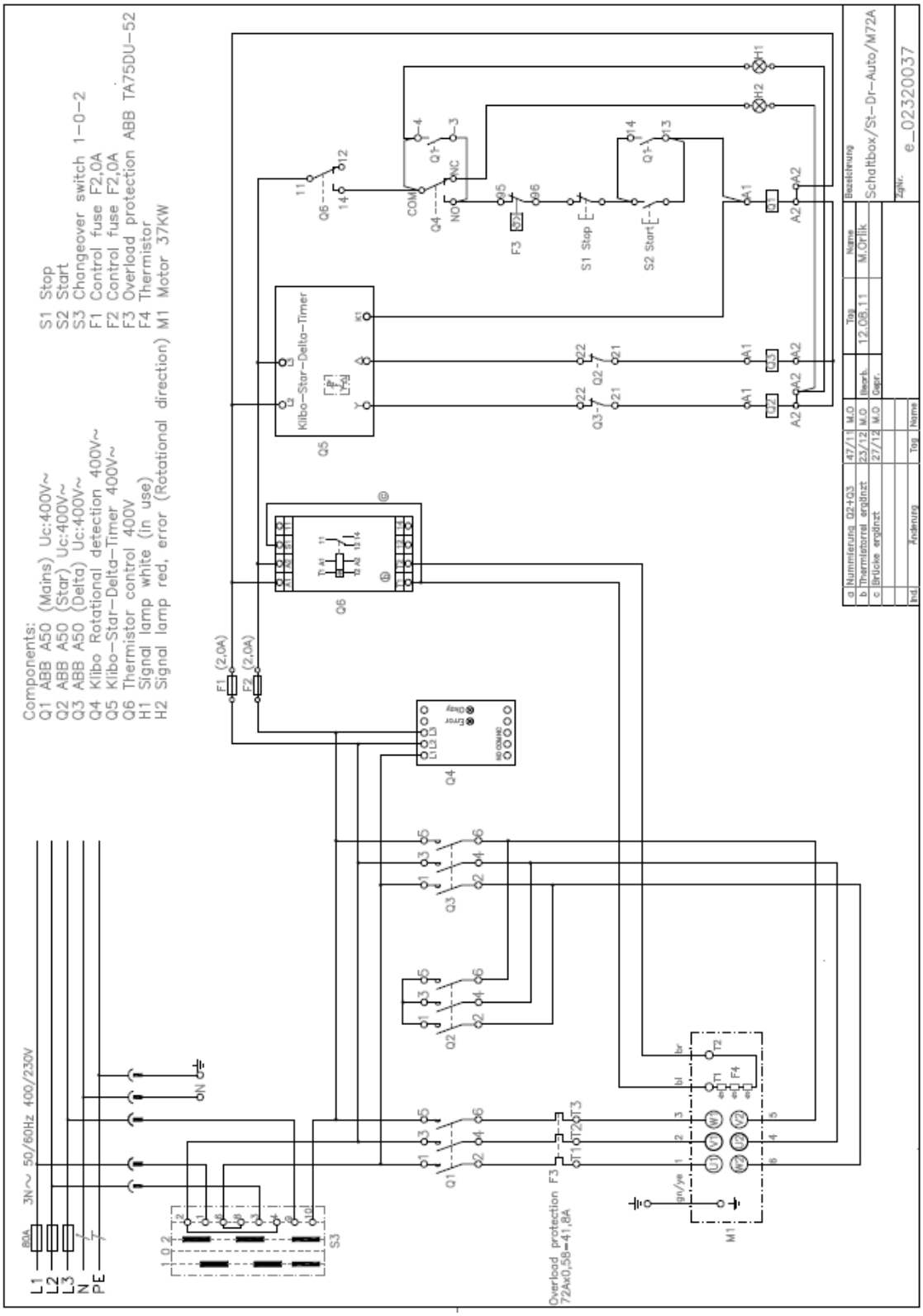
3.2.1 Circuit diagram 37kW/50Hz & 41.5kW/60Hz



3.3 Controls – Operating elements and monitoring gauges

List / Designation:
- Start button (I) green
- Stop button (0) red
- Phase switch – Position 1–0–2
- Operation control lamp (white)
- Phase switch lamp (red)
- Oil pressure gauge compressor
- Maintenance indicator of compressor air filter

3.4 Start

Starting the motor / compressor

- Provide for electrical power connection
- Check phase circiut / direction of ratation
- (switch to 1 or 2 until lamp goes out)
- Press start button “green“
- Check start procedure

Important !!

Start the compressor unit completely relieved of load only. Never start it trying to overcome any backpressure that may exist.

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3.5 Stop/Shut-down

Shut-down motor / compressor
- Relieve compressor discharge pipe
- Press stop button “red”
- Wait for shut-down
- Turn rotary switch to position “0”

3.6 Allowable operating time

- Maximum running time of the compressor without oil cooler: **3 hours** followed by a 1-hour cool-down time.

- Continuous duty of the compressor is only possible with oil cooler which can be supplied as an option.

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3.7 Compressor monitoring during operation
Oil pressure gauge

The oil pressure is indicated on the oil pressure gauge.
The oil pressure must not drop below 0.3 bar.

Important !!

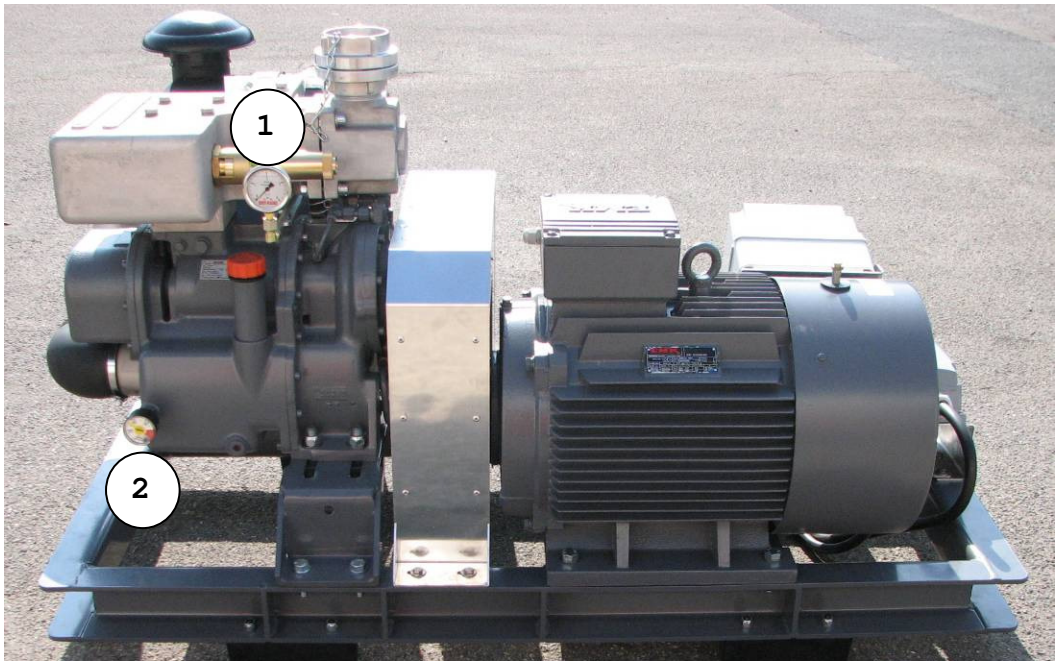
If the oil pressure does not build up within a short period of time, switch off the motor / compressor. Check the oil level and clean the oil suction strainer, if necessary (see operating instructions of compressor, chapter Maintenance).

Maintenance indicator for air filter
Negative pressure is indicated on the maintenance indicator of the compressor unit.

Important !!

If the 65 mbar indication is reached, the negative pressure has dropped below the permissible limit. Clean the filter element in the suction filter of the compressor unit or replace it if it is heavily constricted. Reset the maintenance indicator.
(see operating instructions of compressor, chapter Maintenance)

1 Oil pressure gauge **2 Maintenance indicator**



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4 Maintenance / Service

4.1 Maintenance intervals of motor / compressor

Important!!

In case of compressor units with V-belt drive, retension the V-belts and the quick-lock taper bushes of the V-belt pulleys and retighten the fastening screws of the discharge silecner with a torque of 65 Nm after the first **two hours of operation.**

Daily:
Check the oil level in the compressor, adjust oil level, if necessary.

Weekly:
Clean the filter element in the suction filter of the compressor or replace it in case of heavy fouling. Check the V-belt tension and adjust it, if necessary.

Quarterly:
Motor
Check electrical connections for tightness.
Relubricate rotor bearing, if nececssary.
(see operating instructions)

Compressor
Check non-return valve and safety valve for proper function.
(see operating instructions of compressor).

4.2 Safety information

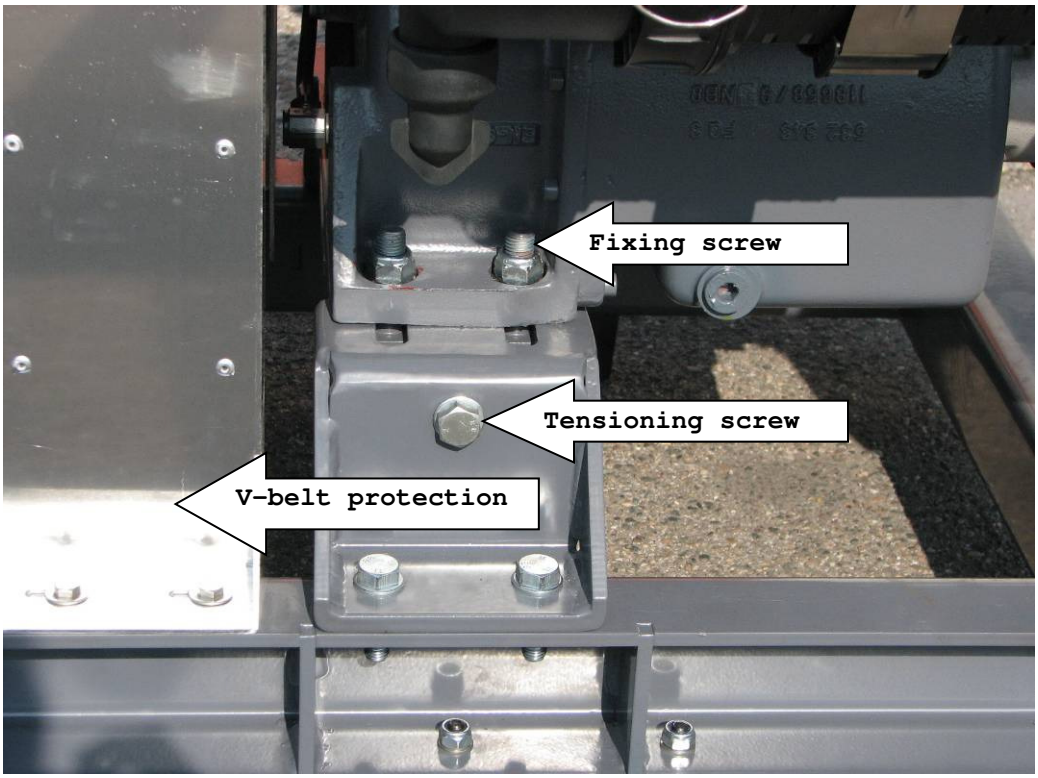
- Conduct all checks and maintenance work only with the motor / compressor switched off and with the system being depressurized.
- Prior to conducting any work on the compressor unit with motor, make sure that the main power cable is unplugged and without power.
- In case of stationary units, remove the fuses.

Important !!

- Hazard of burning due to hot machine parts.
- Wear protective gloves

4.3 Motor / V-belt drive

Tension the V-belts using the tensioning screw and a measuring device in line with the instructions of the V-belt manufacturer.



In order to change or retension the V-belts, remove the V-belt protection to be able to check the V-belt tension. To this end, unscrew the four screws at the foot of the V-belt protection and lift off the protection the protection completely.

Loosen the four fixing screws at the compressor foot afterwards and decrease the tension of the V-belts by turning the tensioning screw to the left or increase it by turning the tensioning screw to the right.

After tensioning, tighten the fixing screws. Install the V-belt protection.

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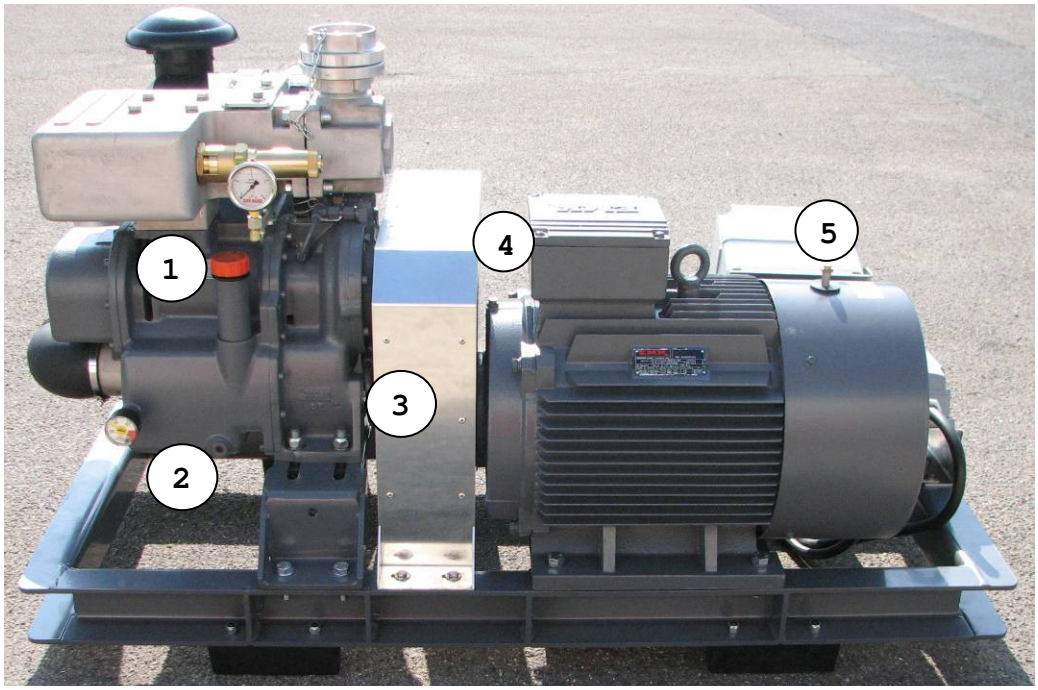
4.4 Oil change / Bearing lubrication



1 Oil change and oil level control
(see operating instructions – compressor)

2 Oil drain screw

3 Cleaning of the oil suction strainer
(see operating instructions – compressor)

4 Bearing lubrication – 45g/side every 3125 hrs
(see operating instructions – motor)

5 Bearing lubrication – 45g/side every 3125 hrs
(see operating instructions – motor)

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5 Malfunctions / Remedies Compressor

Malfunction	Possible cause	Remedy
Oil pressure below 0.3 bar at operating temperature	Drive speed too low	Check drive speed
	Oil strainer soiled	Clean oil strainer
	Wrong oil grade	Replace oil
	Oil level too low	Top up oil
Oil pressure varies	Oil level too low	Top up oil
	Oil intake pipe leaking	Check screwed connection
Oil foams	Wrong oil grade	Top up with approved oil grade
	Water in the oil	Change the oil
	Oil level too high	Reduce oil
Oil leakages	Screwed connection leaking	Check screwed connection
Compressed air pressure too high	Speed too high	Adjust speed
	Non-return valve defective	Replace non-return valve
	Safety valve does not blow off	Check safety valve
Negative pressure gauge reading 65 mbar	Suction filter clogged	Clean / replace filter elements
	Speed to high	Adjust speed

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6 Technical data electric compressor unit

6.1 Typ: CG 600 EP-Light-Belt 400V 30kW 50Hz 2.1bar

Engine speed	2950 1/min
Compressor operating speed:	3140 1/min
Operating pressure:	2,1 bar(g)
Suction volume:	450 m^3 /h (bei 2,0 bar(g)
Construction:	V-belt drive i=1,066
Pulley Compressor:	SPA-5-150/TP
Pulley engine:	SPA-5-160/TP
V-Belt Size:	XPA 882
Dimensions: 165x65x75cm	Weight: 500kg

Technical data Electric engine

Engine Type:	KAE2G200L1-2B3E3KU / IE3
Voltage:	400VD / 50Hz
Performance:	30KW
Design:	IM B3
Engine speed:	2970 1/min
protection class:	IP 55
Insulation class:	F /(B)
Weight:	252kg

6.2 Typ: CG 600 EP-Light-Belt 400V 37kW 50Hz 2.5bar

Engine speed:	2950 1/min
Compressor operating speed:	3161 1/min
Operating pressure:	2,6 bar(g)
Suction volume:	450 m^3 /h (bei 2,0 bar(g)
Construction:	V-belt drive i=1,07
Pulley Compressor:	SPA-5-140/TP
Pulley engine:	SPA-5-150/TP
V-Belt Size:	XPA 832
Dimensions: 165x65x75cm	Weight: 500kg

Technical data Electric engine

Engine Type:	KAE2G200L2-2B3E3KU / IE3
Voltage:	400VD / 50Hz
Performance:	37KW
Design:	IM B3
Engine speed:	2950 1/min
protection class:	IP 55
Insulation class:	155(F) nach 130(B)
Weight:	250kg

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6.3 Typ: CG 600 EP-Light-Belt 380V 41,5kW 60Hz 2.3bar

Engine speed:	3560 1/min
Compressor operating speed:	3357 1/min
Operating pressure:	2,3 bar(g)
Suction volume:	505 m^3 /h (bei 2,0 bar(g)
Construction:	V-belt drive i=0,942
Pulley Compressor:	SPA-5-140/TP
Pulley engine:	SPA-5-132/TP
V-Belt Size:	XPA 832
Dimensions: 165x65x75cm	Weight: 500kg

Technical data Electric engine

Engine Type:	1LE1503-2AA59-0AB4-Z L22+M1B+Y54/IE2
Voltage:	380VD/660 VY,60Hz,60Hz
Performance:	41,5KW
Design:	IM B3
Engine speed:	3560 1/min
protection class:	IP 55
Insulation class:	155(F) nach 130(B)
Weight:	250kg

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7 Service

GHH RAND Schraubenkompressor GmbH

Max-Planck-Ring 27
D-46049 Oberhausen
Germany

SILU service hotline	**Phone (++49)208-999 4177**
Service	**Phone (++49)208-690 3840**
Spare parts	**Phone (++49)208-690 3843**
Fax	**Fax (++49)208-690 3844**

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Notes: