User manual

Blower block

OMEGA 6 PLUS

Number: 9_6914 01 USE

/KKW/BOMBP 1.01 en 01 SBA-OMEGA_6_PLUS

20101202 165122

KAESER COMPRESSORS

Contents

List of Illustrations

List of Tables

List of Tables

1 Regarding this Document

1.1 Using the document

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

- ➢ Keep the installation manual in a safe place throughout the life of the machine.
- ➢ Pass the installation manual on to the next owner/user of the machine.
- ➢ Ensure that all amendments received are entered in the installation manual.
- ➢ Transfer data from the nameplate into the table in chapter 2.

1.2 Further documents

Further documents included with this installation manual to assist in safe and sure operation of the block are:

- Installation declaration in accordance with applicable directives.

Missing documents can be requested from KAESER.

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

1.3 Copyright

This user manual is protected by copyright. Any queries regarding the use or duplication of this documentation should be referred to KAESER. We would be pleased to help you in using the information to meet your unique requirements.

1.4 Symbols and labels

1.4.1 Warning notices

Warnings indicate risks potentially resulting in personal injury, if the measures shown are not taken.

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

- DANGER
- WARNING
- CAUTION

1. **⚠ DANGER** *The type and source of the imminent danger is shown here!*
   The possible consequences of ignoring a warning are shown here.
   The signal word "DANGER" indicates that death or severe injury can result from ignoring the warning.
   - ➢ *The measures required to protect yourself from danger are shown here.*

2. Warnings must always be read thoroughly and carefully observed.

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

Tab. 1 Danger levels and their definition

1.4.2 Potential damage warnings

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

Damage warnings have only one danger level identified with this signal term:

- NOTE

1. **NOTICE** *The type and source of the imminent danger is shown here!*
   Potential effects when ignoring the warning are indicated here.
   ➢ *The protective measures against the damages are shown here.*
2. Carefully read and fully comply with warnings against damages.

1.4.3 Other alerts and their symbols

This symbol indicates particular important information.

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

Precondition — Here you will find conditional requirements necessary to carry out the task.
The conditions relevant to safety shown here will help you to avoid dangerous situations.

➢ This symbol is is placed by lists of actions comprising one stage of a task.
In lists of actions with several stages the sequence of actions is numbered.

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

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

Further information — Further subjects are introduced here.

2 Technical Data

2.1 Nameplate

The model designation and important technical information is to be found on the block nameplate.

The nameplate is fixed to the block casing

- on the gear end.

➢ Enter here the nameplate data as a reference:

Característica	Value
Model	
Material no.	
Serial No.	
Equipment no.	
Year of manufacture	

Tab. 2 Nameplate

2.2 Weight

	OMEGA 61 PLUS	OMEGA 62 PLUS	OMEGA 63 PLUS	OMEGA 64 PLUS
Weight [lb]	242	275	345	410

Tab. 3 Weight

2.3 Flow rate

	OMEGA 61 PLUS	OMEGA 62 PLUS	OMEGA 63 PLUS	OMEGA 64 PLUS
Nominal flow rate [cfm]	35.12	44.43	63.04	81.65

Tab. 4 Theoretical flow rate at maximum speed

The effective flow rate is dependent on speed and pressure conditions.

Further information The design diagrams in chapter 13.2 contain specifications of effective flow rate (delivery).

2.4 Pressure

	OMEGA 61 PLUS	OMEGA 62 PLUS	OMEGA 63 PLUS	OMEGA 64 PLUS
Maximum working pressure [bar]	1.0	1.0	1.0	0.8
Maximum pressure differential Δp in pressure operation [mbar] *	1000	1000	1000	800
Maximum pressure differential Δp in vacuum operation [mbar] *	500	500	500	500
Maximum compression ratio **	2.0	2.0	2.0	2.0

* Differential: inlet pressure to outlet pressure

** Quotient: inlet pressure (absolute) to block discharge pressure (absolute)

Tab. 5 Pressure

2.5 Power and speeds

Required power consumption

The power requirement is related to the operating state.

	OMEGA 61 PLUS	OMEGA 62 PLUS	OMEGA 63 PLUS	OMEGA 64 PLUS
Power requirement [hp]	1.52–64.64	1.83–81.07	2.49–110.0	3.24–110.0

Tab. 6 Power requirement

Permissible speeds

Rotor speed during operation	OMEGA 61 PLUS	OMEGA 62 PLUS	OMEGA 63 PLUS	OMEGA 64 PLUS
Maximum [rpm]	3900	3700	3500	3400
Minimum [rpm]	600	600	600	600

Tab. 7 Speeds

Further information Details of flow rate, temperature rise and blower shaft power in relation to rotor speed and pressure differential can be found in the design diagrams in chapter 13.2.

2.6 Load on the drive shaft

	OMEGA 61 PLUS	OMEGA 62 PLUS	OMEGA 63 PLUS	OMEGA 64 PLUS
Maximum radial loading [N]	5800	5990	6100	6250

Tab. 8 Load on the drive shaft

2.7 Connection dimensions

Flange connection	OMEGA 61 PLUS	OMEGA 62 PLUS	OMEGA 63 PLUS	OMEGA 64 PLUS
Inlet port DN [mm]	150	200	200	250
Discharge port DN [mm]	150	200	200	250

Tab. 9 Connection dimensions (NPT/ANSI adapters available for pipe mounting)

2.8 Temperature

	OMEGA 61 PLUS	OMEGA 62 PLUS	OMEGA 63 PLUS	OMEGA 64 PLUS
Maximum block discharge temperature [°C]	160	160	160	160
Maximum temperature differential [K] *	115	115	115	115
* Discharge temperature minus inlet temperature				

Tab. 10 Temperature

2.9 Recommended oil

The oil to be recommended depends on the operating conditions.

	OMEGA FLUID	
	SB220	SF220
Description	Synthetic oil	Synthetic oil
Application	Suitable for all applications, except food processing.	Specifically for applications where the compressed air comes into contact with foodstuffs.
* Special measures are required for oil temperatures >120 °C. Consult KAESER for advice on this subject.		

	OMEGA FLUID	
	SB220	SF220
Oil temperature [°C]	−10 – +120*	−5 – +110

* Special measures are required for oil temperatures >120 °C. Consult KAESER for advice on this subject.

Tab. 11 Recommended oil

Further information The type of oil with which the block is to be filled is marked near the filling port.
Information on ordering oil is found in chapter 11.2.

2.10 Lubricating oil charge

The block oil chambers are filled with oil at the factory.

Lubricating oil charge [oz] (guide quantity)

Flow direction	the drive-end	the gear-end
Horizontal	1.0 ±15 %	1.3 ±15 %
Vertical	0.65 ±15 %	0.85 ±15 %

Tab. 12 Lubricating oil charge

2.11 Ambient conditions

	OMEGA 61 PLUS	OMEGA 62 PLUS	OMEGA 63 PLUS	OMEGA 64 PLUS
Permissible ambient temperature [°C]	−15 – +60	−15 – +60	−15 – +60	−15 – +60
Inlet air temperature [°C]	−15 – +40	−15 – +40	−15 – +40	−15 – +40

Tab. 13 Ambient conditions

2.12 Sound pressure level

The blower block is not a complete machine.

Data is obtained under the following conditions:

- with drive motor
- with inlet silencer
- with discharge silencer
- without sound enclosure

Actual values are dependent upon:

- Pressure
- Speed
- Design and construction of the silencer

Measurement conditions

- Free-field measurement to EN ISO 2151
- Measurement distance 1 m

Sound pressure level [dB(A)]

Operating mode	OMEGA 61 PLUS	OMEGA 62 PLUS	OMEGA 63 PLUS	OMEGA 64 PLUS
Positive pressure	81–97	82–100	85–101	88–99
Vacuum	83–97	84–95	87–97	90–101

Tab. 14 Sound pressure level

3 Safety and Responsibility

3.1 Basic instructions

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

- danger to life and limb of the operator or third parties,
- adverse effects on the block and other property.

⚠ DANGER

Disregard of these instructions can result in serious injury.

➢ *To use the block safely, read and follow the installation manual carefully.*

➢ Use the block only if it is in a technically perfect condition and only for the purpose for which it is intended; observe all safety measures and the installation manual.

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

3.2 Specified use

The blower block is exclusively intended to form part of a machine for conveying air and other neutral gases in an industrial environment. Any other use is considered incorrect. The manufacturer is not liable for any damages that may result therefrom. The user alone is liable for any risks incurred.

➢ Keep to the specifications listed in this installation manual.

➢ Do not operate the block without pipework or silencers connected to the inlet and outlet.

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

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

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

➢ Intake of solid particles > 0.1 mm is not permitted.

3.3 Improper use

➢ Never direct compressed air at persons or animals.

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

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

3.4 User's responsibilities

3.4.1 To be noted when integrating in a machine

The block will become an integral part of the machine into which it is built. Therefore, it is the responsibility of the machine manufacturer to ensure that the block is suitable for the application and that the necessary conditions for its safe and reliable operation are maintained.

➢ Check the suitability of the block and the conditions under which it will operate.

3.4.2 Observe statutory and universally accepted regulations

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

➢ Observe the statutory and universally accepted regulations when operating the blower block.

3.4.3 Defining personnel

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

Authorized assembly personnel possess the following qualifications:

- are of legal age,
- have read, understood and will abide by the safety instructions and installation manual,
- are fully conversant with the safety concepts and regulations of drive, compressed air and vacuum technology,
- are able to recognize the possible dangers of drive, compressed air and vacuum technology and take appropriate measures to safeguard persons and property,
- have received adequate training and authorization for safe assembly.

➢ Ensure that personnel entrusted with assembly are qualified and authorized to carry out their tasks.

3.5 Dangers

Basic instructions

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

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

Warning instructions are found before a potentially dangerous task.

3.5.1 Safely dealing with sources of danger

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

Forces of compression

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

➢ Close shut-off valves or otherwise isolate the block from the air distribution network to ensure that no compressed air can flow back into the block.

➢ Vent all pressurized components and chambers completely.

➢ Welding, heat treatment and mechanical changes are forbidden as they can effect the strength of the material.
Safety is no longer ensured.

Compressed air quality

- ➢ Never directly inhale compressed air.
- ➢ Use appropriate systems for air treatment before using the compressed air from this block as breathing air and/or for the processing of food products.
- ➢ Use lubricating oil compatible with food products if compressed air can come into contact with them.

Rotating components

Contact with rotating drive shafts or rotors can cause severe injury.

- ➢ Secure the block against unwanted starting and make sure there is no voltage present.
- ➢ Wear close-fitting clothes and a hair net if necessary.
- ➢ Fit covers and guards to prevent accidental contact.

Temperature

- ➢ Do not touch the hot blower block.
- ➢ Avoid contact with hot oil when changing the oil.
- ➢ Wear protective clothing.

Noise

- ➢ Operate the machine only with adequate sound damping.
- ➢ Wear hearing protection if necessary.

Operating materials

- ➢ Strictly forbid fire, open flame and smoking.
- ➢ Follow safety regulations when dealing with lubricants and chemical substances.
- ➢ Avoid contact with skin and eyes.
- ➢ Do not inhale oil mist and vapors.
- ➢ Do not eat or drink while handling lubricants.
- ➢ Keep suitable fire extinguishing agents ready for use.
- ➢ Use only KAESER approved operating materials.

Unsuitable spare parts

- ➢ Use only spare parts that have been approved by the manufacturer for this blower block. Unsuitable spare parts compromise the safety of the machine.
- ➢ Use only genuine KAESER pressure components.

Conversion or modification of the blower block

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

3.5.2 Organizational measures

- ➢ Designate personnel and their responsibilities.

- ➢ Give clear instructions on reporting faults and damage to the block.
- ➢ Give instructions on fire reporting and fire-fighting measures.

3.5.3 Safe operation of the block

Information on conduct that will help in handling the block safely is listed here.

Transport

- ➢ Use suitable lifting gear that conforms to local safety regulations.
- ➢ Allow transport only by personnel trained in the safe movement of goods.
- ➢ Attach lifting gear only to suitable lifting points.
- ➢ Note the center of gravity to avoid danger of the load tipping over.
- ➢ Make sure the danger zone is clear of personnel.

Installing in a machine

- ➢ Do not operate in areas in which specific requirements regarding explosion protection are in force.
- ➢ Ensure adequate cooling.
- ➢ Ensure that required ambient conditions are maintained with regard to:
  - ■ ambient temperature,
  - ■ clean inlet air with no damaging contaminants,
  - ■ inlet air free of explosive or chemically unstable gases or vapors,
  - ■ inlet air free of acid/alkaline forming substances, particularly ammonia, chlorine or hydrogen sulfide.
- ➢ Ensure accessibility so that all work on the block can be carried out without danger or hindrance.

Decommissioning, storage, disposal

- ➢ Drain out the oil and dispose of according to environmental regulations.
- ➢ Return the block to KAESER for disposal.

3.6 Danger areas

The table gives information on areas dangerous to personnel.

Only authorized personnel may enter these areas.

The danger areas related to the following activities are to be defined by the user of the machine into which the blower block is built:

- ■ Commissioning
- ■ Operation
- ■ Maintenance
- ■ Decommissioning

Activity	Danger area	Authorized personnel
Transport	3 ft. radius	Installation personnel for transport preparation. No personnel during transport.
	Beneath the lifted block.	No personnel!
Installation	3 ft. radius	Installation personnel

Tab. 15 Danger areas

3.7 Safety signs

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

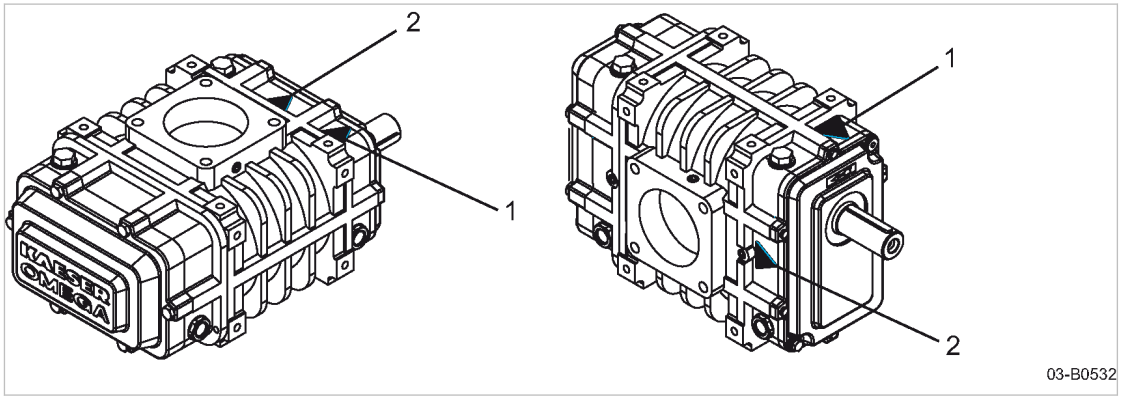


Fig. 1 Location of safety signs

Item	Sign	Meaning
1		Hot surface! Risk of burns caused by contact with hot components ➢ Do not touch the surface. ➢ Wear long-sleeved garments (not synthetics such as polyester) and protective gloves.
2		Risk of serious lacerations or even severing of extremities (fingers) from rotating components. ➢ Operate the machine only with closed flange connections. ➢ Switch off and lock out the power supply disconnecting device.

Tab. 16 Safety signs

3.8 In emergency

3.8.1 Correct fire fighting

Suitable extinguishing agents

- Foam
- Carbon dioxide
- Sand or dirt

Unsuitable or unsafe extinguishing agents

- Strong jet of water

1. Keep calm.
2. Give the alarm.
3. Switch off the power supply disconnecting device, if possible.
4. Move to safety.
   - Warn persons in danger.
   - Help incapacitated persons.
   - Close the doors.
5. Try to extinguish the fire if you have the skill to do so.

3.8.2 Remove lubricating oil from the skin.

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

➢ Skin contact:
Wash off immediately.

3.9 Environmental protection

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

➢ Observe national regulations.
This applies particularly to parts contaminated with lubricating oil.

➢ Do not allow lubricating oil to escape to the environment or into the sewage system.

3.10 Warranty

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

A condition of our warranty is the specified use of the blower block under observation of the specific operating conditions.
Due to the numerous applications for which the blower block is suitable, the obligation lies with the user to determine its suitability for his specific application.

Furthermore, we accept no warranty obligation for:

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

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

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

4 Design and Function

4.1 Function

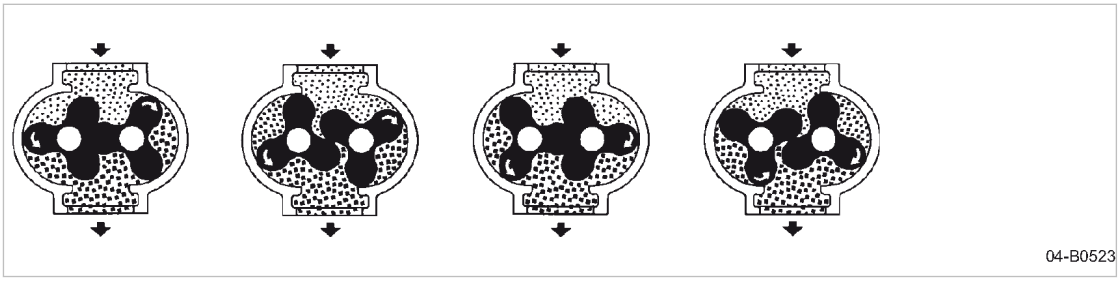


Fig. 2 Principle of compression

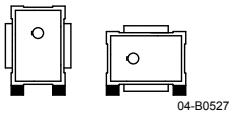
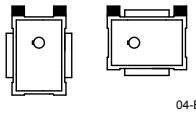
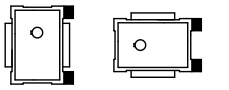
A pair of rotors with intermeshing lobes rotate in opposite directions within a casing. The rotors are synchronized by timing gears on one end. Air in the block inlet is trapped between the rotors and the casing and moved round to the discharge port.

There is no contact between the rotors themselves and the casing so no oil film lubrication is needed.

4.2 Blower block overview

The block rotors have the OMEGA profile developed by KAESER.

The block has mounting feet on all sides to facilitate integration in a machine.

Mounted	Underslung	Hanging from the side
 04-B0527	 04-B0528	 04-B0526

Tab. 17 Integration possibilities

Operating positions

The block is delivered to operate in one of the following positions:

- Horizontal flow direction
- Vertical flow direction

One of the rotors will be designated as driven in the order.

Contact KAESER if the drive should be on the other rotor.

Horizontal flow direction

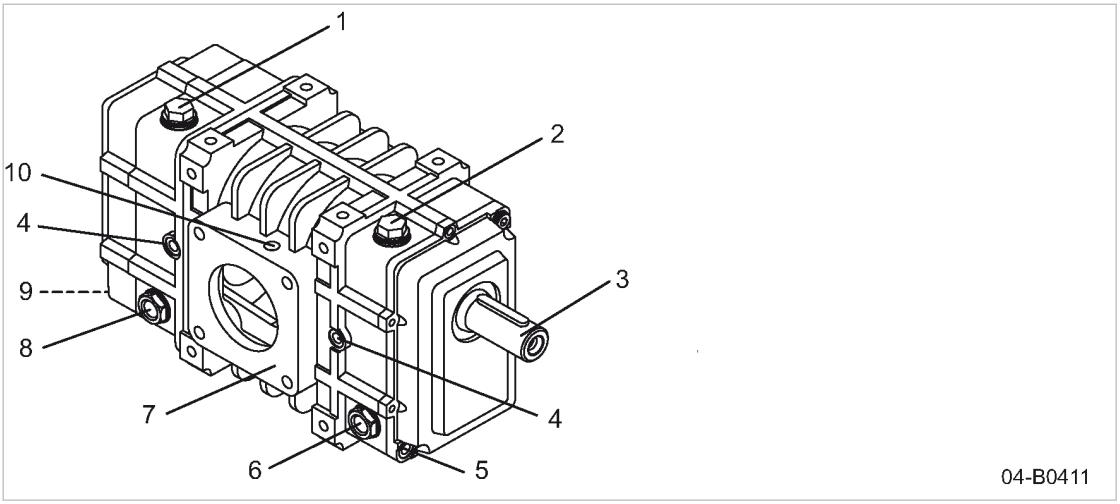


Fig. 3 Block with horizontal flow direction

1	Gear-end oil inlet	6	Drive-end oil sight glass
2	Drive-end oil inlet	7	Flange connection, both ends
3	Drive shaft	8	Gear-end oil sight glass
4	Side gas drainage (closed)	9	Gear-end oil drain
5	Drive-end oil drain	10	Connection for measuring device

Vertical flow direction

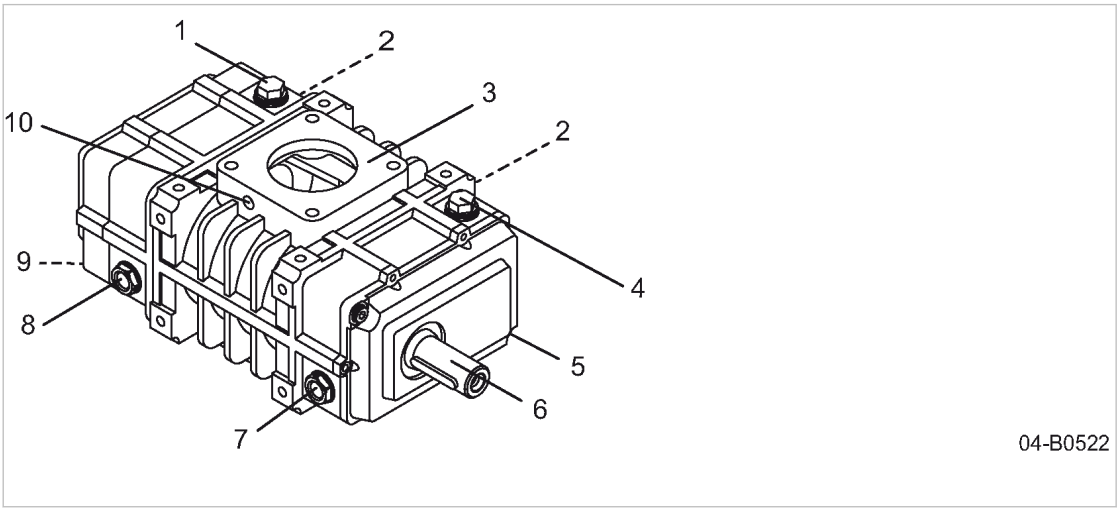


Fig. 4 Block with vertical flow direction

1	Gear-end oil inlet	6	Drive shaft
2	Side gas drainage (closed)	7	Drive-end oil sight glass
3	Flange connection, both ends	8	Gear-end oil sight glass
4	Drive-end oil inlet	9	Gear-end oil drain
5	Drive-end oil drain	10	Connection for measuring device

5 Installation and Operating Conditions

5.1 Safety

- ➢ Strictly forbid fire, open flame and smoking.
- ➢ The blower block is not explosion protected.
  Do not operate in areas in which specific requirements regarding explosion protection are in force.
- ➢ Do not operate the block without pipework or silencers connected to the inlet and outlet.
- ➢ Ensure that required ambient conditions are maintained with regard to:
  - ambient temperature,
  - clean inlet air with no damaging contaminants,
  - inlet air free of explosive or chemically unstable gases or vapors,
  - inlet air free of acid/alkaline forming substances, particularly ammonia, chlorine or hydrogen sulfide.
- ➢ Keep suitable fire extinguishing agents ready for use.

5.2 Installation conditions

The block is intended for installing into a suitable machine.

5.2.1 Determining the location

1. Install the block on a surface that is level and can support its weight.
2. If installed outdoors, the block must be protected from frost, direct sunlight, dust and rain.
3. Ensure accessibility to the block so that all work can be carried out without danger or hindrance.

5.2.2 Operating positions

The block may be installed horizontally or vertically for each flow direction needed.

The oil sight glasses and plugs must be installed in accordance with the operating position and the gas drainage port must be opened or closed accordingly.

1. Check the positions of the oil sight glasses and oil filling plugs on the gear and drive ends.
2. Before installing the block, remove the two transport plugs from the gas drainage ports on the underside of the block to prevent oil being forced into the conveying chamber.
   The two gas drainage ports on the side remain closed.

Further information — Details of the different operating positions is given in chapter 4.2.

The location of the gas drainage ports is given in chapters 4.2 and 13.1.

5.2.3 Drive

The blower block may be driven by readily available drives.

Precondition — The drive power should be at least 12% more than required by the block.

1. Ensure that the maximum permissible rotor speed is not exceeded.

2. Prevent axial force being applied to the drive shaft.
   The shaft bearings are not designed for high axial force.
3. Use couplings and pulleys that do not need high axial force for fitting or removal.
4. Use the centre thread on the shaft end for extracting pulleys and coupling parts.

Directly-coupled drive with flexible coupling

1. Ensure that the balancing quality Q is <6.3 at maximum speed.
2. The drive output shaft and the block input shaft must be aligned precisely.
3. Align the drive output shaft to the block input shaft.

Refer to the coupling manufacturer's technical data for the running tolerances of the coupling.

We recommend the calculation of the critical rotary natural frequency in order to avoid impermissible vibrations.

Belt drive

1. Ensure that the belt drive out of alignment is no more than ±0.5°.
   This applies to the following:
   - Shaft parallelism
   - Off-track running of the belts because of axial offset
2. Ensure that the block pulley meets the following quality requirements:
   - Balance: Q 6.3
   - Maximum eccentricity of the V-grooves: 0.1 mm
3. Check belt tension and adjust if necessary:
   - after commissioning
   - after every belt change
     - after 30 minutes running
     - after 24 operating hours.

Further information The maximum radial loading of the block input shaft end is provided in chapter 2.6.

5.2.4 Required safety devices

Depending on the overall installation, various measures are needed to ensure safe and reliable block operation.

For example:

- A means of detecting incorrect block rotation direction with subsequent immediate shut-down of the drive.
- Flexible pipe connections that do not exert any stress on the blower block from heat expansion or any other force.
- Suitable filtration to prevent the intake of dust or other foreign bodies.
- Suitable components to reduce the sound emission from the block.
  - Inlet and discharge silencers.
  - Sound enclosure

Certain safety and regulating devices are needed for secure operation of the machine into which the blower block is installed:

- Blow-off or vacuum valve to prevent exceeding or falling short of the permissible operating pressure.
  The initial pressure must be matched with the values from the design drawings, wherein a range of at least 30 mbar must be planned between the working pressure and the activating pressure of the valve.
  If the valve activates during operation, an inadmissible operating state exists. In this event, an admissible operating state must be achieved immediately or the machine is to be taken out of service.
  - Highest activating pressure when operating under positive pressure:
    50 mbar above working pressure.
  - Highest activating pressure when operating under vacuum:
    50 mbar above maximum pressure differential.
- A check valve to prevent the return flow of air.
  The valve must be dimensioned according to the following parameters:
  - the size of the inlet and discharge ports,
  - the permissible pressure differential.
- Unloaded start valve to avoid the machine starting against a back pressure.
- Indicators for monitoring the inlet and discharge parameters of:
  - Temperature
  - Pressure or vacuum
- Automatic safety devices to shut down the machine if the permissible limits are reached of:
  - Temperature
  - Pressure or vacuum
  - Current draw

➢ Carefully assess the installation situation and seek advice from KAESER.

Further information — Design diagrams are given in chapter 13.2.

6 Installation

6.1 Safety

Follow the instructions below for safe installation.

Warning instructions are located before a potentially dangerous task.

Basic safety instructions

1. Follow the instructions in chapter 3 'Safety and Responsibility'.
2. Installation work may only be carried out by authorized personnel.
3. Make sure no personnel are working on the block before switching on.

Working on pressure systems

1. Close shut-off valves or otherwise isolate the block from the air distribution network to ensure that no compressed air can flow back into the block.
2. Vent all pressurized components and chambers completely.

Further information

Details of authorized personnel are found in chapter 3.4.3.

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

6.2 Reporting transport damage

1. Check the block for visible and hidden transport damage.
2. Inform the carrier and the manufacturer in writing of any damage without delay.

6.3 Block installation and connection

The block is fixed by means of the feet cast into the casing.

The gear-end and drive-end oil chambers must not be connected.

Precondition

Ensure that the machine in which the block is installed is isolated from the mains and vented of all pressure.

⚠ WARNING

Serious injury or death can result from loosening or opening components under pressure.

➢ *De-pressurise all pressurised components and enclosures.*

⚠ CAUTION

Flange connections open!
Danger of squashing or severing.

➢ *Do not reach into the interior of the block.*

1. Use suitable fixings to screw the block, without stress, to a firm and even base.
2. Check that the drive shaft turns freely by hand.

3. Use a suitable structure to align and fix the block and the drive in relation to each other.
4. Remove the flange connection covers. Check interior for dirt and foreign bodies.
5. Fit suitable pipework:
   - Air inlet guide to the inlet port.
   - Pressure pipe to the discharge port.
   - Support the weight of the pipework so that its weight does not fall on silencers or connecting components.

Further information Details of the fixing holes are contained in the dimensional drawing in chapter 13.1.

7 Initial Start-up

7.1 Safety

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

Basic safety instructions

1. Follow the instructions in chapter 3, "Safety and Responsibility".
2. Have the commissioning carried out by authorized personnel only.
3. Make sure no personnel are working on the block before switching on.

Working on pressure systems

1. Close shut-off valves or otherwise isolate the block from the air distribution network to ensure that no compressed air can flow back into the block.
2. Vent all pressurized components and chambers completely.

Further information
Details of authorized personnel are found in chapter 3.4.3.
Details of dangers and their avoidance are found in chapter 3.5.

7.2 Checking installation and operating conditions

➢ Check and confirm all the items in the checklist before commissioning the block.

To be checked	See chapter	Complied?
➢ Have all packaging material and tools been removed from the machine?	–	
➢ Are the operators fully conversant with safety regulations?	–	
➢ Have all the positioning conditions been complied with?	5	
➢ Is there adequate lubricating oil in the drive-end and gear-end of the block? (level in the centre of the sight glass)	10.3	
➢ Has the blower been mounted free of stresses?	6.3	
➢ Has it been verified that the rotors can be turned freely by hand?		

Tab. 18 Installation conditions checklist

7.3 Instructions to be observed before commissioning or recommissioning

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

➢ Commissioning may only be carried out by trained and authorized personnel.

Special measures for re-commissioning after storage

Storage period longer than	Action
12 months	➢ Change the oil.
36 Months	➢ Have the overall technical condition checked by an authorized KAESER Service Technician.

Tab. 19 Re-commissioning after storage

7.4 Checking direction of rotation

The direction of rotation can be checked when the block is coupled to the drive. Necessary measures are dependent on the design of the drive and should be determined by the user.

An arrow indicating direction of rotation is fixed on the side of the block at the drive end.

➢ Install a safety device that will stop the drive and build-up of suction pressure if the direction of rotation is incorrect.

➢ Check the direction of rotation on first start-up of the block and stop the drive immediately if it incorrect.

The drive has been stopped because of incorrect direction of rotation?

➢ Take appropriate measures to ensure correct direction of rotation.

8 Operation

8.1 Switching on and off

On and off switching conditions are defined by the design of the machine into which the blower block is installed.

1. **NOTICE** *Ambient temperature too low!*
   Frozen condensate and highly viscous lubricating oil can cause damage when starting the machine.
   ➢ *Make sure that the temperature of the block is at least +3 °C before starting the machine.*
2. The block may only be started when the permissible operating conditions are met.

9 Fault Recognition and Rectification

9.1 Basic instructions

The following tables are intended to assist in locating faults.

1. Do not attempt fault rectification measures other than those given in this manual.
2. In all other cases,
   have the fault rectified by an authorised KAESER Service Technician.

9.2 Faults

Fault	Possible cause	Action
Unusual noise when running.	Too much backlash in the timing gears.	Call KAESER Service.
	Bearing play to large.	Call KAESER Service.
	Rotors not synchronized.	Keep to the pressure differential and speed as specified. Call KAESER Service.
Block runs too hot.	Pressure differential too great.	Check and correct pressure differential.
	Clogged inlet filter reducing flow rate.	Clean the inlet filter.
	Rotor clearance too large.	Call KAESER Service.
Oil leaks from the gas drain.	Oil level too high.	Drain off oil until the correct level is reached.
Oil leaking from around the drive shaft.	Shaft seal defective.	Call KAESER Service.
Reduced air inlet flow.	Rotor clearance too large because of wear.	Call KAESER Service.
	Intake resistance too high.	Clean the inlet filter.
Black film on the oil sight glasses.	Oil not changed at the correct interval.	Change the oil. Clean or renew the sight glass.
	Insufficient oil.	Change the oil. Clean or renew the sight glass.
	Oil overheated.	Call KAESER Service.
	Block overloaded.	Call KAESER Service.
Water in the oil.	Condensate build-up by prolonged storage and high humidity.	Change the oil.

Tab. 20 Other faults and actions.

10 Maintenance

10.1 Safety

Follow the instructions below to ensure safe machine maintenance.

Warning instructions are located before a potentially dangerous task.

Basic safety instructions

1. Follow the instructions in chapter 3 'Safety and Responsibility'.
2. Maintenance work may only be carried out by authorized personnel.
3. Make sure no personnel are working on the block before switching on.

Working on pressure systems

1. Close shut-off valves or otherwise isolate the block from the air distribution network to ensure that no compressed air can flow back into the block.
2. Vent all pressurized components and chambers completely.

Further information

Details of authorized personnel are found in chapter 3.4.3.

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

10.2 Maintenance schedule

10.2.1 Logging maintenance work

The maintenance intervals given are those recommended for average operating conditions.

- ➢ Maintenance tasks should be carried out more frequently where operating conditions are unfavourable (e.g. dusty atmosphere) or when the equipment is in constant use.
- ➢ Adjust the maintenance intervals with regard to local installation and operating conditions.

➢ Keep a log of all maintenance and service work.

This enables the frequency of individual maintenance tasks and deviations from our recommendations to be determined.

Further information

A prepared list is provided in chapter 10.7.

10.2.2 Regular maintenance tasks

The table below lists maintenance tasks required.

When operating conditions are unfavourable (e.g. dusty atmosphere) or when the equipment is in constant use, maintenance tasks must be carried out more frequently (shorter intervals).

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

Interval	Maintenance task	See chapter
500 hours after commissioning	Change the lubricating oil.	10.5
Up to 500 h or monthly	Check the oil level.	10.3
Up to 6 000h* at least once a year	Change the lubricating oil.	10.5
As required	Check rotors for contamination.	10.6

h = operating hours

* Reduce lubricating oil change intervals by 50 percent at high operating and ambient temperatures and at oil temperatures above 120° C. The lubricating oil quickly becomes black and viscous.

Tab. 21 Regular maintenance tasks

10.2.3 Regular service tasks

The table below lists necessary service tasks.

➢ Only an authorized KAESER Service Technician should carry out service work.

➢ Carry out service tasks punctually taking ambient and operating conditions into account.

Interval	Service task
Up to 40,000 h*	Have block bearings checked or the block exchanged.

h = operating hours
* guidance

Tab. 22 Regular service tasks

10.3 Checking the oil level

The true oil level can be seen in the oil sight glass only when the machine is stopped.

The gear-end and drive-end oil chambers are not connected.

⚠ WARNING

Danger of burns from hot components!

➢ *Wear long-sleeved clothing and gloves.*

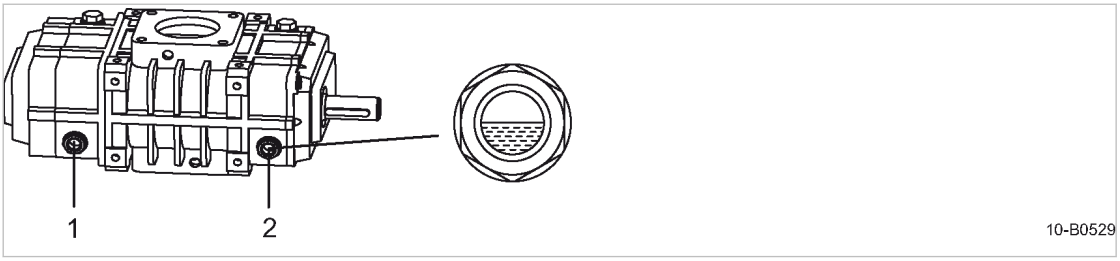


Fig. 5 Checking the oil level

[1] Gear-end oil sight glass
[2] Drive-end oil sight glass

1. Check the oil level in the sight glasses on both ends of the block.
2. Top up as soon as the level falls to 3 mm below the centre of the sight glass.

10.4 Replenishing oil

A sticker on the block specifies the type of oil used.

The block must be isolated from the compressed air network and completely vented before undertaking any work on the pressure system.

Precondition The power supply disconnecting device is switched off
The disconnecting device is locked in the off position.
The oil level has settled.

NOTICE

Unsuitable oil can damage the block.

- ➢ *Never mix different types of oil.*
- ➢ *Never top up with a different type of oil to that already used in the block.*

⚠ WARNING

Danger of burns from hot components and oil!

- ➢ *Wear long-sleeved clothing and gloves.*

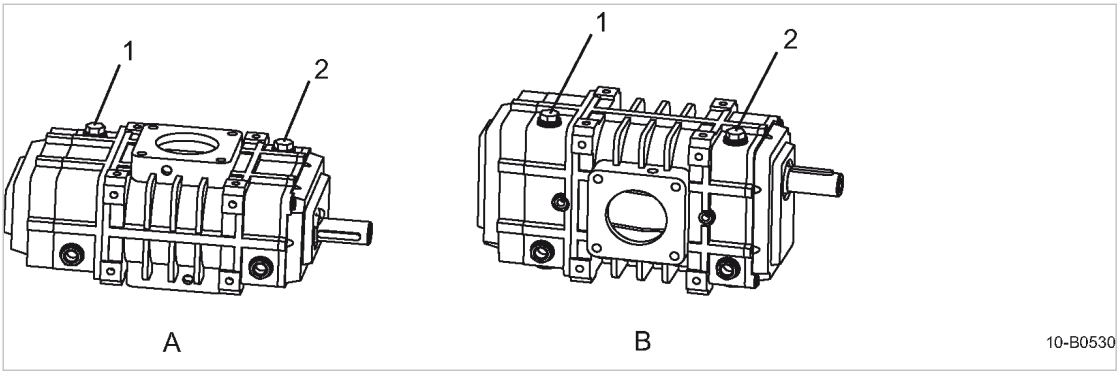


Fig. 6 Replenishing oil

[A] Vertical operating position
[B] Horizontal operating position
[1] Plug (gear-end oil filling port)
[2] Plug (drive-end oil filling port)

1. Slowly remove the plug [1] and/or [2].
2. Top up until the level is in the centre of the sight glass.
3. Screw in the plugs.
4. Visually check for leaks.

10.5 Changing the oil

The block must be isolated from the compressed air network and completely vented before undertaking any work on the pressure system.

The oil should be changed with the block temperature at 130°F to ensure the oil flows freely.

Drain the oil thoroughly from:

- the gear-end
- the drive-end

Material Lubricating oil

Oil receptacle

⚠ WARNING

Danger of burns from hot components and oil!

➢ *Wear long-sleeved clothing and gloves.*

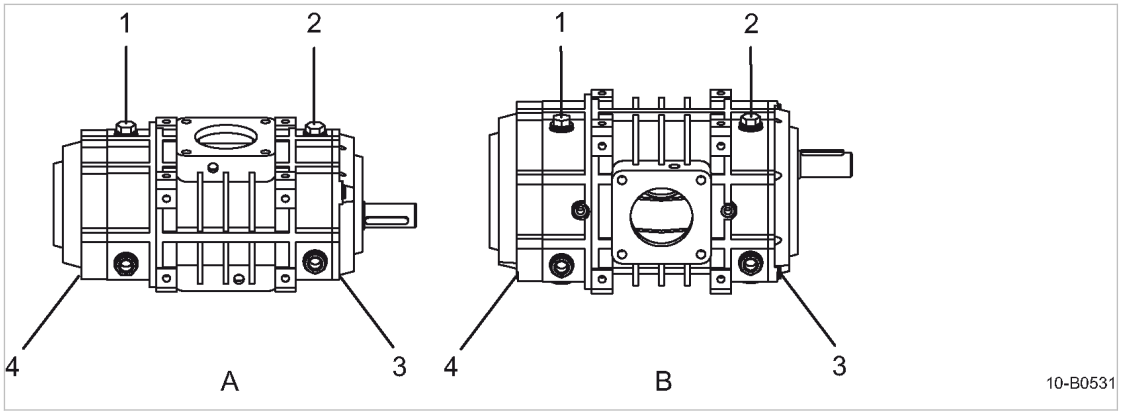


Fig. 7 Changing the oil

[A] Horizontal operating position
[B] Vertical operating position
[1] Plug (gear-end oil filling port)
[2] Plug (drive-end oil filling port)
[3] Plug (drive-end oil drain port)
[4] Plug (gear-end oil drain port)

Drain the oil

1. Have an oil receptacle ready.
2. Loosen the plugs [1] and [2].
3. Remove the plugs [3] and [4].
4. Drain the oil.
5. Replace the plugs in the drain ports.

Dispose of the old oil in accordance with local environmental protection regulations.

Fill with fresh oil.

1. Fill with fresh oil.
2. Check the oil level.
3. Replace the plugs in the oil filling ports.
4. Visually check for leaks.

10.6 Checking rotors for contamination

Any dust conveyed in the media can result in build up inside the block.

The block must be isolated from the compressed air network and completely vented before undertaking any work on the pressure system.

Precondition The supply disconnecting device is switched off,
the device is locked off,
the absence of voltage has been verified.

The block has cooled down.

⚠ WARNING

Danger of burns from hot components!

➢ *Wear long-sleeved clothing and gloves.*

⚠ CAUTION

Rotating rotors.
Danger of squashing or severing of limbs.

➢ *Isolate the drive from the mains and lock off.*

1. Disconnect the flange connections and look for contamination inside the block.
2. If necessary, have the block cleaned by an authorised KAESER Service Technician.

10.7 Document maintenance and service work.

Machine number:

➢ Enter maintenance and service work carried out in the list.

Date	Maintenance task carried out	Operating hours	Signature

Tab. 23 Logged maintenance tasks

11 Spares, Operating Materials, Service

11.1 Note the nameplate

The nameplate contains all information to identify your blower block. This information is essential to us in order to provide you with optimal service.

➢ Please give the information from the nameplate with every enquiry and order for spares.

11.2 Ordering spares and operating fluids/materials

KAESER spares and operating fluids/materials have the same characteristics as the originals. They are selected for use in KAESER blower blocks.

⚠ WARNING

There is risk of personal injury or damage to the machine resulting from the use of unsuitable spares or operating fluids/materials.
Unsuitable or poor quality spares and operating materials may damage the block or impair its proper function.
Personal injury may result from machine damage.

➢ *Use only original KAESER parts and operating fluids/materials.*

➢ *Have an authorised KAESER Service Technician carry out regular maintenance.*

Lubricating oil

Name	Quantity [l]	Number
OMEGA FLUID SB 220	1	831057.00010
	5	831057.0
OMEGA FLUID SF 220	1	892702.00020
	5	892702.00010

Tab. 24 Lubricating oil overview

11.3 KAESER AIR SERVICE

KAESER AIR SERVICE offers:

- authorized service technicians with KAESER factory training,
- increased operational reliability ensured by preventive maintenance,
- energy savings achieved by avoidance of pressure losses,
- optimum conditions for operation of the compressed air system,
- the security of genuine KAESER spare parts,
- increased legal certainty as all regulations are kept to.

➢ Why not sign a KAESER AIR SERVICE maintenance agreement!

Result Your advantage:
lower costs and higher compressed air availability.

11.4 Service addresses

Addresses of all KAESER agents worldwide are provided at the end of this installation instruction.

11.5 Declaration of Contamination

Every company (user) is responsible for the health and safety of its employees. This extends to personnel who carry out servicing work at the user or service contractor.

A Declaration of Contamination must be filled out and signed whenever maintenance or repair work is carried out on the blower block.

Shipment of the blower block

Precondition Correct preparation of the block for shipment.

1. Drain the lubricating oil.
2. Close off the oil drain port
3. Close off the flange connections.
4. Use appropriate packing.
5. Fix a copy of the Declaration of Contamination to the **outside** of the packing.

Further information A Declaration of Contamination form is given in chapter 13.3.

12 Decommissioning, Storage and Transport

12.1 De-commissioning

De-commissioning is necessary, for example, under the following circumstances:

- The block is temporarily not needed,
- The block is to be moved to another location,
- The block is to be scrapped.

Temporary de-commissioning

Precondition The can be run at regular intervals.

➢ Run the block once a week for at least 30 minutes at operating temperature to ensure corrosion protection.

Long-term de-commissioning

➢ Spray the block inside and out with a preserving oil to prevent corrosion.

Further information Details of conserving oils are found in chapter 12.4.

12.2 Packing

A crate is required for overland transport to protect the block from mechanical damage.

Consult KAESER Service for advice concerning sea or air transport.

➢ Close off the flange connections.

12.3 Transporting

12.3.1 Safety

The weight determines the means of transport.

Precondition Transport with lifting gear operated by personnel trained in the safe movement of goods.

➢ Make sure the danger area is clear.

Further information Details of weights are found in chapter 2.2.

12.3.2 Transporting with a crane

Suitable lifting gear ensures correct transportation.

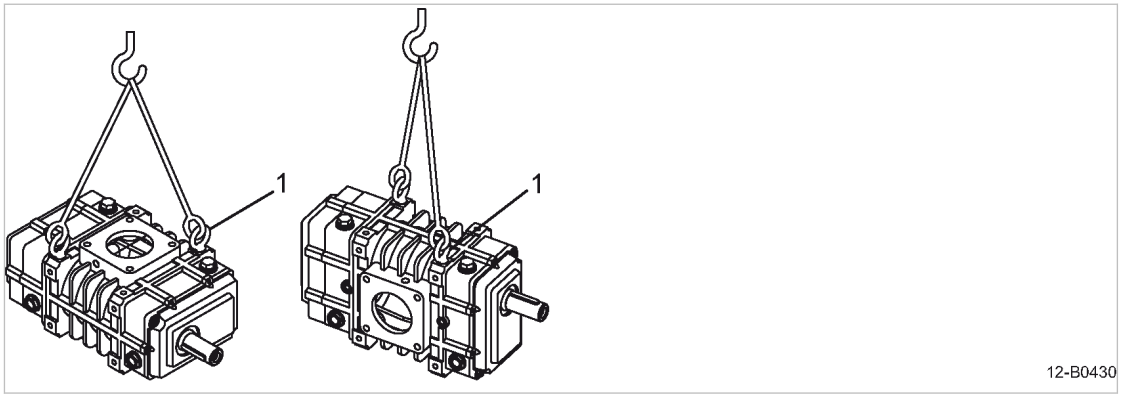


Fig. 8 Transporting with a crane
[1] Eye bolt

➢ Screw the supplied eye bolts diagonally into the prepared holes in the block base.
➢ Lift and transport only by means of the eye bolts.

12.4 Storage

Moisture can lead to corrosion, particularly on the surfaces of the blower block. Storage temperature must not fall below −30 °C.

Advice can be obtained from KAESER on storage and re-commissioning.

NOTICE
Damage to the block by moisture and frost.
➢ *Prevent ingress of moisture and formation of condensation.*

➢ Store the block in a dry room.
➢ Spray preservative onto/into the flange connections, the drive shaft and the flow chamber.
➢ Close off the flange connections to prevent entry of dirt.
➢ Change the lubricating oil annually.

Preservative recommendations

Flange connections, drive shaft	Flow chamber
ESSO RUST BAN 324 MOBIL OIL RECREX 39 SHELL V-Product 9703	AVIA Avilub MK 2000 ESSO LUB MZ 20 W/20 MOBIL Mobilarma 523 or 524 SHELL Ensis Motor oil 20

Tab. 25 Preserving oils

➢ Contact KAESER for other preserving oil recommendations.

After lengthy storage

1. **⚠ CAUTION** *Open flange connection*

Danger of squashing or severing.

➢ *Do not reach into the interior of the block.*

2. Remove the preservative from the flow chamber with cleaning solvent.

➢ Change the lubricating oil.

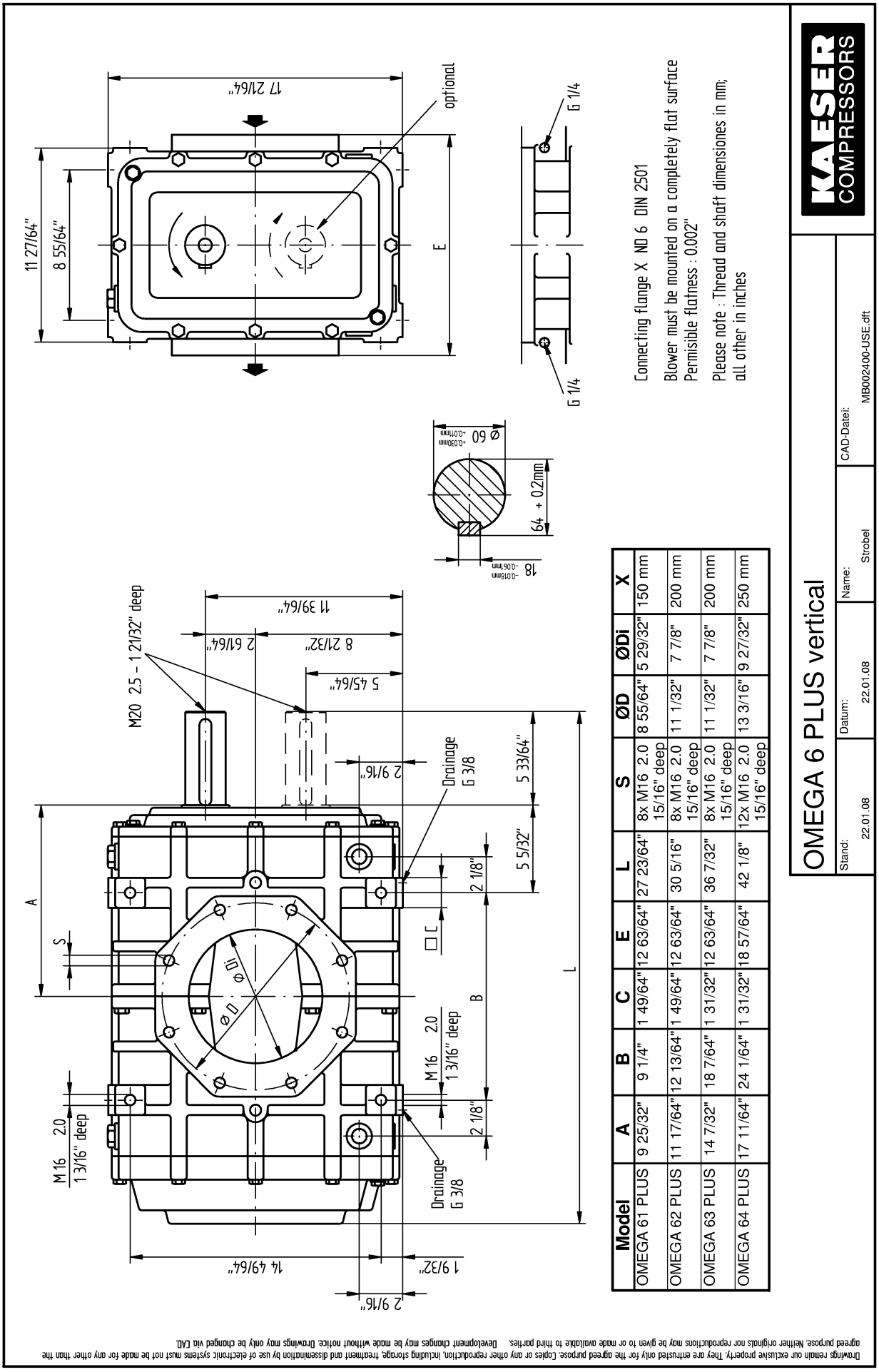
12.5 Disposal

Precondition Blower block without oil. Flange connections are closed.

➢ Return the block to KAESER.

13 Annex

13.1 Dimensional drawing

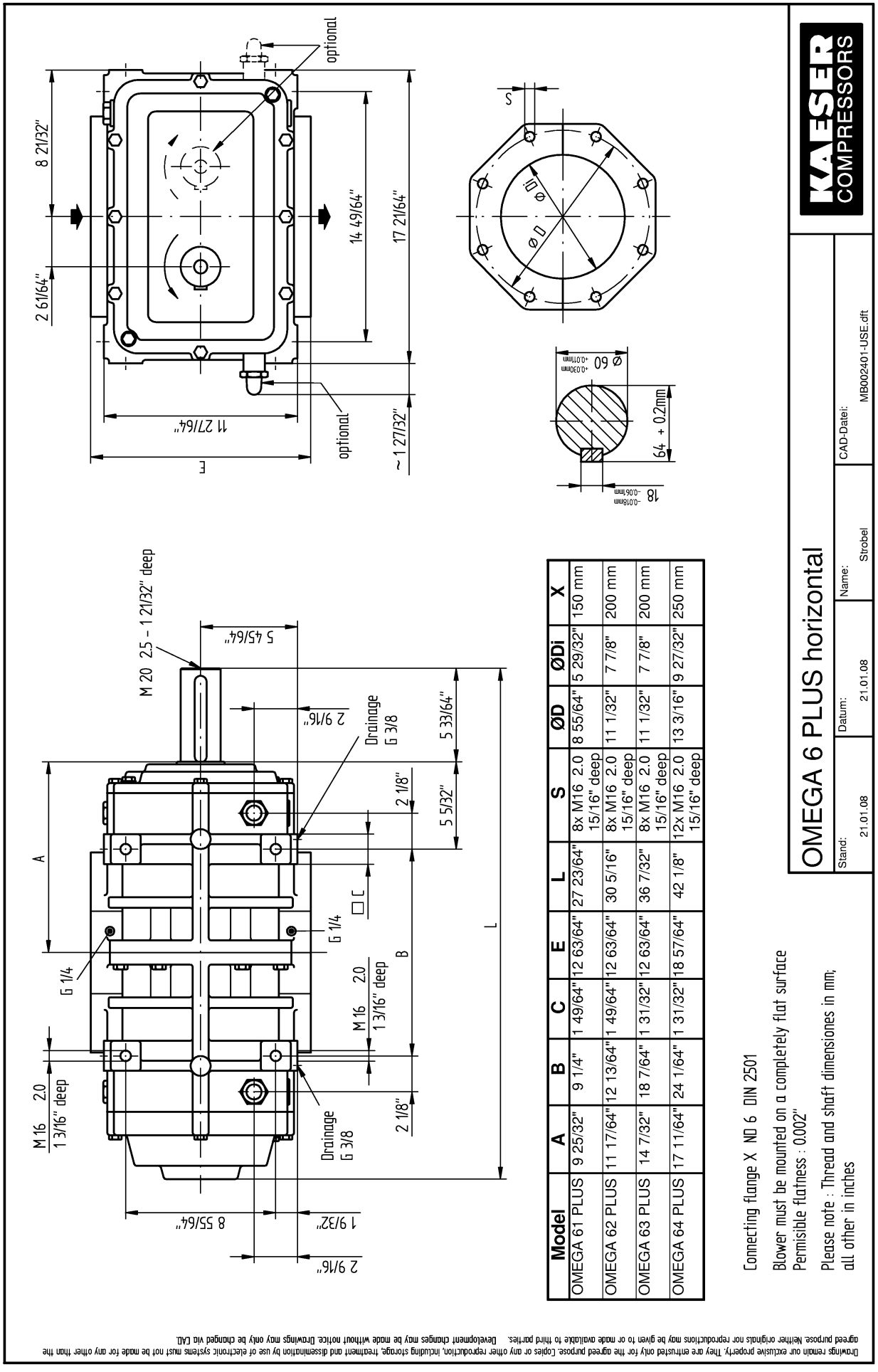


Model	A	B	C	E	L	S	ØD	ØDi	X
OMEGA 61 PLUS	9 25/32"	9 1/4"	1 49/64"	12 63/64"	27 23/64"	8x M16 2.0 15/16" deep	8 55/64"	5 29/32"	150 mm
OMEGA 62 PLUS	11 17/64"	12 13/64"	1 49/64"	12 63/64"	30 5/16"	8x M16 2.0 15/16" deep	11 1/32"	7 7/8"	200 mm
OMEGA 63 PLUS	14 7/32"	18 7/64"	1 31/32"	12 63/64"	36 7/32"	8x M16 2.0 15/16" deep	11 1/32"	7 7/8"	200 mm
OMEGA 64 PLUS	17 11/64"	24 1/64"	1 31/32"	18 57/64"	42 1/8"	12x M16 2.0 15/16" deep	13 3/16"	9 27/32"	250 mm

OMEGA 6 PLUS vertical

Stand: 22.01.08 | Datum: 22.01.08 | Name: Strobel | CAD-Datei: MB002400-USE.dft

KAESER COMPRESSORS



Model	A	B	C	E	L	S	ØD	ØDi	X
OMEGA 61 PLUS	9 25/32"	9 1/4"	1 49/64"	12 63/64"	27 23/64"	8x M16 2.0 15/16" deep	8 55/64"	5 29/32"	150 mm
OMEGA 62 PLUS	11 17/64"	12 13/64"	1 49/64"	12 63/64"	30 5/16"	8x M16 2.0 15/16" deep	11 1/32"	7 7/8"	200 mm
OMEGA 63 PLUS	14 7/32"	18 7/64"	1 31/32"	12 63/64"	36 7/32"	8x M16 2.0 15/16" deep	11 1/32"	7 7/8"	200 mm
OMEGA 64 PLUS	17 11/64"	24 1/64"	1 31/32"	18 57/64"	42 1/8"	12x M16 2.0 15/16" deep	13 3/16"	9 27/32"	250 mm

Connecting flange X ND 6 DIN 2501

Blower must be mounted on a completely flat surface
Permisible flatness : 0.002"

Please note : Thread and shaft dimensiones in mm;
all other in inches

OMEGA 6 PLUS horizontal

Stand:	Datum:	Name:	CAD-Datei:
21.01.08	21.01.08	Strobel	MB002401-USE.dft

13.2 Design diagrams

Over-pressure

The following data can be found in the diagrams:

	Diagram legend
A	Over-pressure operation Intake state: air at 1013 mbar and 20 °C
B	Δp [mbar]
C	Blower speed [min^{-1}]
D	Blower shaft power [kW]
E	FAD [m^3/min] (relative to the intake state)
F	Temperature rise [K]

Tab. 26 Diagram legend – over-pressure

OMEGA 61PLUS

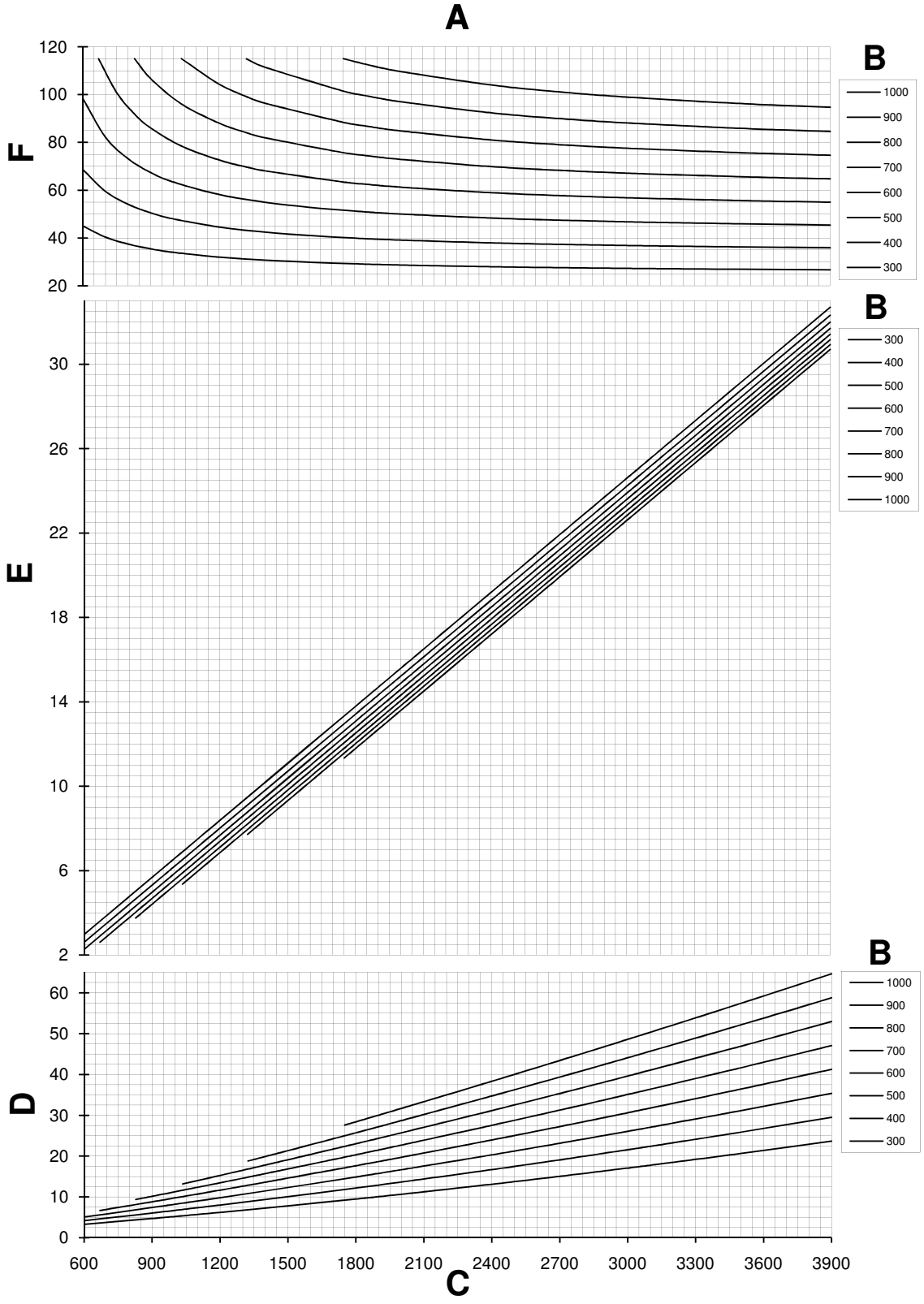


Diagramm O61P

Stand: 01.2010

OMEGA 62PLUS

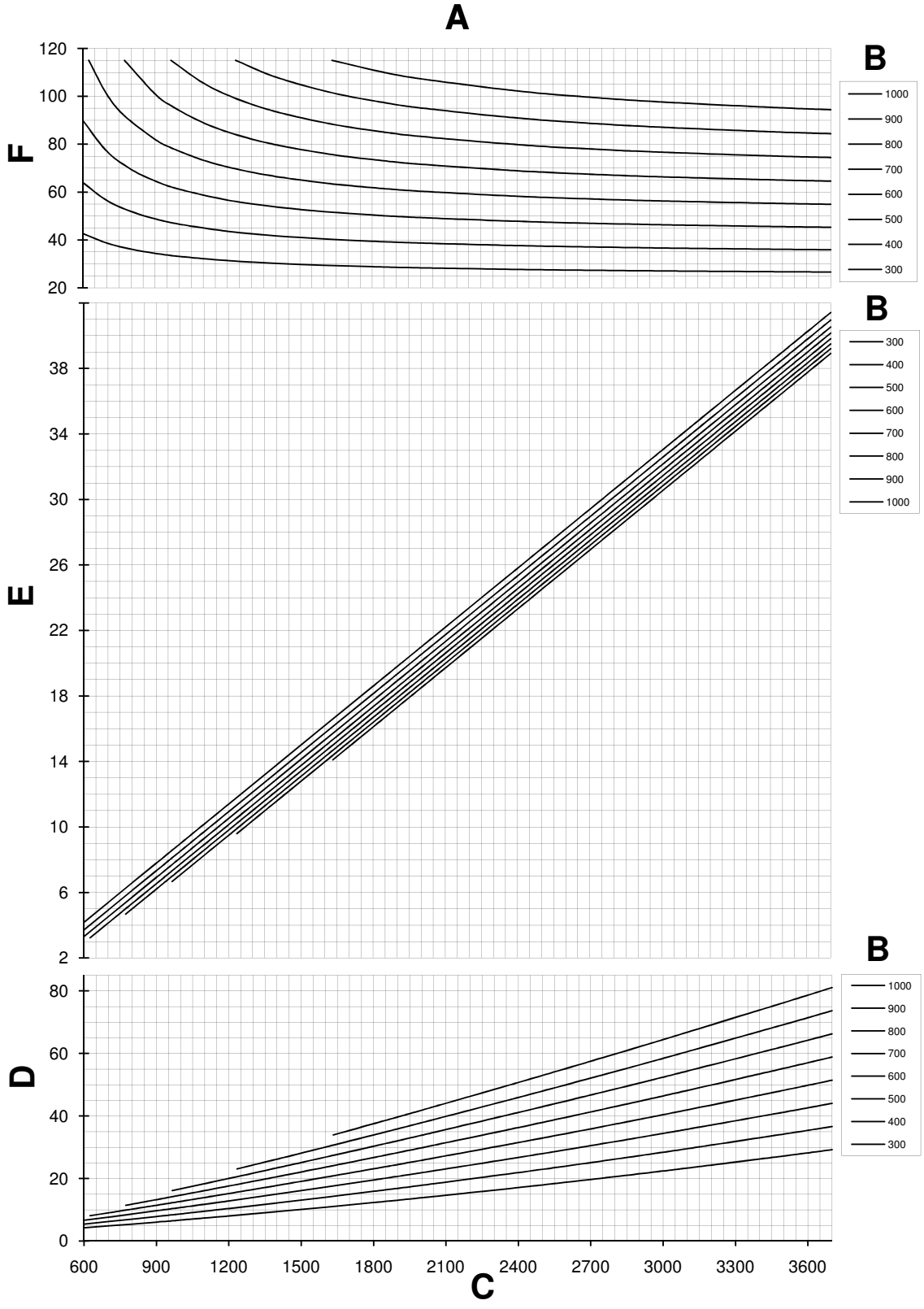


Diagramm O62P

Stand: 01.2010

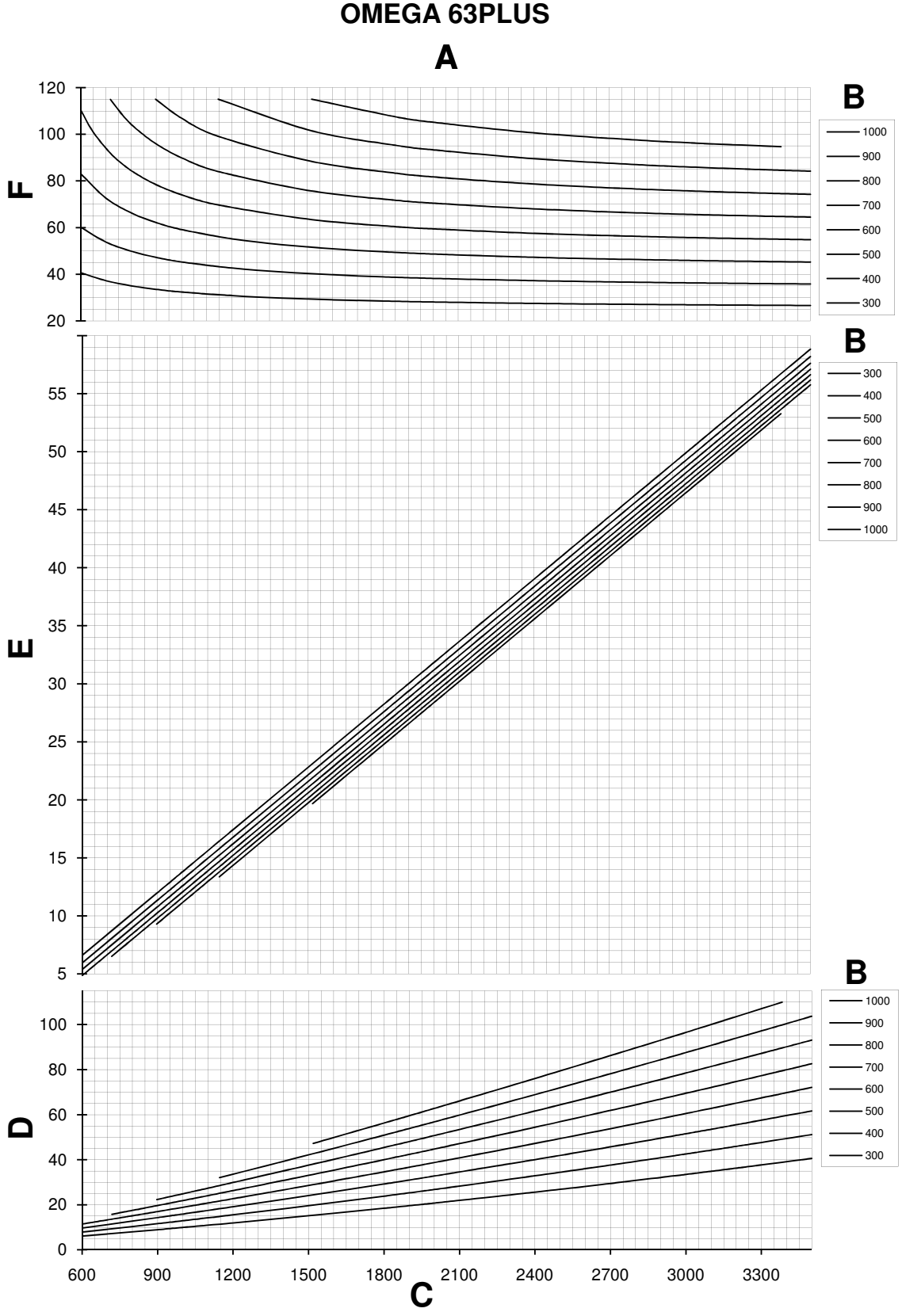


Diagramm O63P

Stand: 01.2010

OMEGA 64PLUS

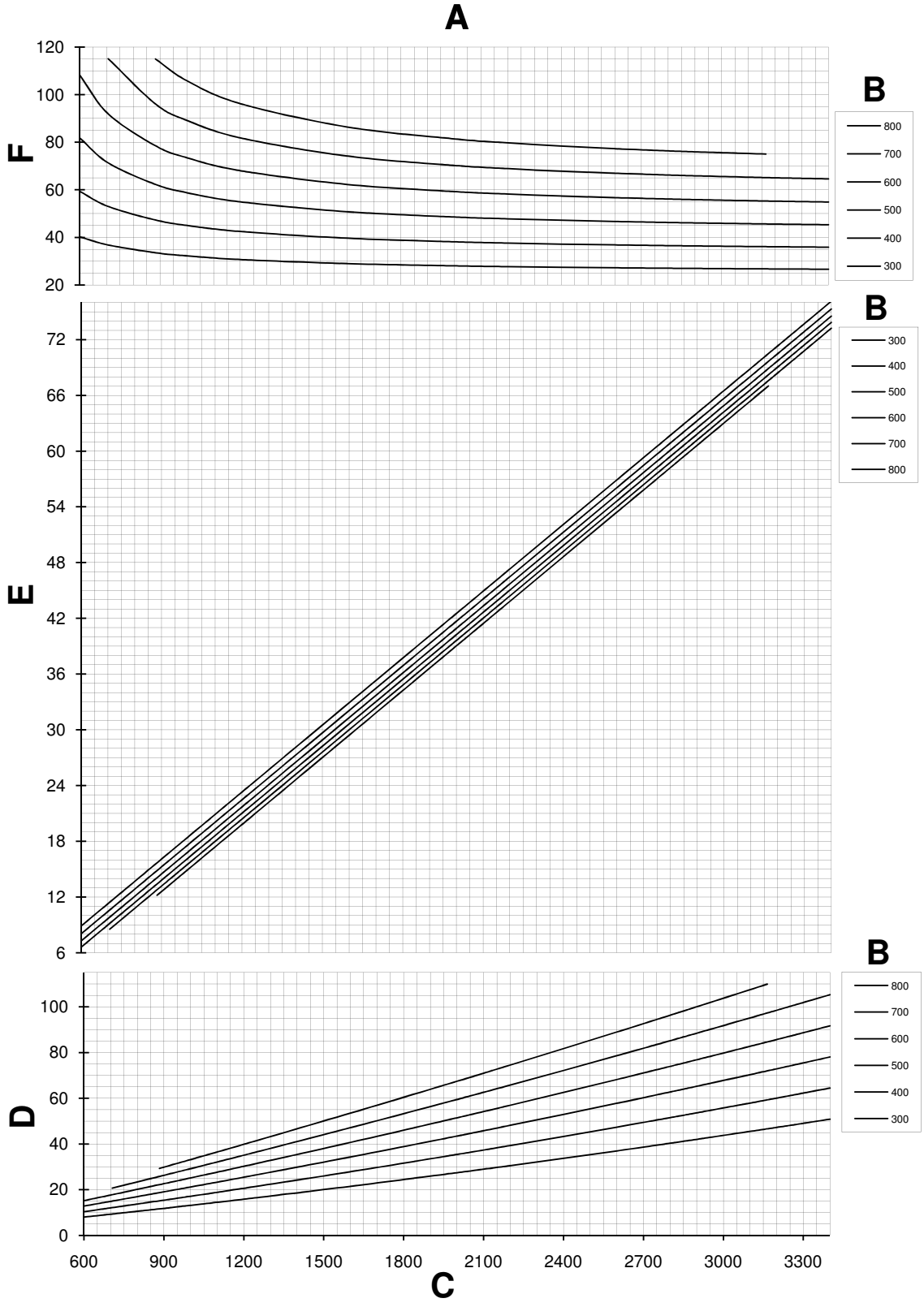


Diagramm O64P

Stand: 01.2010

Vacuum

The following data can be found in the diagrams:

	Diagram legend
A	Vacuum operation Intake state: air at 20 °C / final pressure: 1013 mbar
B	Δp [mbar]
C	Blower speed [min^{-1}]
D	Blower shaft power [kW]
E	Intake capacity [m^3/min] (relative to the intake state)
F	Temperature rise [K]

Tab. 27 Diagram legend – vacuum

OMEGA 61PLUS vac

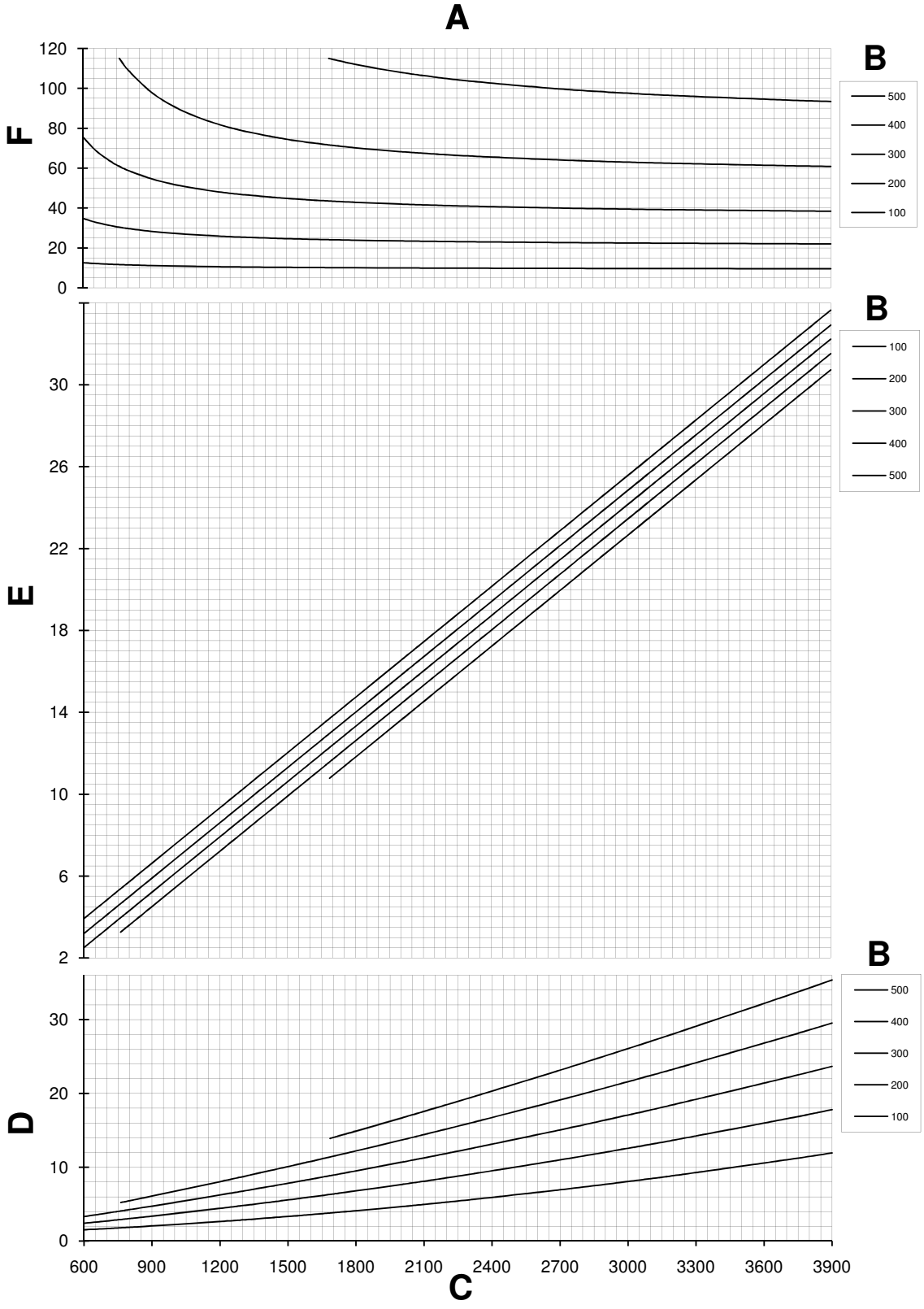


Diagramm O61P-vac

Stand: 01.2010

OMEGA 62PLUS vac

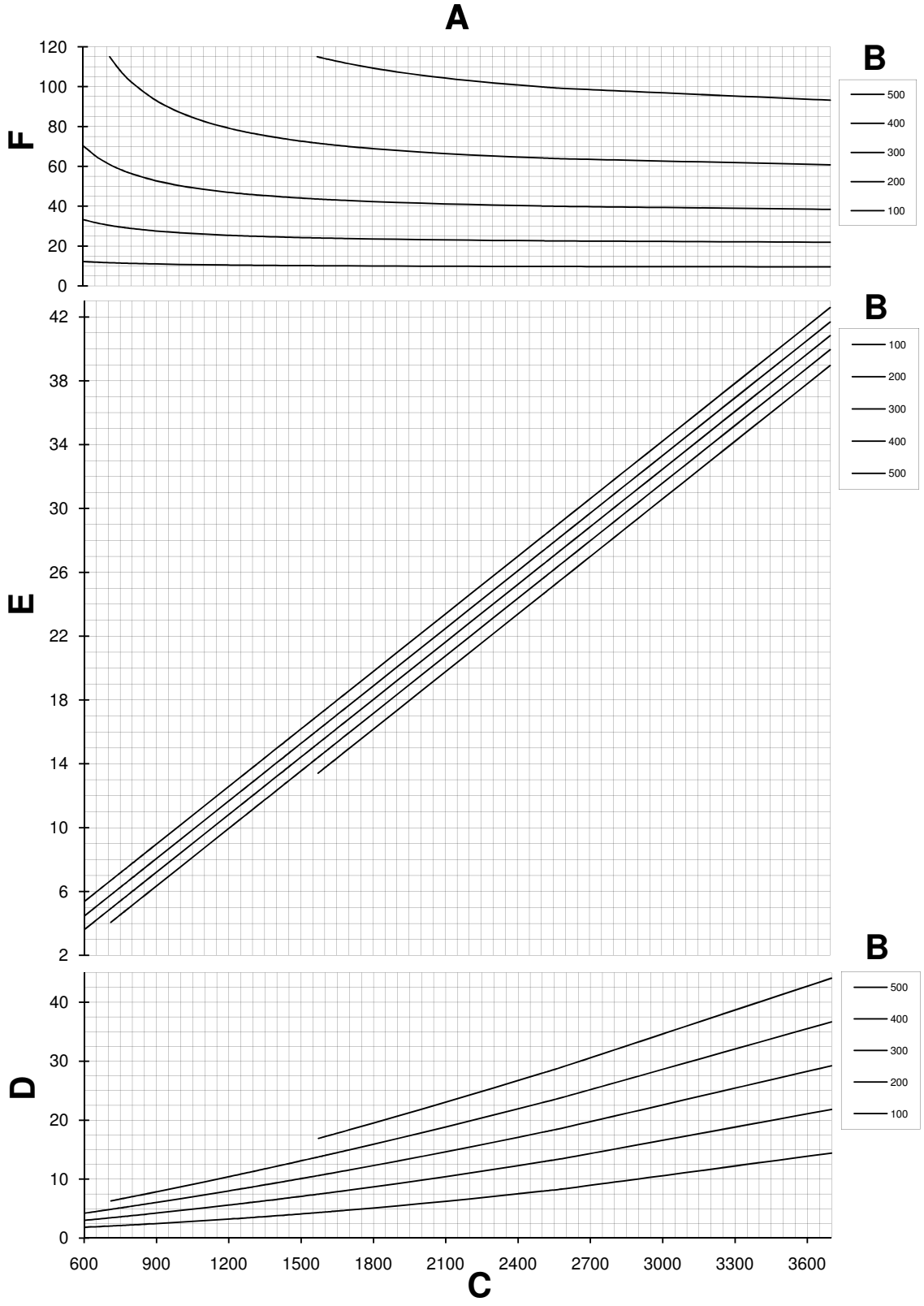


Diagramm O62P-vac

Stand: 01.2010

OMEGA 63PLUS vac

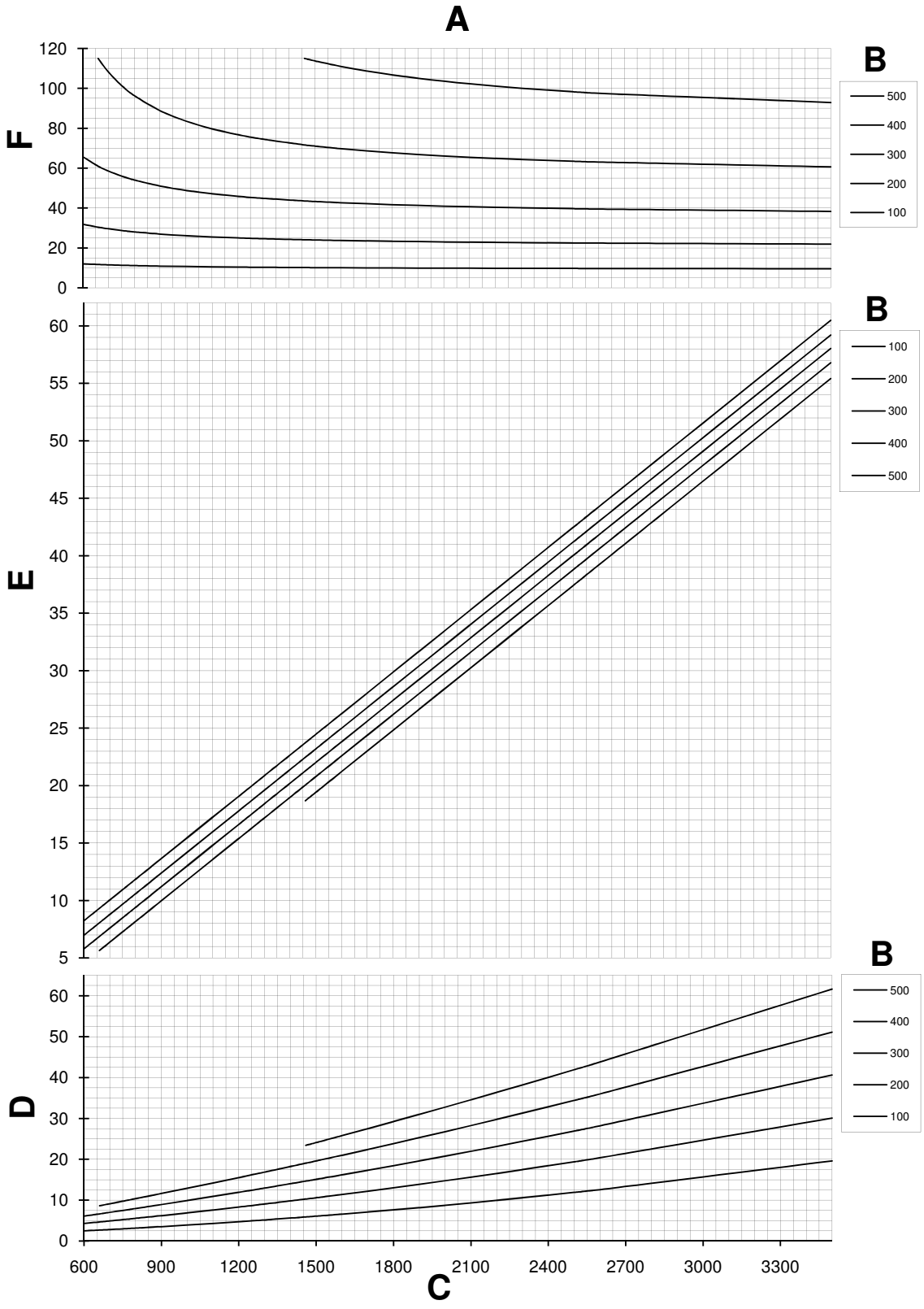


Diagramm O63P-vac

Stand: 01.2010

OMEGA 64PLUS vac

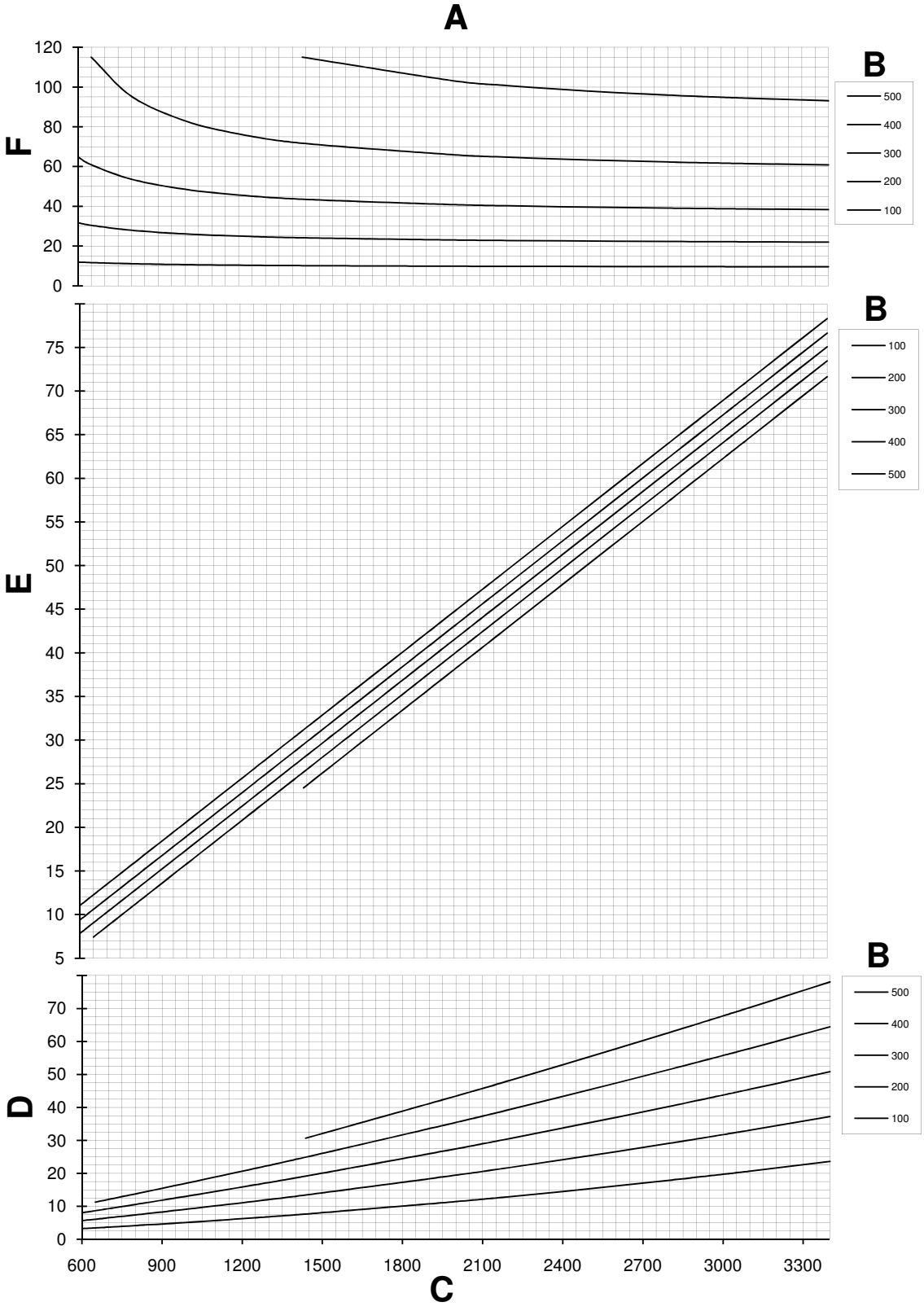


Diagramm O64P-vac

Stand: 01.2010

13.3 Declaration concerning contamination

Declaration of Decontamination
of Blowers, Vacuum Pumps, Compressors, and Components

A completed Declaration of Decontamination form is required prior to shipping any equipment to Kaeser Compressors, Inc. for inspection and/or repair work. A separate Declaration form is required for each item to be sent to us. Items will not be accepted without prior submittal of these forms and Kaeser's authorization to return the equipment. **Equipment that has been exposed to microbiological, explosive, or radioactive substances will not be accepted.** Equipment that has been exposed to any hazardous materials must be **thoroughly decontaminated** prior to shipping to Kaeser Compressors. This Declaration may only be filled out and signed by an authorized and qualified representative of the ordering party (sender of equipment).

Customer and Equipment Information:

Company Name:		Telephone/ Extension:	
Shipping Address:		Fax:	
Contact:		Email Address:	
Model Numbers:		EMR Number:	
Part Number:		Serial Number:	
Arrangement:			
Reason for Return:	☐ Warranty Repair—completed warranty claim form must be attached ☐ Non-warranty Repair ☐ Inspection ☐ Other: (Please specify):		
Purchase Order Number for Inspection or Repair:			
Service Notification Number:			
Symptoms of fault:			
How long was the equipment operated?		What type of oil was used?	
What application was the equipment used for?			

Equipment Condition:

Has this equipment been exposed (internally or externally) to any of the following hazards:

Please answer all questions by selecting (Yes/No) as applicable and by providing details below:

Carcinogenic ☐ yes ☐ no	Biological hazard ☐ yes ☐ no	**Equipment and components which have been contaminated by biological, explosive, or radioactive substances will not be accepted.**
Corrosive ☐ yes ☐ no	Explosive ☐ yes ☐ no	
Flammable ☐ yes ☐ no	Radioactive ☐ yes ☐ no	
Toxic ☐ yes ☐ no		
	Other harmful substances ☐ yes ☐ no	

List all substances, gases, and by-products which came into contact with the equipment: (internally or externally)

Product name manufacturer*	Chemical name or symbol*	CAS Number(s)

*Attach MSDS sheets for all hazardous substances and use second page of this form if necessary to provide additional details.

If the equipment has been exposed to any hazardous materials, decontamination MUST be carried out. Kaeser will not accept any contaminated equipment.

This equipment has been thoroughly cleaned and decontaminated and contains no hazardous residues:	☐Yes ☐No
What method has been used to clean/ decontaminate the equipment?	

Preparation of equipment for shipping

Once the Declaration of Decontamination has been reviewed by Kaeser Compressors, Inc., you will be notified if the equipment can be returned.

Prior to shipping the equipment:

- All service fluids must be drained (if the unit is being returned for warranty consideration, include an oil sample)
- All openings must be sealed (airtight)
- The equipment must be packaged to prevent damage during shipment. (If the packaging in which the unit is received is not suitable to prevent damage for the return shipment, the unit will be repackaged. Please be advised that if this is necessary, there will be a charge for the additional packaging materials and labor. Shipments from Kaeser Compressors, Inc. will be collect or third party billing.)
- Include a copy of the Declaration of Decontamination with the packing list

Legally Binding Declaration

We herby declare the information given in this declaration is accurate and complete and I, as the undersigned, am qualified and authorized to make this declaration. For equipment that was exposed to hazardous substances, we certify that the equipment has been thoroughly decontaminated eliminating all potential hazards. We are aware that by providing false or incomplete information, we are directly liable for any injuries or damages suffered by third parties, particularly Kaeser employees involved in handling and/or repairing the equipment. We agree to hold Kaeser Compressors, Inc. free of any claims from third parties related to hazardous substances in or on this equipment including injuries, damages, improper shipment, or exposure.

If we choose not to have Kaeser Compressors, Inc. repair the unit, we agree to advise Kaeser within 60 days after receiving the repair quote to either return or scrap the unit. Units left over 60 days become property of Kaeser Compressors Inc.

Signature:		Print Name:	
Title:		Date:	
Company:			

For Blowers, please complete and return to:
Kaeser Compressors, Inc.
Attention: Omega Service Center
Fax (901)-795-4885

For all other products, please complete and return to:
Kaeser Compressors, Inc.
Attention: After Sales Service Department
Fax (540) 898-5520

KAESER COMPRESSORS

WARRANTY CLAIM FORM

NOTE: THIS FORM MUST BE COMPLETED AND RETURNED WITHIN THIRTY (30) DAYS OF UNIT REPAIR. DEFECTIVE PARTS OVER $300.00 MUST BE RETURNED (PREPAID) WITH THE COMPLETED WARRANTY FORM. PARTS UNDER $300.00 MUST BE HELD FOR 90 DAYS. PLACE A TAG ON EACH PART RETURNED, WITH THE PART NUMBER AND CLAIM NUMBER CLEARLY MARKED.

REPLACEMENT PARTS CLAIM

REPLACEMENT INVOICE #_____ SAP ORDER/ DIST WC# _____

PART A

DISTRIBUTOR:		OWNER:	
NAME		NAME	
ADDRESS		ADDRESS	
CITY	STATE	CITY	STATE
ZIP	TELEPHONE	ZIP	TELEPHONE

PART B

MODEL _____ PART NO. _____ SERIAL NO. _____ EMR NO. _____
RATED PRESSURE _____ psig VOLTAGE _____ volts START UP DATE _____
SERVICE HOURS _____ LOAD HOURS _____ OPERATING TEMP _____
TEMP RANGE (min to max) _____
UNIT ENVIRONMENT ☐ POOR FAIR GOOD

LUBRICANT TYPE: _____ DATE OF LAST PREVENTIVE MAINTENANCE _____

PART C

FAILURE OCURRED AT STARTUP: YES NO
DESCRIPTION OF FAILURE: PLEASE BE SPECIFIC (ATTACH ADDITIONAL PAGES IF NEEDED)
ANSWER THE QUESTION "WHAT IS THE DEFECT?"

PART D

WORK PERFORMED DATE PERFORMED _____

CUSTOMER SATISFIED: ☐ YES ☐ NO
IF NOT, WHAT MUST BE DONE TO SATISFY CUSTOMER:

PART E

PARTS RETURNED

PART NUMBER	DESCRIPTION	QTY	LIST PRICE/EA.	DISC%	TOTAL NET
				PARTS TOTAL	

PARTS RETURNED TO KAESER COMPRESSORS, INC.: ☐ YES ☐ NO; DATE RETURNED _____

NOTE:PARTS RETURNED TO KAESER COMPRESSORS, INC. MUST BE PROPERLY PACKAGED TO PREVENT DAMAGE DURING SHIPMENT. PLACE A TAG ON EACH PART THAT INCLUDES PART NUMBER AND CLAIM NUMBER.

EXPENSES:
LABOR: _____ HOURS AT _____ $/HOUR TOTAL: _____
TRAVEL: _____ HOURS AT _____ $/HOUR TOTAL: _____
MILEAGE: _____ MILES AT _____ $/MILE TOTAL: _____

TOTAL AMOUNT REQUESTED ON THIS CLAIM: _____

AUTHORIZED NAME _____ DATE _____ SIGNATURE _____

SERVICE/QEM/F-190501-USA-Warranty Claim Form-5/2. Jan 2007