

# OPERATING MANUAL

SCREW COMPRESSOR AIR ENDS  
**EVO2, EVO3 / EVO3-G, EVO6 / EVO6-G, EVO9 / EVO9-G,  
EVO15 / EVO15-G, EVO28 / EVO28-G, EVO42 / EVO42-G**



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## 1 Foreword

### 1.1 General

This manual contains information and regulations for the installation and operation of the screw compressor air ends EVO2, EVO3, EVO3-G, EVO6, EVO6-G, EVO9, EVO9-G, EVO15, EVO15-G, EVO28, EVO28-G, EVO42 and EVO42-G.

### 1.2 Scope

This documentation is applicable for screw compressor air ends of the models EVO2, EVO3, EVO3-G, EVO6, EVO6-G, EVO9, EVO9-G, EVO15, EVO15-G, EVO28, EVO28-G, EVO42 and EVO42-G from delivery date.

### 1.3 Change service

This document is not subject to the change service.

### 1.4 Abbreviations

bar (g)	Operating pressure (relative pressure in bar)
Bh	Operating hours
DHV	Minimum pressure valve
RC	ROTORCOMP
SIV	Safety valve
Min.	minimum
Max.	maximum
V DC	Direct voltage
V AC	Alternating voltage

### 1.5 Manufacturer's information

#### 1.5.1 General information

This operating manual provides information on the operating principles, installation, operation and maintenance of the screw compressor air ends. Read this operating manual carefully before commissioning the screw compressor air ends for the first time in order to ensure proper handling, operation and maintenance from the outset. Please observe all warnings and safety instructions.

ROTORCOMP screw compressor air ends are carefully checked and tested prior to shipping. When your merchandise arrives, the delivery scope must be checked for completeness and possible damage. Any missing parts and/or transport damage must be reported immediately. A damaged screw compressor air end must not be put into operation under any circumstances. Always have the operating manual available for the operating personnel and make sure that operation and maintenance are carried out according

to the instructions.

All instructions contained in this operating manual must be observed in the specified manner and sequence in order to prevent injuries and damage to the system.

The screw compressor air ends has been built according to the latest technology and the recognized safety rules.

Danger may nevertheless result for the user or others or for the screw compressor air end system during its use.

Any use other than described in the chapter "Purpose" is considered improper.

ROTORCOMP shall not be liable for any damage or injuries resulting from such improper use.

We shall not provide any guarantee whatsoever for malfunctions and damage resulting from failure to comply with the operating manual.

The manufacturer reserves the right to carry out further technical developments without prior notice.

Always specify the model and the complete serial number from the nameplate in all correspondence. ROTORCOMP shall assume no liability whatsoever for damage or injuries which occur during handling, operation, maintenance work or repairs due to a failure to comply with the safety instructions to proceed with the usual care and caution, even if this is not expressly mentioned in this operating manual.

### 1.5.2 Purpose

The screw compressor air ends are oil-injected screw compressor air ends that form a perfectly matched compressor unit when completed with components from the ROTORCOMP product range.

The sole intended use of the system is the compression of atmospheric air. The screw compressor air ends may only be used to compress gases or other media following written approval by ROTORCOMP.

The installation of the screw compressor air ends or the assembly of these with components to form a compressor unit may only be carried out by specialized companies with the corresponding know-how.

The safety precautions, technical data, limits, installation guidelines and regulations for commissioning and operation specified in this operating manual must be observed and complied with.

### 1.5.3 Delivery scope

ROTORCOMP supplies screw compressor air ends in accordance with the order confirmation.

### 1.5.4 Optional components

ROTORCOMP offers matching components for all screw compressor air ends for system construction. As a result, there are also matching components for an extremely broad range of applications and operating modes. The "Screw Compressor Technology" catalog from ROTORCOMP is available to help you choose the right screw compressor air ends and components.

Optionally available components are marked with (optional).

### 1.6 Warranty information, liability disclaimer

ROTORCOMP is a manufacturer of screw compressor components and not of ready-to-operate compressor systems.

RC shall only be answerable for any defects of these individual components for which it is responsible within the scope of the warranty conditions. Failure to comply with the following instructions and information shall void any and all liability. This liability disclaimer also results in the loss of claims for damages. This applies in particular in case of:

- Incorrect installation
- Improper use
- Operation of the screw compressor air ends outside the specified limits (see chapter 9.1 Technical data)

- Failure to observe the safety precautions and the usual care and caution
- Unsuitable operating materials (gases, oils)
- Formation of condensed water in the screw compressor air ends
- Corrosion as subsequent damage
- Improper operation
- Insufficient maintenance, missing proof of maintenance
- Use of unsuitable tools
- Failure to use genuine spare parts
- Unauthorized modifications to the screw compressor module and/or its components

### 1.7 Nameplates

For the location of the nameplate, see Figure 3-1 to 3-3.

Should you have questions, please provide us with the data on the nameplate. This ensures that you receive the correct information.

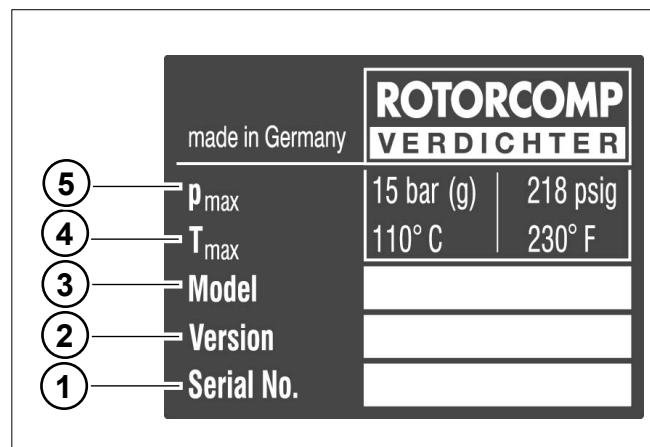


Figure 1-1

Stamping for customers outside Germany (Europe)

1. Serial No.
2. Version No.
3. Model
4. Max. operating temperature
5. Max. operating pressure

## 2 Safety precautions

### 2.1 Marking of safety precautions

Important instructions concerning hazards to persons, technical safety and their operational safety are especially highlighted in the following. They precede the measures to be taken and have the following meaning:



#### Warning:

Indicates working and operating processes which must be exactly complied with in order to prevent endangering of persons. These include information on special dangers when handling the system.



#### Caution:

Refers to working and operating processes which must be exactly complied with to prevent damage to or destruction of parts or all of the system.



#### Note:

Indicates special information for better handling during operating, inspection and adjustment processes and care work.

### 2.2 Safety regulations

The regulations of the respective country for putting into service and operating pressure vessels must be observed. In Germany these include:

- Directive 2014/68/EU (Pressure Vessel Directive DGRL) of 15.05.2014
- Operating Safety Ordinance (BetrSichV) of 01.06.2015

### 2.3 General safety precautions

This operating manual contains important instructions and information on the installation, commissioning, operation and maintenance, which must be observed by the owner. As a result, it is absolutely necessary to turn over the entire documentation to the specially trained personnel of the owner or to make it available at the operating location prior to installation and commissioning. Prior to installation and commissioning, the entire operating manual must be carefully read by the specially trained personnel and then kept in a safe place. Failure to observe the safety precautions can result in a serious hazard for the personnel, the pressure vessel or the environment.

Observe the chapter "Manufacturer's information" on page 1-1 of this operating manual.

The following safety instructions only refer to the screw compressor air ends EVO2, EVO3, EVO3-G, EVO6, EVO6-G, EVO9, EVO9-G, EVO15, EVO15-G, EVO28, EVO28-G, EVO42 and EVO42-G and **not** to the entire compressor system.

The applicable national safety and occupational safety regulations of the respective country in which the system is operated must be complied with.

The manufacturer of the compressor system is responsible for including the necessary safety regulations for the operation of the compressor system in the operating manual of the compressor system.





Installation, operation, maintenance and repair may only be carried out by authorized, trained and qualified personnel.

The operating personnel is expected to safely use the working technology and follow all applicable local operating safety regulations and provisions. The owner bears the responsibility for always keeping the machine in safe operating condition. Limits (pressures, temperatures, time settings, etc.) must be permanently marked.

Should a regulation contained in this list, especially with regard to safety, not comply with legal regulations, then the safer of the two applies.



**2.3.1 Special symbols**

	Do not operate the system without the safety device mounted
	Do not inhale compressed air from this machine
	Warning: System can be started automatically via remote control following a power failure
	Warning: System runs on for 30 seconds after the "OFF" button is pressed
	Watch cooling air
	Warning: Do not operate with doors open or shrouding loose
	Warning: Hot machine parts
	Warning: Pressurized part or system
	Lifting point
	Warning: High voltage
	Active environmental protection

	Warning on a danger point
	Warning: Danger of explosion and/or detonation
	Warning: Hazardous substances
	Warning: Flammable substances
<b>2.3.2 Information on use of safety equipment</b>	
	Wear safety helmet
	Wear safety shoes
	Wear personal safety equipment (safety goggles, protective gloves, safety clothing, etc.) in accordance with the local safety regulations
	Read the operating manual before commissioning, maintenance, service and repairs.



### 3 Technical Description

#### 3.1 General overview of screw compressor air ends EVO2, EVO3, EVO3-G, EVO6, EVO6-G, EVO9, EVO9-G, EVO15, EVO15-G, EVO28, EVO28-G, EVO42 and EVO42-G

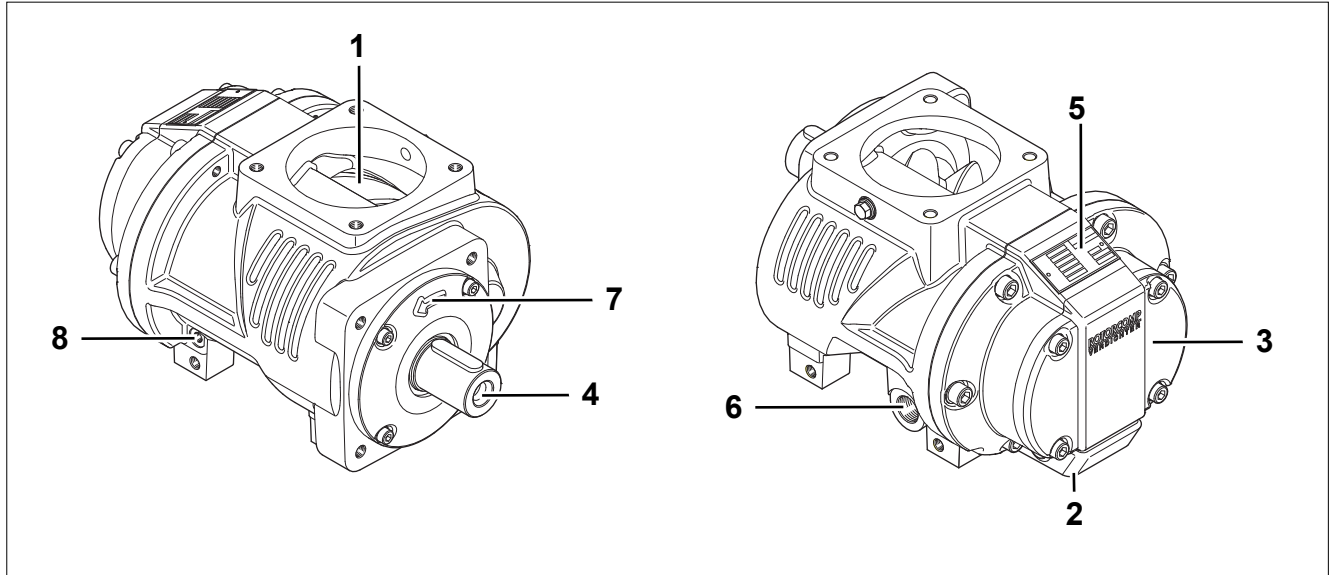


Figure 3-1 Screw compressor air end EVO9

1. Air inlet
2. Air outlet (see installation drawing)
3. Cover plate
4. Drive shaft
5. Nameplate
6. Oil injection
7. Direction of rotation
8. Oil return line (non-return valve not integrated)



**Note:**

All EVO screw compressor air ends are of a similar design (except transmission versions).

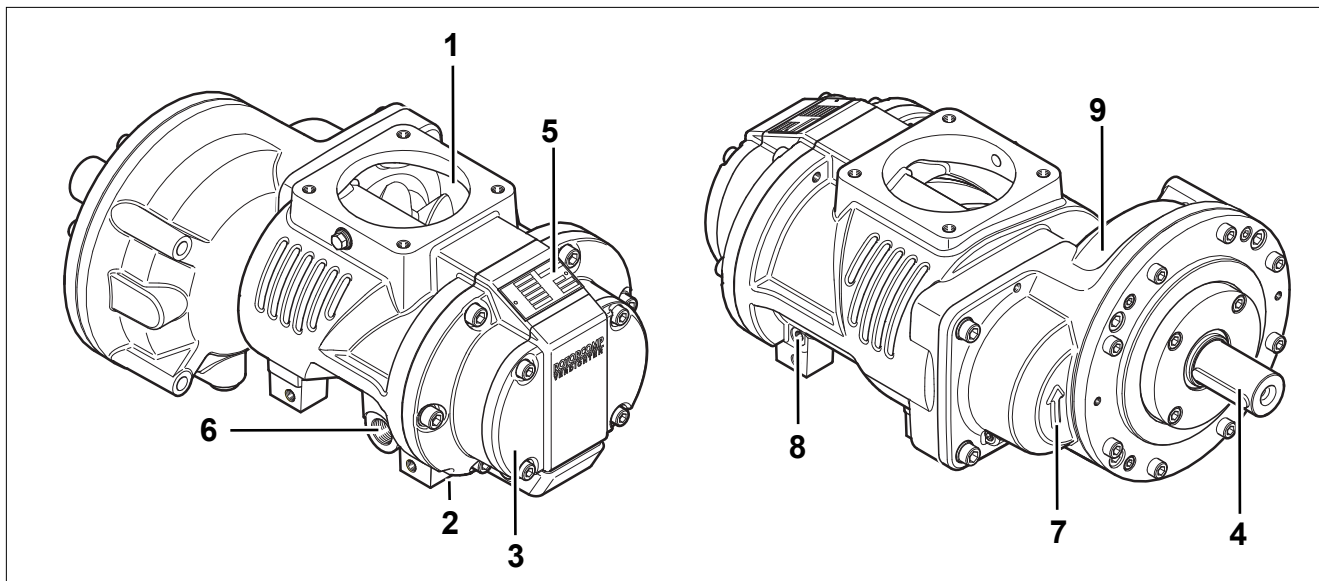


Figure 3-2 Screw compressor air end EVO9-G-V0 (horizontal transmission)

- |  |  |
|--|--|
| 1. Air inlet                             | 6. Oil injection                                     |
| 2. Air outlet (see installation drawing) | 7. Direction of rotation                             |
| 3. End cover                             | 8. Oil return line (non-return valve not integrated) |
| 4. Drive shaft                           | 9. Transmission                                      |

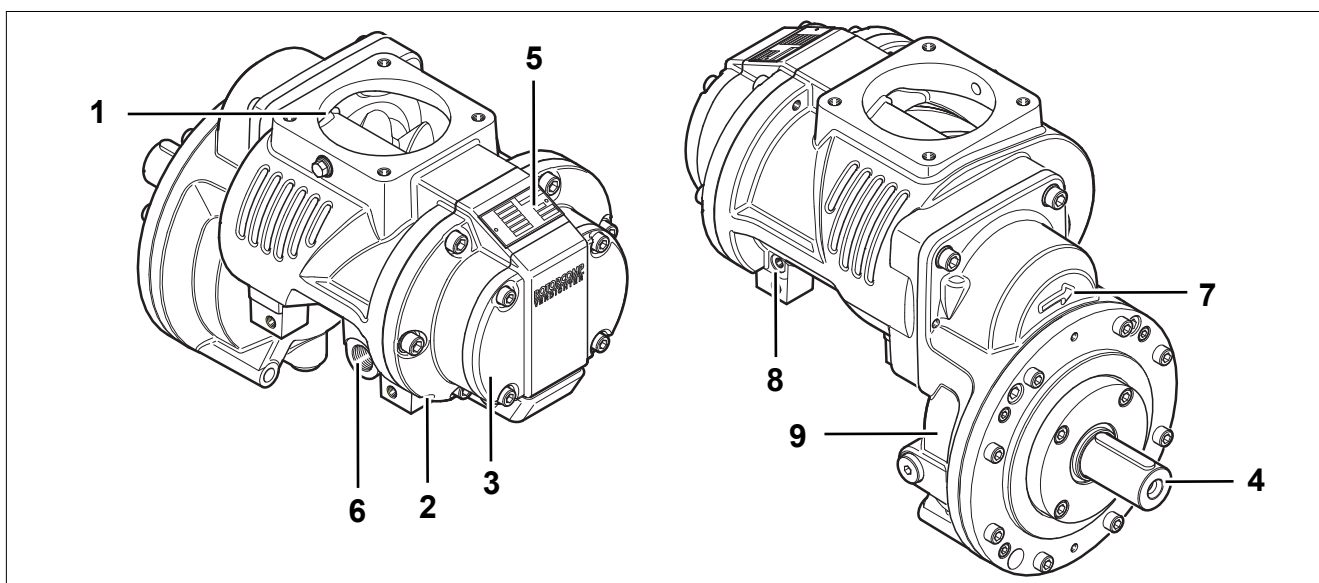


Figure 3-3 Screw compressor air end EVO9-G-V1 (vertical transmission)

- |  |  |
|--|--|
| 1. Air inlet                             | 6. Oil injection                                     |
| 2. Air outlet (see installation drawing) | 7. Direction of rotation                             |
| 3. End cover                             | 8. Oil return line (non-return valve not integrated) |
| 4. Drive shaft                           | 9. Transmission                                      |

## 4 Transport

### 4.1 Delivery and packing

The system is delivered in suitable packing in accordance with the selected shipping method and delivery conditions.

### 4.2 Transport damage

Regardless of the care taken at the factory, the screw compressor air ends may be damaged during transport. Therefore, the screw compressor air ends should be checked for damage following each transport.



#### Caution:

A damaged screw compressor air end must not be put into operation under any circumstances. In case of transport damage, damage claims must be secured in your interest by calling in representatives of the transport company promptly for determination of damage, i.e.:

#### A) Damage or loss

- must be certified with a corresponding note on the freight bill before the merchandise is accepted. With rail transports, a **record of the facts** must also be requested from the railroad.
- With postal consignments, the damage must be certified in writing by the postal service **before accepting** damaged packages etc.

#### B) In case of damage which cannot be recognized immediately

- which are discovered during unpacking, the carrier must be notified **immediately and in writing**.
- If possible, leave packing materials and damaged products in an unaltered state until the facts are recorded.
- Above all, comply with the complaint deadlines.



#### Note:

Each product is checked in accordance with the type and quantity prior to shipment. Should you nevertheless have a reason for complaint, please specify the Order No.

### 4.3 Transporting unpacked system

The screw compressor air end can be moved with a crane or with a lift truck or forklift truck when fastened to a transport pallet.

 **Warning:**

Death or serious injuries due to falling cargo!

- Observe the local safety regulations!
- Select the lifting equipment in accordance with the total weight to be transported!
- Remove all loose or swinging parts before lifting the screw compressor air end!
- Remove drive or body components beforehand!
- Only transport the compressor air ends while depressurized!
- When transported on a pallet, the compressor air end must be securely fastened to it!
- Do not transport the compressor air ends on the forks of a stacker or lift truck!
- Transport eyes are only designed for transporting the compressor air ends!
- Do not stand or walk under cargo during transport!
- The air end must not contain oil, connections must be sealed with a plug or other suitable means.

To transport on a pallet, secure the screw compressor air end on the pallet with angle brackets.

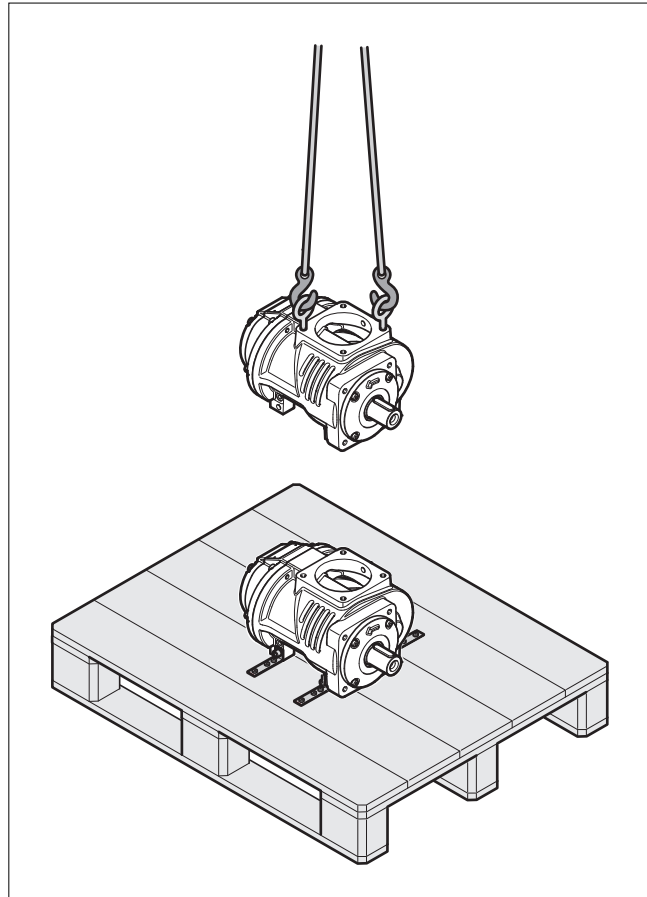


Figure 4-1

## 5 Installation

### 5.1 Assembly

#### 5.1.1 Fastening screws

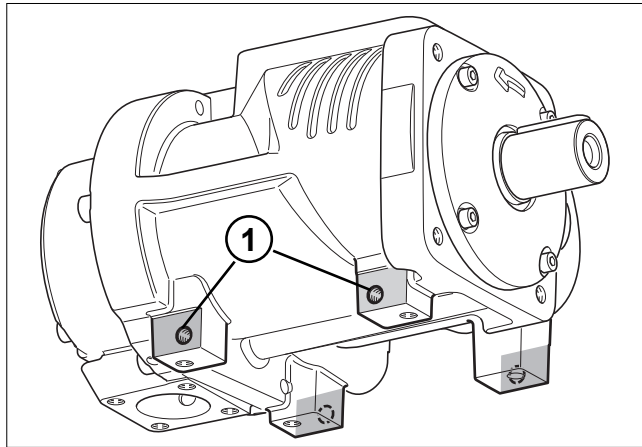


Figure 5-1

Threaded holes **1** are provided on the sides of the compressor air ends. These are used for standard fastening. Only suitable screws with a METRIC THREAD are to be screwed into this female thread.

In addition, there three-point fastening is also possible.

#### 5.1.2 Three-point fastening

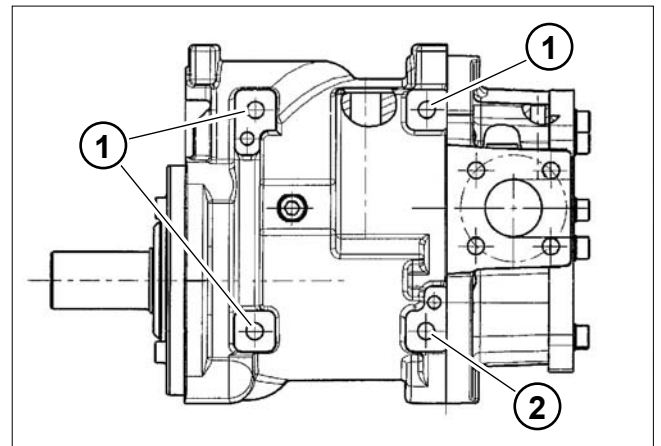


Figure 5-2

With screw compressor air ends driven by a V-belt, it must be ensured that the screw compressors are not twisted on the delivery side under mounted supports. In case of twisting or deformations of the compressor air end, there is a danger of the rotors jamming and the screw compressor air end being destroyed.

The contact surfaces should be machined and flat. Only three of the holes **1** present in the housing/support feed may be used for fastening. The fourth hole **2** is to remain clear (three-point fastening).

#### 5.1.3 Pipe connections

Pipe connections with a female thread for a compressed-air outlet, oil circulation, draining and control lines are provided on the compressor air ends. Only fittings or screw connections with a CYLINDRICAL INCH THREAD suitable for these female threads may be screwed in.

CONICAL THREADS must be avoided, as damage to the housing of the screw compressor air end can occur when screwing in (see installation drawing).



#### Caution:

The maximum permissible tightening torque for all screw connections may not be exceeded. VDI 2330 (see chapter 9.2 "Tightening torques") Only screws suitable for fastening the compressor air ends may be used for this purpose. Consult ROTORCOMP beforehand if necessary.

## 5.2 Safety precautions for installation and assembly

---

### Caution:

- To lift the compressor air ends, suitable lifting equipment must be used which complies with the local safety regulations.
  - All blind flanges, plugs, caps and bags with desiccant must be removed before mounting the pipes. Screw fittings and pipe connections must be of the correct size and must be suitable for the respective operating pressure.
  - The air drawn in may not contain any flammable, caustic, toxic or aggressive vapors or gases whatsoever.
  - Make sure that the pressure line from the compressor to the re cooler or air system can expand as a result of the heat and does not come into contact with flammable materials.
  - The air intake opening must be positioned so that objects, e.g. loose clothing of persons, cannot be drawn in.
  - No external force may be exerted on the air outlet valve; the connected pipe connection must be mounted torque-free.
  - Covers should be removed as late as possible. The screw compressor air end system must be provided with a sufficiently dimensioned ground.
- 

## 5.3 Installation information

---

### Caution:

- The system must be installed at a location at which the ambient air is as cool and clean as possible. Never block the air inlet. It must be ensured that the penetration of moisture with the intake air is kept to a minimum.
- screw compressor air ends must always be installed on a level, torsionally rigid surface and must be aligned with a level if necessary.

In exceptional cases, e.g. with mobile systems, these may only be operated up to a maximum angle of inclination of 10°.

In these cases the inclined position must be taken into account when checking the oil level and must be carried out with particular care.

---

### 5.3.1 Drive

The compressor air ends are designed as an alternative for driving with electric motors, combustion motors, hydraulic motors, etc.

The power can be transmitted indirectly via a belt drive (V-belt, toothed belt, etc.) or directly via a flexible coupling.

The direction of rotation, looking at the shaft, is counterclockwise, i.e. to the left.

On the model with a transmission, the direction of rotation, looking at the shaft, is clockwise, i.e. to the right.

---

### Caution:

When designing the drive, it is generally important to ensure that the drive shaft has axial clearance and is not loaded with axial force in both directions.

---

## 5.4 Belt drive

Improper design and/or installation of the V-belt drive can result in a considerable reduction of the bearing life and/or to breakage of the drive shaft. If the drive shaft breaks and/or in case of bearing damage, ROTORCOMP can only grant a warranty if the belt driven is properly designed and executed.

The following information must be observed for this purpose.

- The belt drive must not be underdimensioned. The maximum design power for a belt drive is contained in the technical data for the respective model.
- The belt pulley must be pushed onto the drive shaft as far as possible and secured.
- Use a belt tensioner with a scale.
- Observe the belt tensioner and the tensioning direction for the different belt types (V, flat, toothed belt etc.).
- The V-belt pulleys must be balanced. It is not permissible to drive the belt pulley onto the drive shaft by striking it with a hammer, and this can result in bearing damage.
- When aligning the belt drive, exact parallelism without vertical and horizontal angular errors must be ensured.
- A torsionally rigid base frame for the belt drive must be installed so that it aligns exactly with the compressor air end.
- "Fluttering" of the belt of the belt drive should be prevented with construction measures (axis spacing of pulleys, belt tension and stability of the base frame and tensioner).
- Do not exceed the specified maximum power  $P_{max}$  at the drive shaft.

### 5.4.1 Belt tensioner with scale

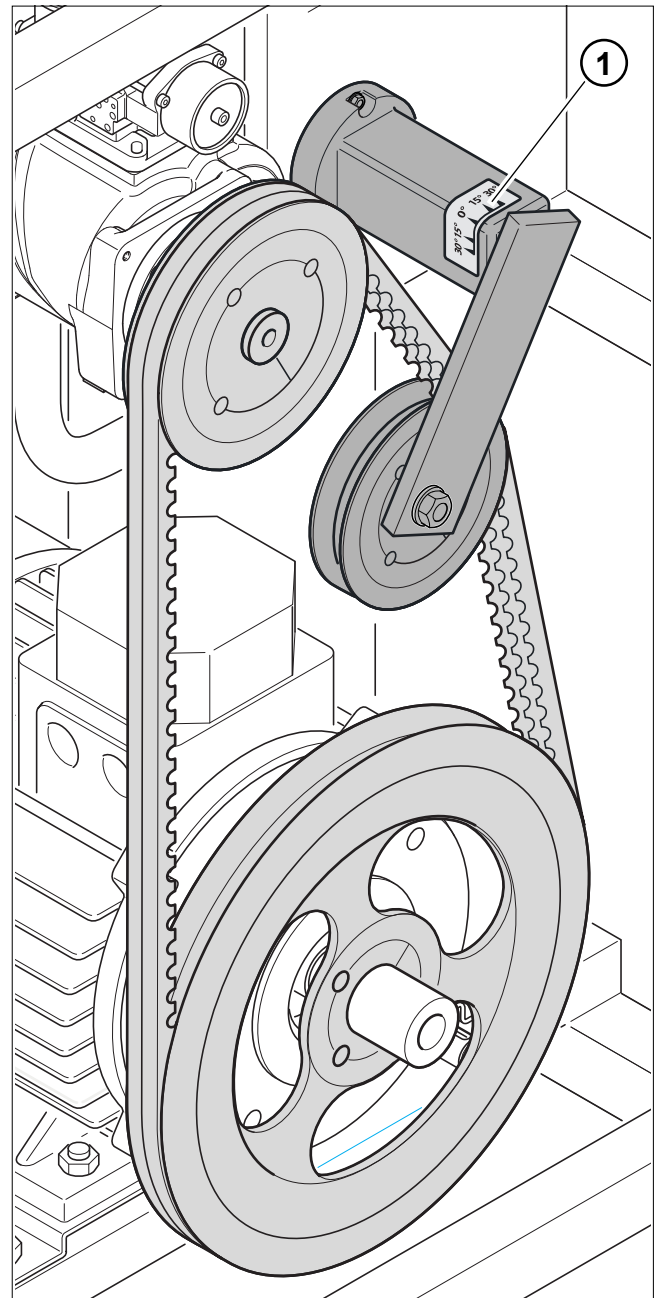


Figure 5-3

The belt drive must first be correctly adjusted with the pretension measuring device. The tensioning element must be set to zero after installation. This enables the correct belt tension to be easily adjusted again without the pretensioning measuring device using the scale **1** on the tensioning element.



### 5.5 Direct drive

**⚠ Caution:**

Offset and angular errors result in damage to bearings and drive shaft!  
 ROTORCOMP recommends installation with an elastic coupling. The alignment of the motor and compressor air end must be carried out according to the instructions of the elastic coupling manufacturer.

A centering flange is available for the compressor air ends for directly coupled units. The flanged unit must be fastened stress-free on the base frame.

#### 5.5.1 Dimensions of centering flange

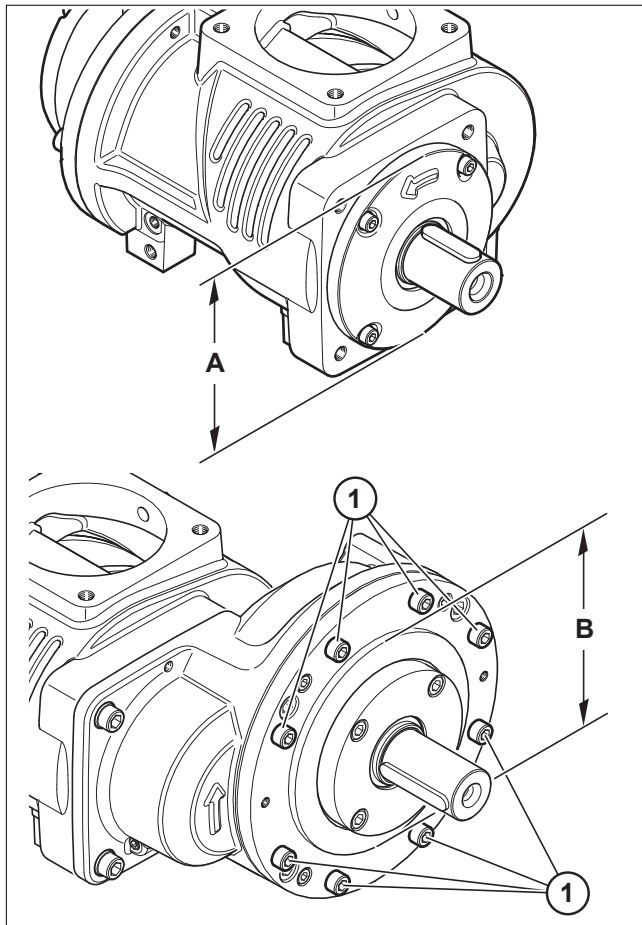


Figure 5-4

**Note:**

The screws **1** (8x) must be replaced with longer screws when flanging on the transmission model.

Model	A [mm]
EVO2	105 f7
EVO3	115 f7
EVO6	140 f7
EVO9	163 f7
EVO15	206.5 f7
EVO28	258 f7
EVO42	275 f7
Model	B [mm]
EVO3-G	115 h6
EVO6-G	150 h6
EVO9-G	182 h6
EVO15-G	182 h6
EVO28-G	170 h6
EVO42-G	200 h6

A - Diameter of centering flange  
 B - Diameter of centering flange for transmission version

### 5.6 Air inlet

Air filtration / Inlet air quality:  
 Contamination with solids with a maximum size of 5 µm according to air purity class 3 ISO 8573.

## 5.7 Air outlet

The pressure loss at the air outlet due to air after-coolers, fittings, piping, etc. should be as small as possible.



### Note:

Cross-sections of the outlet pipe must be generously dimensioned. Avoid pressure losses due to elbow screw fittings.

The outlet pipe must be connected stress-free to the outlet.



### Warning:

Serious injuries and damage are possible in case of operation without a safety valve!

Operation without a safety valve on the separator tank is not permitted.



### Note:

A possible compressed air temperature (at the outlet) of up to 110°C/230°F requires the components connected downstream, e.g. the compressed-air hose, pressure switch, air after-cooler, fittings, etc. to be designed for this temperature. We therefore recommend the installation of an air after-cooler.

When used without an air after-cooler, the high outlet temperature must be pointed out to the final customer.

## 5.8 Oil cooling



### Note:

The cooler connection lines must be connected torque-free to the oil connections.

The following information on the design and execution of the oil cooling system must be observed.

- The oil cooling system must be designed so that the oil outlet temperature is a maximum of 105°C/220°F at the maximum intended ambient temperature.
- The oil circulation quantity is dependent on the pressure difference between the outlet and the inlet pressure of your application.
- The oil cooler must be installed so that it can be cleaned easily.
- When designing the cooling system, the pressure dew point graph (Figure 8-1) must be taken into account.  
If questions arise concerning the pressure dew point, please contact ROTORCOMP.

## 5.9 Service

Ensure good accessibility to the service points when installing the screw compressor air end system in a housing:

- Oil filling point
- Oil drain point
- Removal of the separator cartridge (removal dimensions according to offer drawing)
- Removal of the oil filter cartridge (observe the removal dimensions specified in the offer drawing)
- Easy cleaning of the oil cooler
- Replacement of the shaft seal (removal and installation of the end cover and the bearing race)
- Belt drive (accessibility, specifications for correct belt tension)



## 6 Commissioning

### 6.1 Preparation for commissioning

The components of the screw compressor air end system are carefully checked and tested at the factory. These tests ensure that the required performance and checking data are complied with. Nevertheless, the screw compressor air end system should be observed during the initial operating hours.

Before commissioning, it must be checked whether the screw compressor air end system has been properly installed.

As it is probable that there is no oil in the feed chamber following transport and storage, 0.53 to 2.1 quarts (0.5 to 2 liters) of clean oil of the specified oil quality must be added to the system before initial start-up in dependence on the screw compressor air end size and the system. This prevents the rotors from running dry during starting.



#### Caution:

With regard to commissioning, the applicable regulations of the specific country must be observed. In Germany these include the Operating Safety Ordinance.

The following points must be observed prior to initial commissioning:

- Be sure to observe the direction of rotation (see chapter 6.2 "Checking direction of rotation").
- The final pressure specified on the nameplate may not be exceeded.
- Do not switch off screw compressor air end systems running under load at the Emergency-Stop or main switch.
- Check the oil level.
- Before each initial commissioning and when recommissioning after a longer shut-down of the screw compressor air end system, always carry out the activities described in chapter 6.4 "Recommissioning screw compressor air end system".
- With a belt drive: check the belt tension and belt routing (see chapter 7 "Maintenance").
- Check the position of the shut-off valve.
- Check all screw fitting and fastening screws for firm seating.



#### Caution:

- Commissioning is only allowed when the system is complete (Danger from being pulled into the screw, hot oil and compressed air escaping).

### 6.2 Checking direction of rotation

#### Direction of rotation:

Standard model **rotating to the left** (counter-clockwise) looking at the shaft.

The design with a transmission **rotates to the right** (clockwise)



#### Caution:

The direction of rotation of the screw compressor air end must be checked during initial commissioning and each time changes are made to the electrical supply line of the electric motor drive. For this purpose, switch on the drive motor briefly and then switch off again immediately.

An incorrect direction of rotation for more than 2 seconds will result in destruction in the screw compressor air end. Reconnect the phases of the connection cable if necessary.

### 6.3 Test run



#### Caution:

The system is discharged extremely quickly down to the opening pressure "minimum pressure valve" in the Stop mode, "with shut-off valve opened"! This can result in the oil in the separating tank foaming up.

The possible consequences include:

- Oil escaping with the discharge air
- Oil flooding the fine separator cartridges
- Compressed air containing oil when restarting the system

Therefore, the following points must be observed during the test run:

- Only switch off the system with the shut-off valve closed!
- If possible, connect the system to a compressed-air reservoir!



#### Caution:

Maintain appropriate safety distance.

There is a risk of injury if the rotors are blocked. For safety reasons, only drive for a few seconds during initial startup.

For safety reasons, operation in open state must not be carried out.

Wear ear protection.

## 6.4 Recommissioning screw compressor air end system

Screw compressor air end systems switched off, shut-down or stored for longer than three months cannot be put into operation again until after the following measures have been carried out:

- Rotate the screw compressor air end in the direction of rotation several times by hand.
- With the screw compressor air end system at a standstill, pour 0.53 to 2.1 quarts (0.5 to 2 liters) of oil (same oil type as in the oil separator tank) into the air intake after removing the intake filter or manifold, depending on the compressor size and the system.
- Rotate the screw compressor air end again in the direction of rotation several times by hand.
- Check the oil level in the separator tank and top up if necessary (see chapter 7 "Maintenance").
- Test the running check function for the screw compressor air end system for at least 15 minutes.



### Warning:

The system may not be started with the feed chamber completely filled. There is a danger of considerable damage.

---

Maintain appropriate safety distance.  
Here is a risk of injury if the rotors are blocked.  
For safety reasons, only drive for a few seconds during initial startup. Operation in open state must not be carried out ear ear protection.

## 7 Maintenance

### 7.1 Safety precautions

The owner must ensure that all maintenance, assembly and repair work is carried out by authorized, qualified, specially trained personnel, which has informed itself sufficiently in advance by studying the operating manual in detail. Following commissioning, the owner bears all responsibility and liability for equipment and assembly. Maintenance must be performed on the motor, oil cooler, intake filter, fine oil separator and the other components in accordance with the manufacturer's specifications.

- Only use permissible or suitable tools for maintenance and repair work.
- Only use genuine spare parts.
- All maintenance and repair work must only be carried out with the machines shut down and the power supply switched off. In the process, the machine must be secured against accidental switch-on.
- Before removing pressurized parts, the unit must be effectively cut off from all pressure sources and a pressure relief of the entire system must be carried out.
- Never use flammable solvents or carbon tetrachloride to clean parts. Take precautions against toxic vapors or cleaning agents.
- Always ensure absolute cleanliness during maintenance and when conducting repair work. Keep dirt away from the system. Cover parts and exposed openings with a clean cloth, paper or strips of adhesive tape.
- Do not carry out welding work or any other work requiring or producing heat near the oil system.
- Make sure that no tools, loose parts or cleaning cloths are left behind in or on the system.
- Before releasing the unit for operation following maintenance or overhauling, check whether the operating pressures, temperatures, time settings and the oil level are correct, and whether the control and switch-off devices function properly.
- Electrical components, control devices, etc. must be protected against the penetration of moisture, e.g. from a steam jet.

**Warning:**

During all maintenance work:  
**ACCIDENT DANGER!**  
Danger of being jammed in the screws.

**Note:**

All maintenance work conducted must be entered immediately in the check sheet.

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## 7.2 Oil level

An important factor for the operating safety of the system is the oil level in the oil reservoir. The oil level check must be carried out before commissioning the screw compressor module and then repeated every 100 operating hours.



### Warning:

Rotating, pressurized and hot components, DANGER OF INJURY!

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### 7.2.1 Oil level check via oil filler opening



### Warning:

- The unit parts, oil and oil filler plug may be over 80°C/176°F; danger of burns!  
Wear personal safety equipment!
  - With hot oil, the oil level can be higher than with cold oil shortly after discharging.  
As a result, oil may escape when the oil filler plug is opened at the maximum oil level. In this case, close the oil filler plug again immediately and carefully remove the oil which has escaped.
- 
- Switch off the system and secure it against unauthorized switch-on.
  - Wait for one minute at standstill.
  - Check the oil level.
  - If necessary, top up oil of the same oil type and the same brand up to the maximum level.

## 7.3 Oil change



### Warning:

Rotating, pressurized and hot components, DANGER OF INJURY  
The oil change may only be carried out at a standstill and with the screw compressor air end system completely discharged.

---

### 7.3.1 Oil change intervals

According to the specifications of the system manufacturer. For reference values for the screw compressor air ends, see chapter 7.5 "Maintenance intervals".



### 7.3.2 Oil drain point

The system should be at operating temperature in this case.



**Note:**

Dispose of the used oil according to the applicable regulations

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- Switch off the screw compressor air end with the main switch and selector switch and secure against being switched on again.
- Completely release the pressure in the screw compressor air end system.
- Slowly unscrew the screw plug on the oil filler opening.
- Carefully unscrew the oil drain screw and catch the used oil in a suitable container.
- Clean the oil drain screw and screw in again.

### 7.3.3 Filling with oil



**Caution:**

Observe the oil recommendation, see "Lubricants and Operating Materials". Add oil of the same oil type and the same brand.  
A conversion to another oil type may require flushing of the compressor module.

---

ROTORCOMP recommends also replacing the oil filter during an oil change.

- Replace the oil filter if necessary.
- Pour oil into the filler neck on the separator tank up to the maximum level and screw the screw plug onto the filler neck by hand.
- Switch on the screw compressor and allow it to run for approx. three minutes.
- Oil level check:  
Top up the missing oil quantity again up to the maximum level.
- Check sheet entry (see chapter 7.4 "Maintenance check sheet").



## 7.5 Maintenance intervals



### Caution:

The frequency of the maintenance intervals (oil change, replacement of oil filter, fine separator cartridge and air filter element) varies depending on the application and the operating parameters. Depending on the design of the system, maintenance interval should therefore be specified by the compressor manufacturer. These must be given priority. It is advisable to conclude a maintenance agreement. The following table provides an overview of the reference value for the screw compressor module.

Maintenance intervals (Bh = operating hours)	Maintenance work
Before commissioning	Before start-up check correct assembly of the screw compressor stage, of drive elements and connections of compressed air and oil supply. Check the presence and position of valves and shut-off valves. Check oil level in the oil tank. Follow procedures for initial start-up and recommissioning.
Once after 50 Bh	Check shaft seal for leakage once after 50 operating hours
Every 100 Bh	Check the shaft seal for leakage every 100 operating hours
Every 1,000 - 6,000 hours depending on application, at least every 12 months	Replace oil and oil filter
Every 20,000 Bh	Check rotor bearings for play (axial and radial) Depending on load replace bearings and seals as a precaution



## 8 Lubricants and Operating Materials Maintenance Parts

### 8.1 Lubricants and operating materials

#### 8.1.1 Oil recommendation

RC screw compressor air ends must be operated with an oil suitable for special requirements. This oil must be approved by the lubricant manufacturer for screw compressor air ends. It must even be suitable under unfavorable operating conditions, such as soiling of the intake air with gases, solvent vapors and exhaust gases and at high ambient temperatures.

Suitable oil types and oil manufacturers can be specified for screw compressor air ends on request. As oil for screw compressor air ends, refined oils (mineral oils) synthetic oils and bio oils (biodegradable) can be used as screw compressor oil.

The materials and gaskets used in the screw compressor air end system must be taken into account when selecting the oil type. Corrosion and other material damage may not occur.

It is not permissible to mix different oils.

#### 8.1.2 Topping up oil

Use the same brand and the same oil type (see adhesive label on the oil separating tank). Dropping of the room temperature to below  $-5^{\circ}\text{C}/23^{\circ}\text{F}$  with the compressor stopped should be avoided.

#### 8.1.3 Measures at low room temperature

Sufficient room heating.

At an ambient temperature close to freezing point, the system must be prevented from freezing by installing a standstill heater.

#### 8.1.4 Piping materials

Plastic compressed-air piping systems can be attacked by the oil used in the screw compressor air ends.



#### Note:

See the information sheet!

The requirements placed on the cooling oil in the screw compressor air ends include the following:

- High resistance to aging
- High dispersive power
- Flash point: over  $200^{\circ}\text{C}/392^{\circ}\text{F}$
- Minimum foaming
- High corrosion protection
- Operating temperature: up to  $110^{\circ}\text{C}/230^{\circ}\text{F}$
- Select suitable viscosity class, e.g. ISO VG 68
- viscosity class:
  - A minimum viscosity of approx. 10 cST at operating temperature must be ensured



#### Caution:

Be sure to comply with the oil viscosity, as otherwise there is a danger for the bearing service life.

Rotorcomp offers optimized and tested EVO-Lube oils for screw compressor air ends and recommends their use.

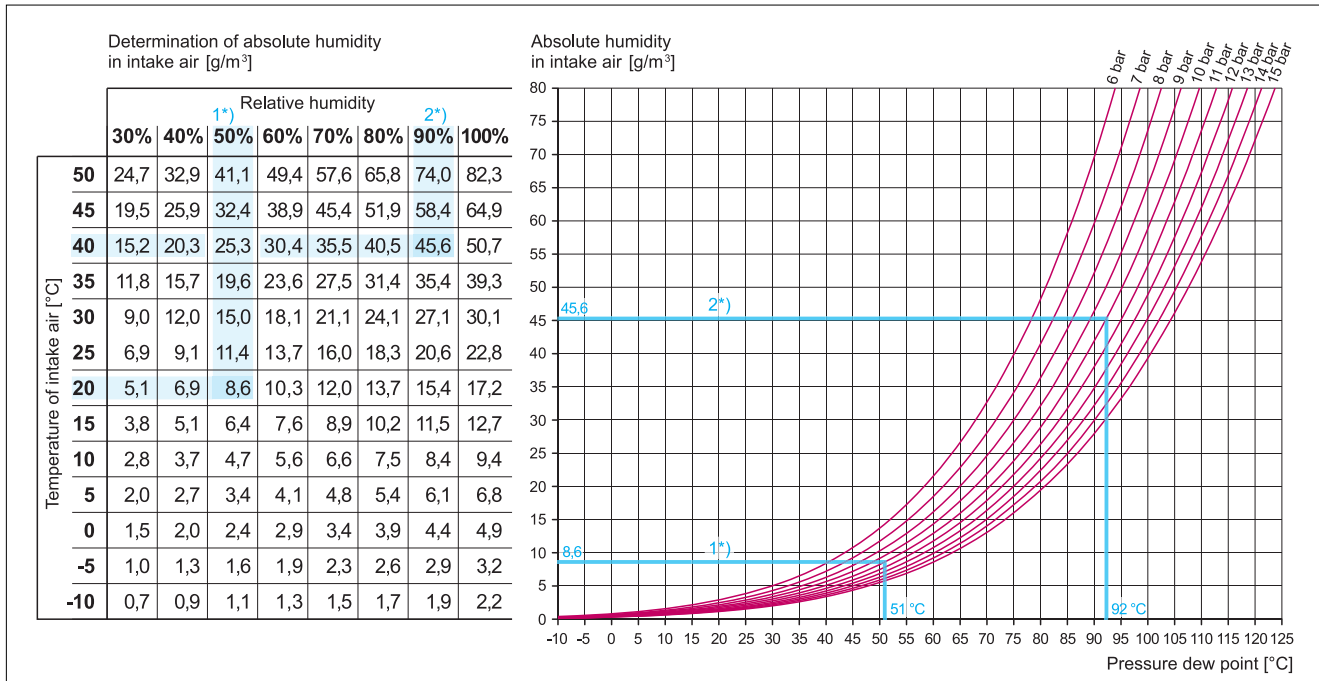


Figure 8-1 Pressure dew point graph

### 8.1.5 Pressure dew point of compressed air

#### Example:

1\*) Temperature of the intake air is 20°C/68°F, humidity is 50 %, resulting in an absolute humidity of approx. 8.6 g/m<sup>3</sup> in the intake air. At a pressure of 10 bar, the pressure dew point is approx. 51°C/124°F.

2\*) Temperature of the intake air is 40°C/104°F, humidity is 90 %, resulting in an absolute humidity of approx. 45.6 g/m<sup>3</sup> in the intake air. At a pressure of 10 bar, the pressure dew point is approx. 92°C/198°F.

### 8.1.6 Temperatures



#### Note:

The optimum operating temperatures for the screw compressor air end system can only be achieved if the oil circuit components (thermostat, cooler, fan, etc.) have been properly designed and the supply and exhaust air temperatures of the installation room and the screw compressor air end system make this possible. The entire thermal economy must be calculated.

### 8.1.7 Condensate damage

The relative humidity and the final operating pressures must always be taken into account in accordance with the selection graph for the working temperature of the thermostat element and for the screw-compressor air end operating temperature in order to prevent condensate from forming in the system.

### 8.1.8 Cold starts

During **compressor cold starts**, the viscosity of the oil must enable the sufficient, immediate supply of the screw compressor air ends with lubricant following starting while taking into account the higher pressure losses in the oil circulation which is still cold. The higher cold-starting power requirement must not overload the screw compressor air end drive.

### 8.1.9 Oil separation

The fine oil separation becomes poorer in the upper area with an increasing screws-compressor air end outlet temperature.

### 8.1.10 Multigrade oil

The use of **multigrade oils** can cause problems in the long run, as "viscosity improvers" used are destroyed over time. The oil is then no longer secured in the upper viscosity class and a thermal stability is no longer completely ensured. Therefore, multigrade oils are not approved for use in ROTORCOMP screw compressor air ends.



**Caution:**

Only use oils approved for screw compressor air ends!

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## 9 Technical Data and Tightening Torques

### 9.1 Technical data

Screw compressor air end Model	Drive outputs up to kW*	Volume flow up to m <sup>3</sup> /min	Operating pressure up to bar	Weight approx. kg
EVO2	11	2	15	15
EVO3	18.5	3	15	18
EVO3-G	18.5	3	15	34
EVO6	37	6	15	30
EVO6-G	37	6	15	70
EVO9	55	9	15	65
EVO9-G	55	9	15	93
EVO15	90	15	15	123
EVO15-G	90	15	15	166
EVO28	160	28	15	250
EVO28-G	160	28	15	328
EVO42	250	42	15	465
EVO42-G	250	42	15	545

\* Higher drive outputs available on request

## 9.2 Tightening torques



### Caution:

The maximum permissible tightening torque for all screw connections may not be exceeded.

VDI 2230

Unless otherwise specified, the following torques must be used. Always tighten screws/bolts with a torque wrench.

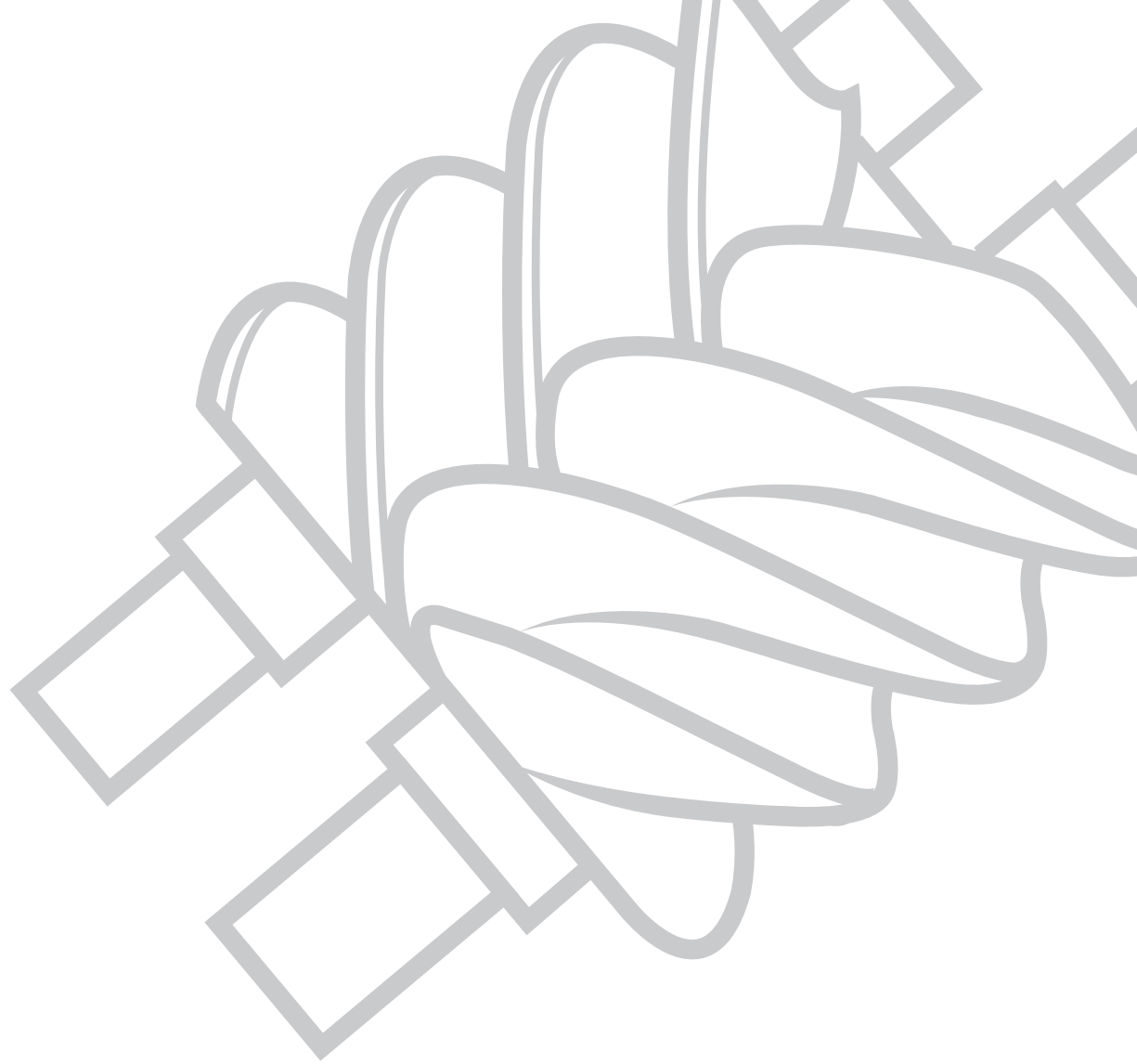
Screw/bolt type	Thread	Max. torque
Hexagonal head bolts Allen screws	M 6	10 Nm (7 ft.lbs)
Hexagonal head bolts Allen screws	M 8	25 Nm (18 ft.lbs)
Hexagonal head bolts Allen screws	M 10	43 Nm (32 ft.lbs)
Hexagonal head bolts Allen screws	M 12	75 Nm (53 ft.lbs)
Hexagonal head bolts Allen screws	M 14	120 Nm (85 ft.lbs)
Hexagonal head bolts Allen screws	M 16	180 Nm (126 ft.lbs)

## 10 Troubleshooting

Fault	Possible cause	Remedy	See chapter
Incorrect direction of rotation	Phases reversed	Reconnect 2 supply lines	
System does not start	No electricity	Check	
	Combistat switches off due to excessively high temperature	Check oil level, cooling, thermo-bypass	
System difficult to start	Motor output insufficient	Check	
	Drive gear ratio "too fast"	Check	
	Star-delta switchover incorrect	Set	
	Screw compressor air end is flooded with oil	Check	
	System has not been discharged yet	Check	
	Oil filling too viscous	Check viscosity	8.1.1
Differential pressure	Pressure in the separator cartridge is too high if the cartridge is full or clogged	Replace separator cartridge	
Combistat switches off due to excessively high temperature	Oil shortage	Check oil level in oil reservoir and top up if necessary	7.2
	Oil filter soiled	Replace oil filter cartridge	
	Thermostat defective	Replace thermostat	
	Oil cooler soiled	Clean oil cooler on air side, clean on oil side if necessary	
	Incorrect installation a) Room ventilation b) Exhaust air blocked c) Thermal short circuit	Observe recommendation on installing system	5.3
	Combistat faulty or incorrectly adjusted	Adjust combistat or replace	
	Fan has failed	Check	

<b>Fault</b>	<b>Possible cause</b>	<b>Remedy</b>	<b>See chapter</b>
Safety valve blows off	Safety valve defective	Replace safety valve	
	Fine separator cartridge soiled	Replace cartridge	
	System does not relieve Continuous operation		
	System does not switch off automatically (drop-out mode)		
Oil in compressed air	Oil extraction line with nozzle in oil sight glass soiled	Clean oil extraction system	
	Fine separator cartridge defective	Check cartridge and replace if necessary	
	Oil level in oil reservoir too high; possibly excessive condensate	Observe oil level marking; drain and replace if necessary	7.2
System is not discharged during continuous operation, system does not switch off automatically in case of intermittent operation, i.e. safety valve blows off	Upper switching point of network pressure monitor set too high	Readjust network pressure monitor	
	Solenoid valve defective Relief valve defective	Replace solenoid valve/ relief valve	
	Minimum pressure valve jammed	Check minimum pressure valve for smooth movement; ensure smooth movement if necessary	
System continually discharges, low feed quantity	Solenoid valve defective Relief valve defective	Replace solenoid valve/ relief valve	
	Break in electric supply line to solenoid valve	Eliminate break	
No or insufficient feed quantity	Intake filter soiled	Replace filter insert	
	Oil shortage	Check oil level and top up if necessary	7.2
	Intake control valve does not open	Check control valve	
	Leaks in system	Check, seal off	

<b>Fault</b>	<b>Possible cause</b>	<b>Remedy</b>	<b>See chapter</b>
Control valve does not close	Pressure switch, or control valve	Check setting	
Oil exits through intake control valve during stop	Sealing surface of control valve is damaged, spring broken	Check parts and replace if necessary	
System does not relieve	Solenoid valve/electrical system	Check	
	Impulse-pressure relief valve	Check and replace parts if necessary	
Control valve constantly discharges	Solenoid valve/electrical system	Check	
Oil escapes during discharging (oil foam in fine separator cartridge)	Oil type incorrect	Oil change	7.3
	Oil foam forms during stop	Install discharge delay valve, replace with different nozzle diameter	
	Oil level too high	Drain off oil	7.2



## CONTACT US

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