ROTORCOMP VERDICHTER

Installation and operating manual

SCREW COMPRESSOR COMPACT MODULE
NK 31

Original operating manual

[en] 02/2014

ROTORCOMP VERDICHTER GmbH

Industriestraße 9
82110 Germering
Germany

Contents

Contents

1 Foreword

1.1 General

This manual contains information and regulations for the installation and operation of the NK 31 Screw Compressor Compact Module.

1.2 Scope

This documentation is applicable for the screw compressor of the type NK 31 Compact Module from the delivery date of 01/2008.

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 mode of operation, installation, operation and maintenance of the NK 31. It is must therefore always be consulted on the operation and maintenance of the NK 31.

Read this operating manual carefully before commissioning the NK 31 for the first time in order to ensure proper handling, operation and maintenance from the outset.

Pay particular attention to all warnings and safety precautions.

ROTORCOMP screw compressors are carefully checked and tested prior to shipping. When your compressor arrives, the delivery scope must be checked for completeness and damage.

Any missing parts and/or transport damage must be reported immediately. A damaged compressor module 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 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 compressor 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 NK 31 is a screw compressor compact module designed for installation in a compressed-air generating station.
The sole intended use of the system is the compression of atmospheric air. The NK 31 may only be used to compress gases or other media following written approval by ROTORCOMP.
The NK 31 may only be installed 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 Standard delivery scope

With the NK 31, ROTORCOMP offers a completely equipped, compact compressor module.
The components of the standard delivery scope are described in the following chapters.
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:

– Installation not approved by RC
– Improper use
– Operation of the compressor outside the specified limits
– Failure to observe the safety precautions and the usual care and caution
– Unsuitable operating materials (gases, oils)
– Condensate in the screw compressor
– 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 Nameplate

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

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

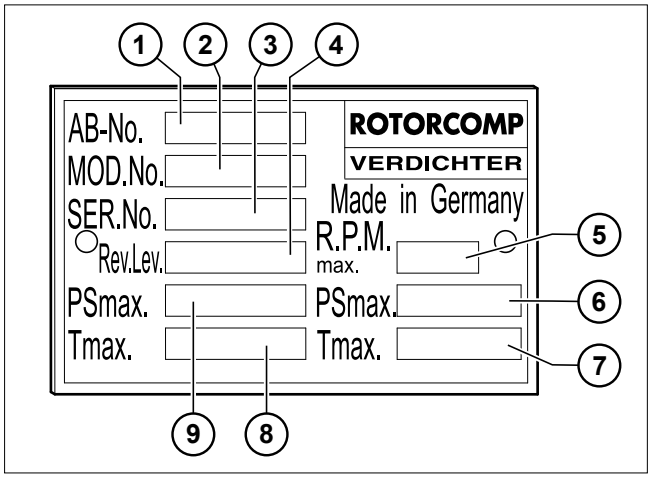

Figure 1-1

Stamping for customers outside Germany (Europe)

1. Order No.
2. Model
3. Serial No.
4. Year of manufacture
5. Max. rpm
6. Max. operating pressure in psi
7. Max. operating temperature °F
8. Max. operating temperature °C
9. Max. operating pressure in bar

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.

Attention

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 97/23/EC (Pressure Vessel Directive DGRL) of 05/29/1997
- Operating Safety Ordinance (BetrSichV) of 09/27/2002

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 precautions only refer to the NK 31 screw compressor module 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 the system if the doors are open or the shrouding is loose.
	Warning: Hot machine parts
	Warning: Part under pressure
	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

2.3.2 Instructions to use safety equipment

	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 initial operation, maintenance, service and repairs.

3 Technical Description

3.1 General overview of NK 31 Screw Compressor Compact Module (standard model with electric control unit)

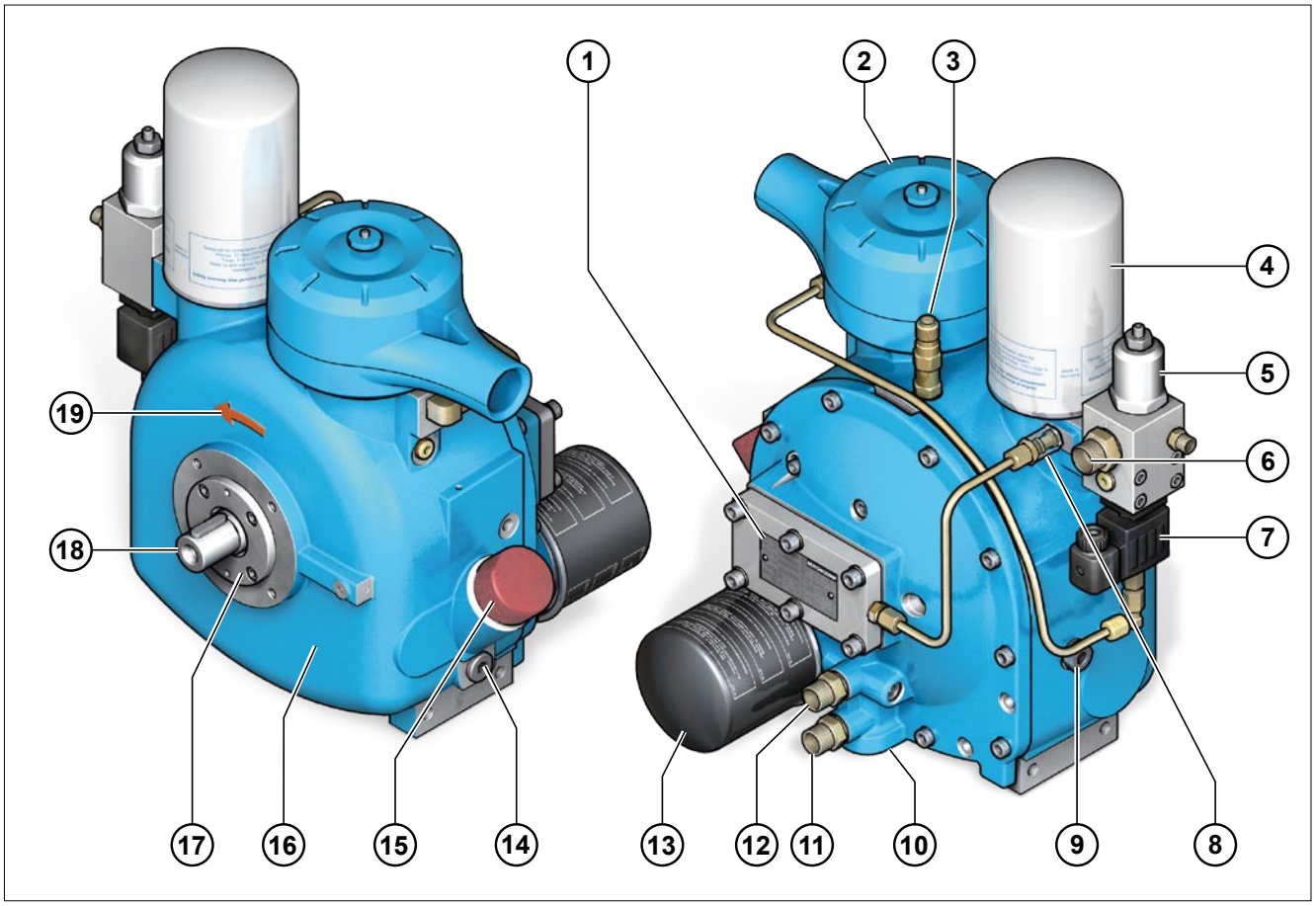

Figure 3-1

1. Name plate
2. Intake valve with intake filter unit
3. Safety valve (optional)
4. Separator cartridge
5. Minimum pressure valve
6. Compressed air outlet
7. Control block, electric
8. Oil sight glass (optional), oil level control
9. Temperature probe connection
10. Oil-Thermostat
11. Oil circuit / outlet
12. Oil circuit / inlet
13. Oil filter
14. Oil drain plug
15. Oil filler
16. NK 31 basic module
17. Front cover
18. Drive shaft
19. Direction of rotation

3.2 Flow diagram of NK 31 (electric control unit)

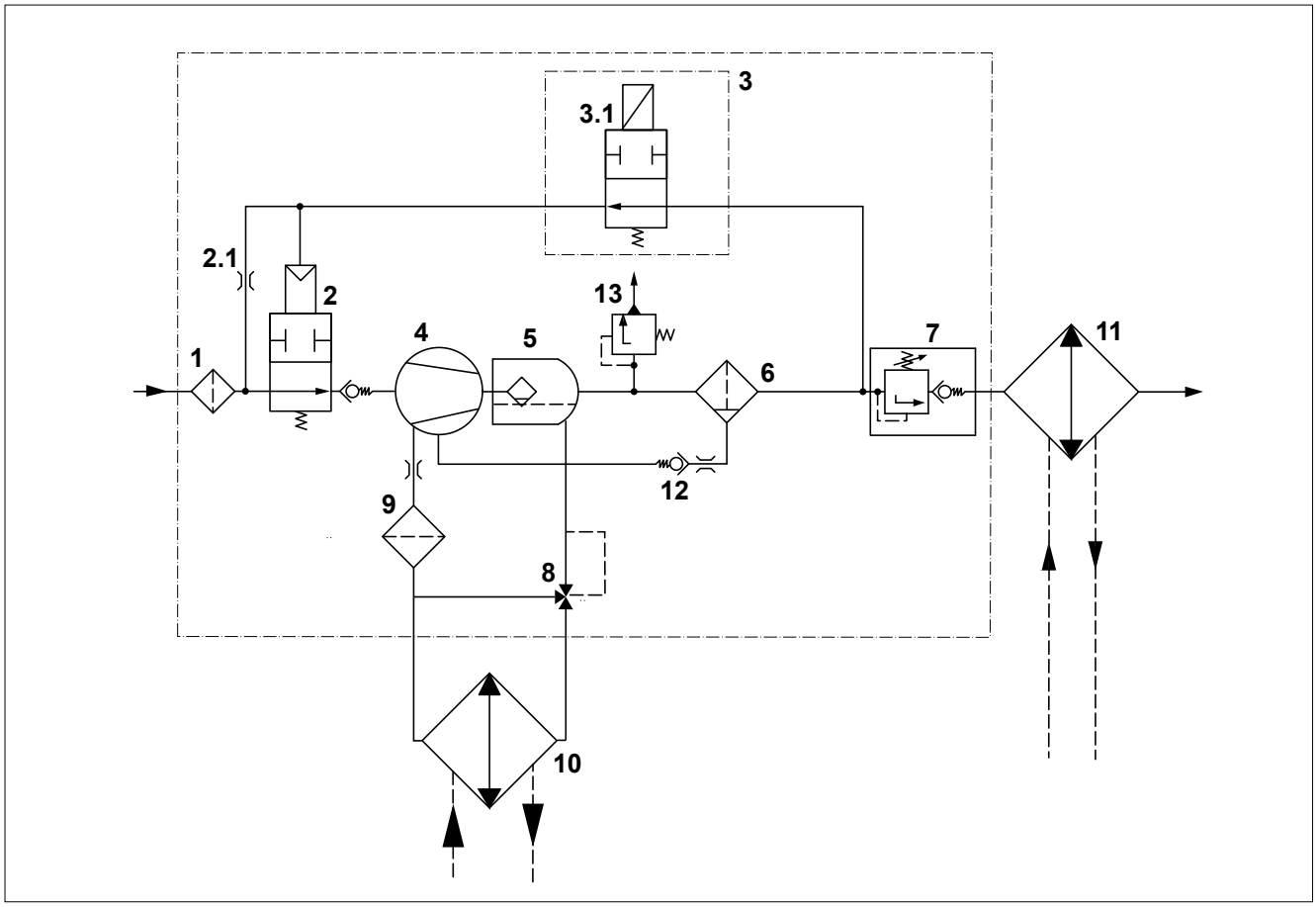

Figure 3-2

1. Intake filter
2. Intake valve
2.1 No-load nozzle
3. Control unit (electric)
3.1 Solenoid valve
4. Screw compressor
5. Separator tank with pre-separation
6. Fine separator
7. Minimum pressure valve
8. Oil thermostat
9. Oil filter
10. Oil cooler
11. Air after-cooler
12. Non-return valve
13. Safety valve (optional)

3.3 Operating description for NK 31 Screw Compressor Compact Module (electric)

The flow diagram shows a schematic view of the operating principle and the arrangement of the main components of the NK 31 screw compressor module with electrical control unit, regardless of any other equipment.

3.3.1 Standstill

At standstill the solenoid valve **3.1** is deenergized, the relief line is open and the downstream devices are depressurized. The minimum pressure valve **7** set to approx. 5.5 bar at the factory is tightly closed. The intake valve **2** is slightly open at standstill.

3.3.2 Relieved stating

During relieved starting a small air quantity is already drawn in at a minimum vacuum by the rotor rotation. This air quantity is then compressed and flows as pilot air via the deenergized, open solenoid valve **3.1** under the piston of the control valve. The intake valve **2** closes and remains in the no-load position. In this throttled position a corresponding air quantity is drawn in at a certain compressor rotational speed so that a residual pressure of approx. 2 bar is maintained in the separator tank **5**. The compressed air flows into the intake filter **1** via the no-load nozzle **2.1** of the intake valve **2** to relieve the system.

3.3.3 Feed phase

During the feed phase the solenoid valve **3.1** is closed electrically. The control pressure of the intake valve **2** is released via the no-load nozzle **2.1**. The intake valve **2** opens due to the spring force and the vacuum in the intake chamber of the compressor. The air drawn in flows via the intake filter **1** through the intake valve **2** directly into the compression chamber of the screw compressor **4**. There the intake air is compressed and oil for lubrication and cooling is injected.

The oil-air mixture then enters the separator tank **5** in which the majority of the oil is separated from the air. The air then flows via the fine separator **6** and the minimum pressure valve **7** to the compressed air outlet.

In the fine separator **6** the oil is filtered out down to a residual content of < 3 mg/m^3 and then routed back into the compressor housing via a nozzle and a non-return valve **12**.

When the compressor is switched off, the minimum pressure valve **7** with a non-return function prevents backflow of the compressed air out of the system into the compression chamber in the discharge phase.

During startup a faster pressure buildup is also ensured, which is required for optimum lubrication and oil separation.

The heat resulting during compression is dissipated via the oil-air mixture. The oil circulation also results from the pressure difference between the outlet and inlet pressure. The optimum operating temperature for the oil is adjusted by the oil thermostat **8**. Depending on the oil temperature, the oil flow is routed directly via the oil cooler **10** or directly to the oil filter **9** by the oil thermostat valve.

The oil then flows via the oil filter **9** to the various injection points in the compressor block.

3.3.4 Switching off

When the system is switched off, the intake valve **2**, operates, supported by spring pressure, as an independent non-return valve. After being switched off, the deenergized solenoid valve **3.1** also opens and compressed air flows into the control piston of the intake valve **2**. The intake opening is closed off oil-tight in the process, and then the system is completely relieved via the no-load/ relief nozzle **2.1** (see Figure **3-5**).

3.4 General overview of NK 31 Screw Compressor Compact Module (standard model with pneumatic control unit)

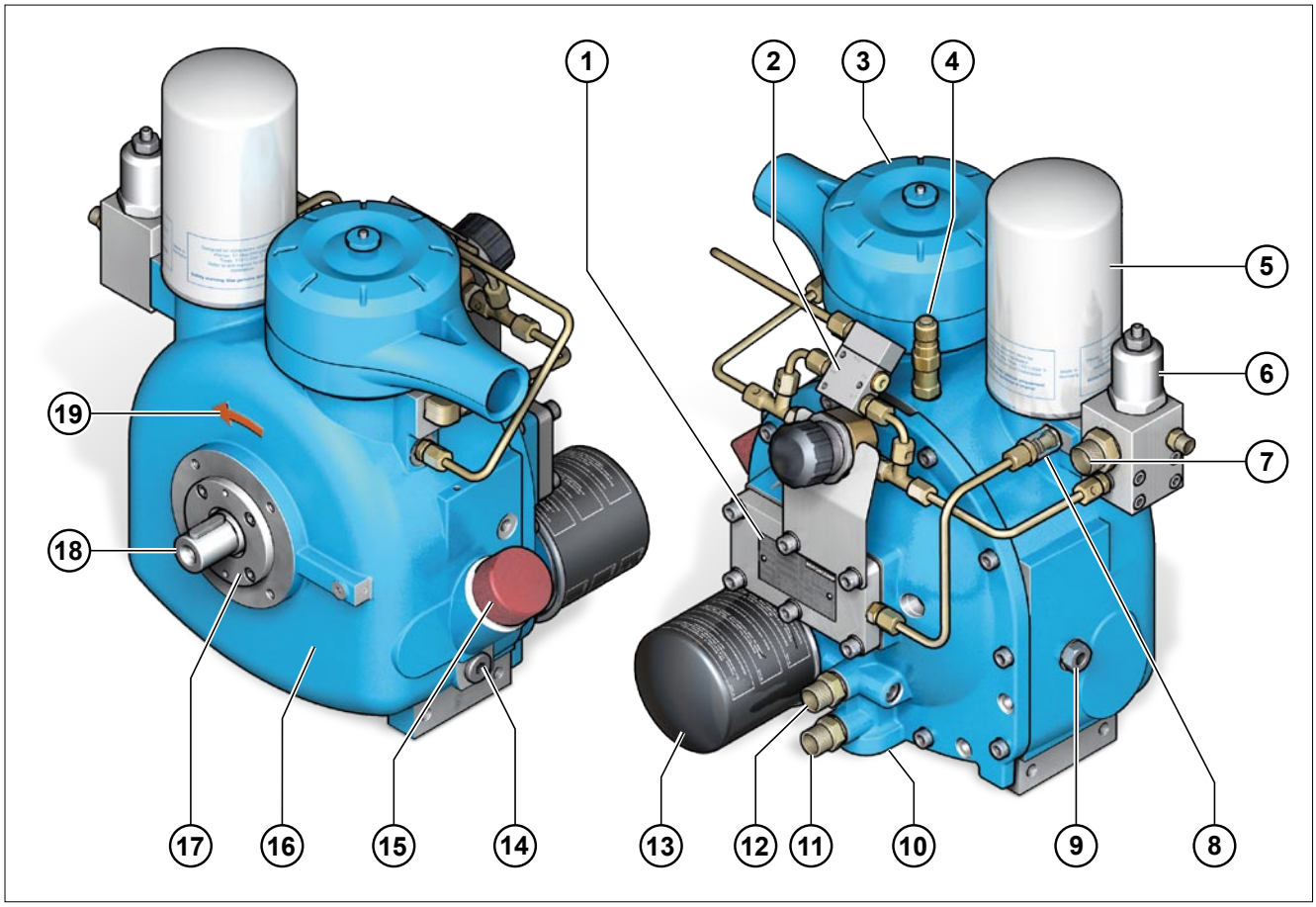

Figure 3-3

1. Name plate
2. Control unit, pneumatic
3. Intake valve with intake filter unit
4. Safety valve (optional)
5. Separator cartridge
6. Minimum pressure valve
7. Compressed air outlet
8. Oil sight glass (optional), oil level control
9. Temperature probe connection
10. Oil-Thermostat
11. Oil circuit / outlet
12. Oil circuit / inlet
13. Oil filter
14. Oil drain plug
15. Oil filler
16. NK 31 basic module
17. Front cover
18. Drive shaft
19. Direction of rotation

3.5 Flow diagram of NK 31 (pneumatic control unit)

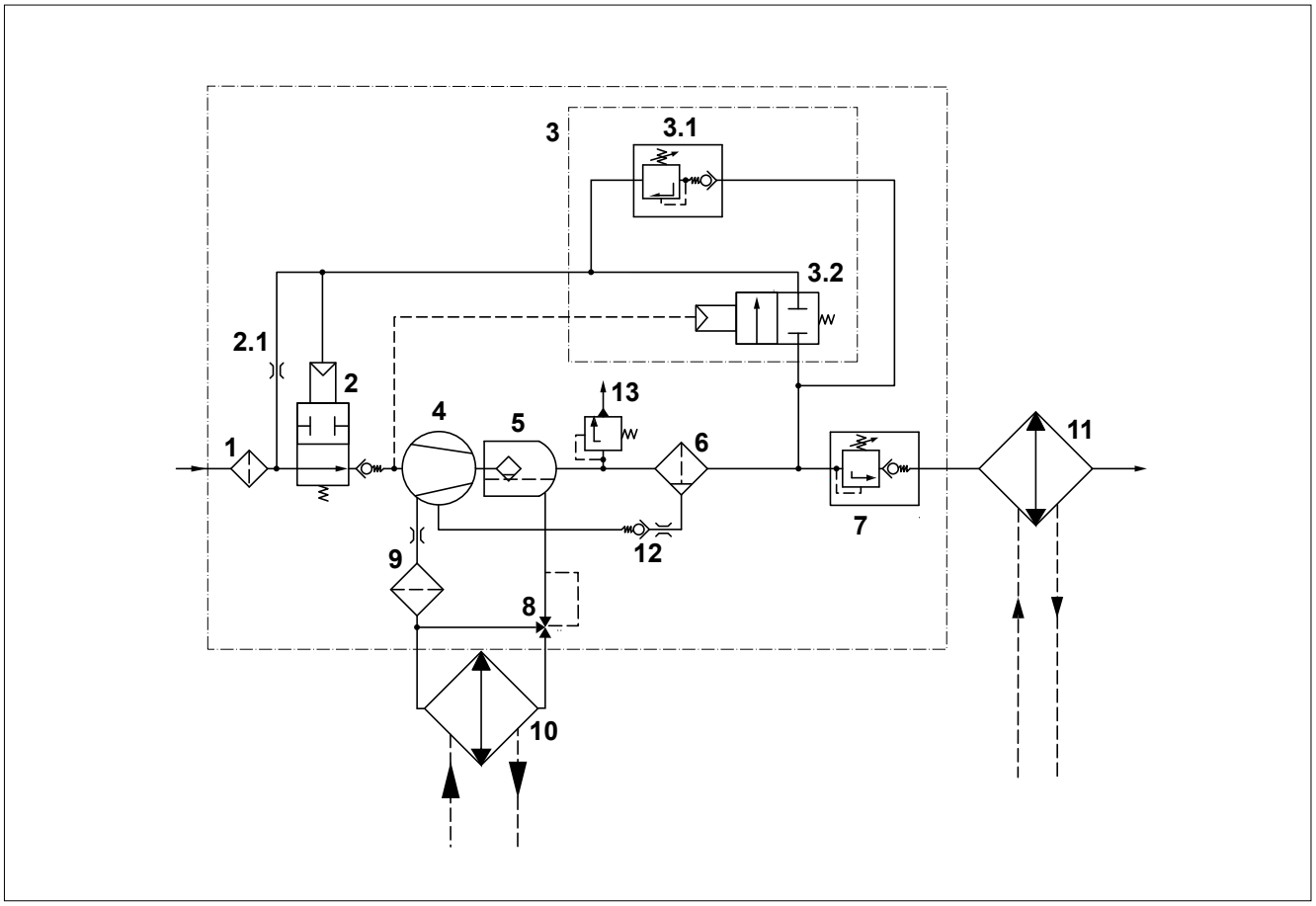

Figure 3-4

1. Intake filter
2. Intake valve
2.1 No-load nozzle
3. Control unit (pneumatic)
3.1 Proportional control valve (positive)
3.2 Impulse-pressure relief valve
4. Screw compressor
5. Separator tank with pre-separation
6. Fine separator
7. Minimum pressure valve
8. Oil thermostat
9. Oil filter
10. Oil cooler
11. Air after-cooler
12. Non-return valve
13. Safety valve (optional)

3.6 Operating description for NK 31 Screw Compressor Compact Module (pneumatic)

The flow diagram shows a schematic view of the operating principle and the arrangement of the main components of the NK 31 screw compressor module with pneumatic control unit, regardless of any other equipment.

3.6.1 Standstill

At a standstill the intake valve **2** and the impulse-pressure relief valve **3.2** are closed by the spring pretension. The downstream devices are depressurized.

The minimum pressure valve **7** is set to approx. **5** bar at the factory is tightly closed. The proportional regulator **3.1** is set to operating pressure.

3.6.2 Starting

During start-up, the intake valve **2** already opens at minimum vacuum in the intake chamber of the screw compressor **4** due to the rotor rotation. The drawn in air flows via the intake filter **1** through the intake valve **2** directly into the compression chamber of the screw compressor **4**. There the intake air is compressed and oil is injected for lubrication and cooling.

The oil-air mixture then enters the separator tank **5** in which the majority of the oil is separated from the air. The air then flows via the fine separator **6** and the minimum pressure valve **7** to the compressed air outlet.

In the fine separator **6** the oil is filtered out down to a residual content of < 3 mg/m^3 and then routed back into the compressor housing via a nozzle and a non-return valve **12**.

When the compressor is switched off, the minimum pressure valve **7** with a non-return function prevents backflow of the compressed air out of the system into the compression chamber in the discharge phase.

During startup a faster pressure buildup is also ensured, which is required for optimum lubrication and oil separation.

When the operating air pressure is reached, the proportional regulator **3.1** opens and the pilot air flows under the piston of the intake valve **2**, which begins to close. The adjustable proportional regulator **3.1** steplessly controls the pressure under the piston of the intake valve **2** in dependence on the compressed-air removal. This pressure acts against the spring force and therefore determines the valve stroke and the drawn-in quantity of air.

The compress pilot air flows via the no-load nozzle **2.1** of the intake valve **2** back into the compression chamber **4**.

The heat resulting during compression is dissipated via the oil-air mixture. The oil circulation also results from the pressure difference between the outlet and inlet pressure. The optimum operating temperature for the oil is adjusted by the oil thermostat **8**. Depending on the oil temperature, the oil flow is routed directly via the oil cooler **10** or directly to the oil filter **9** by the thermostat valve.

The oil then flows via the oil filter **9** to the various injection points in the compressor block.

3.6.3 Switching off

When switching off the system, the intake valve **2** operates, supported by spring pressure, as an independent non-return valve and closes the intake opening oil-tight.

3.7 Flow diagram of NK 31 (START-STOP controller)

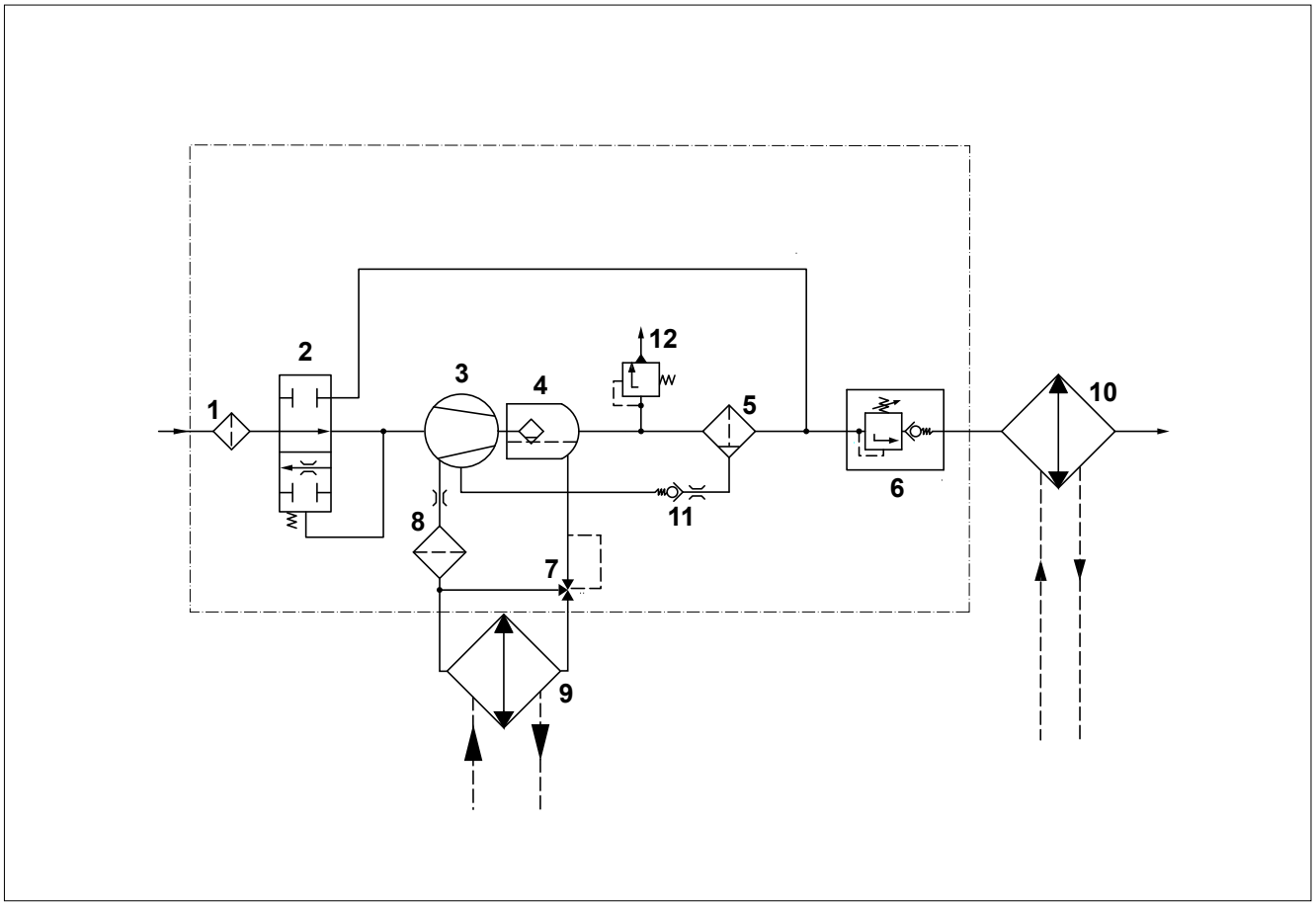

Abbildung 3-5

1. Intake filter
2. Intake valve
3. Screw compressor
4. Separator tank with pre-separation
5. Fine separator
6. Minimum pressure valve
7. Oil thermostat
8. Oil filter
9. Oil cooler
10. Air after-cooler
11. Non-return valve
12. Safety valve (optional)

3.8 Operating description for NK 31 Screw Compressor Compact Module (START-STOP controller)

The flow diagram shows a schematic view of the operating principle and the arrangement of the main components of the NK 31 screw compressor module with pneumatic control unit, regardless of any other equipment.

In the start-stop controller there is no magnet control or piston. The start-stop controller functions only mechanically, through the pressure difference.

3.8.1 Standstill

At standstill the intake valve is slightly open. The minimum pressure valve **6** is set at 5.5 bar and is completely closed. The system is depressurized.

3.8.2 Load condition

The rotor rotation produces vacuum in the suction port which opens the untake valve **2**.
The drawn in air flows via the intake filter **1** through the intake valve **2** directly into the compression chamber of the screw compressor **3**. There the intake air is compressed and oil is injected for lubrication and cooling.

The oil-air mixture then enters the separator tank **4** in which the majority of the oil is separated from the air. The air then flows via the fine separator **5** and the minimum pressure valve **6** to the compressed air outlet.

In the fine separator **5** the oil is filtered out down to a residual content of < 3 mg/m^3 and then routed back into the compressor housing via a nozzle and a non-return valve **11**.

When the compressor is switched off, the minimum pressure valve **6** with a non-return function prevents backflow of the compressed air out of the system into the compression chamber in the discharge phase.
During startup a faster pressure buildup is also ensured, which is required for optimum lubrication and oil separation.

The heat resulting during compression is dissipated via the oil-air mixture. The oil circulation also results from the pressure difference between the outlet and inlet pressure. The optimum operating temperature for the oil is adjusted by the oil thermostat **7**. Depending on the oil temperature, the oil flow is routed directly via the oil cooler **9** or directly to the oil filter **8** by the thermostat valve.

The oil then flows via the oil filter **8** to the various injection points in the compressor block.

3.8.3 Switching off

When the system is switched off pressure builds up over the rotors and closes the intake valve **2** makeing an oil tight seal.

The remaining pressure is released progressively via a pressure line from the fine separator **5** to a nozzle in the intake valve **2**. Through this the system is completely depressurized.

3.9 Intake valve

The NK 31 is equipped with an integrated intake valve mounted directly on the compressor housing.

Different control units can be used for various operating modes:

– the EMC electric control unit or
– the PMC pneumatic control unit

Depending on the application, various intake control-valve systems can also be used.

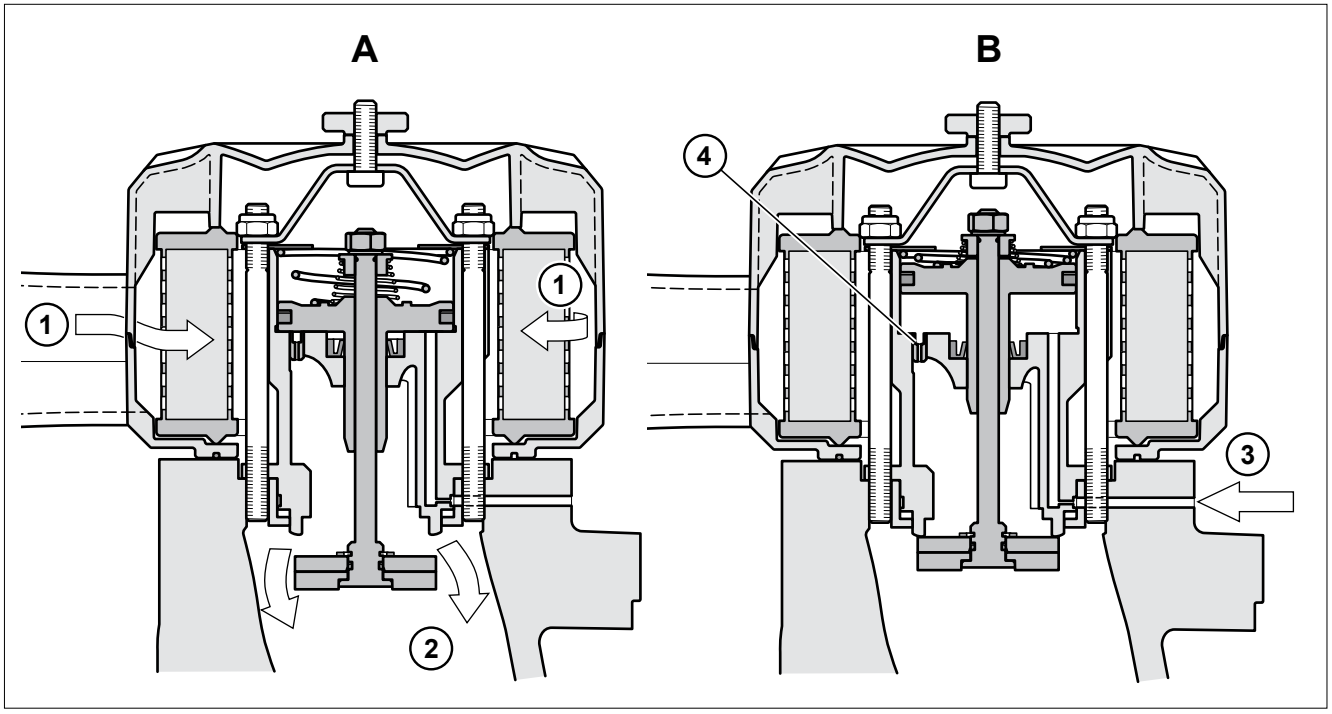

Figure 3-6

A Intake valve opened
B Intake valve closed
1. Air inlet
2. Air outlet
3. Control line of intake valve
4. No-load/relief nozzle

3.9.1 Installation position

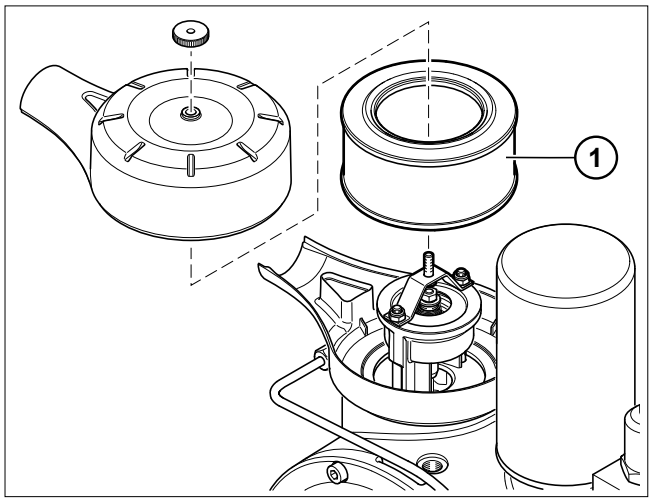

Figure 3-7

3.10 Intake air filter

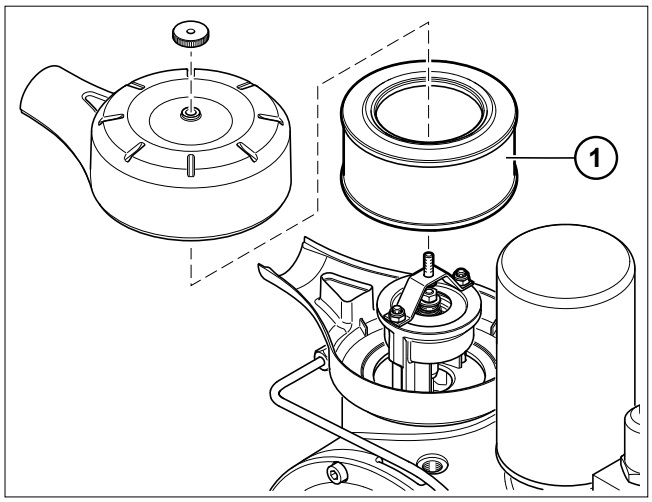

Figure 3-8

3.10.1 Micro air filter element

The RC intake air filter is mounted directly over the intake valve.

The micro air filter **1** with a fineness of 10 µm is used for the filtering of intake air.

The constant degree of separation of almost 100 % on all loading levels, the resistance to heat, cold, water, oil and fuel and a large filter area permit a long service life. As a result, the micro air filter element is the ideal fine filter for the filtering of intake air of compressor system.

3.10.2 Intake filter monitoring

- Maintenance indicator, optical (option)
- Maintenance indicator, electric (option)

The micro air filter elements are recommended as a **1-stage filter** with a low filter resistance for **standard applications**.

Attention

Special applications, e.g. system installation in a heavily soiled environment, mobile systems, etc., require 2-stage filters with a somewhat higher filter resistance, however a better degree of separation for the protection of the compressor system.
Filter Type/Order No.: on special request.

3.11 Fine separator

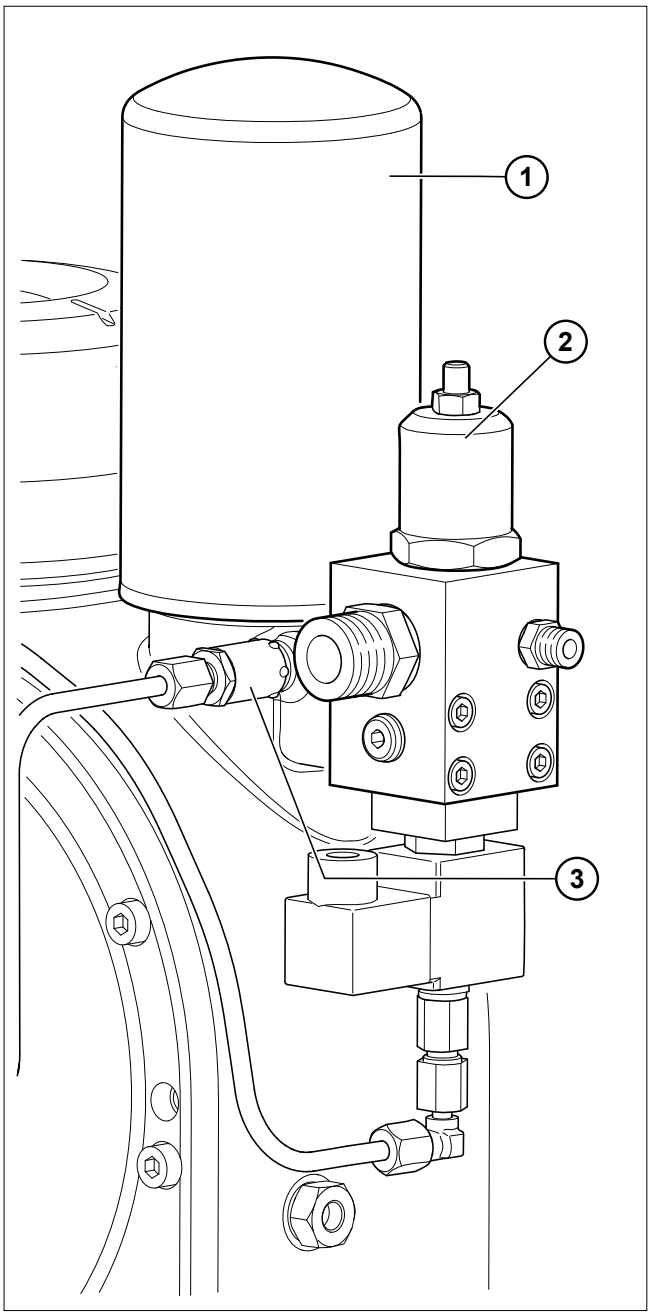

Figure 3-9

1. Fine separator cartridge
2. Minimum pressure valve
3. Sight glass for oil separation

3.11.1 Oil intake non-return valve

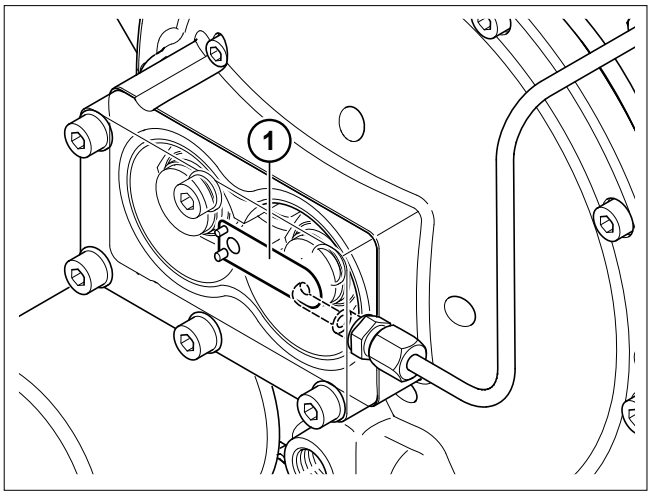

Figure 3-10

The oil intake non-return valve **1** prevents flooding of the fine separator cartridge with oil flowing back out of the screw compressor due to the pressure difference in the system when the screw compressor system is switched off.

3.11.2 Fine separator cartridge

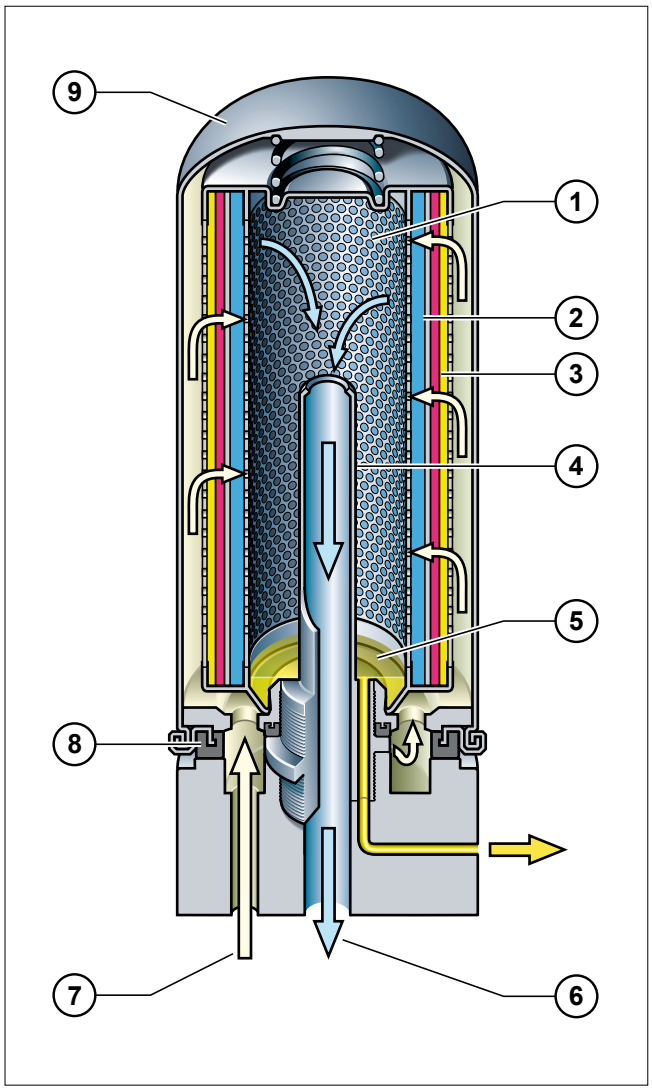

Figure 3-11

1. De-oiled compressed air
2. Post-separator
3. Fine separator
4. Pressure-resistant support pipe
5. Separated oil
6. Outlet of de-oiled air
7. Inlet of air-oil mixture
8. Sealing off
9. Pressure-resistant housing

The fine separator cartridge is used to recover the extremely finely distributed residual oil in the form of droplets following the pre-separation.

The fine separator cartridge separates virtually the entire residual oil from the compressed air.

An optimum pre-separation in the separating tank is assumed - the better the pre-separation, the better the fine separation.

The vertical cartridge is flowed against from below, while the residual oil is separated out while flowing through the special filter element. Then it is fed into the oil circulation again.

3.11.3 Minimum pressure valve

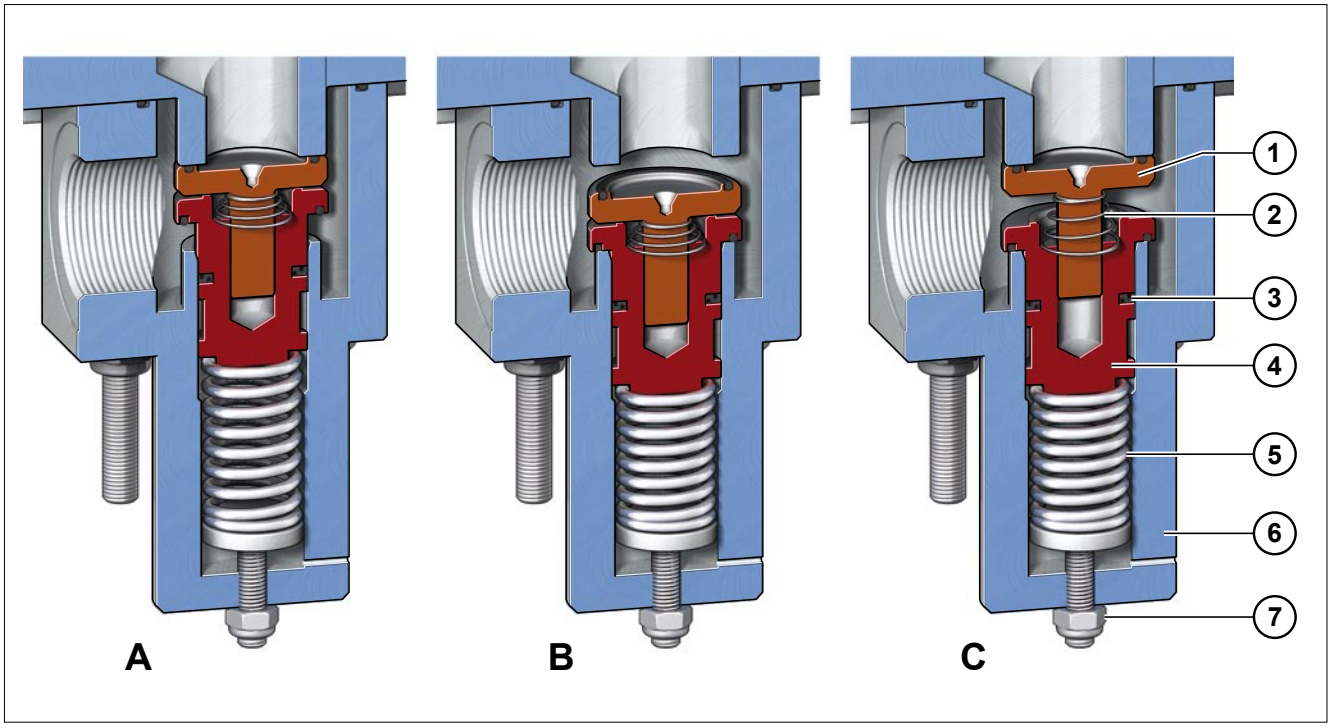

Figure 3-12

A Minimum pressure valve closed
B Minimum pressure valve opened
C Minimum pressure valve opened, non-return valve closed

1. Non-return valve plate
2. Non-return valve spring
3. O-ring
4. Pressure holding valve piston
5. Pressure holding valve spring
6. Pressure holding valve housing
7. Spacing washer

The minimum pressure valve is located on the outlet of the compressor before the air recooler and serves as:

A Pressure holding valve
It prevents the pressure drop, in case of a lack of counter-pressure, under a minimum pressure of approx. 5.5 bar. This pressure is necessary to ensure the oil supply of the compressor. At the same time this is the condition for good oil separation.

C Non-return valve
It prevents compressed air from flowing back out of the system or the compressed-air reservoir into the screw compressor system. As a result, the system can be completely discharged when the separator reservoir is switched off.
This valve operates automatically.

3.12 Air-oil circulation outside compressor module

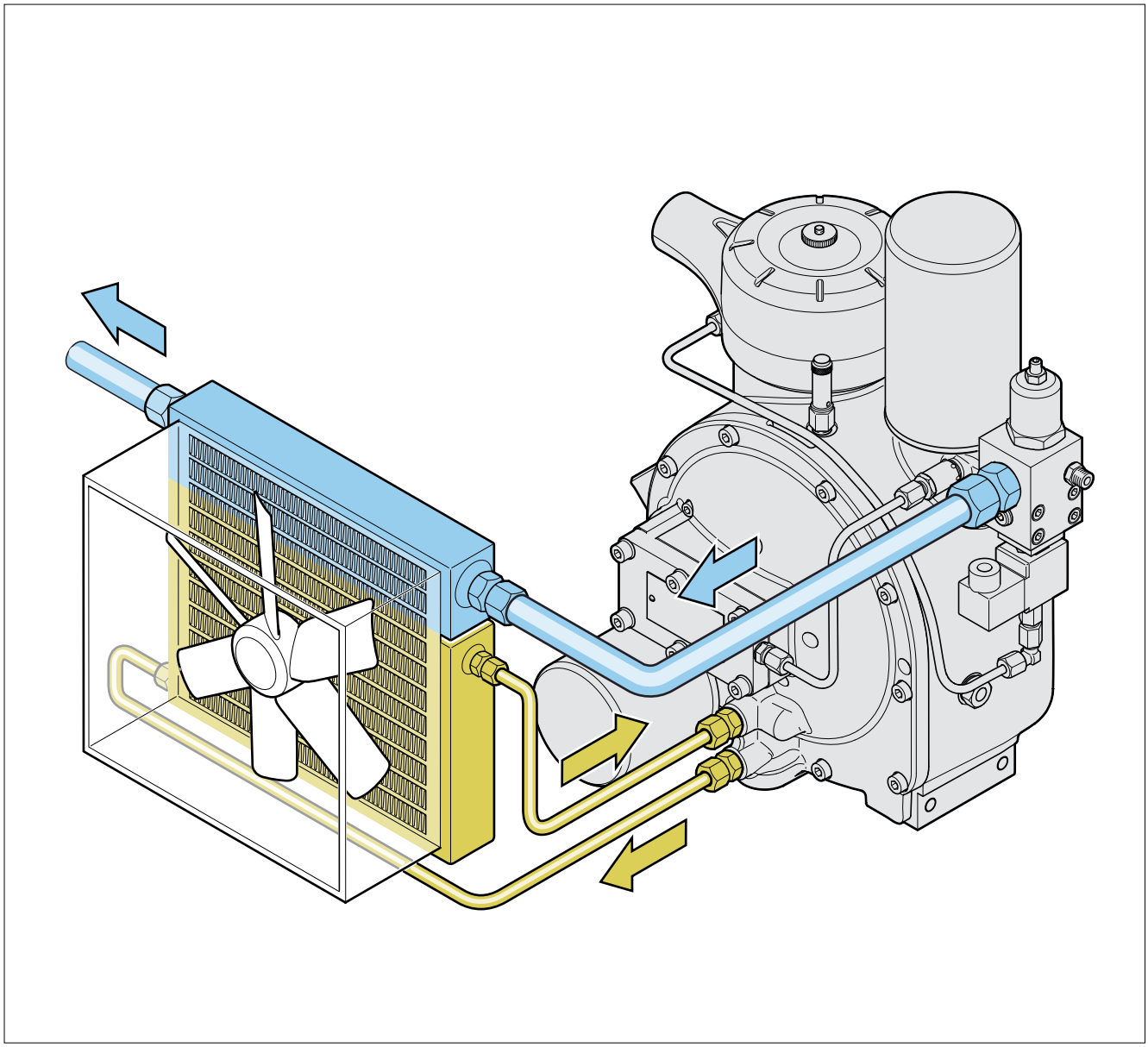

Figure 3-13

After the oil-air mixture in the fine separator cartridge has been deoiled, the compressed air flows through the air cooler and from there to the consumer.
The oil flows via a thermostat located in the thermostat head to the oil cooler.
The cooled oil flows from the oil cooler via the oil filter back into the internal oil-air circuit of the compressor module.

3.12.1 Oil filter

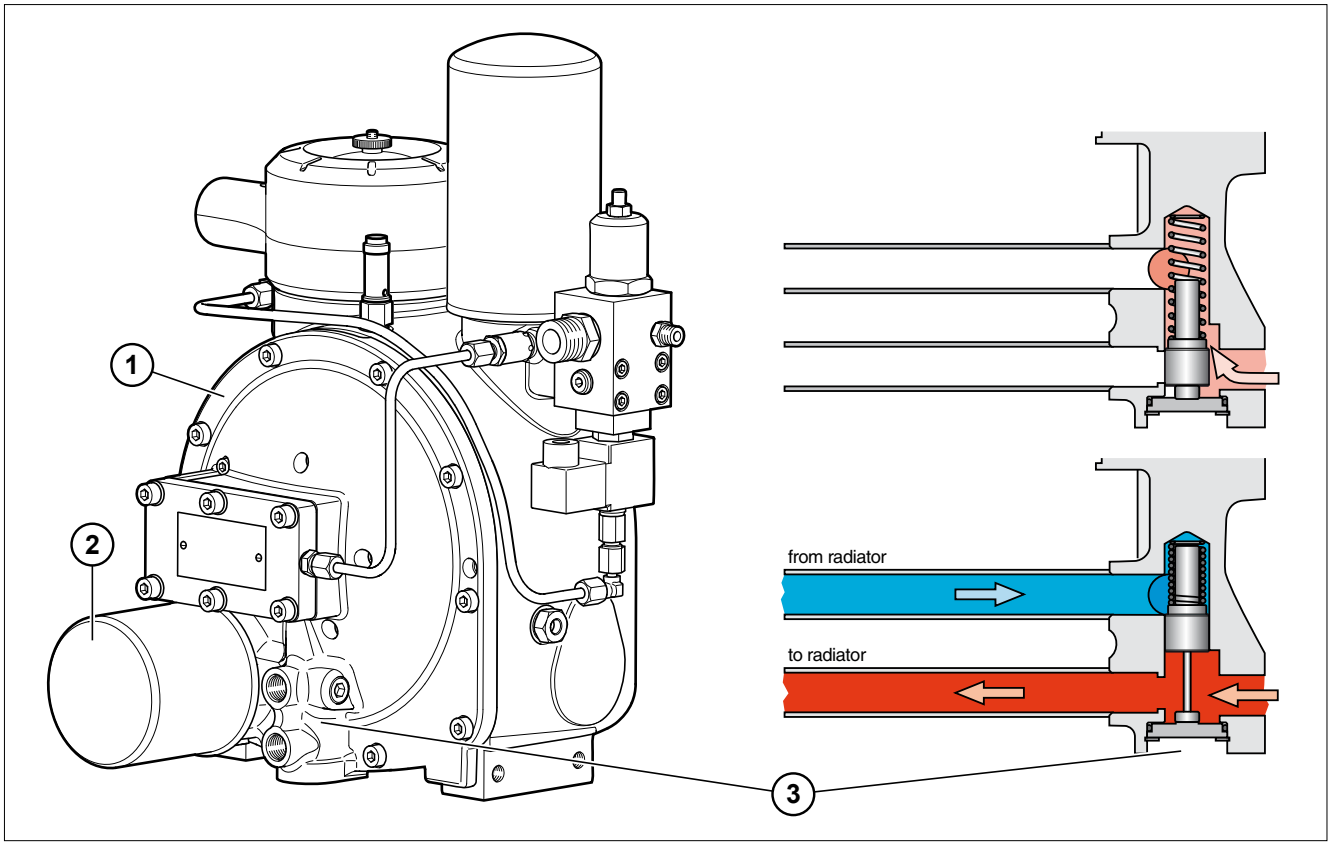

Figure 3-14

1. Basic module
2. Oil filter
3. Oil thermostat

The oil filter is screwed onto the basic module **1**.

The filter fineness is 20 µm.

The replacement filter has a bypass valve which opens with cold, high-viscosity oil or a heavily soiled filter with a pressure difference of 2.5 bar. This eliminates the undersupply of the screw compressor with oil, which results in the maximum permissible compression temperature being exceeded.

3.12.2 Oil thermostat

The NK 31 is equipped with an integrated oil thermostat **3**. This is located in the basic module **1** before the oil filter **2** and is accessible from the outside (at bottom).
The oil thermostat working element can be replaced and must be selected in accordance with the operating temperature.
The oil thermostat opens the connection to the oil cooler when the operating temperature is reached and controls the maintaining of the optimum temperature of the system in the further process. In the startup phase this parameter is reached faster, and therefore the formation of condensate in the oil circulation is largely avoided. Depending on the compressor operating data, the temperature is to be between 70°C and 110°C/ 158°F and 230°F (measured at compressor outlet).
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.
The oil thermostat is maintenance-free. Operation of the compressor system with an impermissible overtemperature can result in a failure of the working element (in this case the working element must be replaced).

Note

When the system is operated at 15 bar, the thermostat working element must always be adapted to the increased requirements.

3.13 Oil cooler/air after-cooler (option)

With air-cooled screw compressor systems the circulating oil is cooled down from the compressor outlet temperature to the compressor injection temperature. As an option, ROTORCOMP offers combination coolers with aluminum fins, which are connected to the air and oil circulation of the respective compressor (see Figure **3-13**).

The corresponding coolers are dimensioned so that they ensure operating safety at an ambient temperature of up to 45°C/113°F. Sufficient cooling air parameters are assumed.

The cold ambient air should be fed through the cooler with a fan. A sufficient distance to the cooler must be chosen in order to achieve uniform cooling air distribution over the entire effective cooling surface.

3.14 Safety valve (SIV) (option)

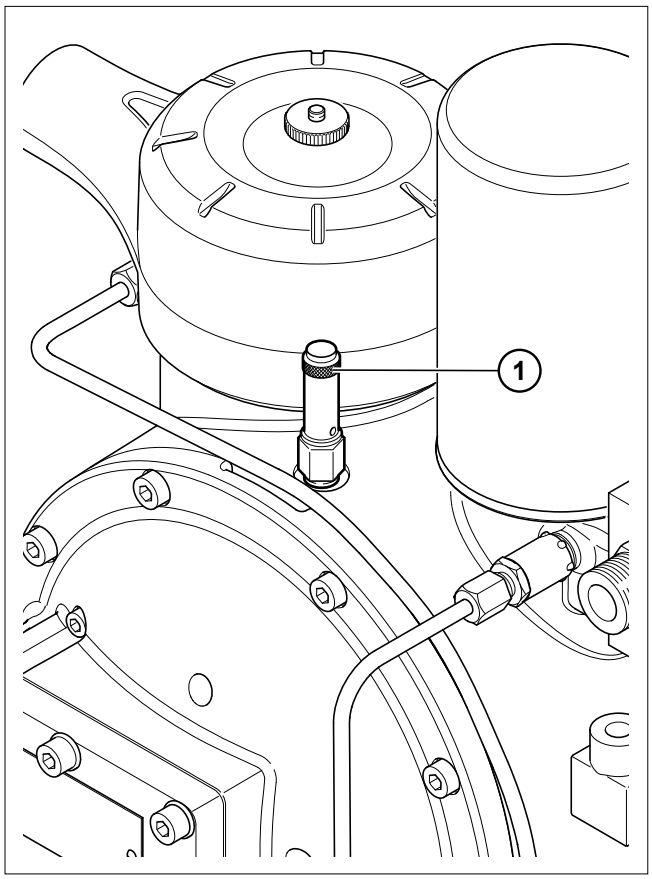

Figure 3-15

1. Knurled screw for operating test

Warning

The safety valve must be installed prior to commissioning.
Operation of the system without a safety valve can be hazardous!

The safety valve is located on the basic module, and is provided with a test device.

While taking the pressure loss in the oil separating system into account, the blow-off pressure is a maximum of 1.5 bar above the respective operating pressure (final pressure) of the system.

The valve is type-tested and leaded (manufacturer's certificate available on request).

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 module may be damaged during transport. Therefore, the screw compressor module should be checked for damage following each transport.

Attention

A damaged module 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) Externally recognizable damage or losses

– 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.

The deadlines are as follows:

a) GERMAN FEDERAL RAILWAY:
within 7 days
(Paragraph 81/82 of EVO - German Regulations Concerning Carriage by Rail)

b) FORWARDING AGENT:
within 7 days
(Paragraph 60ADSp - General German Forwarders' Conditions)

c) POSTAL SERVICE:
immediately, at the latest 24 hours following delivery of the shipment

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 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!
- Remove drive or body components beforehand!
- Only transport the compressor module while depressurized!
- When transported on a pallet, the compressor module must be securely fastened to it!
- Do not transport the compressor module on the forks of a stacker or lift truck!
- Transport eyes are only designed for transporting the compressor module!
- Do not stand or walk under cargo during transport!

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

4.4 Transport options

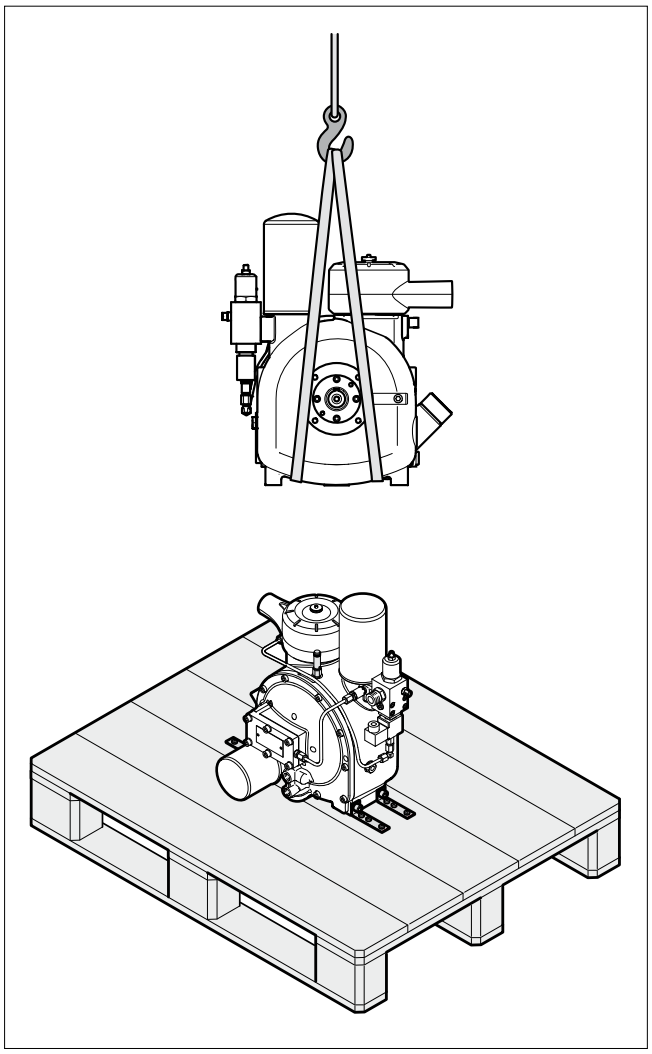

Figure 4-1

5 Installation/Assembly

5.1 Connection thread/assembly

5.1.1 Fastening screws

Female threads are provided on the NK housing which must be used for fastening. Only suitable screws with a METRIC THREAD are to be screwed into this female thread.

5.1.2 Pipe connections

Pipe connections with a female thread for a compressed- air outlet, oil circulation, draining and control lines are provided on the NK housing. 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 NK housing can occur when screwing in (see installation drawing).

Attention

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 housing may be used for this purpose.
Consult ROTORCOMP beforehand if necessary.

5.2 Safety precautions for installation and assembly

Attention

- To lift the compressor module, 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 recooler 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 passersby, cannot be drawn in.
- No external force may be exerted on the air outlet valve; the connected pipe connection must be mounted torque-free.

The compressor block must be provided with a sufficiently dimensioned ground.

5.3 Installation

Attention

– 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 must always be installed on a level 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.

The base frame for the following fastening versions must be torsionally rigid and level.
The fastening of the compressor module on a base frame together with the drive motor can be designed in accordance with the following versions.

5.3.1 Fastening on base frame with screw fitting

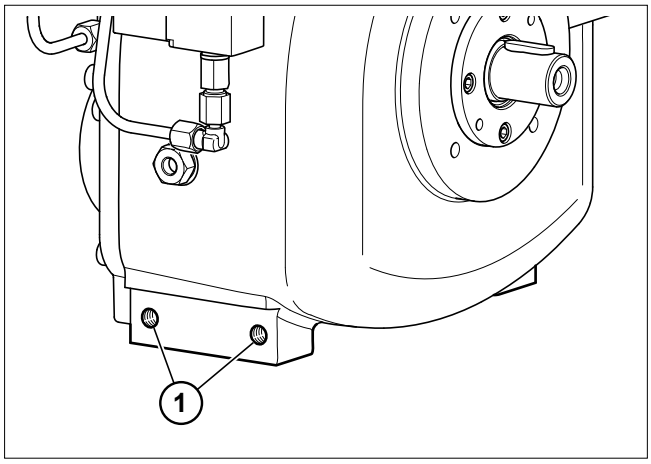

Figure 5-1

Attention

The compressor module may only be fastened at the side holes on the compressor housing provided for this purpose.

The unit must be fastened torque-free at the respective fastening points **1** on the left and right on the base frame.

5.3.2 Drive

The compressor module is 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.

5.4 Belt drive

Improper design and/or installation of the V-belt drive can result in a considerable reduction of he 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 drive is properly designed and executed.

The following information must be observed for this purpose.

- The belt drive must not be underdimensioned.
- The maximum design output for a belt drive is 5.5 kW at 3400 rpm for this screw compressor.
- The belt pulley must be pushed onto the drive shaft as far as possible and secured.
- 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, as 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 module.
- “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).

5.5 Direct drive

Attention

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 module must be carried out according to the instructions of the elastic coupling manufacturer.

The compressor module is provided with a centering flange for directly coupled units.

The flanged unit can be fastened stress-free on the base frame. The connection dimensions of the flange are contained in the offer drawing.

5.6 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.

5.7 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.

5.8 Service

Ensure good accessibility to the service points when installing the compressor module 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 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 system should be observed during the initial operating hours.

Attention

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 commissioning:

- Direction of rotation: be sure to observe (see chapter **6.2** “Checking direction of rotation”).
- The max. final pressure specified on the nameplate may not be exceeded.
- Do not switch off screw compressor systems running under load at the Emergency-Stop or main switch.
- Check the oil level (see chapter **7.2** “Oil level”).
- Before each first commissioning and when recommissioning after a longer shut-down of the screw compressor compact module, always carry out the activities described in chapter **6.4** “Recommissioning screw compressor 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.

6.2 Checking direction of rotation

Direction of rotation:
Standard model rotating to the left (counterclockwise) looking at the shaft.

Attention

The direction of rotation of the screw compressor must be checked during first 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. Reconnect the phases of the connection cable if necessary.

6.3 Test run

Attention

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 line

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!

6.4 Recommissioning screw compressor system

Screw compressor 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 in the direction of rotation several times by hand.
– With the screw compressor system at a complete stop, pour approx. 0.2 liters of oil (same oil type as in oil separator tank) into the filler neck after removing the intake filter. To do this, push down the valve plate and pour the oil directly into the intake opening.
– Rotate the screw compressor 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 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.

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 al responsibility and liability for equipment and assembly.

- 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!

Note

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

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..

The exact oil level check can only be carried out via the oil filler opening.

Warning

Rotating, pressurized and hot components, DANGER OF INJURY!

7.2.1 Oil level check via oil filler opening

Warning

– The unit parts, oil and oil filler plug **1** may be over 80°C/176°F; danger of burns!
Wear personal safety equipment!
– With hot oil, the oil level can be approx. 10 mm 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.

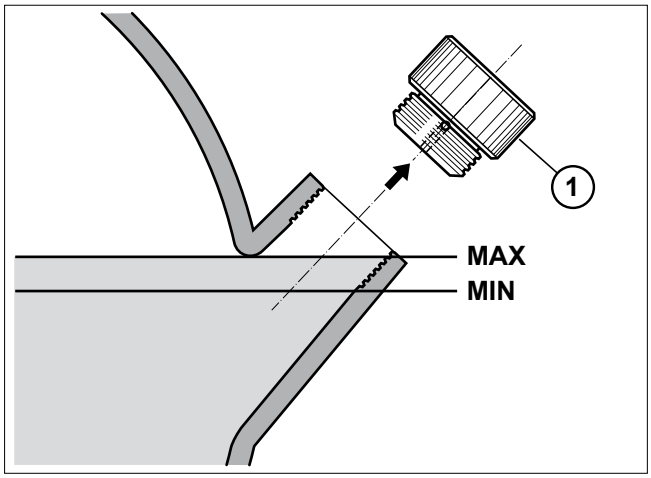

Figure 7-1

Note

The screw cap of the oil filler neck is provided with a safety hole on the side from which oil or air escapes if there is any residual pressure in the separating tank. Wait briefly in this case.

- Switch off the system and secure it against unauthorized switch-on.
- Wait for one minute at standstill.
- Screw off the screw plug **1** of the filler neck by hand with the oil level depressurized.
- Check the oil level.
- If necessary, top up oil of the same oil type and the same brand up to the maximum level.

Note

The oil filler neck is positioned so that overfilling of the screw compressor system is not possible. Excess oil runs out of the filler neck again.

- Screw on the screw plug **1** firmly by hand.
- Switch on the system.
- Check the oil filler plug for leaks and replace the O-ring if necessary.
- Carefully remove escaped, excess oil.

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 system completely discharged.

7.3.1 Oil change intervals

According to the specifications of the system manufacturer.
For the reference values for the screw compressor compact module, see chapter **7.8** “Maintenance intervals”.

7.3.2 Oil drain points

The system should be at operating temperature in this case.

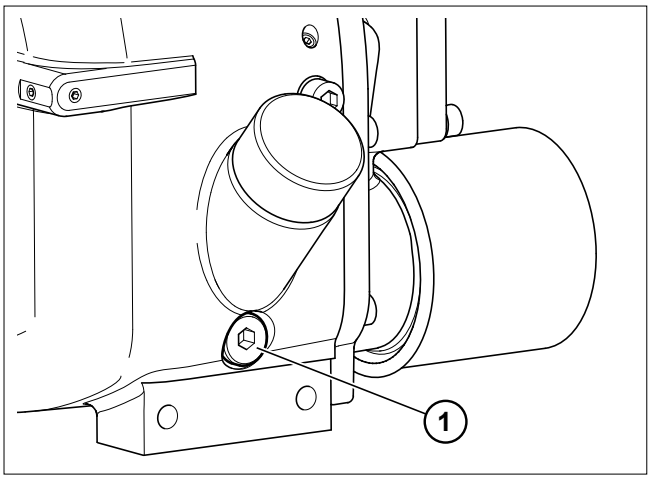

Figure 7-2

Note

Dispose of the used oil according to the applicable regulations.

- Switch off the screw compressor and then secure it against being switched on again by removing the main switch.
- Completely release the pressure in the screw compressor system.
- Slowly screw off the screw plug on the oil filler neck.
- Carefully unscrew the oil drain screw **1** and catch the used oil in a suitable container.
- Clean the oil drain screw **1** and screw in again.

7.3.3 Filling with oil

Attention

Observe the oil recommendation, see “Lubricants and Operating Materials”. Add oil of the same oil type from the same manufacturer.
Switching over to another oil type can require the compressor module to be flushed.

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 **1** onto the filler neck by hand (see Figure **7-2**).
- 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 **7.7** “Maintenance check sheet”).

7.4 Oil filter

Warning

Rotating, pressurized and hot components,
DANGER OF INJURY
– The unit parts, oil and oil filler plug may be over 80°C/176°F; danger of burns!
– Wear personal safety equipment!
The oil filter replacement may only be carried out at a standstill and with the screw compressor system completely discharged.

7.4.1 Oil filter replacement intervals

According to the specifications of the system manufacturer.
For the reference values for the screw compressor compact module, see chapter **7.8** “Maintenance intervals”.

7.4.2 Oil filter replacement

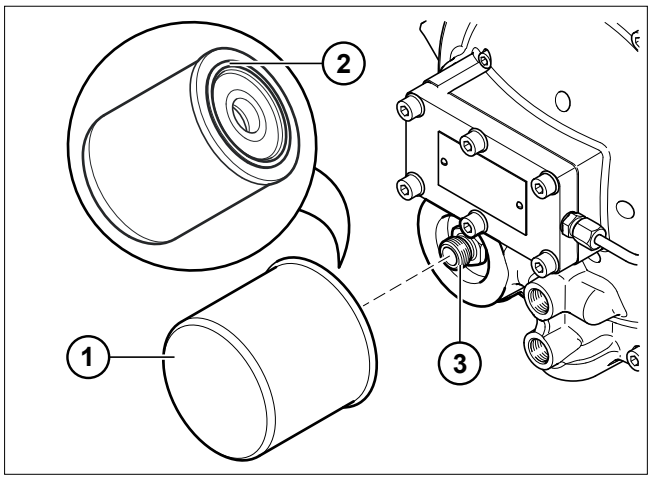

Figure 7-3

- Switch off the system and completely release the pressure in the system.
- Remove the oil filter cartridge **1** with a suitable tool, e.g. oil filter strap wrench.
- Oil the gasket **2** on the new oil filter cartridge **1** with oil of the same oil type as in the compressor module.

Note

Dispose of the old oil filter cartridge according to the applicable regulations.

- Screw the new oil filter cartridge onto the connection nipple **3** and tighten by hand. No tool is required.
- Switch on the screw compressor.
- The oil filter must then be checked for leaks with the system running.
- Oil level check:
  Top up the missing oil quantity again up to the maximum level.
- Check sheet entry (see chapter **7.7** “Maintenance check sheet”).

7.5 Fine separator cartridge

Warning

Rotating, pressurized and hot components, DANGER OF INJURY

– The unit parts and oil may be over 80°C/176°F; danger of burns!
  – Wear personal safety equipment!

The fine separator cartridge may only be replaced at a standstill and with the screw compressor system completely discharged.

7.5.1 Maintenance intervals

According to the specifications of the system manufacturer.

For the reference values for the screw compressor compact module, see chapter **7.8** “Maintenance intervals”.

With heavily soiled intake air or a poor oil quality, the cartridge is heavily soiled, making premature replacement necessary.

7.5.2 Replacing fine separator cartridge

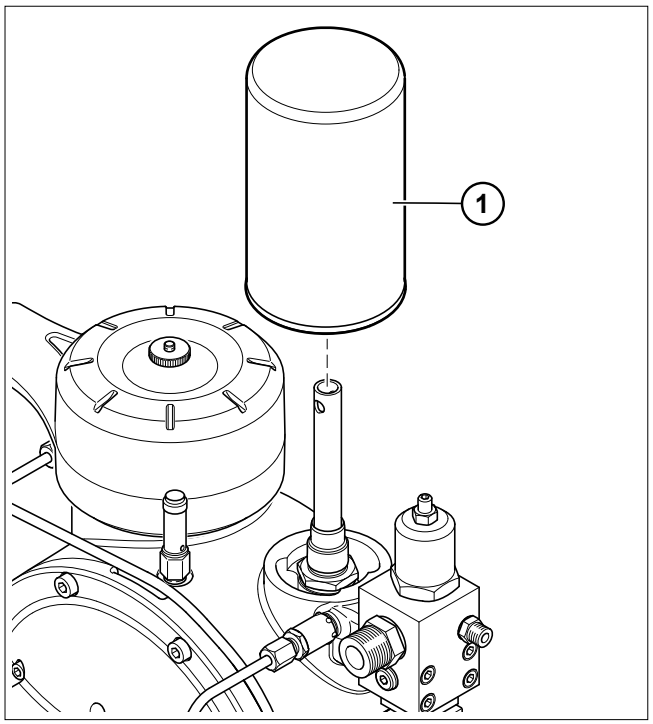

Figure 7-4

Note

Dispose of the old fine separator cartridge according to the applicable regulations.

- Unscrew the fine separator cartridge **1** with a suitable tool, e.g. oil filter strap wrench.
- Oil the gasket on the new fine separator cartridge **1** with oil of the same oil type as in the compressor module.
- Tighten the new fine separator cartridge by hand. No tool is required.
- Switch on the screw compressor system.
- The fine separator must be checked for leaks with the system running.
- Check sheet entry (see chapter **7.7** „Maintenance check sheet“).

7.6 Intake air filter

7.6.1 Maintenance intervals

According to the specifications of the system manufacturer.

For the reference values for the screw compressor compact module, see chapter **7.8** „Maintenance intervals“.

In case of heavily soiled intake air, an earlier replacement of the filter element is necessary when the optical or electric maintenance indicator (optional) indicates this (perm. vacuum up to 50 mbar).

7.6.2 Replacing air filter element

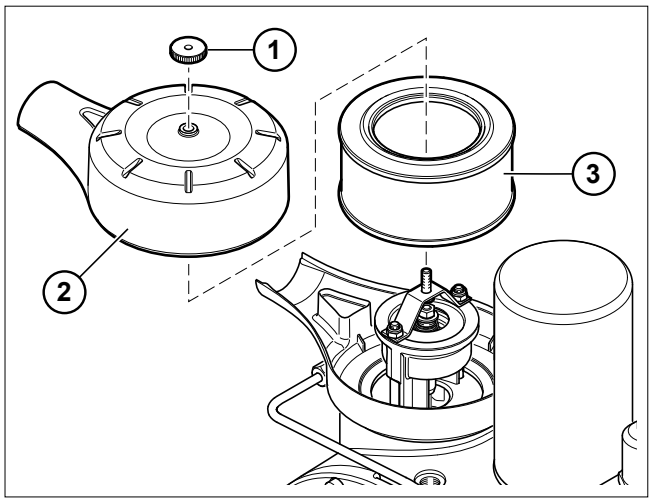

Figure 7-5

Attention

No dirt or dust particles may get into the air inlet of the screw compressor.

Note

It is not permissible to clean the filter element; the filter element must always be replaced in case of soiling!

Dispose of the old air filter element according to the applicable regulations.

- Switch off the system and secure it against unauthorized switch-on.
- Screw off the nut **1** and remove the filter cover **2**.
- Carefully remove dust from the filter housing.
- Remove the old filter element **3**.
- Insert the new filter element in the filter housing.
- Lay on the filter cover, ensuring proper positioning during assembly.
- Tighten the wing nut.
- Switch on the screw compressor system.
- Conduct a test run and an operating test.

7.7 Maintenance check sheet

• Elapsed time meter reading								
	• Replace intake filter							
		• Replace oil filter cartridge						
			• Replace oil fine separator cartridge					
				• Retension V-belts				
					• Replace V-belt set			
						• System repair		
							• Date	
								• Mechanic

Mark work carried out with an „X“ or enter measured values and confirm with your signature.

7.8 Maintenance intervals

Attention

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 NK 31 screw compressor module.

Maintenance intervals (Bh = operating hours)	Maintenance work	See chapter
Before commissioning	Check oil level in separator tank	7.2
Once after 50 Bh	Check oil level in separator tank Tighten all screw pipe fittings and electrical screw terminal fittings; check all other connections for firm seating	7.2
Every 100 Bh	Check oil level in separator tank, top up in case of oil shortage Check maintenance indicator	7.2
Every 1,000 - 6,000 Bh depending on application Recommendation: every 12 months	Replace fine separator cartridge Carry out oil change Replace oil filter Replace filter element in intake air filter Check system for leaks System inspection.	7.5.2 7.3 7.4.2 7.6.2

8 Lubricants and Operating Materials Maintenance Parts

8.1 Lubricants and operating materials

8.1.1 Oil recommendation

RC screw compressors must be operated with an oil suitable for special requirements. This oil must be approved by the manufacturer for screw compressors.
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 on request.
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 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 manufacturer and the same oil type as is currently in use in the screw compressor.

8.1.3 Measures at low room temperature

Sufficient room heating.
At ambient temperatures below 0°C/32°F, the system must be heated up to at least 20°C/68°F before start-up with an integrated standstill heater.

8.1.4 Piping materials

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

Note

See the information sheet!

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

- High resistance to aging
- High dispersive power
- Flash point: over 200°C/392°F
- Minimum foaming
- High corrosion protection
- Operating temperature: up to 110°C/230°F
- Select suitable viscosity class, e.g. ISO VG 68.

Attention

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

Determination of absolute humidity in intake air [g/m³]

Temperature of intake air [°C]	Relative humidity 30%	40%	50% 1*)	60%	70%	80%	90% 2*)	100%
50	24,7	32,9	41,1	49,4	57,6	65,8	74,0	82,3
45	19,5	25,9	32,4	38,9	45,4	51,9	58,4	64,9
40	15,2	20,3	25,3	30,4	35,5	40,5	45,6	50,7
35	11,8	15,7	19,6	23,6	27,5	31,4	35,4	39,3
30	9,0	12,0	15,0	18,1	21,1	24,1	27,1	30,1
25	6,9	9,1	11,4	13,7	16,0	18,3	20,6	22,8
20	5,1	6,9	8,6	10,3	12,0	13,7	15,4	17,2
15	3,8	5,1	6,4	7,6	8,9	10,2	11,5	12,7
10	2,8	3,7	4,7	5,6	6,6	7,5	8,4	9,4
5	2,0	2,7	3,4	4,1	4,8	5,4	6,1	6,8
0	1,5	2,0	2,4	2,9	3,4	3,9	4,4	4,9
-5	1,0	1,3	1,6	1,9	2,3	2,6	2,9	3,2
-10	0,7	0,9	1,1	1,3	1,5	1,7	1,9	2,2

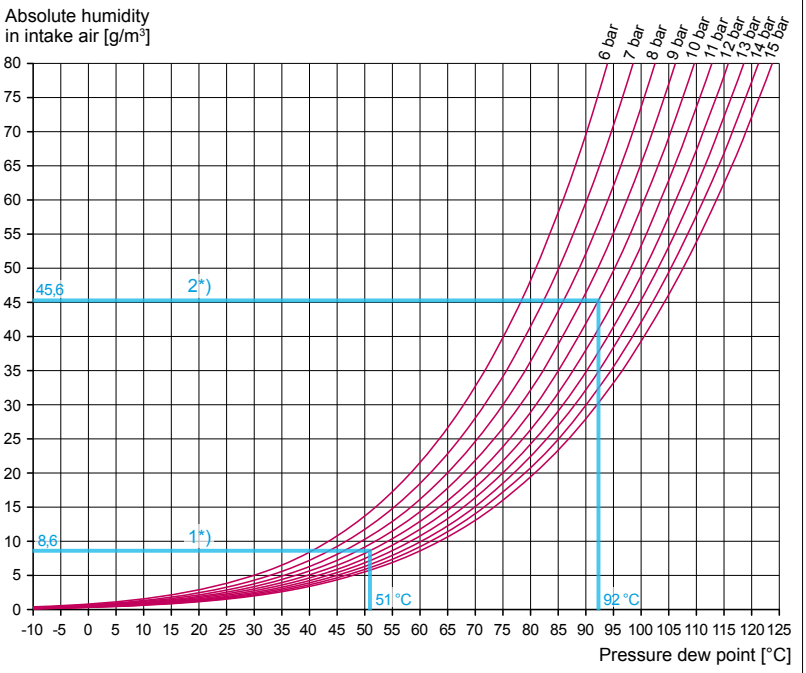

Figure 8-1 Pressure dew point graph

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/m³ 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/m³ 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 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 compressor 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 compressor 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 compressor 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 compressor drive.

8.1.9 Oil separation

The fine oil separation becomes poorer in the upper area with an increasing compressor 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 compressors.

Attention

Only use oils approved for screw compressors!

9 Technical Data and Tightening Torques

9.1 Technical data

Screw compressor model	RC	NK 31
Max. operating pressure.	bar (g)	15
	psi	218
Max. gauge pressure.	bar (g)	16,5
	psi	239
Max. delivered quantity according to DIN 1945 up to *	m^3/min	1,18
	cfm	42
Required output up to (full load without fan)	kW	7,5
	hp	10
Max. speed of main rotor **	rpm	4200
Oil capacity, approx.	l	3
Machine weight without oil, approx.	kg	39
	lbs	86
Compressed-air connection	inch	G ½“
Max. outlet temperature	°C	110
	°F	230
Max. room temperature	°C	45
	°F	115

* at 7 bar (g)
** up to max. 7 bar (g)

Note
This sheet contains only general technical data for this screw compressor.
The corresponding ROTORCOMP performance sheet applies for calculation, design and measurement.
Technical data on the entire screw compressor system, drive motors, electrical system and accessory components in accordance with the corresponding data sheet of the manufacturer or supplier.

9.2 Tightening torques

Attention

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	
	Compressor 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 separator cartridge too high with clogged or full separator cartridge	Replace separator cartridge	7.5.2
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	7.4.2
	Thermostat defective	Replace thermostat	3.10.2
	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	

Fault	Possible cause	Remedy	See chapter
Safety valve blows off	Safety valve defective	Replace safety valve	
	Fine separator cartridge soiled	Replace cartridge	7.5.2
	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	7.5.2
	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	7.6.2
	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	

Fault	Possible cause	Remedy	See chapter
Control valve does not close	Pressure switch, or control valve	Check setting	
Oil exits through intake control valve during stopr	Sealing surface on intake control valve damaged, spring in intake control valve 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

ROTORCOMP VERDICHTER GmbH
Industriestraße 9
82110 Germering
Germany

phone +49 89 72 409 - 0
fax +49 89 72 409 - 38

info@rotorcomp.de
www.rotorcomp.de

A Member of BAUER GROUP