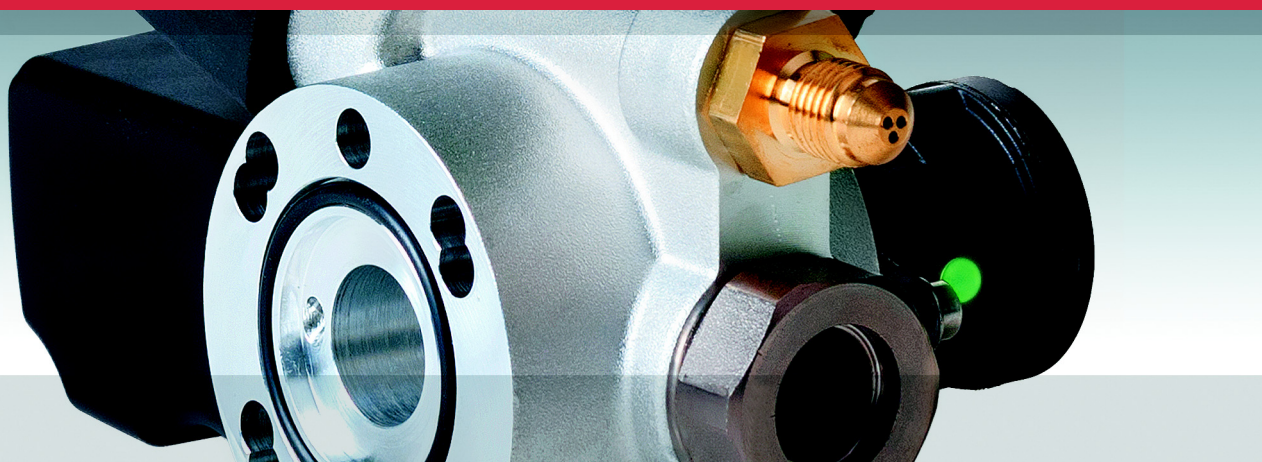


KRIWAN Oil level regulators

Operating Instructions Accessories and Application Information



Content

General information	4
Manufacturer	4
Storage information	4
Supplementary documents	4
List of standards and directives applied	4
Guarantee and liability	5
Updating	5
Copyright	5
1 Safety Guidelines	6
1.1 Meaning of the symbols and safety instructions used in this document	6
1.2 General safety instructions	6
1.2.1 Due diligence of the operator	6
1.2.2 Requirements for personnel	7
1.3 Special types of danger	7
1.3.1 Pneumatic dangers	7
1.3.2 Electrical dangers	7
1.3.3 Thermal dangers	7
1.3.4 Environmental sources of danger	7
2 Product Description	8
2.1 Usage in the specified manner	8
2.2 Reasonably foreseeable misuse	8
2.3 CE Declaration	8
2.4 Application limits	8
2.4.1 Mechanical limits	8
2.4.2 Energy limits	8
2.4.3 Temporal limits	8
2.4.4 Operator limitations	8
3 Transport and Storage	8
4 Assembly	9
4.1 Safety instructions for the installation	9
4.2 Preparation	9
4.3 Electrical connection	9
4.4 Installation	10
4.4.1 Mechanical installation	10
4.4.2 Cable installation	10
4.4.3 DP cable connections	10
4.5 Before commissioning	10
5 Functional description	11
5.1 Application information	11
5.2 INT280 B	11
5.3 "INT280-xxx"	11
5.3.1 "INT280-xxx" Diagnose	12
5.3.2 Explanation of individual parameters.....	12
5.4 "INT280-xxx" Version 2.....	13
5.4.1 Switch on.....	13
5.4.2 Filling process (fixed and adaptive operating mode)	13
5.4.3 Oil level	13
5.4.4 Filling cycle	14
5.4.5 Explanation of the parameters	15
.....	16
5.4.6 Replenished oil quantity	16
.....	17
5.4.7 INTspector, explanation of the values for oil status	17

6	Troubleshooting	18
7	Service	19
7.1	Inspection	19
7.1.1	Function check	19
7.2	Maintenance	19
7.3	Cleaning	19
7.3.1	INT280 B	19
7.3.2	"INT280-xxx"	19
8	Decommissioning and disassembly	20
9	Disposal	20
10	Accessories	21
10.1	Adapter	21
10.1.1	INT280 Adapter 1 1/8"- 12 UNF	21
10.1.2	INT280 Adapter 1 1/8"- 18 UNEF	21
10.1.3	INT280 Adapter 3/4"- 14 NP	22
10.1.4	INT280 Adapter 1 3/4"- 12 UNF	22
10.1.5	INT280 Adapter 1 1/4"-12 UNF	23
10.1.6	INT280 Distance adapter	23
10.2	DP-Y Cable	23
10.3	Replacement seals	24
10.4	Filter installation kit	24

General information

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Manufacturer

KRIWAN Industrie-Elektronik GmbH

Allmand 11

D-74670 Forchtenberg

Phone (+49) 7947 822 0

Fax (+49) 7947 1288

E-mail: info@kriwan.com

Home: www.kriwan.com

Storage information

The operating company is obligated to store these operating instructions for accessories and application information as well as the data sheet for everyone who is tasked with work on or with the system.

A missing document or missing pages need to be replaced promptly.

This document is available for download at www.kriwan.com.

Supplementary documents

In combination with this application information, the following documents and forms need to be observed:

- The data sheet belonging to the oil level regulator
- General or applications-specific operating instructions in the context of labor protection laws and regulations relating to operating materials
- Accident prevention guidelines
- Legal provisions
- Local provisions

List of standards and directives applied

See EU declaration of conformity

Guarantee and liability

The "General Conditions of Sale and Delivery" of the manufacturer are valid as a matter of principle. They are available to the customer at the latest when the contract is signed.

The manufacturer rules out warranty and liability claims in cases of personal and material damage if they can be traced to one or several of the following causes:

- Usage not in the specified manner
- Improper installation, commissioning and application
- Operation when safety systems are not properly attached or not functioning
- Ignoring the safety instructions and information in these application instructions and in the data sheet
- Unauthorized reconstructions and modifications
- Improper or late maintenance
- Accessories, spare parts, and additives that are the cause for damages and for which there are no releases from the manufacturer
- Catastrophic cases due to foreign objects and acts of nature beyond control

Updating

This document is not subject to updating by the manufacturer.

Changes in document can be carried out without further announcement.

The respective current version is available from the manufacturer.

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1 Safety Guidelines

1.1 Meaning of the symbols and safety instructions used in this document

NOTICE

Please note that a safety symbol can never replace the text of safety instructions – the text of safety instructions must therefore always be read completely.

This document contains information that must be observed to protect persons against injuries as well as to prevent material damage.

The safety instructions to protect persons against injuries are highlighted by a signal panel with a warning triangle and a signal word defined according to ANSI Z535.6-2006: A1.2.

The signal words are classified according to ANSI Z535.6-2006: C4.2.

Depending on the degree of exposure, the panels are displayed as following:

DANGER

Points marked with this symbol indicate that fatal or serious injuries will occur if the respective safety precautions are ignored!

WARNING

Points marked with this symbol indicate that fatal or serious injuries can occur if the respective safety precautions are ignored!

CAUTION

Points marked with this symbol indicate that less serious injuries can occur if the respective safety precautions are ignored!

NOTICE

Points marked with this symbol refer to further information and application hints. This symbol does not indicate safety instructions.

The text of safety instructions is organized in:

Description of the type and source of danger

- Description of the consequences if safety instructions are ignored.
- ➞ Precautions

1.2 General safety instructions

Please note that the device is intended exclusively for the application range stated in this document or in the data sheet. Any other or further usage is deemed as usage not in the specified manner.

Use the device

- in the specified manner
- in fault-free condition
- while minding safety and dangers.

The device may be operated only in its specified performance limits (see Technical specifications).

Have malfunctions that may negatively affect the safety rectified immediately.

Only original parts of the manufacturer are approved as spare parts and accessories.

1.2.1 Due diligence of the operator

The operator is responsible for implementing a suitable safety concept and for procuring additional safety equipment.

WARNING

Selection of suitable components

- Danger to the operational reliability
- ➞ Only such components may be selected that are approved for the planned operating condition.

1.2.2 Requirements for personnel

⚠ WARNING Improper installation, commissioning or maintenance.

- Danger to the operational reliability.
 - ➡ Installation, commissioning and maintenance tasks may be carried out only by authorized technicians.
 - ➡ Read the operating instructions thoroughly. Non-adherence can cause the device to fail or be destructed and can lead to injuries.
-

1.3 Special types of danger

1.3.1 Pneumatic dangers

⚠ WARNING Danger of bursting

- Pressurised parts that burst can cause serious to fatal injuries.
 - ➡ The max. test pressure must not be exceeded.
-

⚠ WARNING Pressure in the compressor

- Working on pressurised parts can cause serious to fatal injuries.
 - ➡ Work on the pneumatic equipment may only be carried out by refrigeration technicians.
 - ➡ Depressurise the respective part of the system before installation or disassembly.
-

1.3.2 Electrical dangers

⚠ WARNING Electric shock

- Touching live parts can lead to serious to fatal injuries.
 - ➡ Work on the electric equipment may only be carried out by electricians, taking into account the information specified in the Technical specifications chapter.
 - ➡ The applicable European and national standards for connecting electrical equipment must be observed.
 - ➡ The voltage supply to the oil level regulator has to be switched off prior to connection/ installation and the subsequent tasks.
 - ➡ Maintain the operating voltage specified on type plate.
-

1.3.3 Thermal dangers

⚠ WARNING Overheating

- Fire due to overheating
 - ➡ Maintain temperatures within the specified limits.
-

1.3.4 Environmental sources of danger

⚠ WARNING Electric ignition sources

- Explosion due to electric ignitions of an explosive atmosphere.
 - ➡ The device must not be operated in an explosive atmosphere.
-

⚠ WARNING Electric ignition sources

- Fire due to overheating.
 - ➡ The device must not be operated in flammable areas.
-

2 Product Description

2.1 Usage in the specified manner

The oil level regulator monitors and controls the oil level in the refrigerant compressors.

Details can be found in the corresponding data sheet.

The INT280 adapters (see Chapter Accessories) serve to connect the oil level regulator to refrigerant compressors. The necessity and possibly the selection of an adapter are determined by the design of the sight glass of the refrigerant compressor.

Special specifications on usage in the specified manner:

- The KRIWAN oil level regulators may be operated only within their specified performance limits (see Technical specifications chapter of the respective data sheet).
- Observing the installation instructions and following the maintenance and repair regulations are a prerequisite for use in the specified manner.
- Any other or further usage is deemed as usage not in the specified manner.

2.2 Reasonably foreseeable misuse

- Operation in potentially explosive areas is not permitted.
- Operation in flammable areas is not permitted.
- Modifications to the device are not permitted.
- Spare parts or accessories not supplied by the manufacturer are not permitted because they have not been tested for the operation and they may negatively affect operational safety.

NOTICE

The manufacturer assumes no liability for damages caused by misuse.

2.3 CE Declaration

The valid CE Declaration can be requested from the manufacturer.

2.4 Application limits

2.4.1 Mechanical limits

Mechanical limits according to drawing and technical data on the separate data sheet or in the description of the accessories of this document.

2.4.2 Energy limits

Electrical: Connection specifications refer to separate data sheet.

2.4.3 Temporal limits

Until shut-down.

2.4.4 Operator limitations

Normal mode:	trained personnel
Maintenance / Repair:	trained, qualified personnel

3 Transport and Storage

CAUTION**Soiling of the oil level regulator, in particular the oil connections.**

- Soiling can cause malfunctions.
 - ➞ Transport and storage only in the original transport packaging or in a suitable individual packaging.
-

4 Assembly

4.1 Safety instructions for the installation



WARNING

Danger of bursting

- Pressurised parts that burst can cause serious to fatal injuries.
- The max. test pressure must not be exceeded.



WARNING

Pressure in the compressor

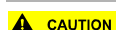
- Working on pressurised parts can cause serious to fatal injuries.
- Work on the pneumatic equipment may only be carried out by refrigeration technicians.
- Depressurise the respective part of the system before installation or disassembly.



WARNING

Electric shock

- Touching live parts can lead to serious to fatal injuries.
- Work on the electric equipment may only be carried out by electricians, taking into account the information specified in the Technical specifications chapter.
- The applicable European and national standards for connecting electrical equipment must be observed.
- The voltage supply to the oil level regulator has to be switched off prior to connection/ installation and the subsequent tasks.
- Maintain the operating voltage specified on type plate.



CAUTION

Soiling of the oil level regulator, in particular the oil connections.

- Soiling can cause malfunctions.
- Installation must be carried out without soiling.

4.2 Preparation

- Prior to installation, ensure that the O-ring at the connecting flange is seated properly.
- There must be no foreign objects in the oil infeed or outfeed area of the Ölspiegelregulators.
- The device has to be mounted to the compressor horizontally. It can be rotated by 180°.
- Use matching washers for the flange fastening screws.
- For use at low temperatures, an oil sump heater has to be installed, to ensure trouble-free operation of the Ölspiegelregulators.
- An oil filter has to be installed in the oil infeed line of the Ölspiegelregulators, to prevent the solenoid valve seat from getting dirty.

4.3 Electrical connection



NOTICE

Separate isolation switches are necessary for the KRIWAN oil level regulators.

- The electrical connection is carried out according to the respective wiring diagrams, which are part of the corresponding data sheets.
- For the 115V and 24V versions, ensure that the correct supply voltage is used.

4.4 Installation

4.4.1 Mechanical installation

NOTICE

The oil level regulator has to be installed in such a way that the sight glass points to the left or to the right. Only the horizontal installation according to the data sheet is in the specified manner and thus permitted.

1. Pre-assemble the oil level regulator in the mounting position.
2. Screw in screws by hand.
3. Then tighten with 9Nm tightening torque.
4. The oil connection has the thread 7/16 -20 UNF
5. The oil connection must be mounted with a tightening torque of 8Nm.

Additionally for the installation of an adapter:

1. Ensure the cleanliness of the thread of the compressor and adapter.
2. Assemble the INT280 adapter so that the hexagon of the inner part is flush mounted with the outer ring (see note A in dimensions in mm in the Accessories chapter).
3. Mount the thus pre-assembled INT280 adapter to the compressor with the specified torque of the manufacturer.
4. Mount the INT280 oil level regulator with sealing ring to the adapter; mounting the screws hand-tight with the included washers. Then tighten with 9Nm tightening torque.

4.4.2 Cable installation

Observe the following points when routing the connecting cables:

- Do not go below the bending radius permitted for the cable used.
- Fixate the cable suitably at sufficient distances.
- Route the cable with drip loop.
- The seal of the PG screw fittings is ensured only when approved cable cross-sections are used (see data sheet).
- If the cover of the electronic part was opened, it must be screwed with a tightening torque of 3Nm.

4.4.3 DP cable connections

- The "INT280-xxx" Diagnose can operate with the data of the compressor protection units INT69 Diagnose. Coupling is by a DP-Y cable (see Accessories).
- If there is a network with an INT600 DM, only original DP cables from KRIWAN may be used.
- DP cables may not be modified or extended.
- If no DP cable is connected, then the DP protection needs to be mounted.
- DP cables may only be connected or disconnected when there is no voltage.

4.5 Before commissioning

- Before the oil level regulator is switched on for the first time, the oil level should already be at ¼ of the sight glass to prevent the alarm relay from being deactivated.
- Before the refrigerating system is filled with refrigerant, the system and the connections of the Ölspiegelregulators have to be checked for leaks.

5 Functional description

5.1 Application information

NOTICE

For proper operation, make sure that there is always enough oil in the oil reservoir and sufficient oil pressure is available.

If there is a malfunction in the refrigeration circuit, in particular in cases where foreign particles, e.g. soot, may get into the oil circuit, the oil and the corresponding filters need to be replaced. The oil level regulator also needs to be replaced in case a cleaning of the prism of the oil level regulator cannot be done.

5.2 INT280 B

After the INT280 B is switched on, the alarm relay picks up after 3s, if no malfunction is present (closed-circuit principle). Regardless of the oil level, a 20 second pause is activated to allow the oil to settle. If, thereafter, a too low oil level is detected, the solenoid valve switches to oil injection in a specified cycle:

1st cycle: fill 5s / wait 5s,

2nd cycle: fill 10s / wait 10s,

3rd cycle: fill 20s / wait 20s...

If, after 135s, an adequate oil level has not been reached, the alarm relay drops out. The last filling cycle that has been reached (fill approx. 30s and wait approx. 30s) stays active. If an adequate oil level has been reached, the alarm relay picks up again after a waiting time, the filling cycle is reset.

If there is a device malfunction (e.g. low supply voltage), the alarm relay drops out and is locked, regardless of the oil level, after approx. 5s. No filling procedure is performed.

The lock can be released by an open circuit of the voltage supply for at least 5s.

5.3 "INT280-xxx"

After the "INT280-xxx" is switched on, the alarm relay picks up after 3s, if no malfunction is present (closed-circuit principle). Regardless of the oil level, a 2 second pause is activated, to allow the oil to settle. If, thereafter, a too low oil level is detected, the solenoid valve switches to oil injection for the filling time (default 10s).

If the fill level has not been reached until then, the solenoid valve is switched off for the break time (default 20 % = 2s) and then switched back on for the filling time. This is continued until the fill level is reached.

If an adequate oil level has not been reached after the oil deficiency alarm delay has expired (default 120s), the alarm relay drops out. Refilling oil is continued to be attempted. If an adequate oil level has been reached, the alarm relay picks up again after a waiting time.

If there is a device malfunction (e.g. low supply voltage), the alarm relay drops out and is locked, regardless of the oil level, after approx. 5s. No filling procedure is performed.

The "INT280-xxx" has its own monitoring system of the optical sensor. If there is a malfunction, the alarm relay is locked and the error is signalled by the flash code.

If there is a soiling of the glass cone, this is signalled by the flash code when the warning threshold is exceeded. The function continues to be ensured.

A cleaning should be carried out during the next general maintenance, see Chapter Cleaning.

If the soiling of the glass cone reaches a critical value, the compressor is switched off locked or the warning soiling stage 2 is generated, depending on the setting.

The lock can be released by an open circuit of the voltage supply for at least 5s.

5.3.1 "INT280-xxx" Diagnose

By means of the diagnose port, data such as the last 20 errors, error counters, current status and switching behaviours can be read out with the INTspector.

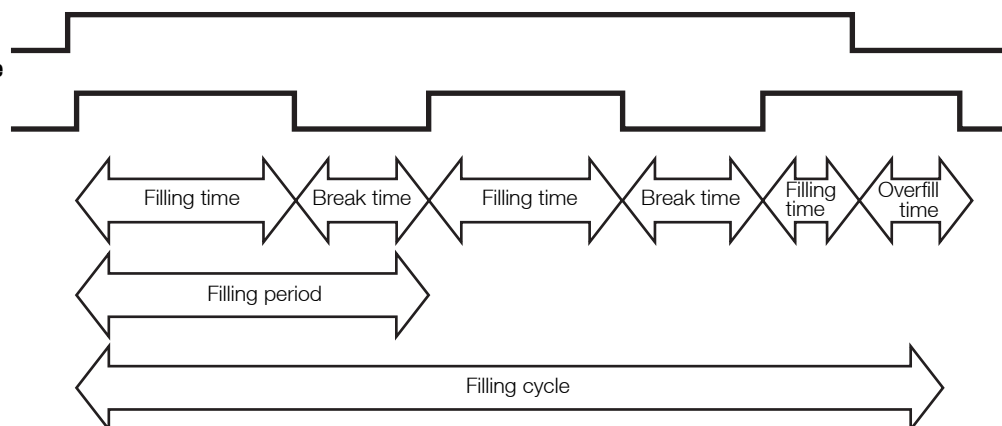
A variety of parameters to be adjusted for optimal adaption to the application. Refer to the data sheet on which parameters these are.

Oil level

too low
good

Solenoid valve

open
closed



5.3.2 Explanation of individual parameters

Parameter name	
Filling cycle type	With "fixed", the filling cycle runs with the set filling and break time. If the filling cycle type is switched to "adaptive", the "INT280-xxx" calculates the optimal filling and break times itself. The times are calculated so that the set nominal filling period number is calculated.
Filling time	Time that the solenoid valve is opened cyclically if there is an oil deficiency.
Break time	Time that the solenoid valve is closed cyclically if there is an oil deficiency. The time is specified in percent of the filling time.
Overfill time	Once the fill level of the oil has been reached, the solenoid valve remains open for the time set here.
Set number of filling periods	With "adaptive" control, the oil level regulator calculates the times so that this number of filling times is needed until the filling.
Oil deficiency alarm monitoring	A choice can be made here whether the alarm delay of the compressor run should be evaluated or not.
Oil deficiency alarm delay	If a deficiency of oil is detected, this time is started. Once the time has elapsed, the relay switched the compressor off. If the function "Alarm monitoring only when compressor is running" is active, the time is stopped when the compressor is at standstill. Once the compressor starts up again, it continues to run.
External alarm via DP bus	When the Diagnose devices are connected, a choice can be made here whether an alarm from a different Diagnose device will also cause the alarm relay of the oil level regulator to be switched off and that the alarm is displayed at the LED of the oil level regulator.
Operating recognition via DP bus	A setting can be made here whether the run detection should be evaluated or not of a connected Diagnose compressor protection unit.
Behaviour monitoring	A setting can be made here whether the behaviour monitoring should be active or not.
Filling cycle time overrun coefficient	When the DP bus run detection is active, the oil level regulator determines an average filling cycle time. If this time is exceeded during a filling process for the coefficient set here, a warning is generated.
Time overrun without filling coefficient	When the DP bus run detection is active, the oil level regulator determines an average time without filling process. If this time is exceeded during compressor run for the coefficient set here, a warning is generated.
Soiling stage 2	The glass cone is monitored for soiling. A choice can be made here whether the compressor should be switched off if the second soiling stage is exceeded.

5.4 "INT280-xxx" Version 2

5.4.1 Switch on

After switching on the "INT280-xxx", the alarm relay picks up after 3s, as long as there is no fault. (closed-circuit current principle). Regardless of the oil level, a 2s pause is activated for oil calming. After this, the INT280 switches to normal operation.

5.4.2 Filling process (fixed and adaptive operating mode)

If a too low oil level is detected, the green LED flashes and the solenoid valve for oil injection switches on for the filling time. When the fill level is reached, the solenoid valve is closed and the LED changes to on. If the filling level has not been reached by the end of the filling time, the solenoid valve is switched off for the pause time and then switched on again for the next filling time.

This is carried out until the fill level is reached or the target number of filling periods has been reached.

- 1) Level reached: filling is finished and the green LED changes to on.
- 2) Target number of filling periods has been reached: Depending on the settings, either the solenoid valve is closed for a long pause or filling is terminated.
 - a) long pause time > 0: the long pause is executed and then a new filling period is started.
 - b) long pause time = 0: the compressor is switched off and an alarm is generated. The compressor remains switched off and no oil is added until a reset is performed.

If the oil level falls below the alarm limit, the low oil alarm delay time is started. If a sufficient oil level is not reached by the end of this alarm delay time (default 120s), the alarm relay drops out. A further attempt is made to top up the oil. If a sufficient oil level is reached again, the alarm relay picks up again.

In the event of a fault in the device (e.g. low supply voltage), the alarm relay drops out after approx. 5s, locked independently of the oil level. No filling process takes place.

The "INT280-xxx" has a self-monitoring of the optical sensor. In the event of a fault, the alarm relay is switched off in a locked state and the fault is output via the blink code.

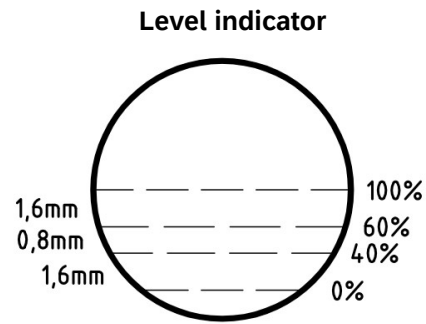
If contamination of the glass cone occurs, this is signaled via the blink code when the warning threshold is exceeded. The function is still ensured. Cleaning should be performed during the next general maintenance, see chapter Cleaning. If the contamination of the glass cone rises to a critical value, the compressor is switched off or the warning Contamination level 2 is generated, depending on the setting. Ignoring this message can lead to damage to the compressor. A locked shutdown must be cancelled via the parameter Locking due to deposit.

5.4.3 Oil level

The oil level can be checked via the sight glass or via the value in the INTspecter app.

The oil level in the sight glass is calmed compared to the oil level in the crankcase. This means that small differences may occur between the oil level in the sight glass and in the compressor housing, e.g. in the event of heavy foaming.

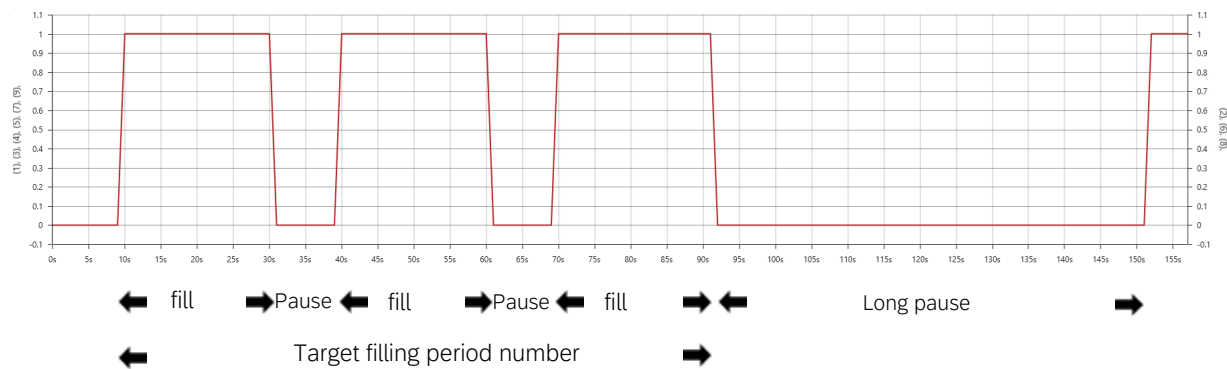
The oil level displayed in the INTspecter is a relative level. This means that 100% corresponds to the middle of the sight glass and 0% corresponds to 4mm lower. If the level rises above the middle of the sight glass, 100% is still displayed.



Assignment of the relative level in the sight glass

5.4.4 Filling cycle

- is started when the level falls below 40%.
- is terminated when the level rises above 60%.
- a filling cycle consists of one or more filling processes and short or long pauses



Filling cycle, state of the solenoid valve

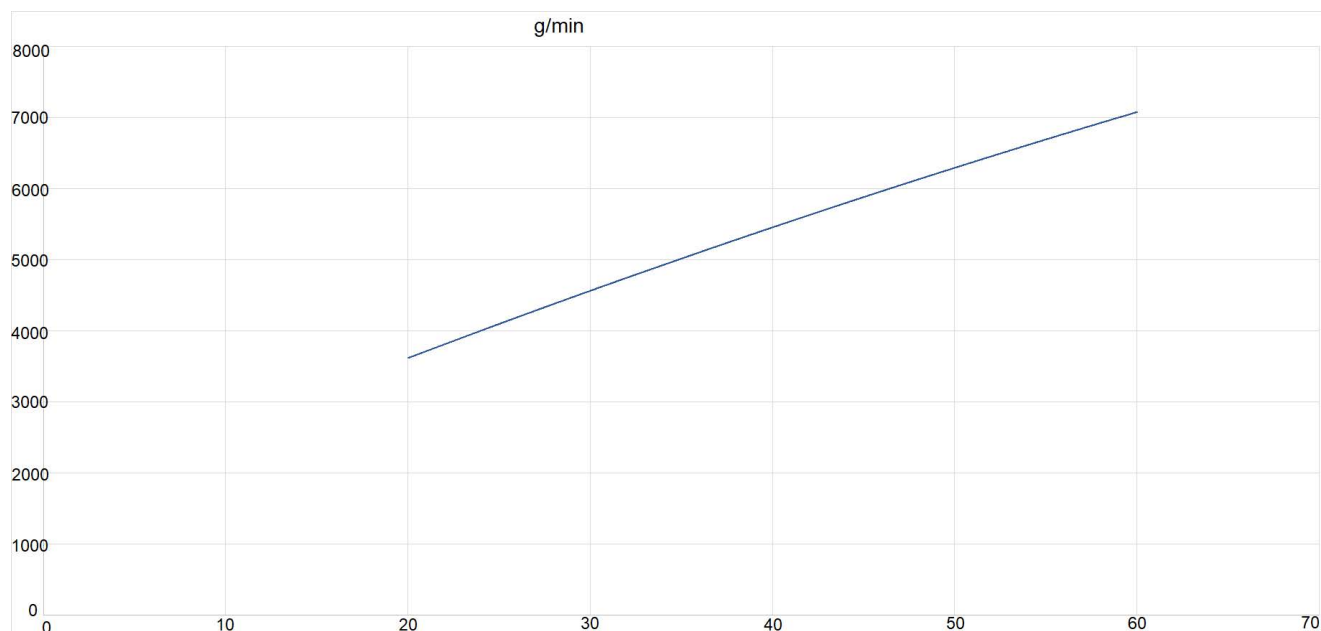
5.4.5 Explanation of the parameters

Parameter name	
Filling cycle type	<p>There are two operating modes. For most cases we recommend to use the adaptive one, because here an automatic adaptation to changing operating conditions takes place and if necessary a long pause is inserted</p> <p>Fixed</p> <ul style="list-style-type: none"> • The set filling, pause and long pause times are used. • The pause time is used as long as the number of filling periods is smaller than the target number of filling periods. <p>Adaptive</p> <ul style="list-style-type: none"> • The filling time. Long pause time and saturation time are calculated by the algorithm, according to the conditions. • The pause time is 5s, depending on whether the algorithm detects foaming, a long pause is inserted.
Filling time	Calculated in adaptive mode, at the first start the set values are used.
Break times	<ul style="list-style-type: none"> • The time is entered in seconds • In the adaptive operating mode, the pause time is always 5s
Long pause time	<ul style="list-style-type: none"> • Calculated in the adaptive mode • If 0 is set, filling is stopped after the target number of filling periods and an alarm is generated. • In the adaptive mode, the algorithm decides whether to perform a pause or a long pause • If the oil level is very low, in adaptive mode, during normal filling cycles, the long pause is not used
Target filling period number	<ul style="list-style-type: none"> • Used in both operating modes • After this number of filling periods, a long pause is always performed
Filling time max	Filling time max is the limit when calculating the time in adaptive mode.
Pause time max	Long pause time max is the limit when calculating the time in adaptive mode.
Oil differential pressure	<ul style="list-style-type: none"> • The average differential pressure between compressor and oil receiver must be entered here • It is needed for the calculation of the replenished oil quantity • This value is for information only, it has no effect on the regulation
Warning Oil supply disturbed	<ul style="list-style-type: none"> • A warning is generated when it is detected that not enough oil is coming from the collector • When filling is started there are normally two reactions, the oil level rises or, in the case of heavy foaming, the level drops. If the level remains constant, this warning is generated
Saturation time	<ul style="list-style-type: none"> • This is an additional filling time at the end of the filling cycle after detecting that the level has been reached • This additional filling time is useful for applications with very short times between two filling cycles • In the adaptive mode this time is calculated by the algorithm • If it is set to inactive, it will not be used
Blocking time	<ul style="list-style-type: none"> • This time starts after the end of a filling cycle • No new filling cycle can be started until the end of the blocking time, even if the oil level is low

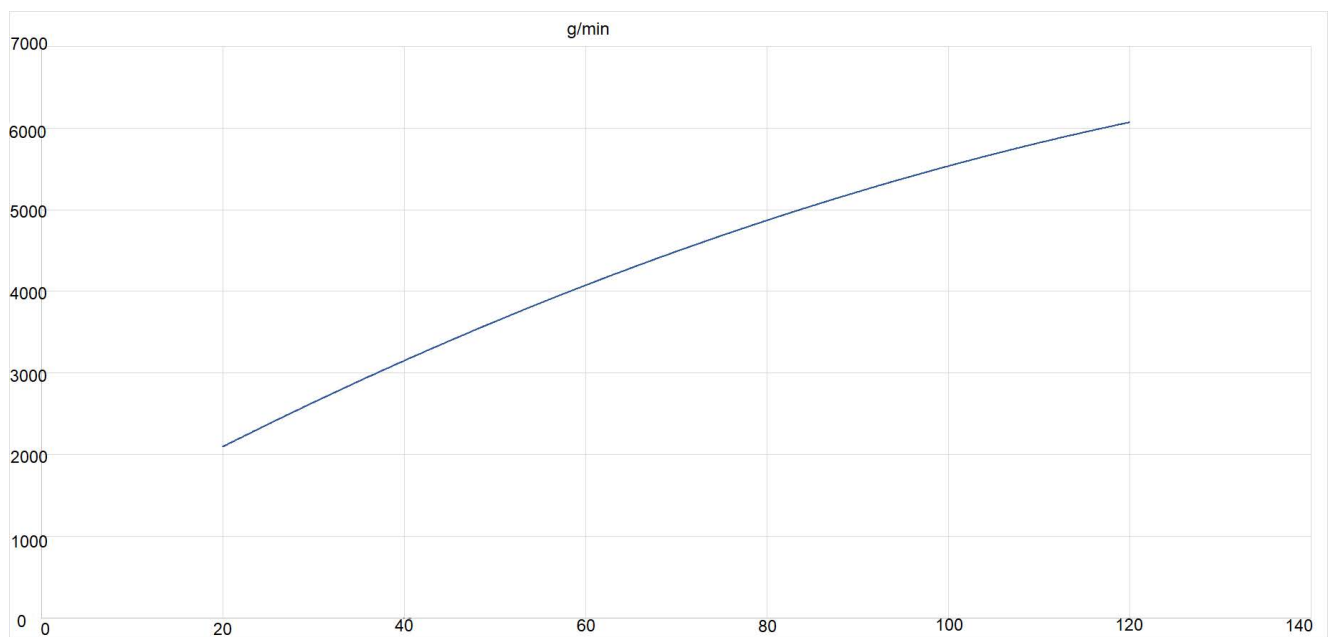
Time until shutdown Oil low	<ul style="list-style-type: none"> Time is started when the oil level falls below 20% Time is stopped when the oil level rises above 30%. When the time has expired, an alarm is generated The alarm is independent of the filling cycle
Trip delay Oil shortage	This delay time is started after too little oil has been detected. After the time has elapsed, filling is started. This function avoids too early refilling in case of oil movements in the crankcase.
Deposit measurement mode	<ul style="list-style-type: none"> Reaction when it was detected that the deposit on the prism becomes too strong "Disabled": Deactivation of the message, which means that the deposit measurement is performed but there is no indication on the LED or the alarm relay, the deposit value can be read in the INTspector. "Level 2 warning": exceeding of threshold 2 is indicated on the LED, there is no shutdown, the message is reset by a mains reset. Attention! Ignoring the message can lead to. "Level 2 shutdown": exceeding is indicated on the LED, a shutdown occurs, the message is reset by a mains reset Attention! Ignoring the message can lead to the destruction of the compressor. "Level 2 Locked" the exceeding is indicated at the LED, a shutdown takes place, the shutdown remains also after a mains reset. To reset the switch-off, the parameter Locking due to deposit must be set to Deactivated.
Locking due to Deposit	If the Deposit measurement mode parameter was set to Level 2 Locked and Threshold 2 was exceeded, the switch-off can be reset here.

5.4.6 Replenished oil quantity

Oil quantity as a function of differential pressure in bar (oil grade Reniso C85E, oil temperature 60°C)



INT280-60

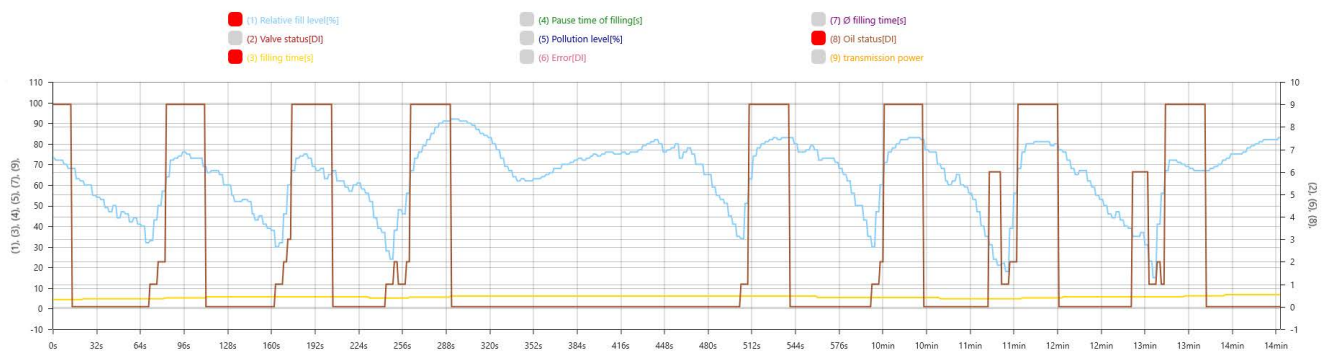


INT280-130

5.4.7 INTspecter, explanation of the values for oil status

The operation currently being performed by the oil level regulator can be displayed in the INTspecter under Live Diagnosis. To do this, "Oil status" must be activated.

- 1: Fill
- 2: Pause
- 3: Saturation
- 4: Alarm and filling
- 5: Alarm and pause
- 6: Deposit measurement
- 7: Long pause
- 8: Alarm and long pause
- 9: Blocking time



6 Troubleshooting

Malfunction	Possible cause	Solution
Oil level in the compressor too low even if there is refilling	No oil in the oil reservoir	Refill oil, find oil imbalance
Oil level in the compressor too low even if there is refilling	Differential pressure is too low	Check whether the differential pressure between oil reservoir and compressor is great enough; set differential pressure valve.
Compressor is running even though there is not enough oil in the compressor for a longer time.	Alarm relay not in the alarm chain	Correct the connection
Alarm relay pulls in even though compressor is at standstill	No filling possible due to missing inlet pressure	Use "INT280-xxx" Diagnose (run detection possible and thus no alarm when compressor at standstill)
Alarm relay responds although there is enough oil, after a short standstill of the compressor the relay switches on again	Due to missing preprint no filling possible	Use "INT280-xxx" diagnostics (run detection possible and therefore no alarm when compressor is stopped).

7 Service

7.1 Inspection

NOTICE

KRIWAN oil level regulators are maintenance-free and therefore there are no fixed inspection intervals specified for them.

7.1.1 Function check

If the application is being inspected for other reasons, the following points can be checked:

1. Is the oil level regulator complete and mechanically undamaged?
 - Replace oil level regulator if necessary.
2. Is the sight glass filled up to half?
 - See Chapter Malfunctions and Troubleshooting.
3. Is the oil level regulator still properly mounted; are the connections sealed?
 - Tighten the mounting screws if necessary.

7.2 Maintenance

NOTICE

The device is maintenance-free.
Replace the oil level regulator if there is a malfunction.

7.3 Cleaning

7.3.1 INT280 B

NOTICE

No special cleaning measures necessary.

NOTICE

The oil level regulator cannot be cleaned at the parts that determine the function.
Replace the oil level regulator if there is a malfunction.

7.3.2 "INT280-xxx"

NOTICE

If the oil level regulator signals that it is soiled, it can be removed and the glass prism can be cleaned with a soft cloth.

⚠ WARNING

Electric shock

- Touching live parts can lead to serious to fatal injuries.
 - ➡ Work on the electric equipment may only be carried out by electricians.
 - ➡ Disconnect the current from the respective part of the system before the disassembly.

⚠ WARNING

Pressure in the compressor

- Working on pressurised parts can cause serious to fatal injuries.
 - ➡ Work on the pneumatic equipment may only be carried out by refrigeration technicians.
 - ➡ Depressurise the respective part of the system before installation or disassembly.

1. Switch the system free of voltage.
2. Evacuate the refrigerant compressor.
3. Depressurise oil connection.
4. Remove the oil level regulator.
5. Clean the glass prim with a soft cloth.

8 Decommissioning and disassembly

**WARNING**

Electric shock

- Touching live parts can lead to serious to fatal injuries.
 - Work on the electric equipment may only be carried out by electricians.
 - Disconnect the current from the respective part of the system before the disassembly.

**WARNING**

Pressure in the compressor

- Working on pressurised parts can cause serious to fatal injuries.
 - Work on the pneumatic equipment may only be carried out by refrigeration technicians.
 - Depressurise the respective part of the system before installation or disassembly.

1. Switch the system free of voltage.
2. Evacuate the refrigerant compressor.
3. Depressurise oil connection.
4. Remove the oil level regulator.
5. Close the opening on the compressor with the original sight glass and close the oil level regulator with the original covers.

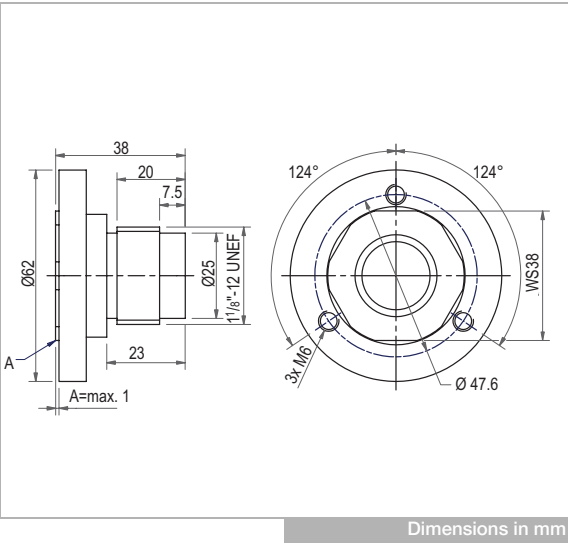
9 Disposal

All corresponding components have to be disposed of according to national recycling regulations.

10 Accessories

10.1 Adapter

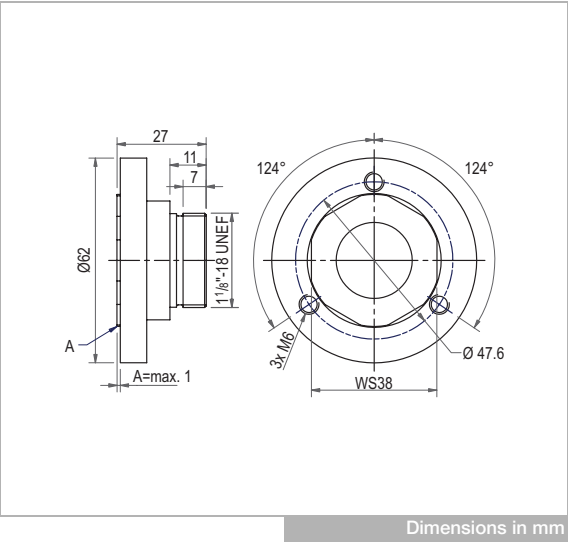
10.1.1INT280 Adapter 1 1/8"- 12 UNF



Order data	
INT280 Adapter 1 1/8" - 12 UNF	02 K 500 S21

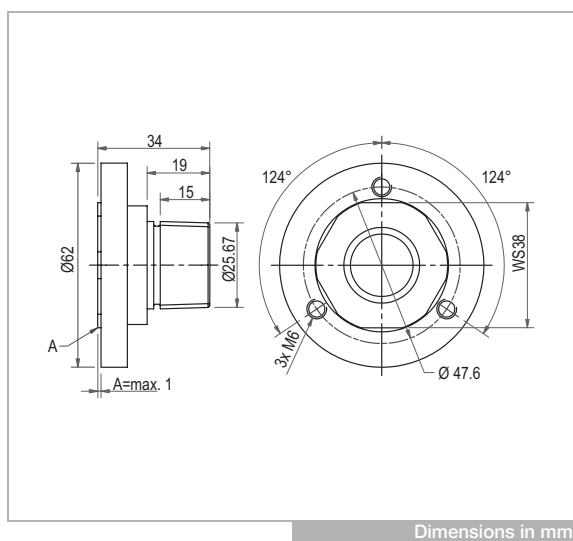
Technical specifications	
Permitted ambient temperature	-30...+100°C
Permitted rel. humidity	10-95% RH, without condensation
Operating pressure	max. 140bar
Test pressure	max. 210bar
Connection thread	1 1/8" - 12 UNF
Flange mounting	
- Screws	M6x20 Class 8.8 DIN 933
- Washer	DIN EN ISO 7089-6-St
- Toothed gear	DIN 6798-A 6.4-FSt
- Seal	EPDM
- Tightening torque	9Nm
Material	Steel, nickel-plated
Permissible media	Oils and refrigerant that do not attack the material of the adapter.
Dimensions	See dimensions in mm
Weight	Approx. 300g

10.1.2INT280 Adapter 1 1/8"- 18 UNEF



Order data	
INT280 Adapter 1 1/8" - 18 UNEF	02 K 502 S21

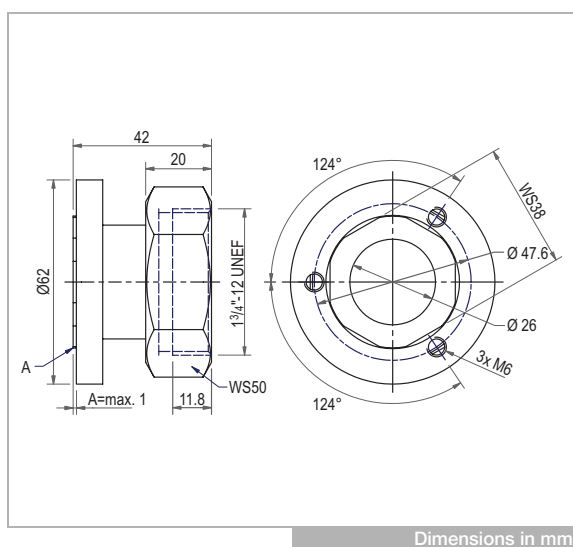
Technical specifications	
Permitted ambient temperature	-30...+100°C
Permitted rel. humidity	10-95% RH, without condensation
Operating pressure	max. 140bar
Test pressure	max. 210bar
Connection thread	1 1/8" - 18 UNEF
Flange mounting	
- Screws	M6x20 Class 8.8 DIN 933
- Washer	DIN EN ISO 7089-6-St
- Toothed gear	DIN 6798-A 6.4-FSt
- Seal	EPDM
- Tightening torque	9Nm
Material	Steel, nickel-plated
Permissible media	Oils and refrigerant that do not attack the material of the adapter.
Dimensions	See dimensions in mm
Weight	Approx. 300g

10.1.3INT280 Adapter 3/4"- 14 NP**Order data**

INT280 Adapter 3/4"- 14 NPT

02 K 503 S21**Technical specifications**

Permitted ambient temperature	-30...+100°C
Permitted rel. humidity	10-95% RH, without condensation
Operating pressure	max. 140bar
Test pressure	max. 210bar
Connection thread	3/4" - 14 NPT
Flange mounting	
- Screws	M6x20 Class 8.8 DIN 933
- Washer	DIN EN ISO 7089-6-St
- Toothed gear	DIN 6798-A 6.4-FSt
- Seal	EPDM
- Tightening torque	9Nm
Material	Steel, nickel-plated
Permissible media	Oils and refrigerant that do not attack the material of the adapter.
Dimensions	See dimensions in mm
Weight	Approx. 300g

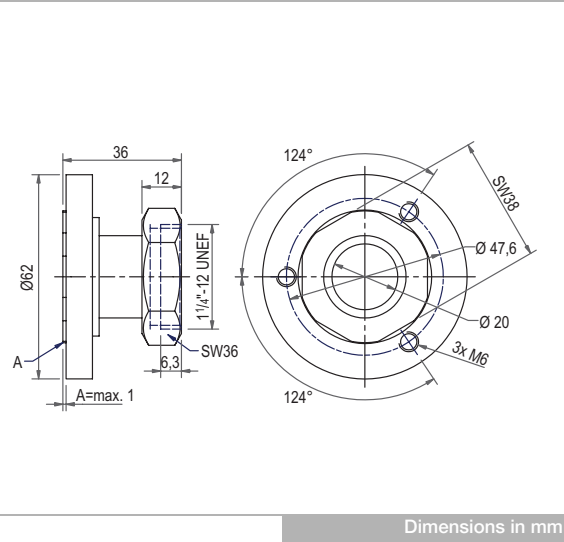
10.1.4INT280 Adapter 1 3/4"- 12 UNF**Order data**

INT280 Adapter 1 3/4"- 12 UNF

02 K 504 S21**Technical specifications**

Permitted ambient temperature	-30...+100°C
Permitted rel. humidity	10-95% RH, without condensation
Operating pressure	max. 140bar
Test pressure	max. 210bar
Connection thread	1 3/4" - 12 UNF
Flange mounting	
- Screws	M6x20 Class 8.8 DIN 933
- Washer	DIN EN ISO 7089-6-St
- Toothed gear	DIN 6798-A 6.4-FSt
- Seal	EPDM
- Tightening torque	9Nm
Material	Steel, nickel-plated
Permissible media	Oils and refrigerant that do not attack the material of the adapter.
Dimensions	See dimensions in mm
Weight	Approx. 300g

10.1.5 INT280 Adapter 1 1/4"-12 UNF



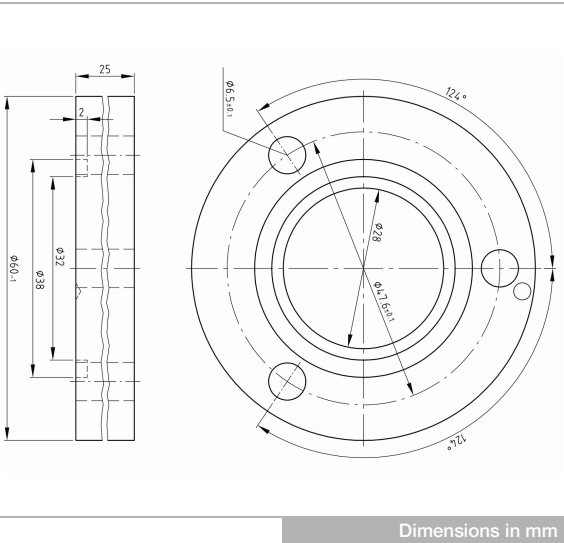
Order data

INT280 Adapter 1 1/4"-12 UNF | 02 K 505 S21

Technical specifications

Permitted ambient temperature	-30...+100°C
Permitted rel. humidity	10-95% RH, without condensation
Operating pressure	max. 140bar
Test pressure	max. 210bar
Connection thread	1 1/4" - 12 UNF
Flange mounting	
- Screws	M6x20 Class 8.8 DIN 933
- Washer	DIN EN ISO 7089-6-St
- Toothed gear	DIN 6798-A 6.4-FSt
- Seal	EPDM
- Tightening torque	9Nm
Material	Steel, nickel-plated
Permissible media	Oils and refrigerant that do not attack the material of the adapter.
Dimensions	See dimensions in mm
Weight	Approx. 300g

10.1.6 INT280 Adapter 1 1/4"-12 UNF



Order data

INT280 Adapter | 02 K 507 S21

Technical specifications

Permitted ambient temperature	-30...+100°C
Permitted rel. humidity	10-95% RH, without condensation
Operating pressure	max. 140bar
Test pressure	max. 210bar
Flange mounting	
- Screws	M6x85 Class 8.8 DIN 933
- Washer	DIN EN ISO 7089-6-St
- Toothed gear	DIN 6798-A 6.4-FSt
- Seal	EPDM
- Tightening torque	9Nm
Material	Steel, nickel-plated
Permissible media	Oils and refrigerant that do not attack the material of the adapter.
Dimensions	See dimensions in mm
Weight	Approx. 300g

10.2 DP-Y Kabel

Order data

DP-Y KABEL 600V | FK02098076

10.3 Replacement seals

Flange

Order data

INT280 - 60	O-ring 32x2,5 mm	HH10034
INT280 - 130	O-ring 32x2,5 mm	HH10042

Oil connection

Order data

INT280 - 60	O-ring 14x1 mm	HH10046
INT280 - 130	O-ring 14x1 mm	HH10047

Installation instructions

- INT280 de-energize
- Shut off compressor against refrigeration circuit of the plant
- Evacuate compressor
- Shut off oil supply
- Unscrew the oil supply line to the INT280
- Unscrew oil connection
- Insert a new O-ring into the circumferential groove of the screw-in thread.
- Screw the oil connection into the thread, O-ring must remain in the circumferential groove
- Oil connection must be tightened with 8Nm torque
- Screw oil supply line back on
- Test the tightness of the oil connection

10.4 Filter installation kit

Order data

INT280 - 60	Filter installation kit	02 Z 844 S010
INT280 - 130	Filter installation kit	02 Z 844 S020

KRIWAN Industrie-Elektronik GmbH

Allmand 11 · D-74670 Forchtenberg

phone (+49) 7947 822 0 · fax (+49) 7947 1288

e-mail: info@kriwan.com · home: www.kriwan.com

