

CENTRAL LUBRICATION

Dual Line Systems



DUAL LINE SYSTEMS

Designed specifically for harsh conditions

A dual line system is recommended for a large number of lubrication points with different lubricant requirements within a radius of up to 120 m, depending on the pipe diameter and ambient temperature and can thus be used for the central supply of entire productions. The monitoring possibilities of the main line up to the monitoring of individual lubrication

points and the option to operate the system autonomously or externally controlled ensure a reliable supply of the lubrication points. The system can be easily expanded by installing additional distributors.

Benefits

- ✓ **Reliable lubricant supply and exact lubricant metering** of an almost unlimited number of lubrication points across a line length of up to 120m
- ✓ **Highest operational safety** even under rough operating conditions
- ✓ **Simple expansion** or adaptation of the lubricant supply

Areas of application

- › Heavy industry
- › Cement works
- › Steel and aluminium industry
- › Pulp and paper industry
- › Mining and ore processing
- › Power plants



OPERATING PRINCIPLE

Dual Line System

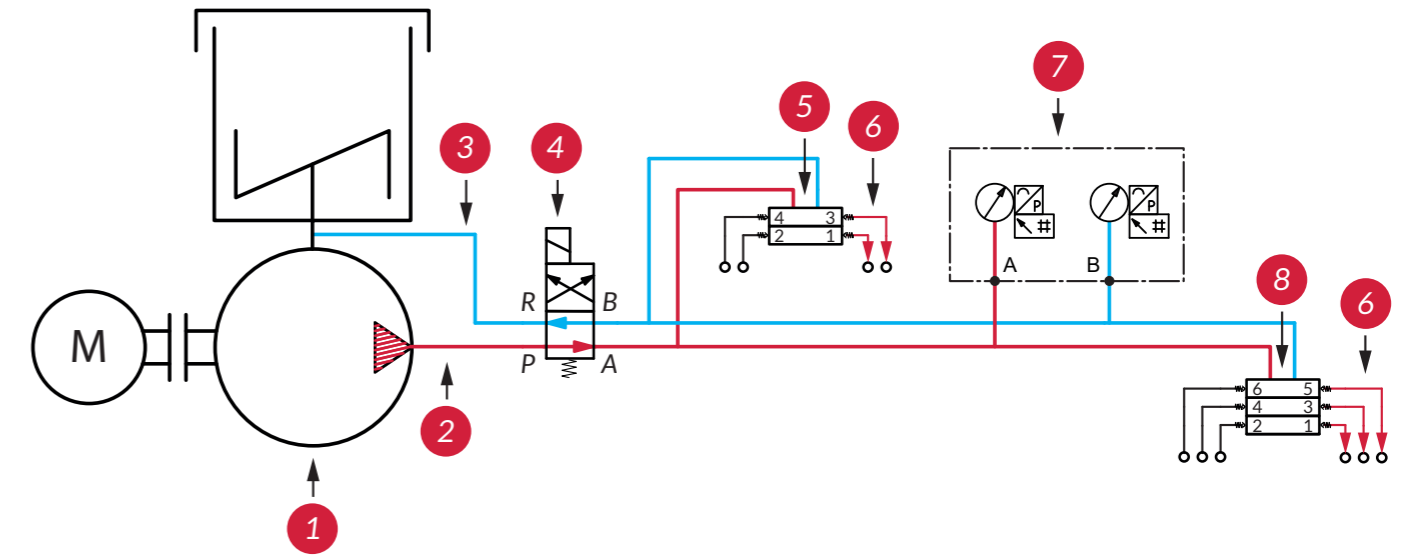
The pump delivers the lubricant via a 4/2 way solenoid valve and two main lines, alternately pressurised, to the distributors and subsequently to the lubrication points in doses.

In the first half impulse, the first main line is pressurised. When the preset pressure is reached, the limit pressure switch and the 4/2 way solenoid valve switch over, the pump stops and the pause time starts. The purpose of the pause time is to relieve the pressurised line - at cold ambient temperatures or long lubricant lines, the pause time is extended accordingly.

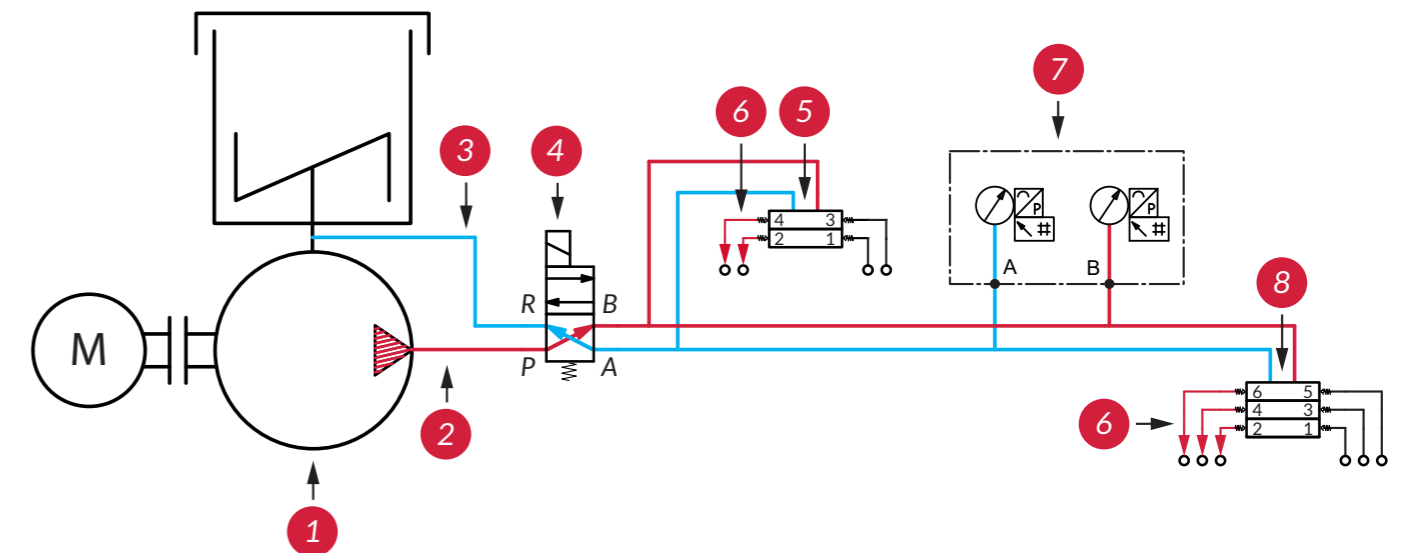
After the pause time has elapsed, the second half pulse starts, the pump begins to deliver and applies lubricant to the second line until the changeover process is initiated again.

- 1 Central lubrication pump
- 2 Pressurized line
- 3 Backflow line
- 4 4/2-way solenoid valve (change-over)
- 5 Dual line distributor with 4 outlets
- 6 Lines to the lubrication points
- 7 Limit pressure switch
- 8 Dual line distributor with 6 outlets

1. Half impulse



2. Half impulse



Ensuring a **reliable lubricant supply** for your systems

DUAL LINE DISTRIBUTOR

Low-maintenance & resilient

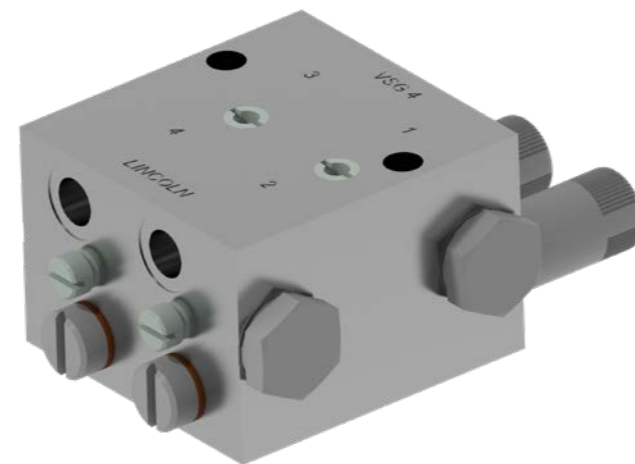
The robust VSG lubricant distributors made of galvanised steel are designed for dual line systems with a pressure of up to 400 bar. The lubricant distributors are available with up to eight outlets, each of which can be monitored. For electrical monitoring, VSG lubricant

distributors can also be equipped with low-wear proximity switches or piston detectors. In addition, you can choose between rust-resistant and rust- and acid-resistant material.

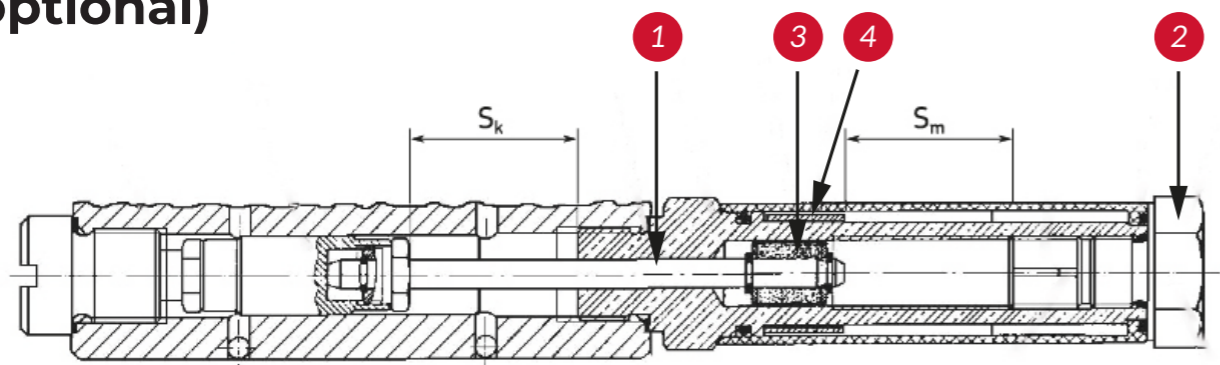
Benefits

- ✓ Resistant, metal-sealing block design possible
- ✓ Effective in a wide temperature range (-20 °C to +120 °C)
- ✓ Optical and electrical function monitoring possible
- ✓ Internal merging of flow rates in a pair of outlets
- ✓ 1 to 8 outlets, meterable from 0 - 5.0 cm³

Different lubricant distributors on request.



Magnetically operated function indicator (optional)



The piston movement is transmitted to the magnet (2) via the piston pin (1).

The magnetic field affects the control ring (3) so that it indicates the piston movement with the stroke $S_k = S_m$.

The delivery rate is adjusted by changing the piston stroke S_k with the regulating screw (4).

Benefit: the optical monitoring of the VSG/L-MR lubricant distributor is metal-sealed and therefore less prone to errors.

Functional description VSG/L-KR

Stage 1:

The lubricant is supplied under pressure to the metering device via main line I. The control piston (Fig. 1/1) moves in the direction of the arrow (A) and pushes back the lubricant in front of the control piston via the depressurized main line II.

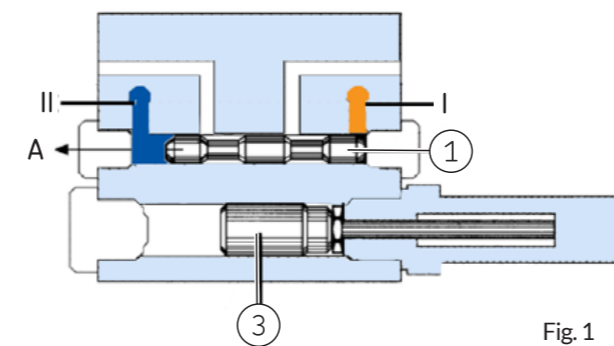


Fig. 1

Stage 3:

At the same time, the changeover valve connects main line II to the pump, and the pressure rises in that line. The control piston (Fig. 3/1) now moves in the direction of the arrow (B) and the lubricant in front of the control piston is supplied to the relieved main line.

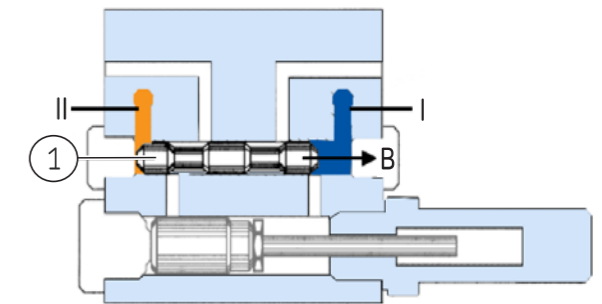


Fig. 3

Stage 2:

Once the control piston (Fig. 2/1) has freed up the duct (Fig. 2/2), the lubricant moves in front of the right-hand face of the delivery piston (Fig. 2/3) and moves that piston to the left in the direction of the arrow (A). The lubricant in front of the delivery piston is now supplied through the duct (Fig. 2/4) to the lubrication point. After the delivery piston reaches its end position, the pressure in main line I rises until the changeover pressure set for the dual-line system is reached.

The changeover valve of the dual-line system now connects the previously pressurized main line I to the lubricant reservoir of the pump, so that the lubricant in the line is relieved and the pressure falls.

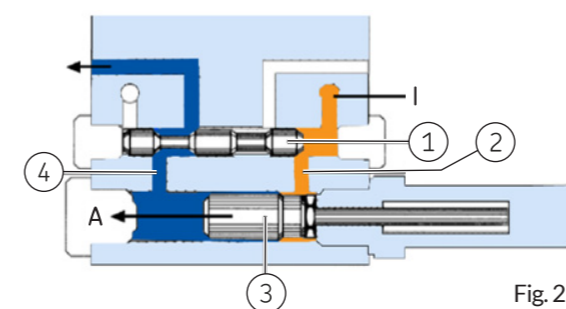


Fig. 2

Stage 4:

Once the control piston (Fig. 4/1) has freed up the duct (Fig. 4/5), the lubricant moves in front of the left-hand face of the delivery piston (Fig. 4/3) and moves that piston to the right in the direction of the arrow (B). The lubricant in front of the delivery piston is supplied through the duct (Fig. 4/6) to the lubrication point. After the delivery piston reaches its end position, the pressure in main line II continues to rise until the changeover pressure set for the dual-line system is reached.

The pressure in main lines I and II now changes again, and the procedure starts again from Stage 1 as described above.

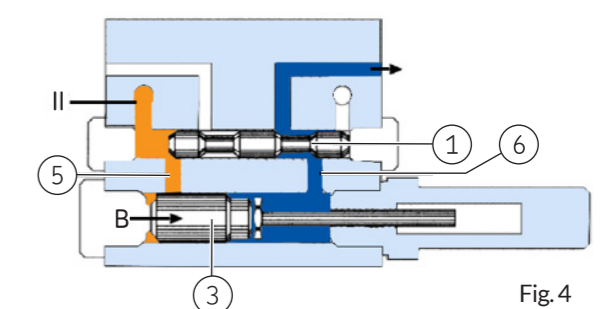


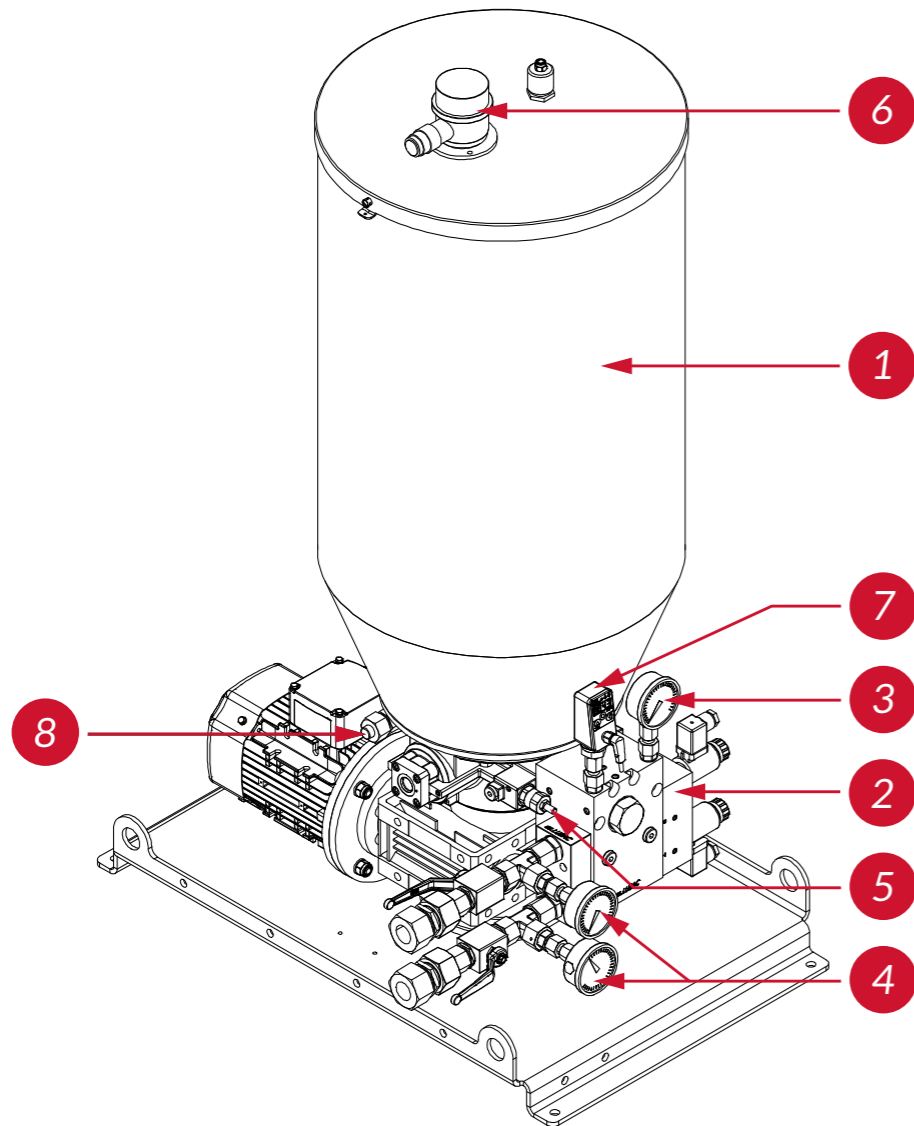
Fig. 4

I - Main line 1
II - Main line 2
1 - Control piston

2 - Duct
3 - Delivery piston
4 - Duct

BASIC PUMP UNIT

The compact supply unit



In two line systems, the basic pump unit is deployed as a compact supply unit. The electric TWIN Pump can deliver lubricant over distances of up to 120 meters and more with a maximum operating pressure of 400 bar, depending on the system design. The compact design of the essential components on a mounting structure facilitates maintainan-

ce and placement in any production facility. The configuration options, such as different container sizes, adapted sensor technology, electrical or pneumatic reversal or an optional redundant stand-by pump, ensure that this module is highly reliable and can be flexibly configured for any application.

Basic Pump Unit

R0G5A4

Component	No.	Description
Electric pump <i>optional with stand-by pump</i>	1	TWIN Pump with integrated agitator, 400 bar, Container size on customer request, 100 dm ³ as standard
Electrical changeover	2	24 VDC, with two 3/2 way valves
Pressure gauge	3	0 to 400 bar, ø63, G ¹ / ₄ ", connection at the bottom
	4	0 to 400 bar, ø63, G ¹ / ₄ ", rear connection
Pressure relief valve	5	Safety valve for TWIN Pump adjustable from 50 to 400 bar
Sensors	6	<i>Level sensor:</i> Detection range: 60 mm to 550 mm Operating temperature: -20 °C to +60 °C Protection class: IP 65
	7	<i>Pressure switch:</i> 0 to 400 bar, G ¹ / ₄ ", digital display, 15 to 30 VDC, 2 switching points / 4 to 20 mA
Filling connection	8	G ¹ / ₂ "

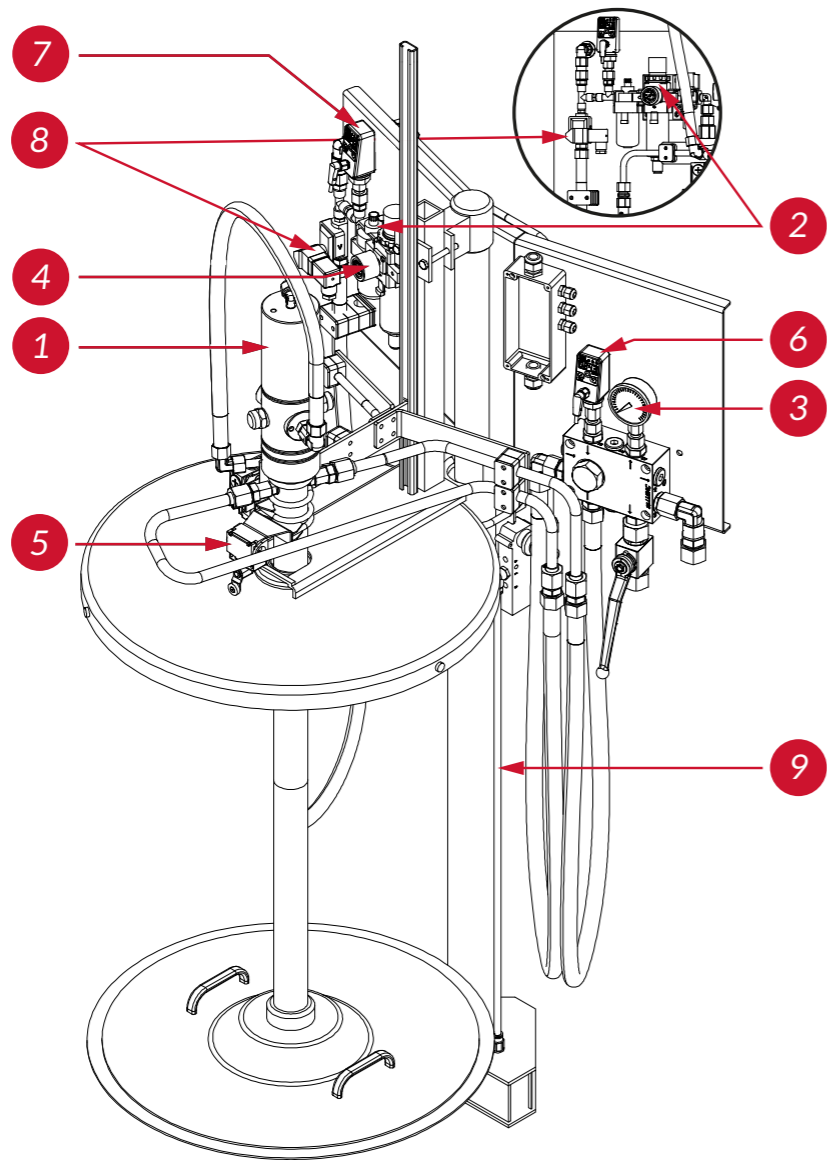
Other info:

- › Lubricant lines by default cutting ring 24°
- › Terminal box pre-wired
- › Drive voltages of the pump motor, other screw connections or special designs on request

- ✓ Compact, electric motor-driven lubricant supply unit (0.75 kW)
- ✓ Maximum operating pressure 400 bar
- ✓ Delivery rate up to 500 cm³ / min
- ✓ Container volume 100 dm³, with level monitoring
- ✓ Electrical and optical pressure monitoring
- ✓ Filtration for filling line and pressure line
- ✓ Further configurations possible on request

BARREL PUMP UNIT

Two line systems directly supplied



The LUBAC dual line barrel pump is perfectly suited for lubrication systems that require large quantities of lubricant. With its powerful air motor and a transmission ratio of 1:65, these units are perfect for high-pressure applications. By mounting the maintenance unit, valves and sensors on the moun-

ting panel, the barrel pump appears very compact despite a capacity of up to 180 kg. For easier and safer barrel changing, the barrel pump can also be equipped with a pneumatic pump lifter, mobile or stationary.

Barrel pump unit

D4C5A8

Component	No.	Description
Pneumatic pump	1	LUBAC barrel pump 1:65 for 180 kg barrels
Maintenance unit	2	Size 30, G $\frac{1}{4}$ ", manual valve, filter regulator, lubricator, flow direction right > left
Pressure gauge	3	0 to 400 bar, \varnothing 63, G $\frac{1}{4}$ ", connection at bottom
	4	0 to 10 bar, \varnothing 40, R $\frac{1}{8}$ "
Sensors	5	<i>Empty signal:</i> Ue = 250VAC, Ie = 3 A Ue = 250VDC, Ie = 0.27 A Operating temperature: -25 °C to +70 °C Protection class: IP 66
	6	<i>Pressure switch:</i> 0 to 400 bar, G $\frac{1}{4}$ ", digital display, 15 to 30 VDC, 2 switching points / 4 to 20 mA
	7	<i>Pressure switch:</i> 0 to 10 bar, G $\frac{1}{4}$ ", digital display, 15 to 30 VDC, 2 switching points / 4 to 20 mA
Compressed air valve	8	2/2 way compressed air valve G $\frac{1}{4}$ "
Pump lifter	9	stationary version, lifting height 910 mm

Other info:

- › Lubricant lines by default cutting ring 24°
- › Terminal box pre-wired
- › Additional changeover panel necessary

Compressed air requirements:

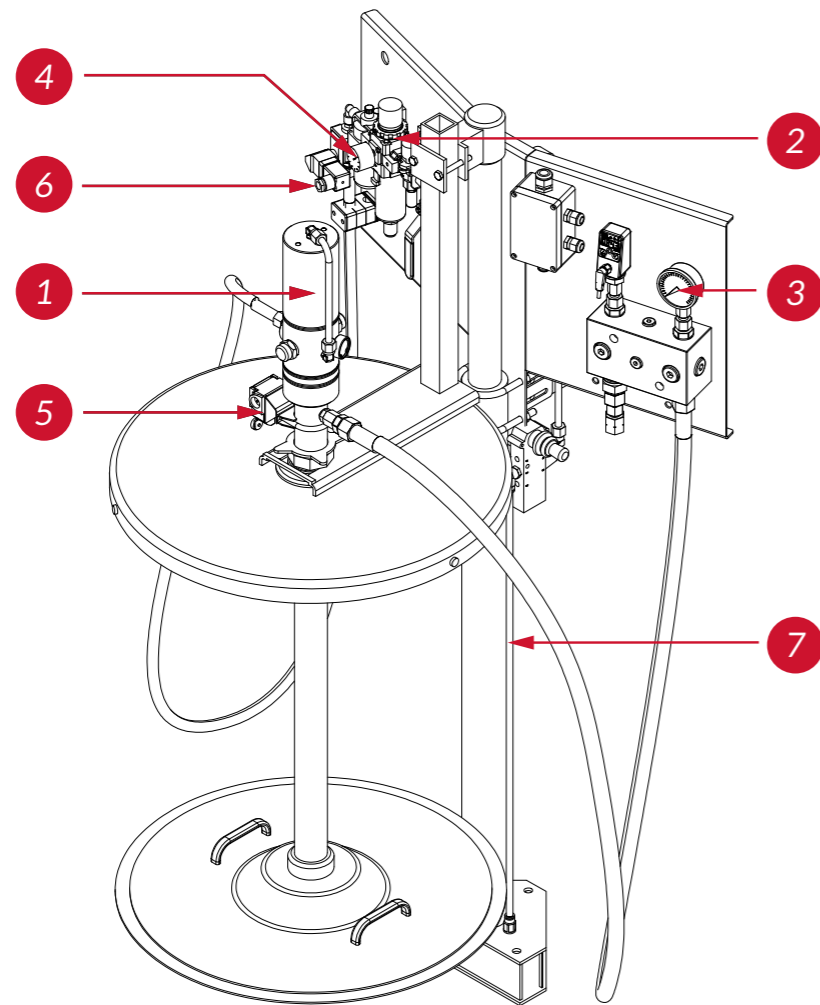
- › Instrument air
- › min-max 3 to 10 bar

- ✓ Powerful air motor with transmission ratio 1:65
- ✓ Maximum operating pressure 400 bar
- ✓ Perfectly suited for extensive installations

- ✓ Compact due to mounting panel
- ✓ Electrical and optical pressure monitoring
- ✓ With pump lifter for easy barrel change

FILLING PUMP UNIT

To pre-fill the Basic Pump Unit



The filling pump with its powerful pneumatic pump motor is used for pre-filling one or more Basic Pump Units. It is essential for reliable and uninterrupted operation of the two line systems. This maintains the filling level in the Basic Units, which serves as a buffer during a barrel change. It is therefore not necessary to

shut down the system during a barrel change. For an easier and safer barrel change, the filling pump can also be equipped with a pneumatic pump lifter, mobile or stationary.

Filling Pump Unit for Basic Pump Unit

Q0L5A1

Component	No.	Description
Pneumatic pump	1	Barrel pump 1:26, for 180 kg barrels incl. bunghole adapter G2
Maintenance unit	2	Size 30, G $\frac{1}{4}$ ", manual valve, filter regulator, lubricator, flow direction right > left
Pressure gauge	3 4	0 to 400 bar, \varnothing 63, G $\frac{1}{4}$ ", connection at bottom 0 to 10 bar, \varnothing 40, R $\frac{1}{8}$ "
Sensors	5	<i>Empty signal:</i> Ue = 250VAC, Ie = 3 A Ue = 250VDC, Ie = 0.27 A Operating temperature: -25 °C to +70 °C Protection class: IP 66
Compressed air valve	6	2/2 Wege Druckluftventil, G $\frac{1}{4}$ ", 24 VDC
Pump lifter	7	stationary version, lifting height 910 mm

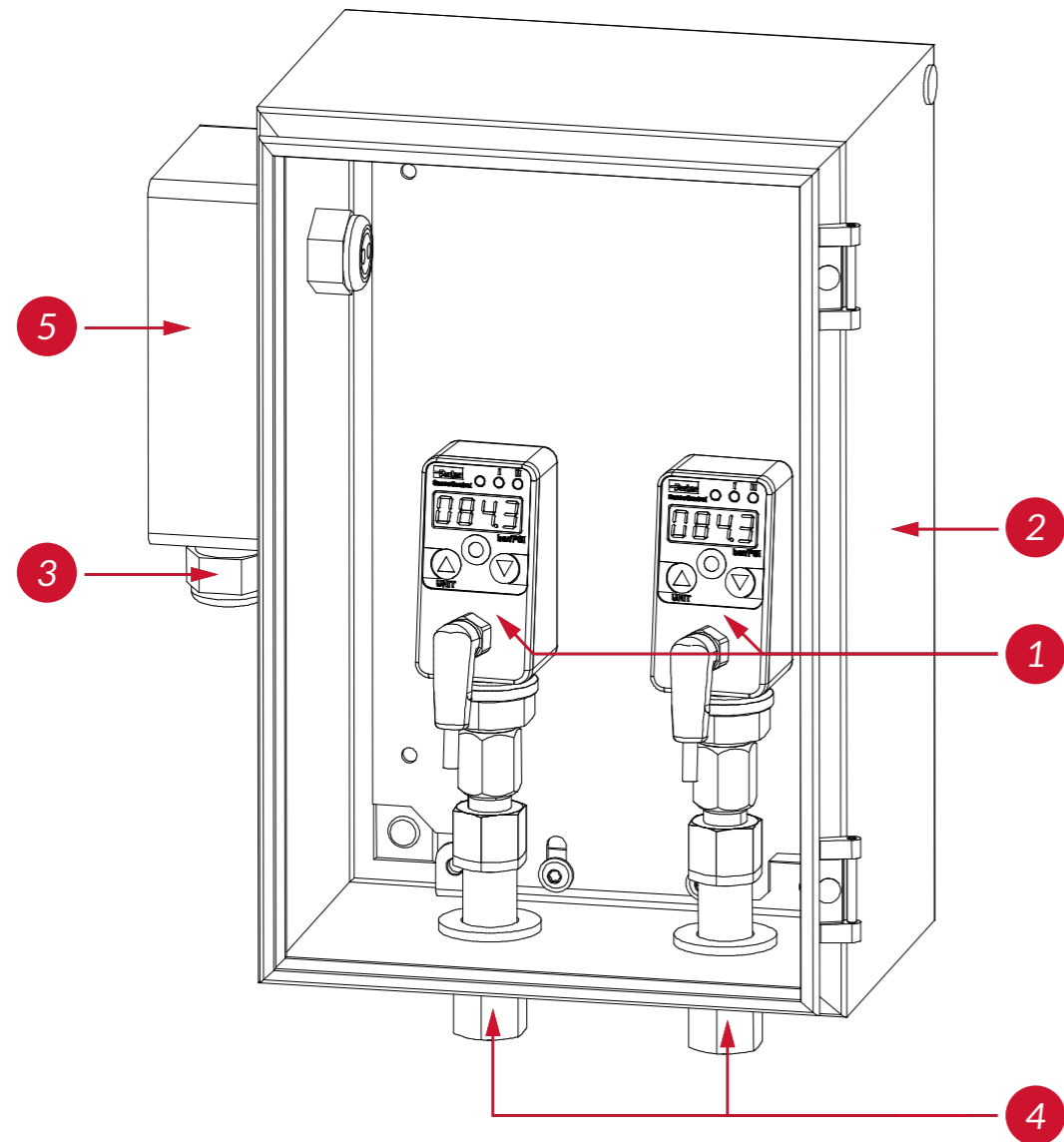
Other info:

- › Lubricant lines by default cutting ring 24°
- › Terminal box pre-wired

- ✓ To automatically fill Basic Pump Units
- ✓ Contamination of the lubricant is prevented
- ✓ Optical pressure monitoring
- ✓ With electrical empty signal
- ✓ With pump lifter for easy barrel change

LIMIT PRESSURE SWITCH

Monitoring of the entire system



To be able to operate a two line system reliably and safely, a final pressure switch must be used. They are used to monitor the system and to control the changeover process. The limit pressure switch monitors whether a target pressure can be reached at the end of the line within a certain period of time. The changeover is then trigge-

red. If the target pressure is not reached, an error signal is emitted. This functionality ensures reliable operation and constant monitoring of the entire system.

Limit pressure switch

A4C5A0

Component	No.	Description
Sensor	1	Pressure switch: 0 to 400 bar, G $\frac{1}{4}$ ", digital display, 15 to 30 VDC, 2 setpoints / 4-20 mA
Control cabinet	2	200x300x155 mm, incl. mounting plate and door, RAL 7035 Material according to customer requirements
Cable gland	3	M20x1.5, nickel-plated brass
Pipe fitting	4	Bulkhead fitting 10S Material according to customer requirements
Terminal box	5	125x80x57mm, external, pre-wired Material according to customer requirements

CAUTION DURING INSTALLATION!

- › The limit pressure switch must be installed before the last lubricant distributor
- › Avoid stub lines that are too long

If these points are not observed, the lubricant exchange in the lines to the final pressure switch will be too low. As a result, the lubricant hardens and correct function monitoring is no longer ensured.

- ✓ To monitor the system pressure at the end of the line
- ✓ Digital pressure display, analogue and digital output signal
- ✓ Pre-wired on terminal box



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