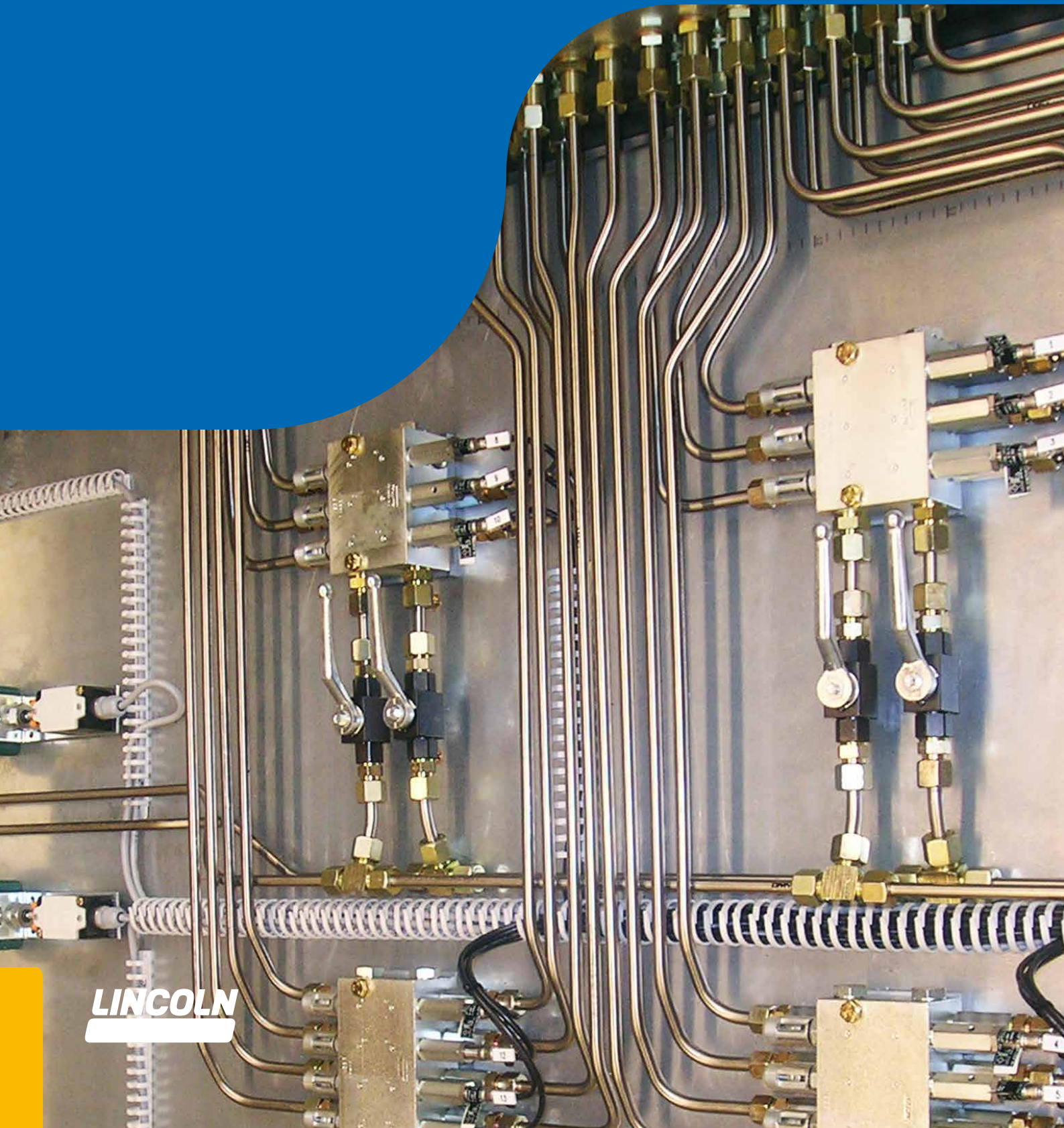


Lincoln Dual-line Systems



LINCOLN

People, capabilities and systems to save resources and increase productivity

Industry leader

Continually satisfying our customers with the world's best lubrication equipment and pumping systems has made Lincoln the largest and most successful company in our field. For nearly a century, companies have relied on our technical and quality leadership; our world-class manufacturing and customer service, and our vast network of distributors and support facilities.

Research development

In order to provide the best worldwide and regional application solutions, Lincoln develops new products and systems at research and development facilities in the United States, Germany and India.

Providing solutions

Industrial customers in large processing plants, automotive manufacturing, pulp and paper mills, food and beverage and other manufacturing facilities can depend on solutions from Lincoln. For the toughest mobile applications, on the road or in the field, Lincoln protects heavy equipment used in mining, construction, agriculture and over-the-road trucking. In addition, Lincoln offers the best lubrication equipment to meet the needs of automotive service professionals.

Complete product line

Lincoln supplies automated lubrication systems, pumps and pump stations and top quality lubrication equipment and accessories. Our quality systems in the Czech Republic, Germany, India and United States are ISO 9001 registered. Additionally, our production sites in Czech Republic and Germany are ISO 14001 registered.

Worldwide support

With five technical support centers on three continents, and a network of distributors supported by regional sales and service offices, our customers can always draw on our worldwide resources.

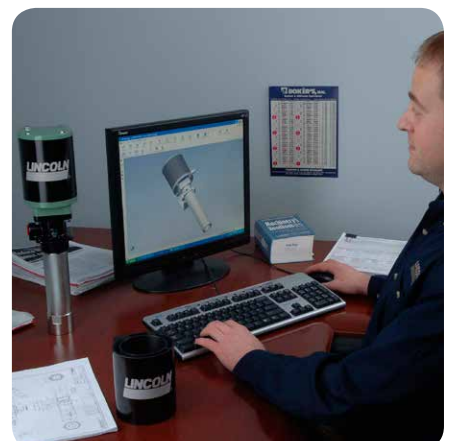


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Two-line Systems

Application

- Large systems with dispersed lube points
- Varying lubrication quantities
- Ideal for rigorous conditions (e.g. coldness)

Sample applications:

Large systems using grease up to NLGI 2

Industries

Cement plants, steel mills, power plants, mining, large machines

The advantage of a two-line system is that it supplies an exact metered quantity of lubricant from one pumpstation over large distances.

The metering devices are operated by two main lines, whereby here the lubricant is simultaneously the control medium of the system.

The two-line system can be combined with secondary progressive metering devices, thereby increasing the total number of lubrication points that are served by a two-line metering device.

Capabilities

- Lincoln's high pressure capability allows small diameter tubing to be used, thereby reducing installation and material costs. Additionally, this reduces the amount of grease in the tubing which over a long period of time may deteriorate.
- Visual or electric monitoring of each metering device outlet pair.
- If a bearing clogs or a metering device outlet fails to function, all other outlet pairs will continue to function normally.
- Simple and individual metering of lubricant.
- Problem-free readjustment of metered lubricant output after installation
- Optimum monitoring and control possibility with a field bus system
- Easy to extend

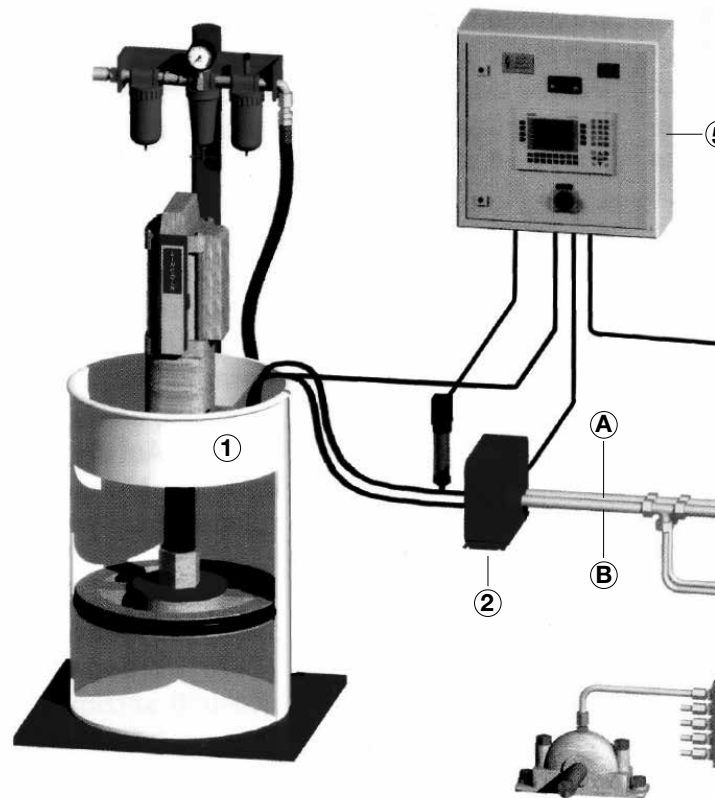
The Self-thinking System

The special components of a Lincoln self-thinking two-line system adjust the system to the optimum required pressure. Conventional two-line systems operate on a fixed pressure difference principle. This means that the change-over process is then initialized when a fixed pressure at the end of the lines has been reached.

Consequently, the system always operates at a maximum pressure. With the Lincoln self-thinking two-line system, the pressure is constantly monitored and modified accordingly. The system thereby automatically regulates

the pressure and can compensate for temperature fluctuations. Manual adjustments of the system, even during installation, are no longer required.

Since only the effective required pressure is generated during each lubrication cycle, the pump and other system components have a longer service life, the system always operates in its most efficient mode and the grease is subjected to less strain. A further advantage is the direct display of all important parameters on the controller. This enables full monitoring of the system and the pump.



Schematic Two-line System

Function of a Two-Line System

In the first half-cycle, the lubricant is pumped into the main line (A) and the main line (B) is connected to the relief line. The lubricant, which is also the control medium for the system, is supplied to the metering devices. The pistons of the metering devices are moved into their adjusted end positions, thus dispensing an exact metered quantity of grease. Once all metering devices have dispensed their lubricant to the consumption point, the system is hydraulically

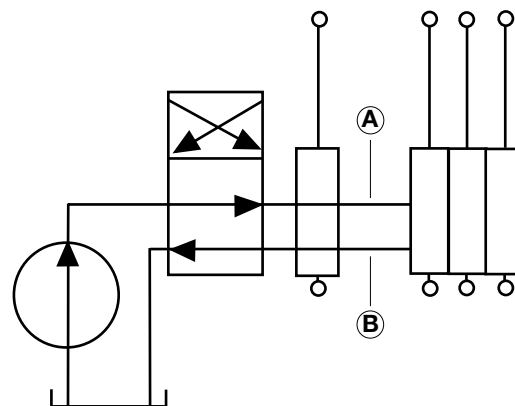
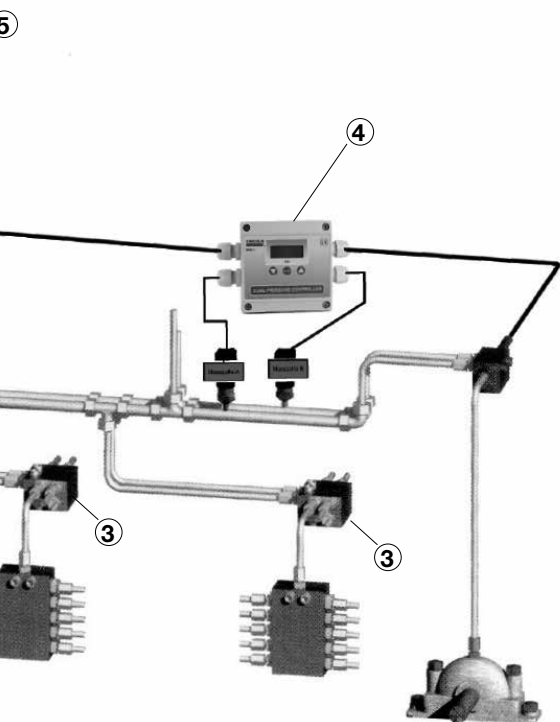
closed which causes the pressure in main line (A) to rise, and is measured by the pressure transducer. The control unit turns the pump off and signals the change-over valve to relieve main line (A).

At this point half of the lubrication points in the system have been lubricated. In the second half-cycle, main line (B) is pressurized and the cycle continues as before.

Common Components

| | |
|--------------------------|---|
| pumps with reservoir: | HJ2 manual pumps, ZPU01/02, ZPU08/14/24 electric pumps |
| for drums: | PowerMaster pneumatic pumps*, Lubrigun pneumatic pumps |
| metering devices: | VSG, VSL, VSKH, VSKV |
| change-over valves: | DU1 pressure change-over valve EM-U2 electric change-over valve MP2 pneumatic change-over valve MHY1 hydraulic change-over valve |

*Not covered in this catalogue – ask your Lincoln representative for details.



Schematic Two-line System

Legend

- ① Pump
- ② Change-over valve
- ③ Metering devices
- ④ Pressure transducer
- ⑤ Switch cabinet
- Ⓐ, Ⓑ Main line

HJ2 Pumps



HJ2 Pump

The central lubrication pump type HJ (Helios Junior) is a manually operated high-pressure pump used for the supply of grease or oil in progressive systems, or when equipped with one pressure line and one relief line, for small two-line lubrication systems.

| Part No. | Description |
|-------------|--------------------------------------|
| 603-40558-3 | HJ2L-30 left-hand lever 1 outlet |
| 603-40558-4 | HJ2R-30 right-hand lever 1 outlet |
| 603-40558-1 | HJ2AL-30 left-hand lever 2 outlets* |
| 603-40558-2 | HJ2AR-30 right-hand lever 2 outlets* |

**for progressive systems*

Technical Data

| | HJ2 | HJ2A |
|-------------------------------------|--|--|
| number of outlets | 1 | 2 |
| lubricant output per lever movement | 2 cm ³ (0.122 in ³) | 2x1 cm ³ (2 X 0.061 in ³) |
| operating pressure | 300 bars (4350psi) | |
| hand force at maximum pressure | 300 N | |
| suitable lubricants | grease up to NGLI 3 | |
| outlet threaded connection | G 1/4 female (BSPP) | |
| reservoir capacity | 3 liters (183 in ³) | |
| weight empty | 8.7 kg (19 lbs) | 8.9 kg (19.6) lbs |
| dimensions (L x W x H) | 410 x 140 x 393 mm (16.1 x 5.5 x 15.5 in) | |

Accessories

| Part No. | Description |
|-------------|----------------------------|
| 223-13052-1 | check valve for 6 mm tube |
| 223-13052-2 | check valve for 8 mm tube |
| 223-13052-3 | check valve for 10 mm tube |

ZPU01/02 Pumps

Depending on the number of pump elements, these high-pressure, high-volume pumps can be used for following applications:

1. As a supply pump for small to midsize two-line systems ('F' version with filter block, safety valve and pressure gauge) in conjunction with a pressure-controlled change-over valve. The supply range lies within a radius of approximately 50 m from the pump depending on the ambient temperature and type of lubricant.
2. As a supply pump for progressive and single-line systems ('F' or 'V' version).

The principle of operation is similar to the very reliable and efficient multi-line pump 215. They are available with or without an ultrasonic level control and come with a 3-phase multi-range motor for 380 – 420 volt at 50 Hz or 440 – 480 volt at 60 Hz or with a free shaft end for use with other motors. Gear ratio is 100:1.



ZPU02 ... F

Popular Models

| Part No. | Description | Motor | Reservoir Size | | | Level Control | Pump Element |
|-------------|---------------------------------------|---------|----------------|-----------------|------|---------------|--|
| | | | Liters | In ³ | Lbs. | | |
| 661-40692-3 | ZPU02-M100-010XYBU-F-380-420/440-480 | 3-phase | 10 | 610 | 20 | yes | bracket with 2 elements, filter block, pressure gauge and safety valve |
| 661-40710-3 | ZPU02-M100-030XYBU-F-380-420/440-480 | 3-phase | 30 | 1830 | 60 | yes | |
| 661-40644-7 | ZPU02-M100-010XN-F-000 | none | 10 | 610 | 20 | no | |
| 661-40710-7 | ZPU01-M100-010-XYBU-E-380-420/440-480 | 3-phase | 10 | 610 | 20 | yes | 1 element only |

Technical Data

| Number of Elements | 1 or 2 |
|--|---|
| threaded connection: | |
| E version | G 1/4 female (BSPP) |
| V or F versions | for 10 mm tube or G 3/8 female (BSPP) |
| filling connection | G 3/8 female (BSPP) |
| maximum operating pressure | 300 bars 4350 psi |
| | „E” version must be protected with pressure relief valve (not included) |
| suitable lubricant | grease up to NGLI 2 / NLGI 3 on request |
| | oil with a viscosity of min. 20 cSt |
| lubricant output per pump element (output increases by 20% for 60 Hz applications) | 800 cm ³ / hour (49 in ³ / hour) |
| reservoir sizes | 10 or 30 liter (2.6 or 8 U.S. gal) |
| temperature range | -20° to 70° C (-4° to 158° F) |

ZPU01/02 Pumps

Required Pressure Relief Valve for Single Element "E" Version

| Part No. | Description | Tube Diameter | Pressure |
|-------------|--------------|---------------|---------------------|
| 624-25478-1 | relief valve | 6 mm tube | 200 bars (2900 psi) |
| 624-25479-1 | relief valve | 6 mm tube | 350 bars (5076 psi) |
| 624-25480-1 | relief valve | 8 mm tube | 200 bars (2900 psi) |
| 624-25481-1 | relief valve | 8 mm tube | 350 bars (5076 psi) |
| 624-25482-1 | relief valve | 10 mm tube | 200 bars (2900 psi) |
| 624-28483-1 | relief valve | 10 mm tube | 350 bars (5076 psi) |

Dimensions

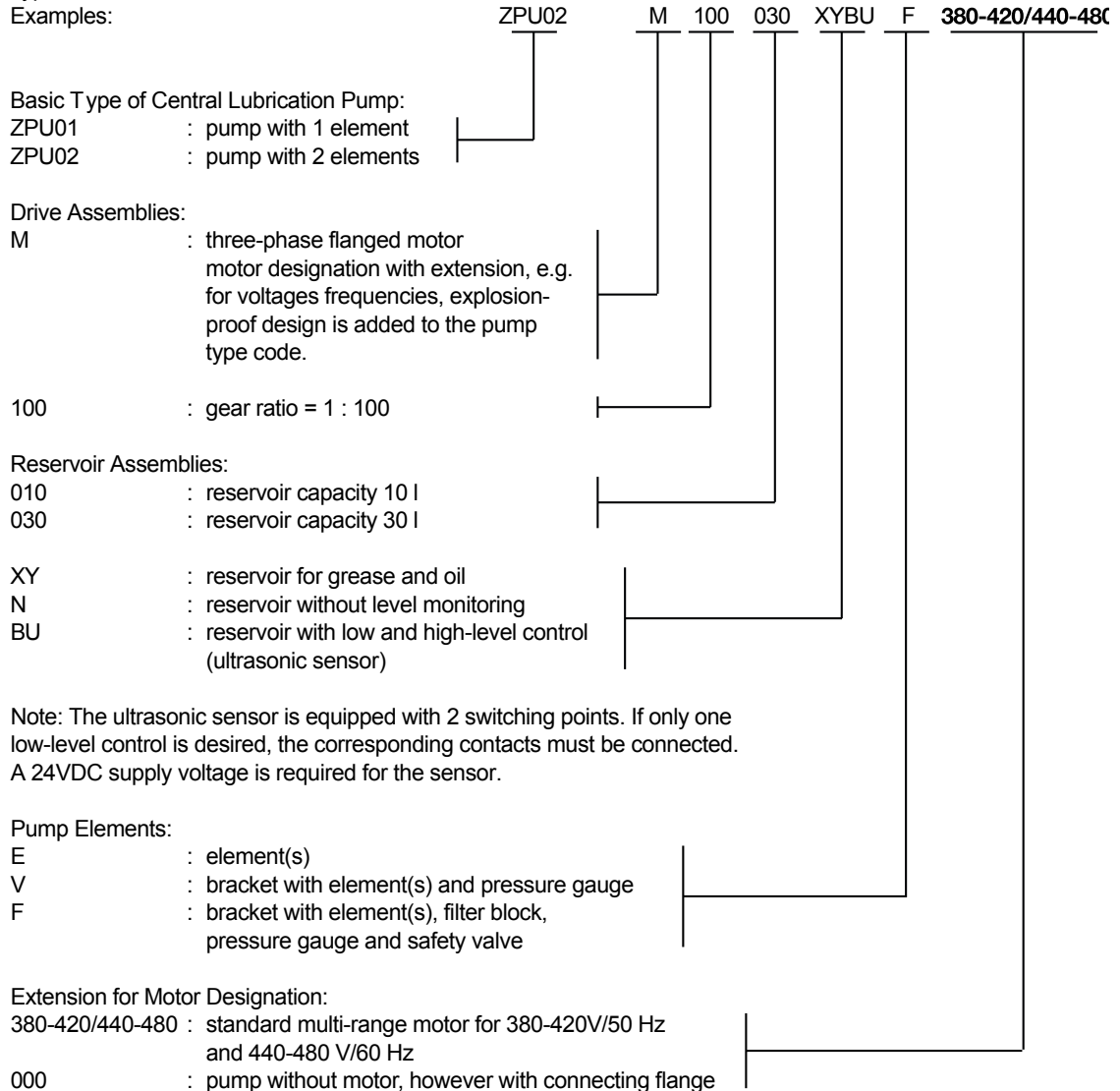
| Reservoir Size | Height | Width | Depth |
|---------------------------------------|-------------------|----------------|------------------|
| 10 liters (without low-level control) | 514 mm (20.25 in) | 379 mm (15 in) | 317 mm (12.5 in) |
| 30 liters (without low-level control) | 754 mm (29.75 in) | 431 mm (17 in) | 377 mm (15 in) |
| low-level sensor | 30 mm (1.2 in) | 125 mm (5 in) | 65 mm (2.75 in) |

Identification Code Models ZPU01/02

Description

Type Identification Code

Examples:



ZPU08/14/24 Pumps

The high-pressure ZPU08, ZPU14 and ZPU24 pumps are primarily used in two-line systems or as a supply pump.

The pump element, made of hardened steel, operates as a piston pump with two pistons operating in opposite directions which draw in lubricant alternately and feed it through the outlet hole to the

pressure line. The outlet channels of the high-pressure pistons are controlled by a floating piston.

These state-of-the-art pumps are extremely serviceable and reliable. All main components are easily accessible. The pumps come standard with a pressure relief valve, a check valve, a lubricant filter, and a pressure gauge.



ZPU08-40XL

Popular Models

| Part No. | Description | Reservoir Size | | | Level Control | Motor |
|-------------|-------------------------------|----------------|-----------------|------|---------------|---------|
| | | Liters | In ³ | Lbs. | | |
| 605-40272-5 | ZPU08G-40XL-380-415, 420-480 | 40 | 2441 | 80 | yes | 3-phase |
| 605-40273-3 | ZPU08G-100XB-380-415, 420-80 | 100 | 6102 | 200 | yes | 3-phase |
| 605-40276-3 | ZPU14G-100XB-380-415, 420-480 | 100 | 6102 | 200 | yes | 3-phase |
| 605-40279-3 | ZPU24G-100XB-380-415, 420-480 | 100 | 6102 | 200 | yes | 3-phase |

Technical Data

| Model | ZPU08 | ZPU14 | ZPU24 |
|--|--|---|--|
| lubricant output (output increases by 20% for 60 Hz applications) | 8 liters/hour (2.1 U.S. gal/h) 488 in³/h | 14 liters/hour (3.7 U.S. gal/h) 854 in³/h | 24 liters/hour (6.3 U.S. gal/h) 1464 in³/h |
| drive speed | 60 rpm | 100 rpm | 180 rpm |
| operating pressure | 400 bars (5800 psi) | | |
| connection thread | pressure line | G 3/4 female (BSPP) | |
| | relief line | G 3/4 female (BSPP) | |
| | filling line | G 3/4 female (BSPP) | |
| direction of rotation of the drive | optional | | |
| reservoir capacity | 40 or 100 liters/(10 or 26 U.S. gal) 2441 in³ or 6102 in³ | | |
| lubricant filter | filter area 5.1 cm² | | |
| | grade of filtration 280 µm | | |
| overpressure valve | fixed setting to 410 bars (5946 psi) tamper-proof | | |
| operating temperature | -20° to 80 °C | | (-4° to 176 °F) |

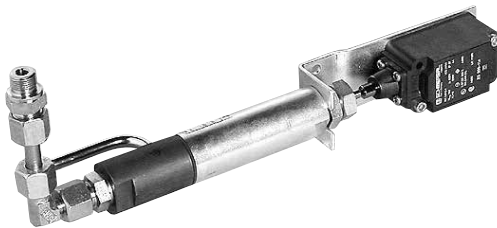
Dimensions

| Reservoir Size | Height | Width | Depth |
|---|------------------|---|----------------|
| 40 liters (without low-level control) | 760 mm (30 in) | 670–735 mm (26–29 in) depending on version | 410 mm (16 in) |
| 100 liters (without low-level control) | 975 mm (38.5 in) | 760–825 mm (30–32.5 in) depending on version | 500 mm (20 in) |

ZPU Pump Accessories



623-25461-2



623-37243-1

Accessories

| Part No. | Description |
|-------------|--|
| 623-25456-2 | electric pressure switch 75 – 170 bars (1087 – 2465 psi) |
| 623-25461-2 | electric pressure switch 160 – 400 bars (2320 – 5800 psi) |
| 623-37243-1 | electric pressure switch kit for 40 l reservoir versions (includes part number 623-25461-2 and required connection fittings) |
| 623-37242-1 | electric pressure switch kit for 100 l reservoir versions (includes part number 623-25461-2 and required connection fittings) |
| 623-37567-1 | electronic pressure transducer kit for 40 and 100 l reservoir versions (includes electronic pressure switch with digital display, part number 234-13194-4, see accessories) |



Electronic Pressure Transducer Kit
623-37567-1

Identification Code Pump Models ZPU08, ZPU14 & ZPU24

Model Designation

The complete pump unit is defined by a model designation (mentioned on the nameplate).

Examples of model designations:

ZPU08 F 40 XL 000
ZPU08 G 40 XYBU 380-415/420-480 C

ZPU14 G 100 XB 500
ZPU14 S 40 XYBU 380-415/420-480

Lubricant Output:

08 = 8 dm³h⁻¹
14 = 14 dm³h⁻¹
24 = 24 dm³h⁻¹

Type of Drive:

F : with free shaft end
G : with flanged gear motor construction IMB5
S : with worm gear and 3-phase motor construction IMV1
SF : with worm gear and shaft end, suitable for 3-phase motor construction

S and SF only available for model 08

Reservoir Capacity:

40 = 40 dm²
100 = 100 dm²

Reservoir Design:

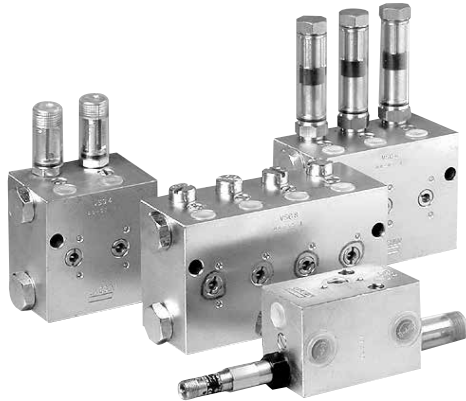
XN = grease reservoir, standard design
XV = grease reservoir with high-level control
XVD = grease with high-level control and cover interlock switch
XL = grease reservoir with low-level control
XB = grease reservoir with high and low-level control
XYBU = reservoir for grease or oil with low-level control via ultrasonic sensor

Supply Voltage of the Motors:

380-415/420-480 = standard multi-range motor for 380-415/420-480V 50 Hz and 420-480V 60 Hz
500 = 500V, 50 Hz
000 = unit without motor
other voltages on request

C = version as feed pump for COBRA

VSG, VSL, VSKH and VSKV Two-line Metering Devices



VSG-KR

These high quality, galvanized steel metering devices are designed for high-pressure (up to 400 bar) two-line systems. They can also be used in low to medium-pressure systems. They are available with up to 8 outlets. Each outlet pair is equipped with an indicator pin for visual monitoring. Additional optional

features include rust proof material, rust and acid proof material, electrical monitoring, adjusting device with magnetically operated function for rigorous environments, viton seals for high temperature applications, and NPT inlet/outlet threads. Refer to the identification code for model designations to order these devices with the additional features.

All models function on the same principle. The difference between VSL, VSG and VSKH lies in the output per outlet. Model VSKV has the same features as the VSKH with the exception that the outlet ports are located on the front face (vertical positioning). This provides an alternative for applications requiring a different tube orientation. Versions ... MD (with magnetically operated indication of function) are designed without dynamic seals and can work under extremely adverse ambient conditions: water, dust, high temperature up to 120° C (176° F).

VSG-KR Models

VSG-KR

Indicator Pin and Adjustable Output 0–2.2 cm³ (0–0.13 in³)

| Connection Thread BSPP | Connection Thread BSPP | Number of Outlets | Connection Thread BSPP | Connection Thread NPTF | Connection Thread NPTF |
|----------------------------|------------------------------------|----------------------|---------------------------------------|----------------------------|--------------------------------|
| Carbon Steel Galvanized | Stainless Steel (VA 1.4305/303) | | Stainless Steel (VA 1.4571/316 Ti) | Carbon Steel Galvanized | Stainless Steel (VA 1.4305) |
| 620-40022-1 | 620-40567-1 | 1 | | 620-40022-2 | |
| 620-40015-1 | 620-40567-2 | 2 | 620-40839-2 | 620-40015-2 | |
| 620-40022-3 | 620-40567-3 | 3 | | 620-40022-4 | |
| 620-40015-3 | 620-40567-4 | 4 | 620-40839-4 | 620-40015-4 | |
| 620-40022-5 | 620-40567-5 | 5 | | 620-40022-6 | |
| 620-40015-5 | 620-40567-6 | 6 | 620-40839-6 | 620-40015-6 | |
| 620-40022-7 | 620-40567-7 | 7 | | 620-40022-8 | |
| 620-40015-7 | 620-40567-8 | 8 | 620-40839-8 | 620-40015-8 | |

VSG, VSL, VSKH and VSKV Two-line Metering Devices



VSG8-D

VSG-KD and D

Indicator Pin and Fixed Output* 2.2 cm³ (0.13 in³) Metering Screw (KD)
or with Metering Screw only (D) as Shown

| KD | | D | | KD | D |
|---------------------------|-------------|----------------------|---------------------------|-------------|---|
| Connection Thread BSPP | | Number of Outlets | Connection Thread NPTF | | |
| Carbon Steel Galvanized | | | Carbon Steel Galvanized | | |
| 620-40023-1 | 620-40025-1 | 1 | 620-40023-2 | 620-40025-2 | |
| 620-40023-3 | 620-40025-3 | 2 | 620-40023-4 | 620-40025-4 | |
| 620-40023-5 | 620-40025-5 | 3 | 620-40023-6 | 620-40025-6 | |
| 620-40023-7 | 620-40025-7 | 4 | 620-40023-8 | 620-40025-8 | |
| 620-40024-1 | 620-40026-1 | 5 | 620-40024-2 | 620-40026-2 | |
| 620-40024-3 | 620-40026-3 | 6 | 620-40024-4 | 620-40026-4 | |
| 620-40024-5 | 620-40026-5 | 7 | 620-40024-6 | 620-40026-6 | |
| 620-40024-7 | 620-40026-7 | 8 | 620-40024-8 | 620-40026-8 | |

* also available: 0.55, 1.1, 1.65 cm³ (0.0336, 0.067, 0.1 in³)

VSG-KR-NP

Indicator Pin, Proximity Switch for Circular Plug M12
(237-13442-4) and Adjustable Output 0–2.2 cm³ (0–0.13 in³)

| Connection Thread BSPP | Number of Outlets | Connection Thread NPTF |
|---------------------------|----------------------|---------------------------|
| Carbon Steel Galvanized | | Carbon Steel Galvanized |
| 620-40733-1 | 1 | |
| 620-40733-2 | 2 | |
| 620-40733-3 | 3 | |
| 620-40733-4 | 4 | |
| 620-40733-5 | 5 | |
| 620-40733-6 | 6 | |
| 620-40733-7 | 7 | |
| 620-40733-8 | 8 | |



VSG2KR-NP

Note: High pressure-rated proximity switch is available as a retrofit for
VSG models beyond series 9905. Part Number: 520-34018-1

MD

Magnetic Indicator Device

The MD magnetic indicator device is completely maintenance free and is suitable for extreme ambient conditions in the heavy industry. Even at temperatures of up to 120°C the device is resistant to dust and steam penetration. Therefore it is ideal for application in continuous casters or rolling mills.

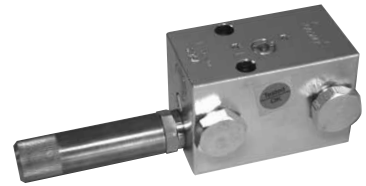
In conventional two-line metering devices the indicator pin has been the weak spot when the metering device is subjected to full operating pressure. However, with the magnetic indicator device, seals are not required. The movement of the

indicator pin is conveyed without contact by the aid of a strong magnet to the outer control ring sleeve. The control ring is coated with a bright colour so that it is visible even in poorly lit conditions.

The output of the two-line metering devices is adjusted by means of metering screws available in different sizes.

Technical Data:

Operating pressure: max. 400 bars
Operating temperature: max. 120° C



VSL-MDMS

VSG with magnetic indicator device

| Protection cap | | Adjusting device |
|----------------|-------------|------------------|
| Brass | Plastic | |
| 520-33105-1 | 520-33270-1 | A 0.55 cm³ |
| 520-33106-1 | 520-33271-1 | B 1.10 cm³ |
| 520-33107-1 | 520-33272-1 | C 1.65 cm³ |
| 520-33073-1 | 520-33273-1 | D 2.20 cm³ |

VSL with magnetic indicator device

| Protection cap | | Adjusting device |
|----------------|-------------|------------------|
| Brass | Plastic | |
| 520-33103-1 | 520-33274-1 | A 1.25 cm³ |
| 520-33104-1 | 520-33275-1 | B 2.50 cm³ |
| 520-33108-1 | 520-33276-1 | C 3.75 cm³ |
| 520-33074-1 | 520-33277-1 | D 5.00 cm³ |

VSKH/VSKV with magnetic indicator device

| Protection cap | | Adjusting device |
|----------------|-------------|------------------|
| Brass | Plastic | |
| 520-33109-1 | 520-33266-1 | A 0.30 cm³ |
| 520-33110-1 | 520-33267-1 | B 0.60 cm³ |
| 520-33112-1 | 520-33268-1 | C 1.20 cm³ |
| 520-33075-1 | 520-33269-1 | D 1.50 cm³ |

VSG, VSL, VSKH and VSKV Two-line Metering Devices



VSG2-KR-KS

VSG-KR-KS Indicator Pin/Limit Switch Adjustable Output 0–2.2 cm³ (0–0.13 in³)

| Connection Thread BSPP | Number of Outlets | Connection Thread NPTF |
|--------------------------------|----------------------|--------------------------------|
| Carbon Steel Galvanized | | Carbon Steel Galvanized |
| 620-40027-1 | 1 | 620-40027-2 |
| 620-40027-3 | 2 | 620-40027-4 |
| 620-40027-5 | 3 | 620-40027-6 |
| 620-40027-7 | 4 | 620-40027-8 |
| 620-40028-1 | 5 | 620-40028-2 |
| 620-40028-3 | 6 | 620-40028-4 |
| 620-40028-5 | 7 | 620-40028-6 |
| 620-40028-7 | 8 | 620-40028-8 |



VSG2-KR-KA

VSG-KR-KA Indicator Pin & Adapter for Proximity Switch (Thread M12 x 1) Adjustable Output 0–2.2 cm³ (0–0.13 in³)

| Connection Thread BSPP | Number of Outlets | Connection Thread NPTF |
|--------------------------------|----------------------|--------------------------------|
| Carbon Steel Galvanized | | Carbon Steel Galvanized |
| 620-40605-1 | 2 | |
| 620-40605-2 | 4 | |
| 620-40605-3 | 6 | |
| 620-40605-4 | 8 | |

VSG, VSL, VSKH and VSKV Two-line Metering Devices

VSL-KR Indicator Pin and Adjustable Output 0–5 cm³ (0–0.3 in³)

| Connection Thread BSPP | Number of Outlets | Connection Thread NPTF |
|--------------------------------|----------------------|--------------------------------|
| Carbon Steel Galvanized | | Carbon Steel Galvanized |
| 620-40062-1 | 1 | 620-40062-2 |
| 620-40062-3 | 2 | 620-40062-4 |
| 620-40062-5 | 3 | 620-40062-6 |
| 620-40062-7 | 4 | 620-40062-8 |
| 620-40064-1 | 5 | 610-40064-2 |
| 620-40064-3 | 6 | 620-40064-4 |
| 620-40064-5 | 7 | 620-40064-6 |
| 620-40064-7 | 8 | 620-40064-8 |



VSL4-KR



VSL8-D

VSL-KD & D

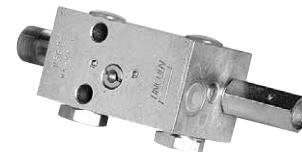
Indicator Pin and Fixed Output* 5.0 cm³ (0.3 in³) Metering Screw (KD)
or with Metering Screw only (D) as Shown

| KD | | D | | KD | | D |
|---------------------------|-------------|---|----------------------|---------------------------|--|---|
| Connection Thread BSPP | | | Number of Outlets | Connection Thread NPTF | | |
| Carbon Steel Galvanized | | | | Carbon Steel Galvanized | | |
| 620-40065-1 | 620-40063-1 | 1 | 620-40065-2 | 620-40063-2 | | |
| 620-40065-3 | 620-40063-3 | 2 | 620-40065-4 | 620-40063-4 | | |
| 620-40065-5 | 620-40063-5 | 3 | 620-40065-6 | 620-40063-6 | | |
| 620-40065-7 | 620-40063-7 | 4 | 620-40065-6 | 620-40063-8 | | |
| 620-40066-1 | 620-40067-1 | 5 | 620-40066-2 | 620-40067-2 | | |
| 620-40066-3 | 620-40067-3 | 6 | 620-40066-4 | 620-40067-4 | | |
| 620-40066-5 | 620-40067-5 | 7 | 620-40066-6 | 620-40067-6 | | |
| 620-40066-7 | 620-40067-7 | 8 | 620-40066-8 | 620-40067-8 | | |

*also available: 1.25, 2.5, 3.75 cm³ (0.07, 0.15, 0.228 in³)

VSL-KR-KA Indicator Pin & Adapter for Proximity Switch (Thread M12 x 1) Adjustable Output 0–5 cm³ (0–0.3 in³)

| Connection Thread BSPP | Number of Outlets | Connection Thread NPTF |
|--------------------------------|----------------------|--------------------------------|
| Carbon Steel Galvanized | | Carbon Steel Galvanized |
| 620-40637-2 | 2 | |
| 620-40637-4 | 4 | |
| 620-40637-6 | 6 | |
| 620-40637-8 | 8 | |



VSL2-KR-KA

VSG, VSL, VSKH and VSKV Two-line Metering Devices



VSKV5-KR



VSKH5-KR

VSKH-KR and VSKV-KR Indicator Pin & Adjustable Output 0–1.5 cm³ (0–0.09 in³)

| VSKH (Horizontal) | | | Number of Outlets | VSKV (Vertical) | | |
|----------------------------|------------------------------------|--------------------------------------|----------------------|----------------------------|------------------------------------|--------------------------------------|
| Connection Thread BSPP | | | | Connection Thread BSPP | | |
| Carbon Steel Galvanized | 303 Stainless Steel (VA 1.4305) | 316Ti Stainless Steel (VA 1.4571) | | Carbon Steel Galvanized | 303 Stainless Steel (VA 1.4305) | 316Ti Stainless Steel (VA 1.4571) |
| 620-27438-1 | 620-27488-1 | 620-27766-1 | 1 | 620-27442-1 | 620-27496-1 | 620-27857-1 |
| 620-27418-1 | 620-27489-1 | 620-27767-1 | 2 | 620-27422-1 | 620-27497-1 | 620-27858-1 |
| 620-27439-1 | 620-27490-1 | 620-27768-1 | 3 | 620-27443-1 | 620-27498-1 | 620-27859-1 |
| 620-27419-1 | 620-27491-1 | 620-27769-1 | 4 | 620-27423-1 | 620-27499-1 | 620-27860-1 |
| 620-27440-1 | 620-27492-1 | 620-27770-1 | 5 | 620-27444-1 | 620-27500-1 | 620-27861-1 |
| 620-27420-1 | 620-27493-1 | 620-27771-1 | 6 | 620-27424-1 | 620-27501-1 | 620-27862-1 |
| 620-27441-1 | 620-27494-1 | 620-27772-1 | 7 | 620-27445-1 | 620-27502-1 | 620-27863-1 |
| 620-27421-1 | 620-27495-1 | 620-27773-1 | 8 | 620-27425-1 | 620-27503-1 | 620-27864-1 |

Technical Data

| Model | VSL | VSG | VSKH | VSKV |
|---|--|--|--|--|
| output per outlet and stroke (KR versions) | 0–5.0 cm ³ (0–0.3 in ³) | 0–2.2 cm ³ (0–0.13 in ³) | 0–1.5 cm ³ (0–0.09 in ³) | 0–1.5 cm ³ (0–0.09 in ³) |
| inlet thread | G3/8 (BSPP) 3/8 NPTF | G3/8 (BSPP) 3/8 NPTF | G1/4 (BSPP) 1/4 NPTF | G1/4 (BSPP) 1/4 NPTF |
| outlet thread | G1/4 (BSPP) 1/4 NPTF | G1/4 (BSPP) 1/4 NPTF | G1/4 (BSPP) 1/4 NPTF | G1/4 (BSPP) 1/4 NPTF |
| maximum operating pressure | 400 bars (5800 psi) | | | |
| materials available | carbon steel galvanized | | | |
| | stainless steel: 1.4305 / 303 | | | |
| | stainless steel: 14571 / 316 Ti | | | |
| maximum operating temperature | 120° C (248° F) for MR and viton versions (KRFKM) 80° C (176° F) for standard versions (KR) | | | |

Dimensions for Standard KR Versions

| Model | Height | Width | Depth |
|--------------------|------------------|--|-----------------|
| VSG-KR | 122 mm (4.86 in) | 2 outlet: 44.5 mm (1.78 in) 4 outlet: 76 mm (3.04 in) | 54 mm (2.16 in) |
| VSL-KR | 140 mm (5.6 in) | 6 outlet: 108 mm (4.32 in) 8 outlet: 140 mm (5.6 in) | |
| VSKH-KR VSKV-KR | 124 mm (4.96 in) | 2 outlet: 52 mm (2.08 in) 4 outlet : 80 mm (3.2 in) 6 outlet: 108 mm (4.32 in) 8 outlet: 136 mm (5.44 in) | 57 mm (2.28 in) |

Identification Code

VSG, VSL, VSKH and VSKV

Two-line Metering Devices

| | | | | | | | | |
|---|---|----|-----|-----|-----|----|-----|--|
| VSKV | 6 | VA | -KR | FKM | -KN | | -01 | (1.4571) |
| VSKV | 2 | VA | -KR | | | | | (1.4305) |
| VSG | 4 | | -KR | | -NP | | | |
| VSKV | 5 | | -KR | | -KS | C | | |
| VSKV | 8 | | -KR | | -KN | TU | -A | |
| VSKH | 4 | VA | | | -KS | H | | (1.4305) |
| VSKV | 4 | | -D | 0,6 | -KS | H | | |
| VSKH | 2 | | -KR | | | | | (1.4305) |
| Basic Types: | | | | | | | | |
| VSKV | | | | | | | | = outlet vertical |
| VSKH | | | | | | | | = outlet horizontal |
| VSG/VSL | | | | | | | | = outlet horizontal |
| Number of Outlets (max. 8): | | | | | | | | |
| Standard Version | | | | | | | | |
| Steel Body Galvanized: | | | | | | | | |
| VA | | | | | | | | = stainless steel body |
| Adjustment Device & Monitoring: | | | | | | | | |
| KR | | | | | | | | = with indicator pin and infinitely variable adjustment device |
| KRFBKM | | | | | | | | = with indicator and infinitely variable adjustment device with viton seals (max. operating temp. 120 °C / 248 °F) |
| MDMS | | | | | | | | = magnetic indicator and infinitely variable adjustment device |
| KD | | | | | | | | = with indicator pin and metering screw |
| D | | | | | | | | = with metering screw 0.1; 0.3; 0.6; 0.9; 1.2; 1.5 cm ³ |
| Adjustment Device Standard Version Galvanized: | | | | | | | | |
| NP | | | | | | | | = piston detector |
| KN | | | | | | | | = indicator pin and proximity switch |
| KS | | | | | | | | = indicator pin and limit switch |
| KA | | | | | | | | = indicator pin and adapter (proximity switch to be supplied by customer) |
| BA | | | | | | | | = internal abbreviations |
| TU | | | | | | | | = internal abbreviations |
| H | | | | | | | | = internal abbreviations |
| C | | | | | | | | = internal abbreviations |
| 01, 02, 03 | | | | | | | | = two-digit number for special versions |
| A | | | | | | | | = US-version (NPT - thread) |
| Stainless Steel (Except VSL Models) | | | | | | | | |
| Material Number: | | | | | | | | |
| 1.4305 | | | | | | | | |
| 1.4571 (acid resistant) | | | | | | | | for VSKH/VSKV/VSG only |

VSG, VSL, VSKH and VSKV Two-line Metering Devices

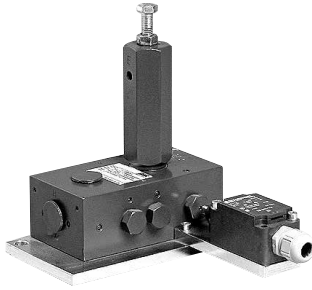
Accessories

| Part No. | Description |
|-------------|--|
| 303-17526-2 | closure plug for VSG/VSL |
| 420-22139-1 | outlet extension VSG (R1/4 x R1/4) |
| 420-22140-1 | outlet extension VSL (R1/4 x R1/4) |
| 420-23628-1 | outlet extension VSKH (R1/4 x R1/4) |
| 420-23790-1 | outlet extension VSKH (R1/4 x R1/4) stainless steel |
| 303-17505-1 | metering screw VSG 0.55 cm ³ (0.021 in ³) |
| 303-17506-1 | metering screw VSG 1.10 cm ³ (0.043 in ³) |
| 303-17507-1 | metering screw VSG 1.65 cm ³ (0.065 in ³) |
| 303-17508-1 | metering screw VSG 2.2 cm ³ (0.087 in ³) |
| 303-17509-1 | metering screw VSL 1.25 cm ³ (0.05 in ³) |
| 303-17510-1 | metering screw VSL 2.50 cm ³ (0.099 in ³) |
| 303-17511-1 | metering screw VSL 3.75 cm ³ (0.15 in ³) |
| 303-17512-1 | metering screw VSL 5.00 cm ³ (0.196 in ³) |
| 223-13052-1 | outlet check valve for 6 mm tube* |
| 223-13052-2 | outlet check valve for 8 mm tube* |
| 223-13052-3 | outlet check valve for 10 mm tube* |
| 421-21288-1 | mounting spacer ring 8.5 x 18 x 5 |

* Outlet check valves are recommended when secondary progressive metering devices are used, or when the compression volume of the grease (about 2%) in the feed line to the lubrication point exceeds the output per outlet.

Welding mounting plates are available for all metering devices – ask your Lincoln representative for details.

Change-over Valves DU1



DU1-GKS

Lincoln change-over valves come in pressure controlled, pneumatically operated, electric motor operated or hydraulically operated versions. They are primarily designed for use in two-line systems.

This pressure controlled change-over valve has a maximum operating pressure of 350 bar and is designed for use in two-line systems. The operating principle is similar to that of a 4/2 way valve which alternately discharges the lubricant fed by the pump into one of the two main lines while the other line is connected to the return line connection of the pump. Once a preset pressure is reached the change-over process is automatically initiated.

Available in Three Models:

| Part No. | Model | Description |
|-------------|---------|---|
| 617-28683-1 | DU1-G | mounted on a base plate |
| 617-28619-1 | DU1-GK | mounted on a base plate with indicator pin |
| 617-28620-1 | DU1-GKS | mounted on a base plate with indicator pin and limit switch |

Technical Data

| | |
|-------------------------|--|
| flow rate | maximum 14 liters/hour (3.7 US gal/hour) |
| operating pressure | maximum 350 bar (5075 psi) |
| change over pressure | minimum 140 bar (2030 psi) maximum 350 bar (5075 psi) |
| factory setting | 170 bars (2465 psi) |
| threaded connections | G 1/2 female (BSPP) |
| operating temperature | -20° C to 80° C (-4° F to 176° F) |
| mounting position | variable |
| position switch | max. |
| nominal circuit voltage | 500 V, 25–60 Hz |
| continuous current | 10 A |
| operating current | 4A |

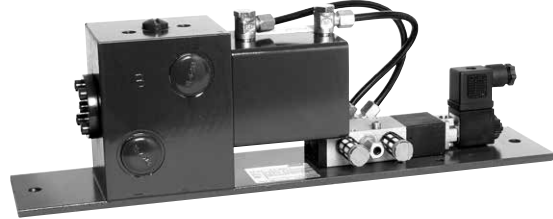
Dimensions

| Model | Height | Width | Depth |
|------------------------|-----------------|-----------------|-----------------|
| DU1-GK 617-28619-1 | 195 mm (7.8 in) | 190 mm (7.6 in) | 100 mm (4.0 in) |
| DU1-GKS 619-28620-1 | 195 mm (7.8 in) | 190 mm (7.6 in) | 195 mm (7.8 in) |

Change-over Valves MP2

This pneumatically operated change-over valve is designed for use in two-line systems and operates like a 4/2 way valve which alternately discharges the lubricant fed by the pump into one of both main lines, while the other main line is connected to the return line connection of the pump. It can also be used as a 3/2 way valve for grease systems.

It is available in four voltages, 24 VDC, 110 VAC, 110 VDC and 220 VAC.



MP2

Models

| Part No. | Supply Voltage | Description |
|-------------|-----------------|-------------------|
| 618-28965-2 | 24 VDC | MP2-24VDC |
| 618-28964-2 | 110 V, 50/60 Hz | MP2-110AC/50-60Hz |
| 618-28963-1 | 110 DC | MP2-110VDC |
| 618-28966-2 | 220V, 50/60 Hz | MP2-220AC |

Technical Data

| | |
|-----------------------|---|
| flow rate | maximum 65 liters/hour (17 US gal/hour) |
| operating pressure | 400 bar (5800 psi) |
| compressed air | max. 10 bars (145 psi) |
| threaded connections | G 3/4 female (BSPP) |
| operating temperature | -20° C to 70° C (-4° F to 158° F) |
| mounting position | variable |
| sound pressure level | < 70 dBA |

Dimensions

| | Height | Width | Depth |
|-----|-----------------|----------------|-----------------|
| MP2 | 135 mm (5.4 in) | 400 mm (16 in) | 180 mm (7.2 in) |

Also Available Hydraulically Operated: Model MHY1

| Part No. | Supply Voltage | Description |
|-------------|----------------|-------------|
| 618-28883-2 | 24 VDC | MHY1-24VDC |

Technical data correspond to MP2.

Operating hydraulic pressure: max. 60 bars (870 psi)

Change-over Valves EM-U2



EM-U2

This electric motor operated change over valve is designed for use in two-line systems with a maximum operating pressure of 400 bars. It is available in 24 VDC and 230 VAC versions.

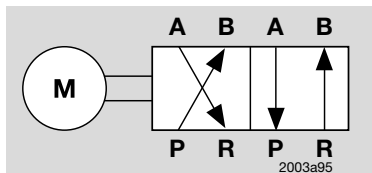
The principal of operation is similar to that of a 4/2 way valve which alternately discharges the lubricant fed by the pump into one of the two main lines while

the other line is connected to the return line connection of the pump. After all metering devices in the system have completed a half-cycle, the signaled change over process commences.

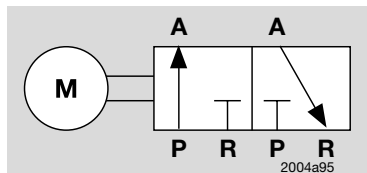
Depending on the version, the EM-U2 can also be used as a 2/2 or 3/2 way slider valve for lubrication circuits.

Models

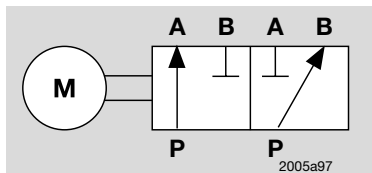
| Part No. | | Description |
|----------------|-----------------|--|
| 24 VDC Version | 230 VAC Version | |
| 618-28387-1 | 618-28388-1 | change-over valve 4/2 way |
| 625-28448-1 | 625-28450-1 | 3/2 way valve connection B closed |
| 625-28449-1 | 625-28451-1 | 3/2 way valve connection R closed |
| 625-28590-1 | 625-28591-1 | 2/2 way valve connections B & R closed |



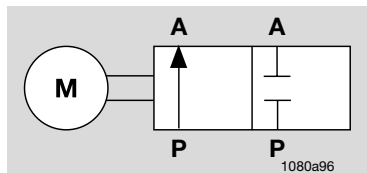
Change-over Valve
(4/2 Way Valve)



3/2 Way Valve
Connection B closed



3/2 Way Valve
Connection R closed



3/2 Way Valve
Connection B + R closed

Technical Data

| | |
|------------------------|---|
| flow rate | maximum 65 liters/hour (17 US gal/hour) |
| operating pressure | maximum 400 bars (5800 psi) |
| threaded connections | G3/4 female (BSPP) |
| operating temperatures | -20° C to 80° C (-4° F to 176° F) |
| mounting position | variable |
| sound level | < 70 dBA |
| switching time | 0.5 seconds |
| supply voltage | 24 VDC or 230 VAC |

Dimensions

| | Height | Width | Depth |
|-------|-----------------|------------------|-----------------|
| EM-U2 | 210 mm (8.4 in) | 350 mm (14.0 in) | 160 mm (8.3 in) |

End-of-line Pressure Unit



End-of-line Pressure Unit 632-36501-1

The mechanical end-of-line pressure switch unit is used for control and monitoring of the two-line system.

| | |
|-----------------------|---|
| Part No.: | 632-36501-1 |
| Dimensions: | 400 mm high x 300 wide |
| Consisting of: | electric/hydraulic pressure switch with limit switch, two pressure gauges 0–600 bars and connection fittings for 10 mm tube |
| Connection: | for 10 mm tube or G3/8 female (BSPP) |



DPC1 Electronic end-of-line pressure switch unit with pressure sensors

DPC1 Electronic end-of-line pressure switch unit with integrated control unit and automatic setting of the optimum operating pressure

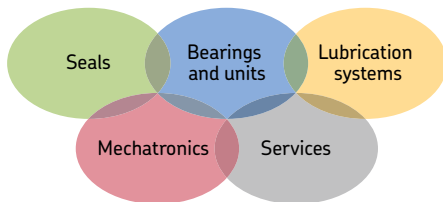
| | |
|--|-------------------|
| Part No.: | 234-10723-3 |
| Dimensions: | 100 x 100 x 62 mm |
| Input voltage: | 24 VDC |
| For this device two pressure sensors are required. | |
| Part No.: | 234-10663-7 |

Notes

[illegible]

Notes

[illegible]



The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide. These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management systems. A global presence provides SKF customers uniform quality standards and worldwide product availability.



Important information on product usage

All products from Lincoln may be used only for their intended purpose as described in this brochure and in any instructions. If operating instructions are supplied with the products, they must be read and followed.

Not all lubricants are suitable for use in centralized lubrication systems. Lincoln does offer an inspection service to test customer supplied lubricant to determine if it can be used in a centralized system. Lincoln lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1 013 mbar) by more than 0,5 bar at their maximum permissible temperature.

Hazardous materials of any kind, especially the materials classified as hazardous by European Community Directive EC 67/548/EEC, Article 2, Par. 2, may not be used to fill SKF centralized lubrication systems and components and delivered and/or distributed with the same.

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