

## ***Lubrication Systems QLS 301, 311 without Control Unit***



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4269a00

810-55250-1

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### Explanation of symbols:

- = explanation
- \* = describes an action
- = listing within a section

## Safety Instructions

### Appropriate Use

- Only use QLS 301, 311 for the delivery of lubricants. The pumps QLS 301, 311 are designed for intermittent operation. Other applications may be permitted on exact knowledge of the application conditions and on the manufacturer's prior approval. QLS is designed for supplying lubricant to a **maximum of 18 lube points per cycle**.
- Do not use QLS with **SSV block in bottom mounting position for mobile applications or in machines exposed to shock**.

### General Safety Instructions

- QLS 301 and 311 lubrication systems
  - are state of the art
  - can be assembled for safe operation.
- Refill QLS 301, 311 with suitable clean lubricant.
- Do not overpressurize when filling the QLS 301.
- Each outlet must be equipped with an appropriate check valve.

**Important:** Don't paint pump. Before painting machine or commercial vehicle remove or completely cover the pump.

- Unauthorized modifications or changes to an installed system are not recommended and will void warranty. Any modifications must be subject to prior consultation with the manufacturer or the contract partner.

### Regulations for prevention of accidents

- To prevent accidents, observe all city state and federal safety regulations of the country in which the product will be used.

### Operation, Repair and Maintenance

- Repairs should only be performed by authorized personnel familiar with the instructions.
- QLS 301, 311 must only operate with mounted or connected SSV distributor block.
- Reservoir of QLS 301, 311 must be regularly refilled with suitable clean lubricant.
- QLS 301, 311 operates automatically customized. However, a regular check (approx. every 2 weeks) should be made to ensure that lubricant is being dispensed from all points.
- Used or contaminated lubricants must be disposed of in accordance with local environmental regulations, see technical data sheets of lubricants.
- The manufacturer of the centralized lubrication system will not accept any liability for
  - damages caused by insufficient lubricant and irregular pump refilling
  - damages due to the use of greases which are not or only conditionally pumpable in centralized lubrication systems
  - damage caused by using contaminated lubricants
  - damage caused by an environmentally incompatible disposal of used or contaminated lubricants
  - damage caused by unauthorized modification of system components
  - damage caused by the use of unapproved parts (voids the pump warranty).

**Installation**

- Do not remove, modify or alter any safety equipment already installed on the machine.
- QLS 301, 311 pumps must be kept away from sources of heat (see Operating Temperature Specifications).
- Don't paint QLS 301, 311. Before painting of machine, cover complete pump.
- Only use original spare parts for QLS 301, 311(see Parts Catalog QLS 301, 311) or parts approved by LINCOLN.
- Adhere to:
  - the installation instructions of the vehicle or machine manufacturer as regards all drilling and welding procedures,
  - the specified minimum distances between the bore holes and the upper/lower rim of the frame or between two bore holes.
- Keep feed lines as short as possible.
- Provide access to fill, clean and visually monitor the pump operation.

**Installation Instructions**

**Pump**

- Use drilling template to mark and drill mounting holes of the QLS 301, 311. Drilling template and mounting bolts are included in the package of the QLS 301, 311.
- Important:** In case of divider blocks mounted on the back, remove the check valve installed on outlet 2 for the transport of the QLS 311.

**SSV Divider block**

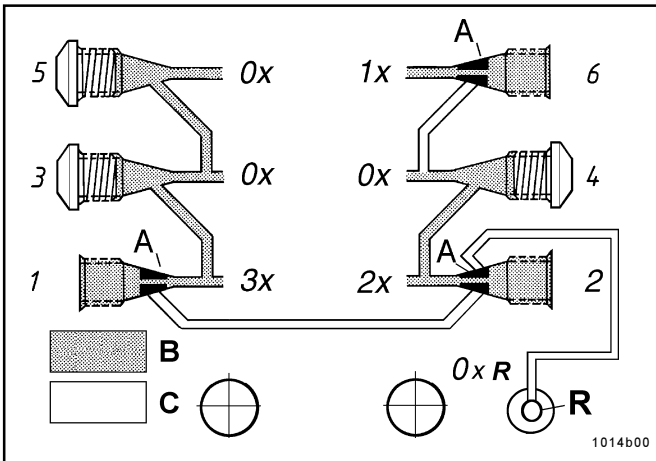


Fig. 1 - Single, double and triple lubricant output;SSV mounted on the back

- x - Outlet quantity (single, double, etc.)
- 1...6 Outlet numbers
- A - Clamping ring (brass)
- B - Grease or oil supply
- C - Grease or oil included
- R - Return



Fig. 2 - Closure plug, provided in the accessory kits

**Determination of the output by crossporting the outlets**

- A simple output is the quantity of lubricant supplied by the piston per stroke per outlet borehole to a lube point. **It amounts to approx. 0.2 cm<sup>3</sup>.**
- The outlets of the SSV divider block can be combined to increase the amount of lubricant for a particular outlet. To do this, simply plug the unused outlets with the closure plug (see Fig. 2), provided in the accessory kit.
- Lubricant from a plugged outlet is redirected to the next outlet on the same side of the SSV divider block in descending numerical order (see Fig. 1).
- For instance, plugging outlets 5 and 3 will triple the amount of lubricant to outlet 1. The connecting channel to outlet 2 is closed by means of the check valve's clamping ring (A).
- Lubricant quantities not needed may be returned to the reservoir (see Return to Reservoir).

**Important:** Do not plug outlet numbers 1 and 2 on SSV 8, 12 and 18 of pump models with SSV divider block installed on the bottom (outlets in horizontal position).

\* Install a closure plug in each outlet borehole which is not required, see Fig. 1 or 4.

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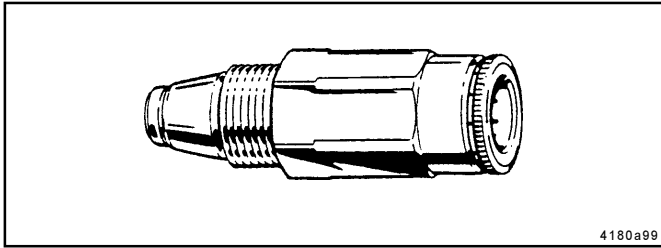


Fig. 3 - Check valve, push-in type

**Check valves**

**Important:**

Install one complete check valve in each outlet borehole that will be used.

As to QLS 311 with back mounted lubricant divider block **make sure to install a check valve** into each outlet borehole that will be used, as otherwise the reservoir will empty.

- For high pressure plastic tubes ( $\varnothing$  4x1 mm; 1/8 in. or 6x1,5 mm; 1/4 in.) use check valve with standard pliers and knurled flange.

**Return of lubricant quantities**

- All QLS pumps with the **back mounted SSV divider block** (vertical outlets) have the capability to return unused lubricant from the distributor block directly to the reservoir **internally**.
- To achieve this automatically, **outlet 2 has to be closed with a closure plug** (see Fig. 4). Lubricant quantities of pair and impair outlets are returnable via the connection of outlets 1 and 2.
- For returning, always start with the outlets with the lowest outlet numbers, i.e. 2, 4, 6... or 1, 3, 5... **plus outlet 2**. As shown in Fig. 4, the lubricant from outlets 1, 2 and 4 (3xR) will be internally returned to the reservoir.
- The remaining outlets are to be used for the connection to the lube point or to increase the lubricant quantity (double or triple).

**Important:** If **outlet 2** is connected to a **lube point**, **outlet 1 must not be closed**, see Fig. 1.

*Note:* To return unneeded lubricant quantities from **bottom mounted divider blocks**, connect unneeded outlet via feed-line to return plug 5 (Fig. 15) for **external** return.

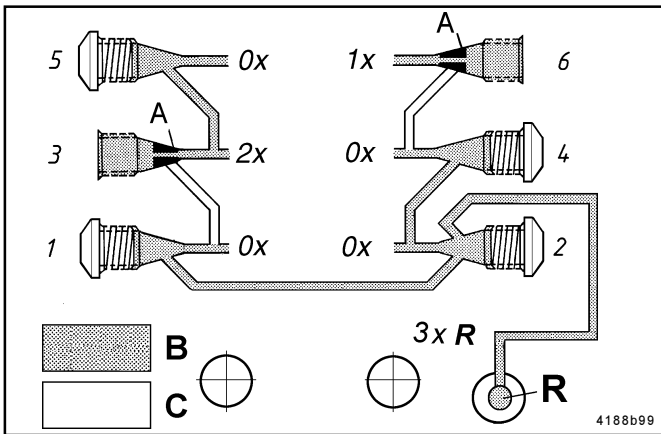


Fig. 4 - Internal return of supplied lubricant, only on back mounted SSV divider blocks

- X - Outlet quantity (single...)
- 1...6 Outlet numbers
- A - Clamping ring (brass)
- B - Grease or oil supply
- C - Grease or oil included
- R - Return line borehole

**Lubrication points**

**Installing Quicklinc fittings (for metric size accessory kits only)**

- \* Remove lube fittings from lube points and install appropriate Quicklinc fittings into boreholes of the lube points.

**Installing Zerk-Locks onto grease fitting (for inch size accessory kits only)**

- The Zerk-Lock fitting consists of the Zerk-Lock body, an insert and a push-in fitting.
- \* Place the Zerk-Lock body over the grease fitting.
- \* Then stake the Zerk-Lock insert by means of the special staking tool (part of the accessory kit) and a hammer until the filling nipple is tightly enclosed by the insert.

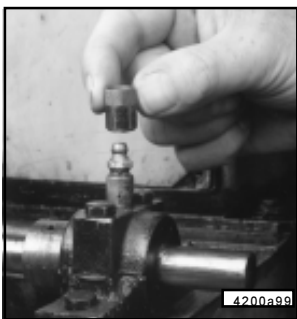


Fig. 5 - Place the Zerk-Lock body over the grease fitting



Fig. 6 - Installation of Zerk-Lock body with staking tool

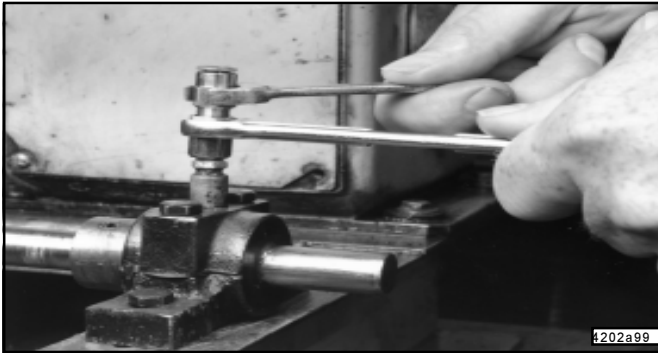


Fig. 7 - Screwing Quicklinc fitting into the Zerk-Lock body

- \* Screw the Quicklinc fitting into the Zerk-Lock body and tighten until parts resist further tightening (about 1-1/2 turns).

*Note: Quicklinc hex. is 12 mm. Zerk-Lock body hex is 1/2".*

- \* Move the Zerk-Lock and tube fitting from side to side on the grease fitting to ensure the Zerk-Lock is firmly seated on the grease fitting.

### Connection of feed lines



Fig. 8 - Install feed line in the Quicklinc fitting

- \* Measure, cut and route the feed lines included in the accessory kit.

*Note: Avoid sharp bends of the plastic tubing and the moving parts of the machine that could damage the lubrication lines. Minimum bending radius is 50 mm (2in).*

- \* Secure the lubrication lines to the machine using nylon ties or corrugated tubes.
- \* If the lines are not primed, prime all lubrication feed lines before connecting them to the lube points (by releasing an additional lubrication).
- \* Connect feed lines to the check valves of the distributor block and to the Quicklinc quick connecting fittings of the lube point.

*Note: Push the end of the line firmly into the Quicklinc fitting until it is fully seated in the body. Primed feed lines are marked with white lines (Fig.9, 10) as an installation aid.*

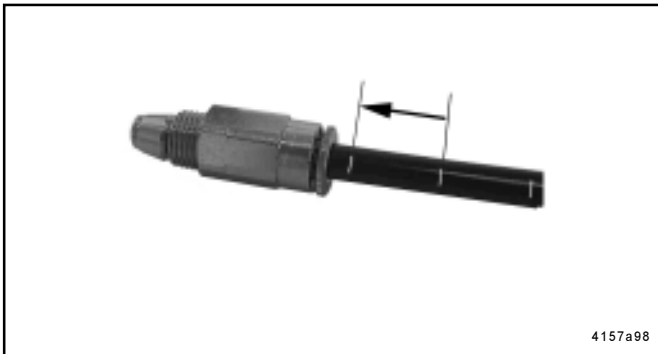


Fig. 9 - Insert feed line into the Quicklinc fitting up to the next white mark

- \* Cut the high pressure plastic tube at one of the white lines before it is mounted.
- \* Then insert the feed line into the fitting up to the next white mark.
- This will ensure that the feed line is completely installed in the tube fitting.

### Filling of reservoir

#### QLS 301, QLS 311

- \* Fill the reservoir with clean suitable lubricant.

#### QLS 301

**Caution:** Expel all air from the lubricant under the follower plate. Make sure that the follower plate sealing lip moves above the vent hole to ensure that all air pockets are vented (see Fig. 10).

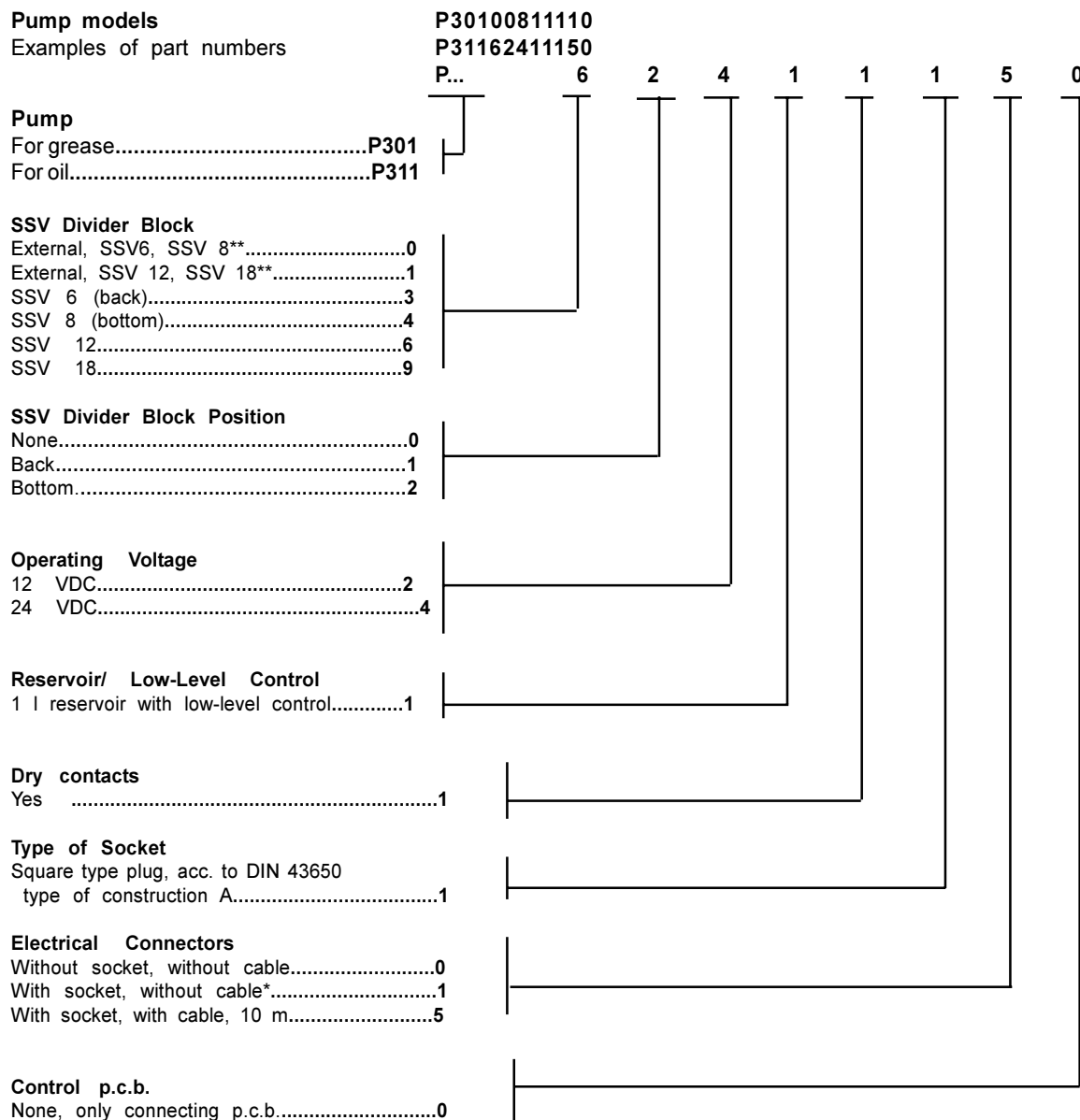
**Caution:** When filling the reservoir make sure **not to exceed the maximum mark**. **When overcharging the reservoir it might burst!**



Fig. 10 - Vent hole on reservoir, only for QLS 301

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## Selection Guide of QLS without Control Unit



**Important:** QLS models differing from this selection guide in one or more points are to be considered as special pumps and have to be ordered with a special part number.

**Example of an explained model number:**

**Pump model P30131411110-** Grease pump, SSV 6 divider block back mounted, 24 VDC, with low-level and dry contact.

- \* Note: Pumps for the industry are supplied without electrical cord.
- \*\* Note: For external divider block application only use the specific divider blocks SSV...KNQLS.
- † Note: Do not use QLS with SSV block in bottom mounting position for mobile application or in areas exposed to shock (also see „Safety instructions“).

**Accessory Kits:**

**Inch Size Kits:**

- SSV 6/8 part n°.550-36971-1
- SSV 12 part n°.550-36971-2
- SSV 18 part n°.550-36971-3

**Metric Size Kits: Grease**

- SSV 6/8 part n°.550-36970-1\*\*\*
- SSV 12 part n°.550-36970-2\*\*\*
- SSV 18 part n°.550-36970-3\*\*\*

\*\*\*Lube fittings must be ordered separately.

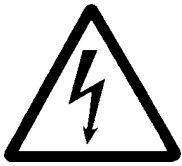
**Metric Size Kits: Oil**

- SSV 6/8 part n°.550-34010-1\*\*\*
- SSV 12 part n°.550-34010-2\*\*\*
- SSV 18 part n°.550-34010-3\*\*\*

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### Electrical Connecting Diagrams

**Electrical Connection**



**Warning:** Before starting, make sure that the electrical supply is off. The device may not be connected or disconnected when the power is on. The protective conductor must always be connected.

Take care that this line section is undamaged and conforms to standards and that the contacts are safe.

\* Connect the electric wires acc. to the following electrical connecting diagrams.

*Note:* The protection IP6K9K is guaranteed when the socket is tightened on housing cover ( x1, x2) with flat packing.

**Direct current (VDC) with mounted SSV divider block**

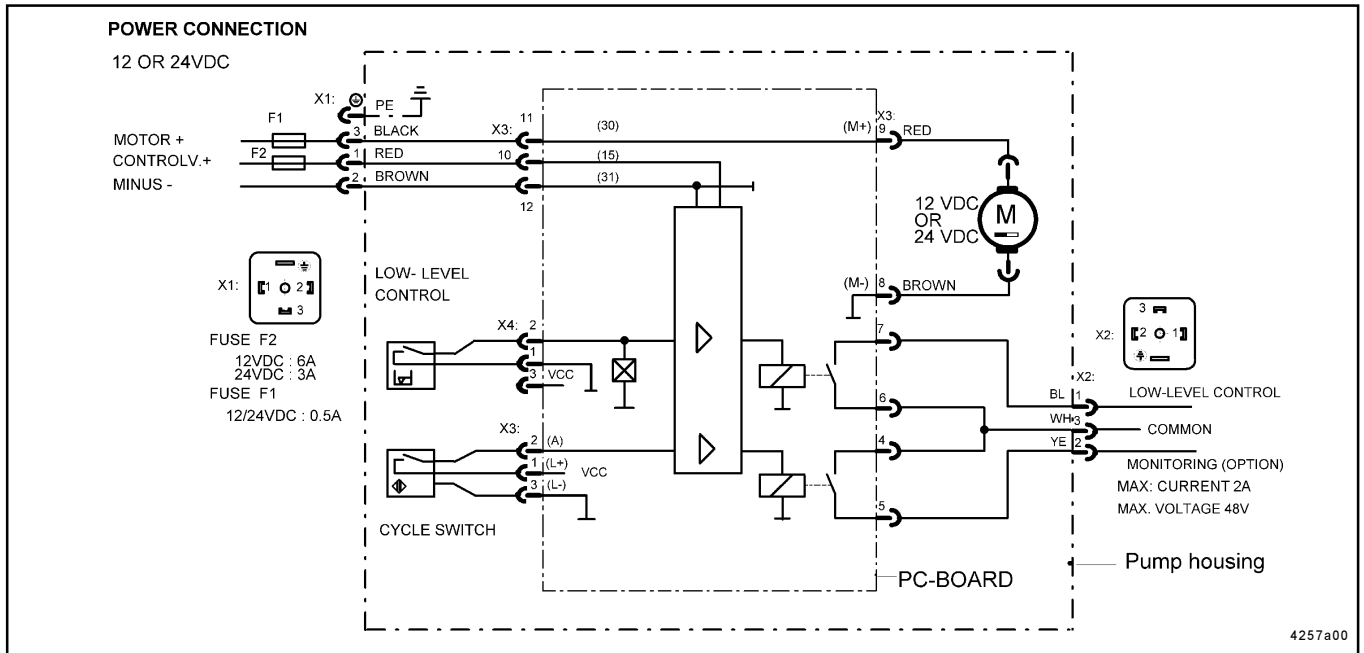


Fig. 11 - Electrical connecting diagram, direct current with integrated SSV divider block

**Direct current (VDC) with external divider block**

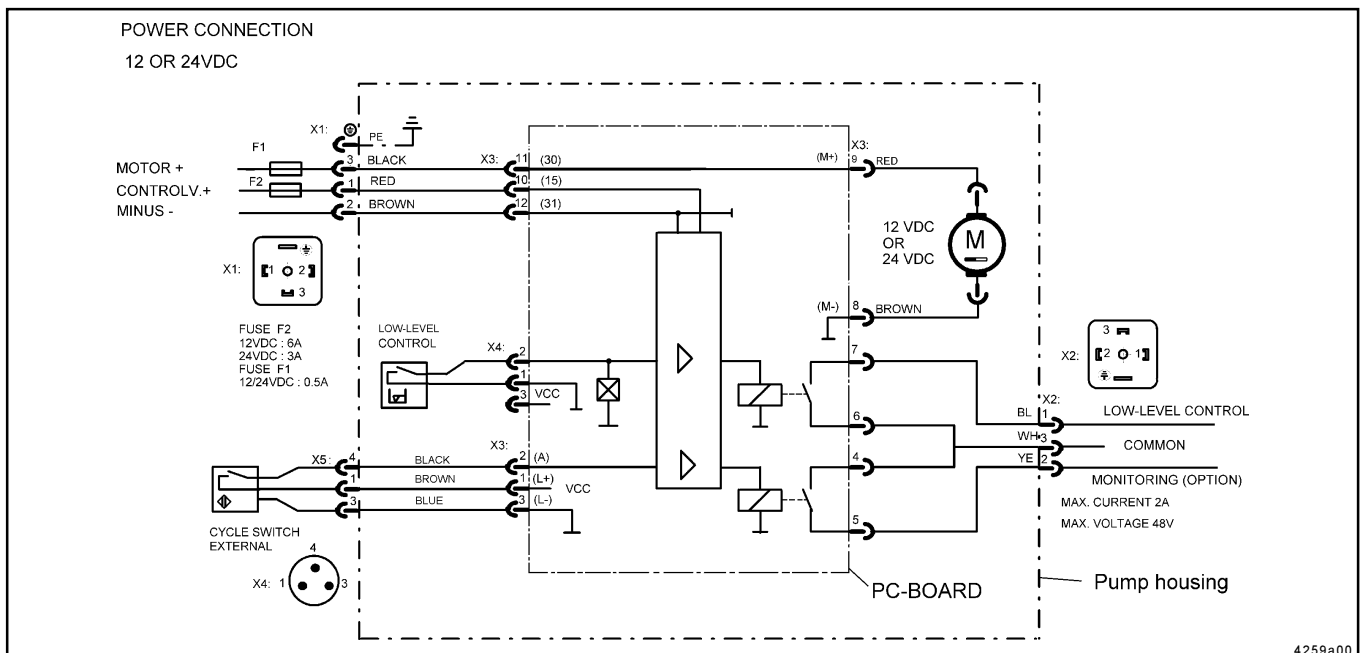


Fig. 12 - Electrical connecting diagram, direct current and external SSV distributor block

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## Description of QLS



Fig. 13 - QLS 301 with bottom position of the SSV divider block

- |                       |  |
|-----------------------|--|
| 1 - Connecting block  | 4 - Nipple for external manual lubrication |
| 2 - Manifold          | 5 - Plug, R 1/8"                           |
| 3 - SSV divider block | (P=Pump, R=Return line)                    |

- The QLS 301, 311 is a complete compact lubrication system for a **maximum of 18 lubrication points**.
- Pumps QLS 301, 311 have three basic configurations:
  - SSV divider block mounted on the bottom (see Fig. 13)
  - SSV divider block mounted on the back (see Fig. 14)
  - Pump without the SSV divider block attached (no figure).
- The QLS 301, 311 with the SSV divider block mounted on the bottom has the capability of using steel tubing as lubrication lines if necessary.
- Standard lubrication lines are high pressure plastic tubes included in the accessory kits (ø 6x1.5 mm; 1/4 in.).

*Note: The function of the QLS 301, 311 is independent from the mounting position of the SSV divider block and the proximity switch.*



Fig. 14 - QLS 311 with back position of the SSV divider block

- An external power supply starts the electric motor and the pump element starts pumping the lubricant to the SSV divider blocks.
- When all lubrication points have received lubricant, one lubrication cycle is completed. Then, an internal proximity switch (initiator, see e.g. Fig. 14) turns the motor and the external power supply off.
- The monitoring of the lubrication cycle can be effected by an external control unit (SPS) in such way that the QLS 301, 311 does not start automatically any more.

- |                      |  |
|----------------------|--|
| 1 - Proximity switch | 3 - SSV divider block                      |
| 2 - Control pin      | 4 - Nipple for external manual lubrication |

## Operation of the QLS

### Pump

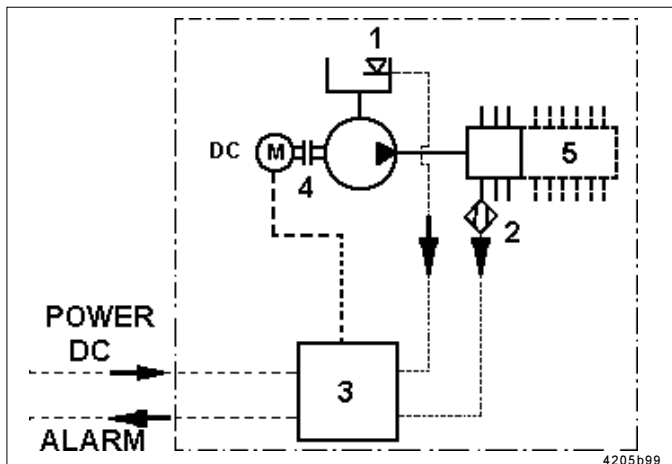


Fig. 15 - QLS 301, 311 Scheme

- The QLS 301, 311 operates according to lube cycles (pause and operating times).
- The pause time begins the cycle, then the operating time occurs.
- A division of the lube points (option) via secondary metering devices (SSV 6) and one main divider block (SSV 6, SSV 8) is possible only up to **max. 18 lube points per cycle**. In this case, the number of the cycles of the main divider block must be set according to the number of lube points or the lubricant need, if possible by means of an external control unit.

- |                       |                      |
|-----------------------|----------------------|
| 1 - Low-level control | 3 - Control unit     |
| 2 - Proximity switch  | 4 - Pump unit        |
|                       | 5 - SSV 6, 8, 12, 18 |

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### Pressure relief valve

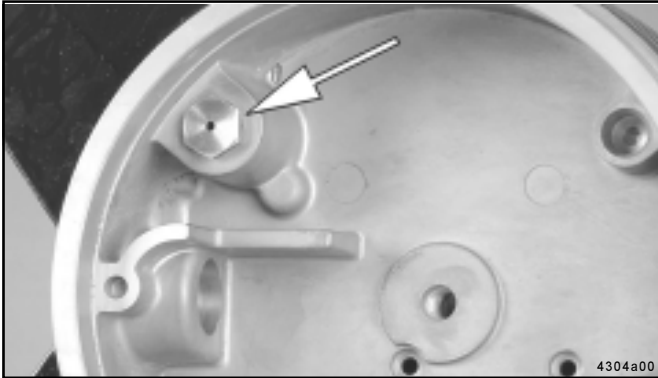


Fig. 16-Pressure relief valve (cartridge) in housing

- The QLS 301, 311 is protected with a pressure relief valve (cartridge).
- The pressure relief valve limits the pressure build-up in the QLS 301, 311. It opens at an overpressure of 205 bar (QLS301) or 80 bar (QLS 311).
- If the pressure relief valve is actuated, this indicates that the system is malfunctioning. The lubricant flows back into the reservoir (not visible).

### Low-level control

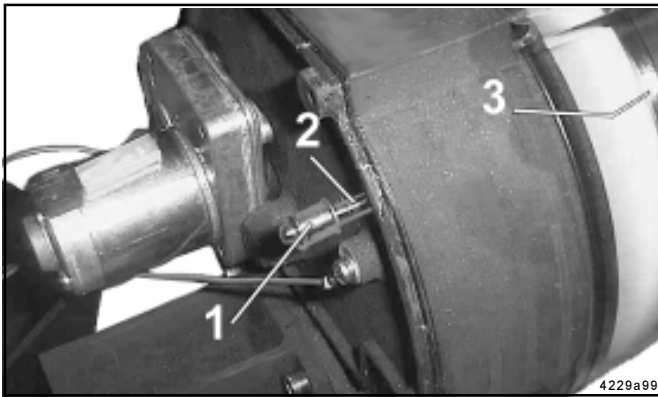


Fig. 17 -Parts of low-level control, QLS 301

- 1 - Magnet
- 2 - Pin
- 3 - Follower plate

### QLS 301

- When the reservoir is empty, the follower plate (3) (Fig. 17 and 19) of the reservoir moves the pin (2) (Fig. 17) with the magnet (1) ahead of the printed circuit board and initiates an external low-level signal.
- The external low-level control and the conditions for connection and disconnection of the low-level control as well as the starting and stopping conditions of the motor during low-level have to be adjusted according to the customer's requirements.

### QLS 311

- In case of a low-level indication, a float magnetic switch in the reservoir initiates an external low-level indication.
- The external low-level indication and the conditions of connection and disconnection of the low-level control as well as the starting and stopping conditions of the motor in case of a low-level have to be adjusted according to the customer's requirements.

## Maintenance, Repair and Tests

### Maintenance

- Maintenance is essentially limited to refilling the reservoir with clean lubricant as necessary. However, check regularly whether the lubricant is being dispensed to all lube points.
- Also check the high pressure plastic hoses and feed lines for damage and replace them, if necessary.

*Note: Whenever work is performed on the centralized lubrication system, special attention should be paid to cleanliness. Dirt will cause failure of the system.*

**Important:** To clean the system use petroleum spirit or petroleum. **Do not use Tri, Per or similar solvents or polar or organic solvents such as alcohol, methanol, acetone, etc.**

### To fill reservoir

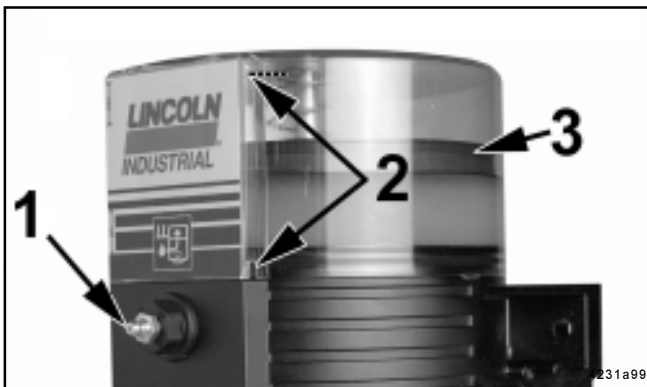


Fig. 18 - Fill reservoir up to the „Max.“ mark (QLS 301)  
1 - Filling nipple  
2 - Vent hole  
3 - Follower plate

### QLS 301

\* Fill the reservoir up to the „Max.“ mark via the filling nipple (1) (Fig. 18).

\* Fill reservoir via an adapter with the cartridge up to the „Max.“ mark .

**Important:** When filling the reservoir with a cartridge, inclusions of air may be transported into the reservoir. They form in the adapter, the outlet of the cartridge, the grease of the cartridge as well as in the area of the cartridge piston. Therefore, make sure to fill in the grease without air conclusions.

**Important:** The grease must be free from impurities and must not be liable to change its consistency over the course of time.

*Note: If the reservoir has been completely emptied, the pump may require a longer running time to reach the full lubricant output. Therefore, initiate additional lube cycles manually.*

### Filling of the empty reservoir

- Make sure that after refilling the empty reservoir all air has been expelled from under the follower plate (3) as described in the following.
- \* After reaching the upper filling level position of the follower plate (3), its seal should clear the vent hole (2) located on the side of the reservoir. Then a small amount of grease should be refilled to ensure expelling of air from under the follower plate (3).



**Caution:** When filling the reservoir make sure **not to exceed the max. filling mark. An overfilled reservoir bears the risk of bursting.**

### Repair

- For repair work on the QLS 301, 311 use only Lincoln Industrial original spare parts.
- Using non-Lincoln Industrial parts will void the warranty.

**Caution:** By operating the QLS 301, 311 without the reservoir installed **there is a risk of injury** by the eccentric gear in the housing.

### Functional Test

Initiate externally if possible.

### QLS 311

Fill the reservoir via the reservoir cover up to the „Max.“ mark.

**Important:** The oil must be free from impurities and must not be liable to change its consistency over the course of time.

*Note: When the reservoir has been completely emptied, the pump may require a longer running time to reach the full lubricant output. Therefore, several additional lube cycles have to be initiated externally.*

## Troubleshooting

### Pump of the QLS 301, 311

<p>• <b>Fault: Pump motor doesn't run</b></p>	
<p>• <b>Cause:</b></p> <ul style="list-style-type: none"> <li>• Power supply interrupted.</li>   <li>• Power supply from printed circuit board to motor interrupted. Electric motor defective.</li> </ul>	<p>• <b>Remedy:</b></p> <ul style="list-style-type: none"> <li>* Check the voltage supply to the pump/ fuses. If necessary eliminate the fault or replace the fuses.</li>   <li>* Check the feed line from the fuses to the plug of the pump and then to the motor.</li>   <li>* If possible, initiate an additional lube cycle. Check voltage supply from the printed circuit board to the motor. If necessary replace motor.</li> </ul>
<p>• <b>Fault: Pump does not deliver lubricant</b></p>	
<p>• <b>Cause:</b></p> <ul style="list-style-type: none"> <li>• Reservoir empty. External low-level display is flashing.</li>   <li>• Air pockets in the lubricant by filling the reservoir via a cartridge (transport due to air in the adapter, in the cartridge outlet and in the area of the cartridge piston).</li> <li>• Improper lubricant has been used.</li>   <li>• Suction hole of pump element clogged.</li>   <li>• Pump piston is worn.</li>   <li>• Check valve in pump element defective or clogged.</li> </ul>	<p>• <b>Remedy:</b></p> <ul style="list-style-type: none"> <li>* Fill up the reservoir with clean grease resp. oil, let the pump run (initiate external additional lube cycle) until the lubricant shows at all lube points. <i>Note: Depending on the ambient temperature and/or the kind of lubricant, the pump element needs a longer run time to reach the full output. Therefore, initiate several additional lube cycles..</i></li>   <li>* If possible, trigger several additional lube cycles. Lubricant must dispense without air bubbles.</li>   <li>* Change the lubricant, ask for a lubricant table.</li> <li>* Clean and rinse pump/ lubrication system.</li> <li>* Remove pump element. Check suction hole for foreign particles. If there are any, remove them.</li>   <li>* Replace pump element.</li>   <li>* Replace pump element.</li> <li>* Clean check valve.</li> </ul>
<p>• <b>Fault: Pump doesn't switch off</b></p>	
<p>• <b>Cause:</b></p> <ul style="list-style-type: none"> <li>• Proximity switch is not dampened, i.e. the control pin on the SSV divider block does not move within the switching range of the proximity switch (initiator) or the distance between the control pin and the proximity switch surface is more than 0.5 mm or control pin is too long.</li> </ul>	<p>• <b>Remedy:</b></p> <ul style="list-style-type: none"> <li>* If possible, initiate an additional lubrication. Check whether the control pin moves centrally (+/- 1.2 mm tolerance) over the switching surface of the proximity switch.</li> <li>* Check the distances and if necessary adjust newly.</li> <li>* The distance between the control pin and the switching surface may be max. 0.5 mm.</li> <li>* Distances - upper edge of proximity switch to upper edge of fixing nut: 16<sup>-0,2</sup> mm for backside-mounted divider blocks 12,7<sup>+/-0,1</sup>mm for bottom-mounted divider valves</li> <li>* Tighten the nut with 1.5 Nm, then secure with Loctite 274 or similar.</li> <li>* Check the length of control pin while it moves over the surface of the proximity switch (forward and backward movement). During the insert status, the end of the control pin should be located on the edge of the switch surface. Otherwise, the pin has to be shortened by approx. 1 mm (0.03 in).</li> </ul>

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## Troubleshooting, Continuation

### Divider block of QLS 301, 311

<p>• <b>Fault: Blockage in the downstream progressive system</b></p>	
<p>• <b>Cause:</b></p> <ul style="list-style-type: none"> <li>• Bearings, lines or divider block clogged.</li> <li>• Mounting position of divider block: bottom                     <ul style="list-style-type: none"> <li>– On divider blocks SSV 8, SSV 12 or SSV 18, the outlet borehole 1 and/ or 2 is closed.</li> </ul> </li> <li>• Mounting position of divider block: back                     <ul style="list-style-type: none"> <li>– On divider blocks SSV 6, SSV 12 or SSV 18, the outlet borehole 1 is closed and outlet 2 is connected.</li> </ul> </li> </ul> <p>The fault can be identified as follows: The indicator pin on the divider block piston doesn't move.</p>	<p>• <b>Remedy:</b></p> <ul style="list-style-type: none"> <li>• Determine the cause of the blockage as described in the following example and eliminate it:                     <ul style="list-style-type: none"> <li>* Let the pump run.</li> <li>* Disconnect all feed lines (D) (Fig. 19) of the divider block one after the other. If grease or oil shows e.g. at outlet 3 under pressure, the blockage is located in the line of outlet 3 or in the connected bearing point.</li> <li>* Pump through the blocked line or bearing point using a hand pump.                             <p><i>Note: To check the individual outlets, leave all outlets disconnected for a while, since only one piston stroke is executed with each motor revolution. However, several strokes are required for a full cycle of all divider blocks.</i></p> </li> </ul> </li> <li>* Check pressure relief valve (Fig. 16). Replace it, if necessary.</li> </ul>
<p>Fig. 19 - Example of a QLS 301, 311</p>	
<p>• Divider valve is blocked</p>	<ul style="list-style-type: none"> <li>* Replace the divider block or clean it as follows.</li> <li>* Remove all threaded tube fittings.</li> <li>* Unscrew the piston closure plugs.</li> <li>* Remove the piston, if possible, with a soft mandrel (smaller than <math>\varnothing</math> 6 mm; 0.23 in).</li> </ul> <p><b>Important:</b> The pistons are individually fitted in the bore holes of the divider block. After removing the pistons, mark them in order to reinstall them in the right direction and position. They may not be interchanged when installed.</p> <ul style="list-style-type: none"> <li>* Thoroughly clean the divider block body in a grease desolving detergent and dry it out with compressed air.</li> <li>* Clean through the material passages (<math>\varnothing</math> 1.5 mm; 0.05 in) at the thread ends of the piston bore holes using a pin.</li> <li>* Clean the divider block once more and dry it thoroughly.</li> <li>* Reassemble the divider block.</li> </ul>
<p>• <b>Fault: Differing lubricant amounts at the lube points</b></p>	
<p>• <b>Cause:</b></p> <ul style="list-style-type: none"> <li>• Incorrect lubricant metering</li> <li>• Incorrect setting of pause time</li> </ul>	<p>• <b>Remedy:</b></p> <ul style="list-style-type: none"> <li>• Check the lubricant metering acc. to the lubrication chart.</li> <li>• Check time setting.</li> <li>• Observe manufacturer's indications to grease or oil quantity.</li> </ul>

## Technical Data

### QLS 301, general

Operating temperature .....	-25° C to 70° C
Maximum operating pressure (Pump model without divider block) .....	approx. 205 bar (3000psig)
Number of outlets .....	6, 8, 12, 18
Output per outlet and cycle .....	approx. 0.2 cm <sup>3</sup>
Reservoir capacity .....	1 l
Lubricant .....	grease up to consistency class NLGI 2
Weight .....	5.7 kg

### QLS 311, general

Operating temperature .....	-25° C bis 70° C
Maximum operating pressure (Pump without divider block) .....	approx. 80 bar (1200psig)
Number of outlets .....	6, 8, 12, 18
Output per outlet and cycle .....	approx. 0.2 cm <sup>3</sup>
Reservoir capacity .....	1 l
Lubricant .....	Oils of at least 40 mm <sup>2</sup> /s (cSt)
Weight .....	5.7 kg

### Electrical Data DC (direct current)

Operating voltage .....	12 V, - 20%/+ 30 %
Max. operating current .....	2.0 A
Operating voltage .....	24 V, - 20%/+ 30 %
Max. operating current .....	1.0 A
Residual ripple in relation to operating voltage .....	± 5% acc. to DIN 41755
Protection .....	IP6K 9K acc. to DIN 40050 T9 (NEMA 4)
Reverse polarity protection: The operating voltage inlets are protected against reverse polarity.	

*Note: The pump motors are suitable for intermittent operation only. Other applications may be allowed on exact knowledge of the application conditions and on prior consultation of the manufacturer.*

- In addition to the EMV regulation, the **DC systems** also correspond to the following regulations and standards:
  - the vehicle guideline 95/245/EG
  - EN 40839 T1, 3 and 4

### Recommendation for time setting

Min. pause time .....	4 minutes
Max. operating time .....	4 minutes

### Lubrication lines

Plastic tube (ø 4x1 mm; 1/8 in.), only oil	
Plastic tube (ø 6x1.5 mm; 1/4 in.)	
Min. bending radius .....	50 mm
Bursting pressure at 20°C .....	approx. 210 bar

### Tightening Torques

#### Pump

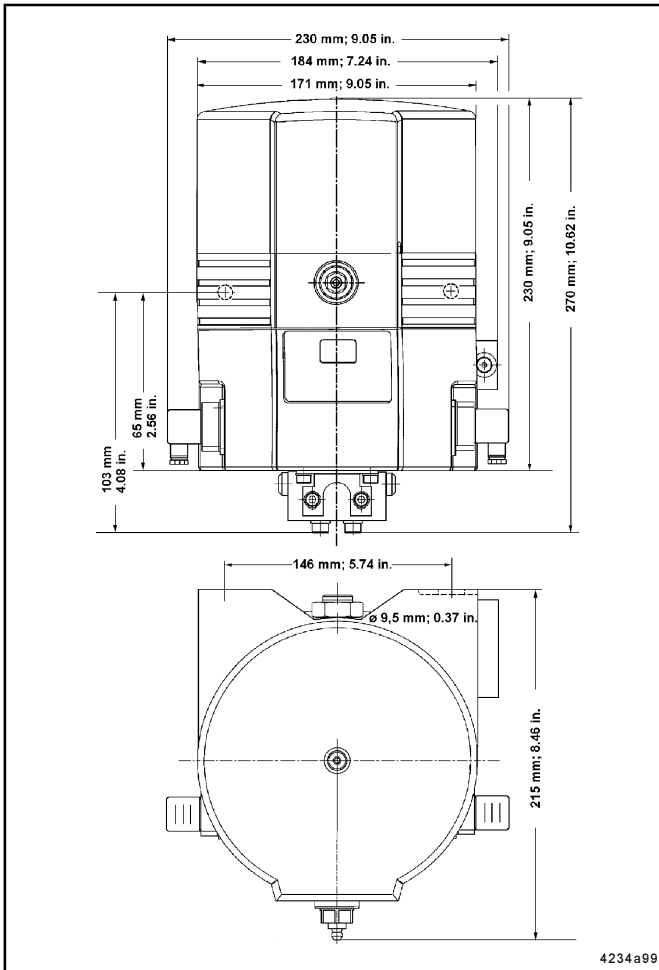
Electric motor to housing .....	3 Nm
Pump element in housing .....	25 Nm

#### Divider block

Closure plug (piston) in divider block .....	18 Nm
Closure plug (outlets) in divider block .....	15 Nm
Outlet fitting in divider block, screw-type .....	17 Nm
push-in type .....	12 Nm
Coupling nut onto outlet fitting, screw-type	
Plastic tube .....	10 Nm
Steel tube .....	11 Nm
Fitting for indicator pin .....	18 Nm
Mounting of the divider block (M 6; 8.8) .....	10 Nm

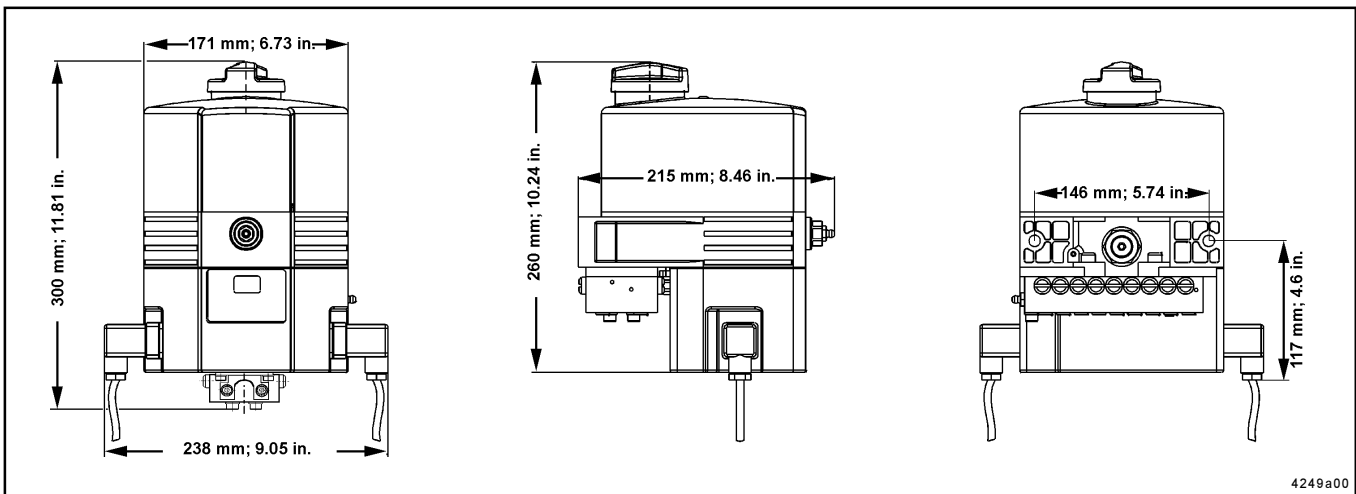
## Dimensions

### Pump



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Fig. 20- Dimensions of QLS 301



4249a00

Fig. 21 - Dimensions of QLS 311

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Divider Blocks

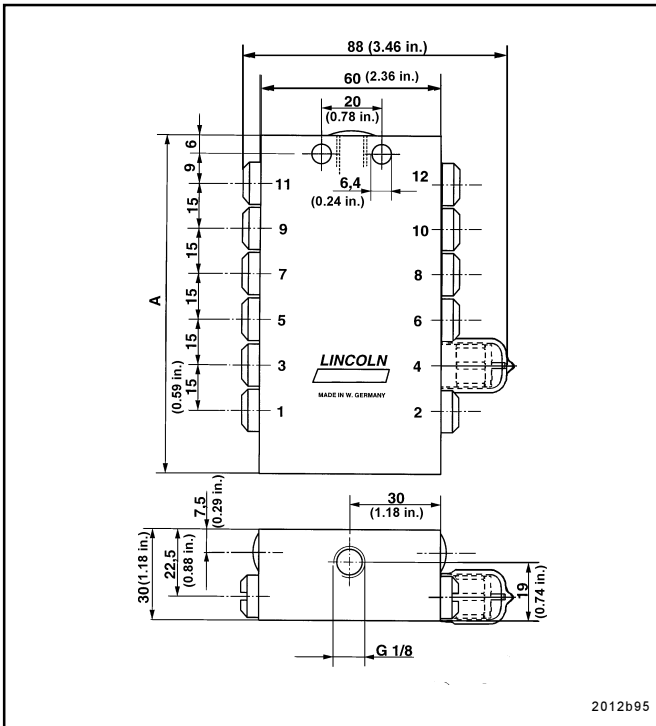


Fig. 22 - Dimensions of bottom mounted SSV divider block

Number of outlets	Dimensions A in mm
8	75
12	105
18	150

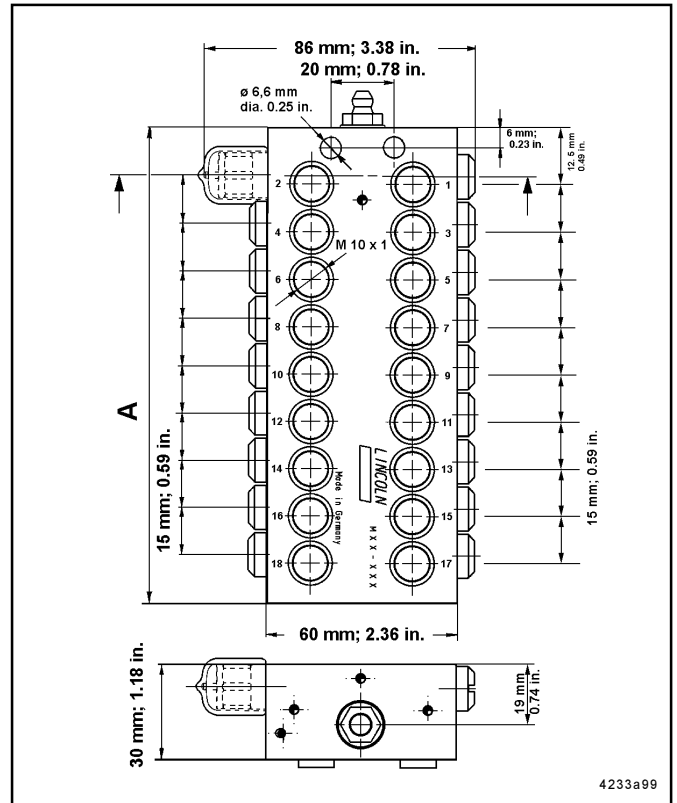


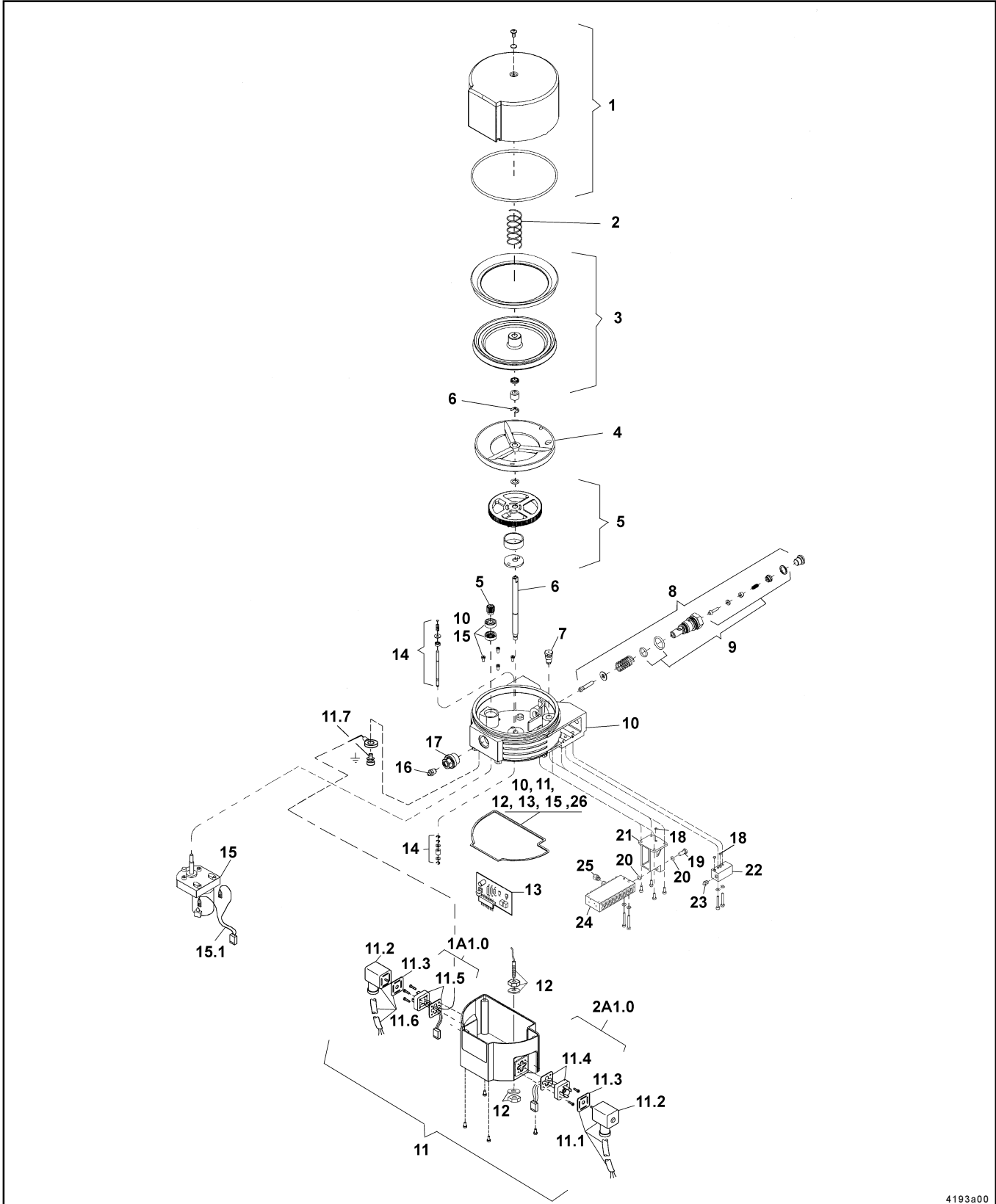
Fig. 23 -Dimensions of back mounted SSV divider block

Number of outlets	DimensionsA in mm
6	60
12	105
18	150

Subject to change without notice

### Service Parts and Assembly Kits for the QLS 301

QLS 301 with bottom mounted SSV divider block



4193a00

Fig. 24 - QLS 301 with bottom mounted SSV divider block

Subject to change without notice



**Parts List**

Pos.	Designation	Kit	Part	Qty	Part N°.	Pos.	Designation	Kit	Part	Qty	Part N°.
1	Reservoir	x		1	550-36979-2	11.6	Appliance plug 1 with 10 m cable for power supply		x	1	664-36078-7
2	Spring, DA 28 x 1,6 x 106		x	1	218-14172-6	11.7	Combination screw		x	1	201-14434-1
3	Follower piston	x		1	550-36979-3	12	Proximity switch	x		1	550-36980-1
4	Intermediate plate	x		1	450-24749-1	13	P.c.b. board		x	1	236-14490-1
5	Eccentric gear	x		1	550-36979-4	14	Low-level control	x		1	550-36979-9
6	Shaft	x		1	550-36979-1	15	Motor, 12 VDC	x		1	550-36982-1
7	Pressure relief valve		x	1	235-14343-1	15.1	Motor, 24 VDC	x		1	550-36982-2
8	Pump element, complete ø 6 mm		x	1	650-28856-1	16	Motor connection		x	1	664-36968-2
9	Sealing kit for pump element	x		1	550-36979-5	17	Hydr. lube fitting, ST AR 1/8		x	1	251-14040-1
10	Housing for low-level control	x		1	550-36981-3	18	Adapter M 22x1.5 (a) x G 1/8 in.(i)		x	1	304-19619-1
11	Housing cover for low-level control and VDC, plug 1A1.0	x		1	550-36984-1	19	O-ring ø 5 x1.5 mm		x	3	219-12222-2
	VDC, plug 2A1.0	x		1	550-36984-2	20	Hollow screw		x	1	226-13777-2
11.1	Appliance plug 2 with 10 m cable for power supply	x		1	664-36078-9	21	Sealing ring, alu		x	2	226-13780-1
11.2	Socket, black GMD-3011		x	2	236-13277-9	22	Manifold	x		1	550-36979-6
11.3	Flat packing		x	2	236-13294-3	23	Connecting block	x		1	550-36979-7
11.4	Appliance plug 2, for power supply, VDC		x	1	664-36968-6	24	Hydr. lube fitting, ST AR 1/8		x	1	251-14040-1
11.5	Appliance plug 1, for power supply VDC		x	1	664-36968-4	25	SSV divider block SSV 8 - K		x	1	619-37586-1
							SSV 12 - K		x	1	619-37587-1
							SSV 18 - K		x	1	619-37588-1
						25	Closure plug for indicator pin	x		1	519-32123-1
						26	Sealing kit for QLS			1	550-36979-8

QLS 301 with back mounted SSV divider block

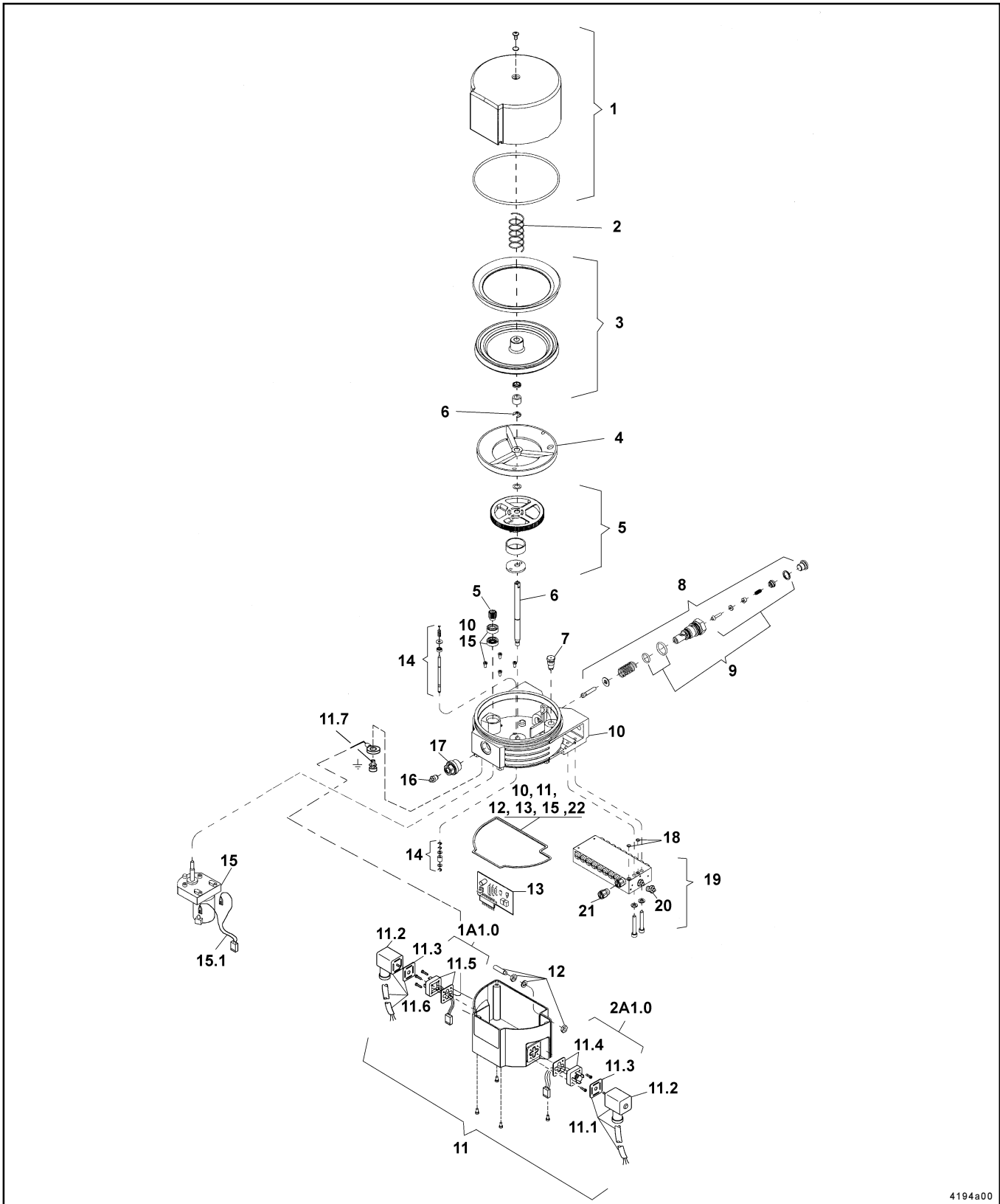


Fig. 25 - QLS 301 with back mounted SSV divider block

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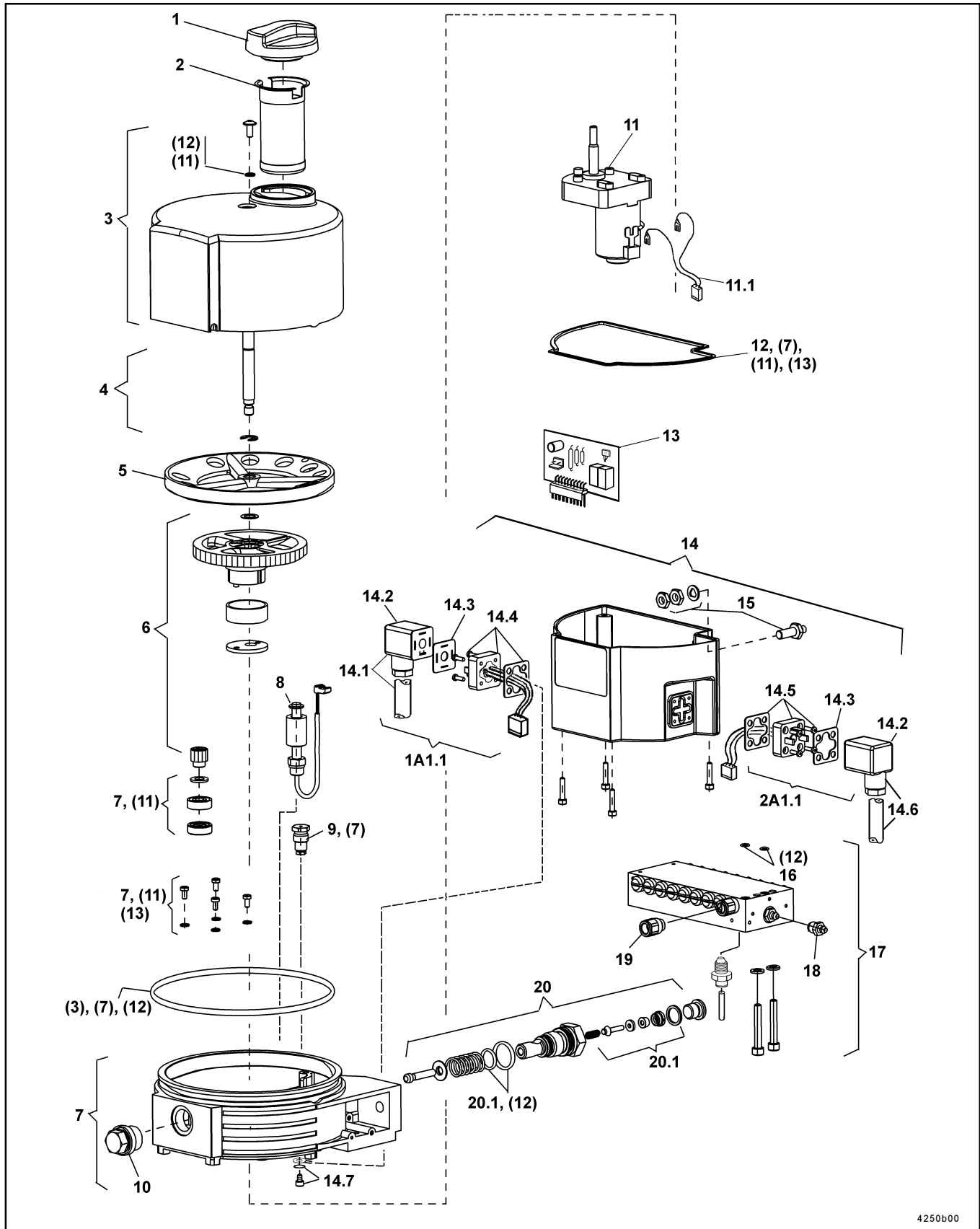
**Parts List**

Pos.	Designation	Kit	Part	Qty	Part N°.	Pos.	Designation	Kit	Part	Qty	Part N°.
1	Reservoir	x		1	550-36979-2	11.6	Appliance plug 1 with 10 m cable, for power supply		x	1	664-36078-7
2	Spring, DA 28 x 1,6 x 106		x	1	218-14172-6	11.7	Combination screw		x	1	201-14434-1
3	Follower piston	x		1	550-36979-3	12	Proximity switch	x		1	550-36980-1
4	Intermediate plate	x		1	450-24749-1	13	P.c.b.		x	1	236-14490-1
5	Eccentric gear	x		1	550-36979-4	14	Low-level control	x		1	550-36979-9
6	Shaft	x		1	550-36979-1	15	Motor, 12 VDC	x		1	550-36982-1
7	Pressure relief-valve insert		x	1	235-14343-1		Motor, 24 VDC	x		1	550-36982-2
8	Pump element, compl. ø 6 mm		x	1	650-28856-1	15.1	Motor connection VDC		x	1	664-36968-2
9	Sealing kit for pump element	x		1	550-36979-5	16	Hydr. lube fitting ST AR 1/8		x	1	251-14040-1
10	Housing for low-level control	x		1	550-36981-3	17	Adapter M 22x1.5 (a) x G 1/8 in.(i)		x	1	304-19619-1
11	Housing cover for low-level control and VDC, plug 1A1.0	x		1	550-36984-1	18	O-Ring ø 5 x1.5 mm		x	3	219-12222-2
	VDC, plug 2A1.0	x		1	550-36984-2	19	SSV divider block SSV V6 - K	x		1	619-37589-1
11.1	Appliance plug 2 with 10 m cable for power supply	x		1	664-36078-9		SSV V12 - K	x		1	619-37590-1
11.2	Socket, black GMD-3011		x	2	236-13277-9		SSV V18 - K	x		1	619-37591-1
11.3	Flat packing		x	2	236-13294-3	20	Hydr. lube fitting ST AR 1/8		x	1	251-14040-1
11.4	Appliance plug 2, for power supply, VDC		x	1	664-36968-6	21	Closure plug for indicator pin		x	1	519-32123-1
11.5	Appliance plug 1, for power supply, VDC		x	1	664-36968-4	22	Sealing kit for QLS			1	550-36979-8

Subject to change without notice

### QLS 311 Parts List

QLS 311 with back mounted SSV divider block



4250b00

Fig. 26 - QLS 311 with back mounted SSV divider block

Subject to change without notice

Parts List

Pos.	Designation	Kit	Part	Qty.	Part N°.	Pos.	Designation	Kit	Part	Qty.	Part N°.
1	Cover		x	1	221-12488-4	14.3	Flat packing		x	2	236-13294-3
2	Filter		x	1	235-13128-2	14.4	Appliance plug 1, for power supply, VDC		x	1	664-36968-4
3	Reservoir	x		1	550-34004-1	14.5	Appliance plug 2, for remote control, VDC		x	1	664-36968-6
4	Shaft	x		1	550-36979-1	14.6	Socket 2 with 10 m cable, for remote control	x		1	664-36078-9
5	Intermediate plate	x		1	450-24857-1	14.7	Combination screw		x	1	201-14434-1
6	Eccentric gear	x		1	550-36979-4	15	Proximity switch	x		1	550-36980-1
7	Housing	x		1	550-34003-1	16	O-Ring 5x1,5		x	2	219-12222-2
8	Floating switch		x	1	450-24856-1	17	SSV divider block SSV V6 - K	x		1	619-37589-1
9	Pressure relief valve insert, 80 bar		x	1	235-14343-4		SSV V12 - K	x		1	619-37590-1
10	Closure plug M 22x1,5x12		x	1	303-19285-1		SSV V18 - K	x		1	619-37591-1
11	Motor, 12 VDC	x		1	550-36982-1	18	Hydraulic lube fitting St. R1/8 A3 F		x	1	251-14109-6
	Motor, 24 VDC	x		1	550-36982-2	19	Closure plug for indicator pin		x	1	519-32123-1
11.1	Motor connection, VDC		x	1	664-36968-2	20	Pump element, complete ø 6 mm		x	1	650-28856-1
12	Sealing kit for QLS 311			1	550-36979-8	20.1	Sealing kit for pump element	x		1	550-36979-5
13	P.c.b.		x	1	236-14490-1						
14	Housing cover for low-level control and VDC, plug 1A1.0	x		1	550-36984-1						
	VDC, plug 2A1.0	x		1	550-36984-2						
14.1	Appliance plug 1 with 10m cable, for power supply		x	1	664-36078-7						
14.2	Socket, black GMD-3011		x	2	236-13277-9						

QLS 311 with bottom mounted SSV divider block

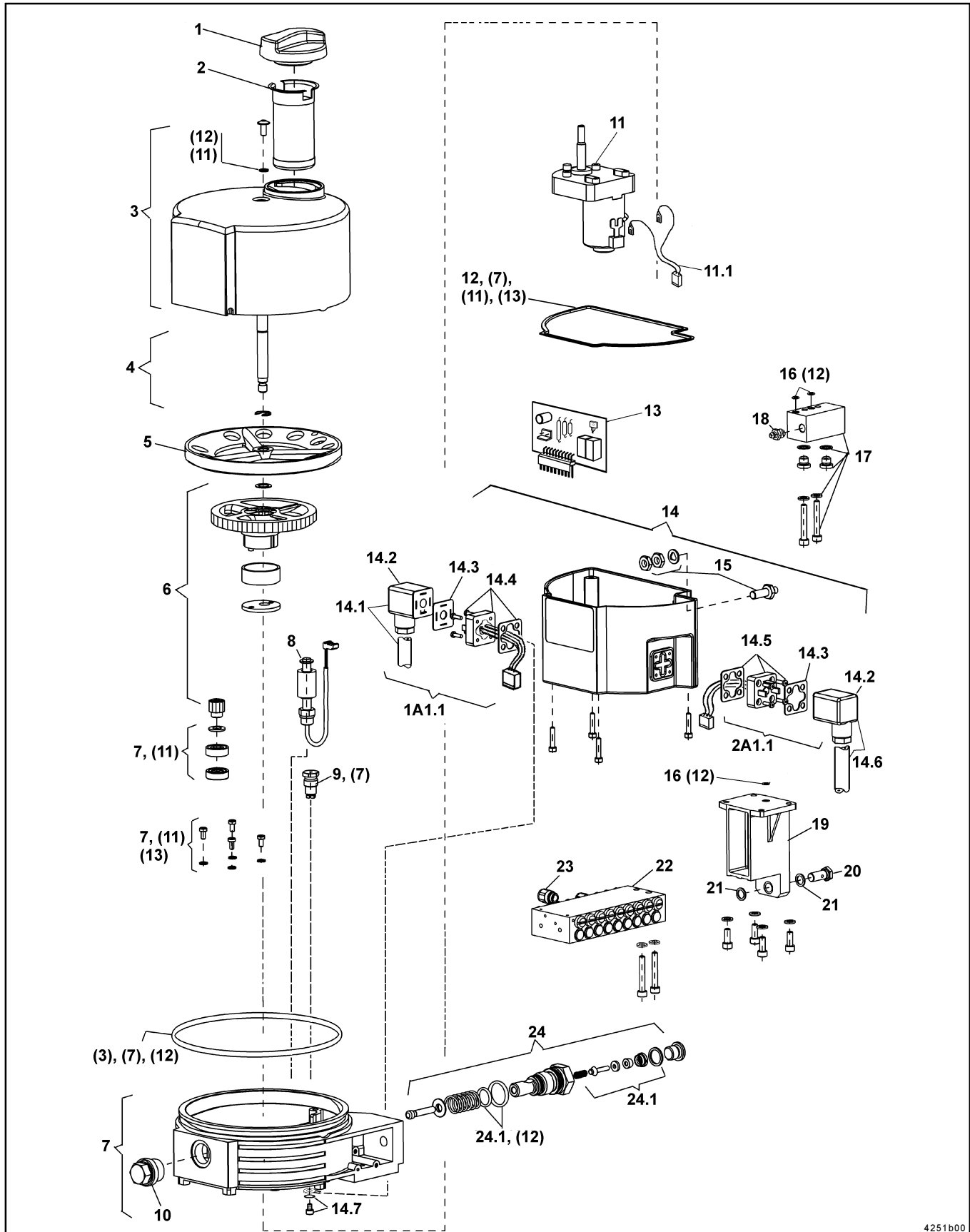


Fig. 27 - QLS 311 with bottom mounted SSV divider block

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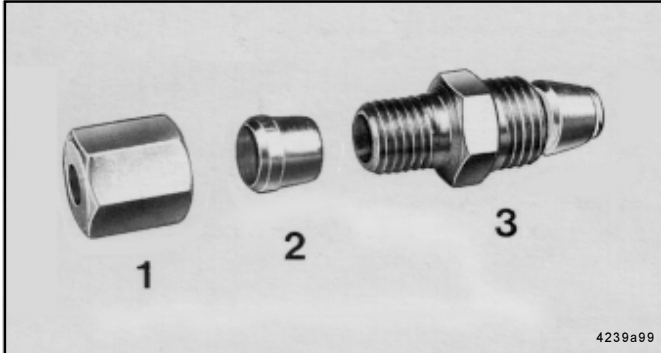
**Parts List**

Pos.	Designation	Kit	Part	Qty.	Part N°.	Pos.	Designation	Kit	Part	Qty.	Part N°.
1	Cover		x	1	221-12488-4	14.3	Flat packing		x	2	236-13294-3
2	Filter		x	1	235-13128-2	14.4	Appliance plug 1, for power supply, VDC		x	1	664-36968-4
3	Reservoir	x		1	550-34004-1	14.5	Appliance plug 2, for remote control, VDC		x	1	664-36968-6
4	Shaft	x		1	550-36979-1	14.6	Appliance plug 2 with 10 m cable, for remote control	x		1	664-36078-9
5	Intermediate plate	x		1	450-24857-1	14.7	Combination screw		x	1	201-14434-1
6	Eccentric gear	x		1	550-36979-4	15	Proximity switch	x		1	550-36980-1
7	Housing	x		1	550-34003-1	16	O-Ring 5x1,5		x	3	219-12222-2
8	Floating switch		x	1	450-24856-1	17	Connecting block	x		1	550-36979-7
9	Pressure relief valve insert		x	1	235-14343-4	18	Hydr. lube fitting, St. R 1/8 A3 F		x	1	251-14109-6
10	Closure plug M 22x1, 5x12		x	1	303-19285-1	19	Manifold	x		1	550-36979-6
11	Motor, 12 VDC	x		1	550-36982-1	20	Banjo bolt		x	1	226-13777-2
	Motor, 24 VDC	x		1	550-36982-2	21	Sealing ring, Alu		x	2	226-13780-1
11.1	Motor connection, VDC		x	1	664-36968-2	22	SSV divider block SSV V8 - K	x		1	619-37586-1
12	Sealing kit for QLS 311			1	550-36979-8		SSV V12 - K	x		1	619-37587-1
13	P.c.b.		x	1	236-14490-1		SSV V18 - K	x		1	619-37588-1
14	Housing cover for low-level control and VDC, plug 1A1.0	x		1	550-36984-1	23	Closure plug for indicator pin		x	1	519-32123-1
	VDC, plug 2A1.0	x		1	550-36984-2	24	Pump element, complete ø 6 mm		x	1	650-28856-1
14.1	Appliance plug 1 with 10 m cable, for power supply		x	1	664-36078-7	24.1	Sealing kit for pump element	x		1	550-36979-5
14.2	Socket, black GMD-3011		x	2	236-13277-9						

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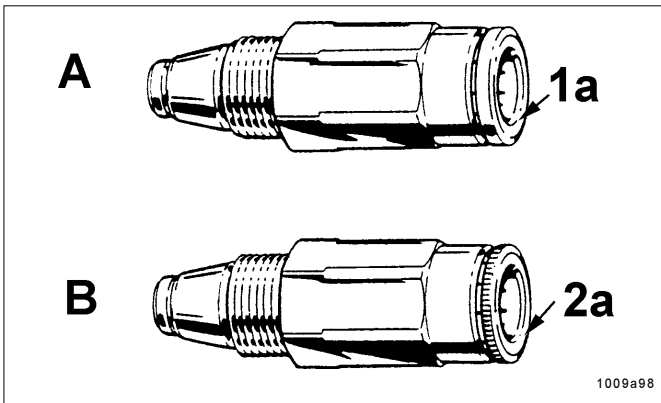
### Optional for metric fittings (not provided in the accessory kits)

Tube fittings, screw-type or push-in type for SSV outlets



- 1 - Coupling nut
- 2 - Cutting ring
- 3 - Valve body with sealing and clamping ring

Fig. 28 - Check valve, screw-type



- For high-pressure plastic hose ( $\varnothing$  8.6x2.3 mm) use check valve A (Fig. 29) with reinforced pliers (1a) and smooth flange (part n°. 226-14091-4)
- For plastic tube ( $\varnothing$  6x1.5 mm) use check valve B (Fig. 29) with standard pliers (2a) and knurled flange (part n°. 226-14091-2)

- A - Check valve with reinforced pliers
- B - Check valve with standard pliers
- 1a - Smooth flange
- 2a - Knurled flange

Fig. 29 - Different types of check valves

### Fitting the plastic tube or the high-pressure plastic hose



Fig. 30- Check valve with reinforced pliers and high-pressure plastic hose

*Note: Use high-pressure plastic hoses on construction machines or agricultural machines. In such cases the check valves of the secondary divider blocks must have reinforced pliers and a smooth flange (check valve type 1a).*

**Important:** Check valves with reinforced pliers may be connected only to high-pressure plastic hoses ( $\varnothing$  8.6x2.3 mm) with threaded sleeve and hose stud.

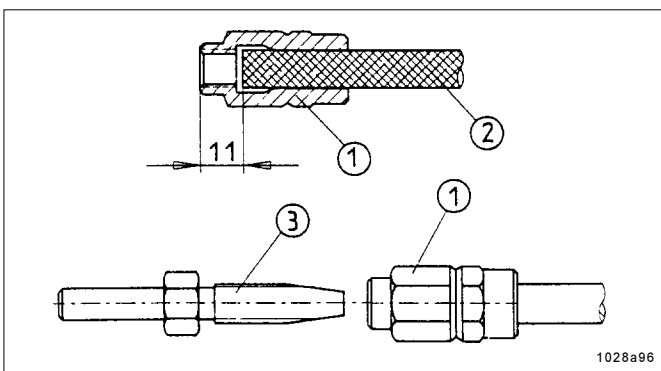


Fig. 31 - Preassembly of threaded sleeves and hose studs on the main line.

### Fitting the threaded sleeves and hose studs on the high-pressure plastic hose

\* Screw the threaded sleeve (item 1, Fig. 31) counterclockwise onto the high-pressure plastic hose (2) until the illustrated dimension of 11 mm is reached. Then screw the hose stud (3) into the threaded sleeve (1).

**Important:** Oil parts 1 and 3 before screwing them together.

- 1 - Threaded sleeve
- 2 - Main line
- 3 - Hose stud

Subject to change without notice



**Declaration of conformity as defined by machinery directive 89/392/EEC, Annex II A**

This is to declare that the design of the

**QLS 301, 311 lubrication system**

in the version supplied by us, complies with the provisions of the machinery directive 91/368/EEC.

**Applied harmonized standards in particular:**

- EN 292-1** Safety of machinery part 1  
Basic terminology, methodology
- EN 292-2** Safety of machinery part 2  
Technical principles and specifications
- prEN 809** Pumps and pump units for liquids,  
Safety requirements
- EN 60204-1** Safety of machinery  
Electrical equipment of machines  
Part 1: General requirements

**Declaration of conformity according to EMV directive 89/336/EEC**

We declare that the model of the

**Centralized lubrication systems QLS 301, 311**

in the version supplied by us, complies with the provisions of the above mentioned directive.

**Applied harmonized standards in particular:**

- EN 55011** Radio disturbances of ISM radio-frequency equipment  
Limiting value class B
- EN 50081-1** Electromagnetic compatibility  
Generic emission standard  
Part 1:  
Residential, commercial and small industry
- EN 50082-2** Electromagnetic compatibility  
Generic emission standard  
Part 2:  
Industrial environment

Walldorf, 31. 08.2000 , Dr. Ing. Z. Paluncic

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