

# Lubrication System QLS 301



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6093b03

U.S. Patent-No. 6,244,387, German Registration Design No. 29923765.6

Subject to modifications

810-55230-1

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## Introduction

### Explanation of Symbols Used

The following description standards are used in this manual:

#### Safety Instructions

Structure of safety instructions:

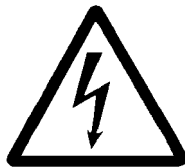
- Pictogram
- Signal word
- Danger text
  - Danger note
  - How to avoid danger

The following pictograms are used in this manual and are combined with the corresponding signal words:



1013A94

- ATTENTION
- CAUTION
- WARNING



4273a00

- ATTENTION
- CAUTION
- WARNING



6001a02

- NOTE
- IMPORTANT

The signal words give the seriousness of danger if the following text will be not observed:

<b>ATTENTION</b>	refers to faults or damages on machines.
<b>CAUTION</b>	refers to bad damages and possible injuries.
<b>WARNING</b>	refers to possible dangerous injuries.
<b>NOTE</b>	refers to improvements in handling of systems.
<b>IMPORTANT</b>	refers to considerable disadvantages in handling of systems.

#### Example:



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#### ATTENTION!

*When making use of other than the original spare parts, serious damage may affect your device.*

*Therefore, for the operation of your device always use original spare parts made by Lincoln GmbH & Co. KG.*

Furthermore, you will find the following text symbols in this manual:

- Listing
  - Subpoint
- ➞ Procedural instruction

### User's Responsibility

To ensure the safe operation of the unit, the user is responsible for the following:

1. The pump / system shall be operated only for the intended use (see chapter "Safety Instructions", on page 5) and its design shall neither be modified nor transformed.
2. The pump / system shall be operated only if it is in a proper functioning condition and if it is operated in accordance with the maintenance requirements.
3. The operating personnel must be familiar with this Owner Manual and the safety instructions mentioned within and observe these carefully.

The correct installation and connection of tubes and hoses, if not specified by Lincoln GmbH & Co. KG, is the user's responsibility. Lincoln GmbH & Co. KG will gladly assist you with any questions pertaining to the installation.

### Environmental Protection

Waste (e.g. used oil, detergents, lubricants) must be disposed of in accordance with relevant environmental regulations.

### Service

The personnel responsible for the handling of the pump / system must be suitably qualified. If required, Lincoln GmbH & Co. KG offers you full service in the form of advice, on-site installation assistance, training, etc. We will be pleased to inform you about our possibilities to support you purposefully. In the event of inquiries pertaining to maintenance, repairs and spare parts, we require model specific data to enable us to clearly identify the components of your pump / system. Therefore, always indicate the part, model and series number of your pump / system.

## Safety Instructions

### Appropriate Use

The lubrication system QLS 301 has been designed for initial and retrofit installation. It has been designed for:

1. the automatic lubrication of machines and systems
2. the automatic lubrication of commercial vehicles and construction machines
3. the automatic lubrication of hydraulically driven units and devices.

The lubrication system QLS 301 is able to deliver greases up to NLGI - class 2 or fluid greases of NLGI - class 000 or 00.

- Use the QLS 301 exclusively to supply lubricants.
- The QLS 301 is adequate for intermittent operation only.
- The QLS 301 is adequate for feeding max. 18 lube points per lube cycle.
- Do not use QLS 301 with SSV divider block in bottom mounting position for mobile applications. Do not install the system with machines exposed to shock.

### Misuse

Any use of the QLS 301 that is not expressly mentioned in this Owner Manual will be regarded as misuse. If the QLS 301 is used or operated in a different manner other than specified, any claim for warranty or liability will be null and void.



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#### NOTE

*If personal injury or material damage occurs as a result of inappropriate operation, e.g. if the safety instructions are ignored or resulting from an incorrect installation of the QLS 301, no claims or legal actions may be taken against LINCOLN GmbH & Co. KG.*

### General Safety Instructions

- Lubrication systems QLS 301
  - are designed state-of-the-art.
  - can be assembled for safe operation.
  - must be regularly refilled with clean lubricant.
- Incorrect use may result in bearing damage caused by poor or over-lubrication.
- Do not over-pressurize reservoir when filling the pump. Refill QLS 301 pump with clean lubricant.
- Each outlet needed must be equipped with an appropriate check valve.



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#### IMPORTANT

*Do not paint the pump. Before painting a machine or commercial vehicle, remove or cover the pump completely.*

- 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 of the QLS 301.

### Regulations for Prevention of Accidents

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

### Operation, Repair and Maintenance



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#### ATTENTION!

*Malfunction because of dirt!  
When executing any maintenance or repair works on the QLS 301, ensure absolute cleanliness.*



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#### CAUTION!

*115-230 V!  
For pumps with 120 VAC and 230 VAC, switch off the power supply before beginning maintenance or repair work.*

#### Repair

Repairs should only be performed by authorized personnel who are familiar with the instructions.

## Safety Instructions, continuation

### Operation, Repair and Maintenance, continuation

#### Operation/Maintenance

Lubrication systems QLS 301

- must operate with mounted pressure relief valve, only.
- must operate only with mounted or connected SSV divider blocks.
- must be regularly filled with clean and air-free lubricant.
- operates automatically. However, a regular check (approximately every 2 weeks) should be made to ensure that lubricant is being dispensed from all lubricant points.

#### Disposal

Used or contaminated lubricants must be disposed of in accordance with local environmental regulations, see technical data sheets of lubricants.

#### Exclusion of Liability

The manufacturer of the centralized lubrication system will not accept any liability for:

- damage caused by insufficient lubricant and irregular refilling of pump.
- damage due to the use of greases which are not or are only conditionally pumpable in centralized lubrication systems.
- damage caused by the use of contaminated lubricants.
- damage caused by inadequate 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



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#### IMPORTANT

*Do not remove, modify or alter any safety equipment already installed on the machine.*

### Installation, continuation

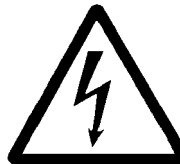
- If necessary, these devices may be removed temporarily during the installation of the pump.
- The devices must be properly put back in place after the installation of the pump.
- Use only original spare parts or spare parts authorized by LINCOLN.
- Pump QLS 301 must be kept away from sources of heat (see Operating Temperature Specification).
- Provide access to fill, clean and visually monitor the pump operation.



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#### IMPORTANT

*Follow installation instructions of the OEM regarding minimum distances between the drilled holes and welding procedures.*

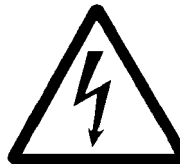


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#### CAUTION!

**115-230 V!**  
*The QLS 301 may only be installed by qualified personnel. The connection (N/L/PE) of the supply voltage must be made according to VDE 0100 and VDE 0160.*

*Install a protective and lock out device for isolating and disconnecting the QLS 301. Before beginning the installation work, disconnect the electrical supply.*



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#### WARNING!

**115-230 V!**  
*Failure to observe the safety instructions, e. g. touching electrically charged parts when the system is opened, or improper handling of the QLS 301 may **cause serious injury or death.***

*If the values specified in the Technical Data are exceeded, the device may overheat. It may damage the QLS 301 and thus impair the electric safety.*

## Installation Instructions

### Pump

### SSV Divider Block

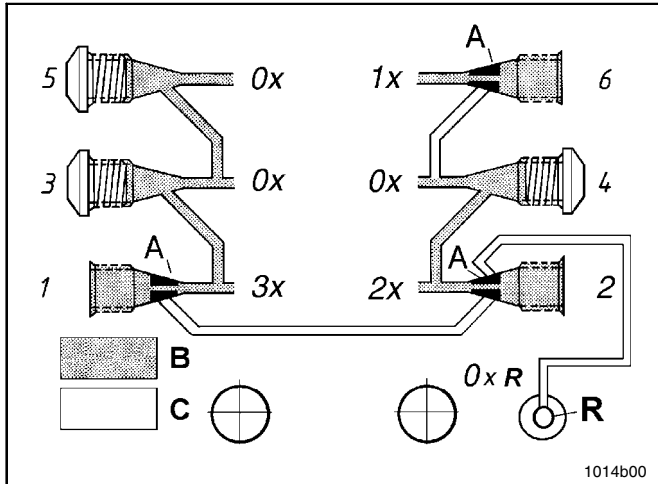


Fig. 1 Single double and triple lubricant output, on rear side mounted divider blocks

- 0x-3x Outlet quantity (single, double, etc.)
- 1-6 Outlet numbers
- A Clamping ring (brass)
- B Grease supply
- C Enclosed grease
- R Return to reservoir



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

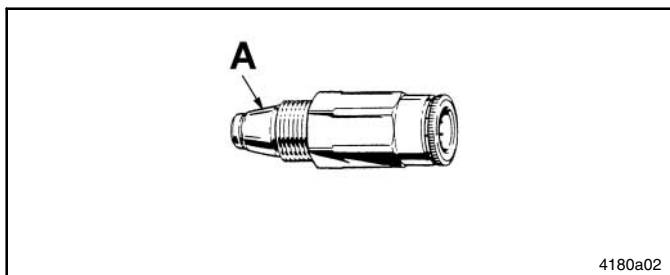


Fig. 3 Check valve, push-in type  
A Clamping ring (brass)

Use drilling template to mark and drill mounting holes of the QLS 301. Drilling template and mounting bolts are included in the package.

### Crossporting of the SSV divider blocks

#### Single Output

A single output is the lubricant quantity fed to the lube point by a piston per stroke and outlet port. **It amounts to approximately 0.2 cm<sup>3</sup>**, see outlet 6, fig. 1.

#### Double or Multiple Outputs

- Outputs can be increased by simply plugging the unused outlet ports with closure plugs (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).
- Example, see fig. 1:  
By closing
  - of outlet 4, outlet 2 receives the double quantity.
  - of outlets 5 and 3, outlet 1 receives the triple amount of lubricant. The connecting conduit from outlet line 1 to outlet line 2 and to the return line (R) is closed by clamping rings (A) of the check valve.
- Unused lubricant can be internally fed back to the reservoir, see paragraph "direct internal feed back feature".



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#### NOTE

**Do not plug outlets number 1 and 2** (horizontally positioned outlets) on bottom-mounted lubricant divider blocks SSV 8, 12 and 18.

**Do not plug outlets number 1 or 2** on externally mounted divider blocks.

- ➔ Install a closure plug in each outlet port hole which is not required, see fig. 1 or 4.

#### Check valve

- ➔ For feedlines (diameter 6x1.5 mm, 1/4" I.D., provided in the accessory kits) use check valves with standard collar and knurled flange.

## Installation Instructions, continuation

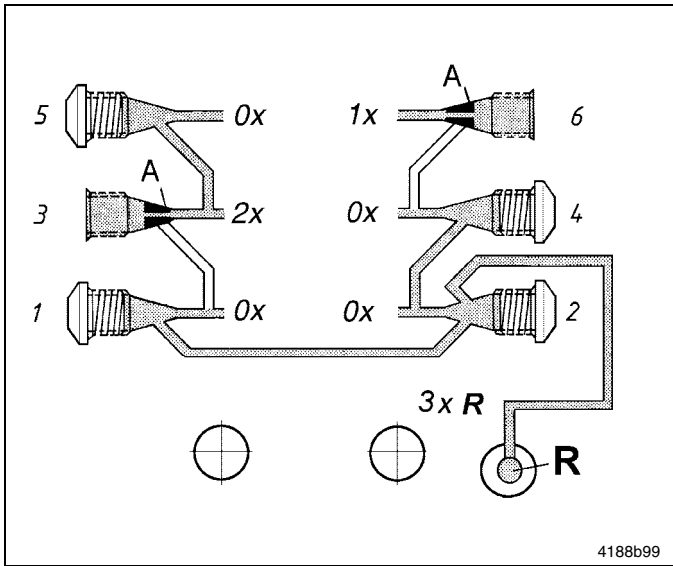


Fig. 4 Internal feedback of supplied lubricant, only on rear-side mounted SSV divider blocks

- 0x-2x Outlet quantity (single, double, etc.)
- 1-6 Outlet numbers
- A Clamping ring (brass)
- B Grease supply
- C Enclosed grease
- R Return line bore hole



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### NOTE

Maximum **internal** combination of outlets:

SSV 6 = 3

SSV 12 = 6

SSV 18 = 9

Further combinations are possible outside the divider valve by means of a tee-piece only.

### Direct (internal) feedback feature

- All pumps with **back-mounted SSV divider block** have the capability to feed back unused lubricant internally from closed outlets directly to the reservoir (see R fig. 4, 5).
- This procedure will start automatically, if **outlet port 2** is plugged with a closure plug. All pumps have capability to feed back the lubricant directly to the reservoir **from even and odd outlets** via the channel from outlet 1 to outlet 2.
- Start from the smallest outlet number when closing the outlets, for instance 2, 4, 6 on even side or 1, 3, 5 on odd side plus outlet 2. In fig. 4 the quantities of outlets 1, 2 and 4 (3xR) are fed back to the reservoir.
- The remaining outlets are to be used for the connection to the lube point or for increasing the lubricant quantity (double or triple), see fig.1.



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### CAUTION!

To change the outlet 2 for bearing lubrication, replace closure plug with check valve (Fig. 3), **then never close outlet 1, see fig. 1.**



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### NOTE

To feed back unneeded lubricant quantities from **bottom-mounted** divider blocks to the reservoir, connect unneeded outlet via the feedline to plug 5 (fig. 17) for external return line.



## Installation Instructions, continuation

### Lubrication Points

#### Installing Quicklinc fittings into lube points

Remove hydraulic lube fittings from lube points and install appropriate Quicklinc fittings into the bore holes of the lube points.

#### Installing Zerk-Locks onto Grease Fittings

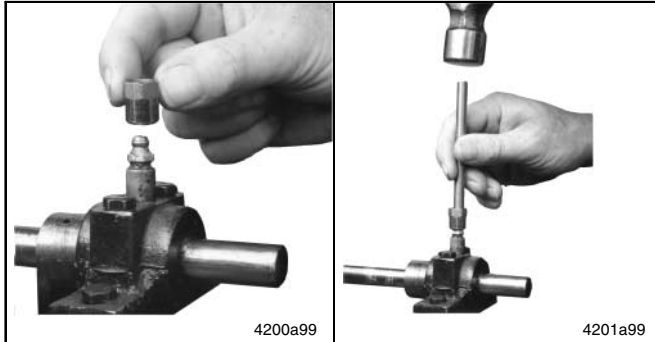


Fig. 5 Place the Zerk-Lock body over the grease fitting

Fig. 6 Installation of Zerk-Locks with staking tool

The Zerk-Lock fitting consists of the Zerk-Lock body, insert and a Quicklinc fitting.

- Place the Zerk-Lock body over the grease fitting and place the staking tool firmly against the Zerk-Lock insert. (Staking tool is included in the accessory kits).
- Strike the tool sharply with a hammer until the Zerk-Lock insert partially crimps onto the grease fitting.

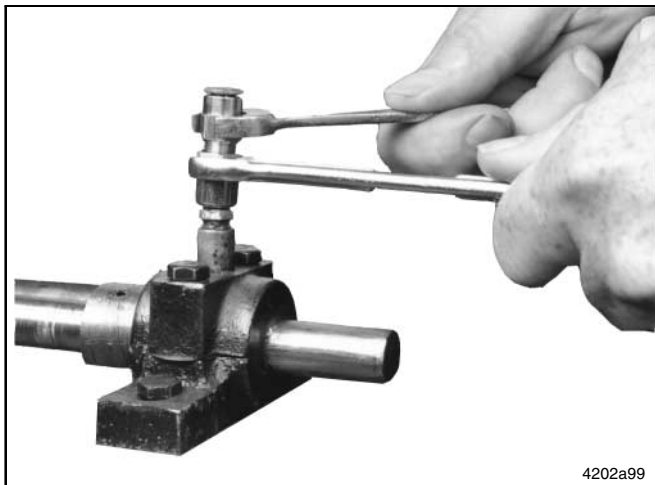


Fig. 7 Screwing Quicklinc fitting into the Zerk-Lock body

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



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#### 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 insure the Zerk-Lock is firmly seated.

## Installation Instructions, continuation

### Connection of Feed Lines



Fig. 8 Feedline installed in the Quicklinc fitting

- Measure, cut and route the feedlines included in the kit.



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#### 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 (2 in).*

- Secure the lubrication lines to the machine using nylon ties, clamps or straps provided in the accessory kit.
- If the feedlines are not primed, prime all lubrication feedlines before connecting them to the lube point (by triggering additional lubrications).
- Connect the feedlines directly to the check valves of the divider block and to the Quicklinc fittings of the lube point.



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#### NOTE

*Push the ends of the feedlines firmly into the Quicklinc fittings until they are fully seated in the body of the fitting. The primed feedlines are marked with white lines (fig. 9, 10) to facilitate installation.*

- Cut the pressure plastic tube off at one of the white lines before it is mounted.
- Then insert the plastic pressure tube into the fitting up to the next white mark. This will ensure a correct installation of the pressure plastic tube in the threaded tube fitting.

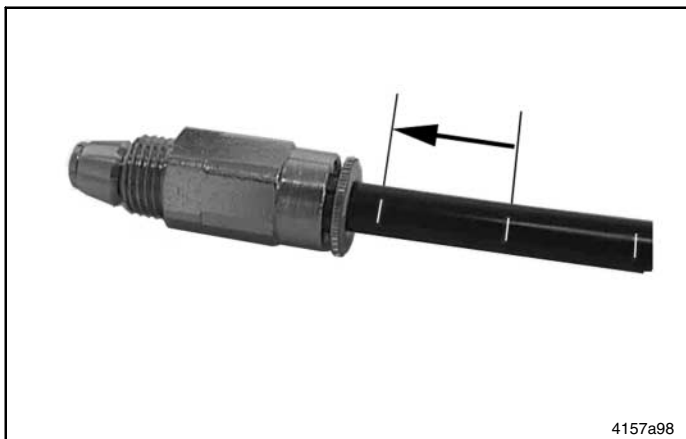


Fig. 9 Feedline insert into the fitting up to the next white mark

### Filling of reservoir



Fig. 10 Vent hole on reservoir

- Fill the reservoir with suitable clean lubricant.



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#### WARNING!

***Risk of bursting if the reservoir is overfilled. When filling the reservoir by means of pumps with a large delivery volume do not exceed the max. filling mark.***

#### CAUTION!

*Avoid inclusions of air in the lubricant below the follower plate. When filling the reservoir, the follower plate sealing lip – overlaps the vent hole (see fig. 10) to ensure that all air pockets can be vented.*

### QLS 301 Selection Guide

Pump models		P30100810111								
Examples of part numbers		P30162410151								
		P301	6	2	4	1	0	1	5	1
<b>Pump</b>										
for grease .....	P301									
<b>SSV Divider Block</b>										
External, SSV 6, SSV 8** .....	0									
External, SSV 12, SSV 18** .....	1									
SSV 6 (back) .....	3									
SSV 8 (bottom) .....	4									
SSV 12 .....	6									
SSV 18 .....	9									
<b>SSV Divider Block Position</b>										
None .....	0									
Back .....	1									
Bottom <sup>1</sup> .....	2									
<b>Operating Voltage</b>										
12 VDC* .....	2									
24 VDC* .....	4									
120 VAC* .....	6									
230 VAC* .....	8									
<b>Reservoir / Low-level control</b>										
1 L reservoir with low level control .....	1									
<b>Dry contacts</b>										
None .....	0									
Yes .....	1									
<b>Type of Plug Connector</b>										
Square-type, acc. to DIN 43650 type of construction A .....	1									
<b>Electrical Connectors</b>										
Without socket, without cable .....	0									
With socket, without cable* .....	1									
With socket, with cable, 10 m .....	5									
With socket, with ADR cable, 10 m .....	6									
<b>Control p. c. b.</b>										
None .....	0									
Monitored, 1 cycle, SSV 12, SSV 18										
Monitored, 1, 2, 3 cycles, SSV 6, SSV 8										
Alarm contact (option) normally open contact	1									
Alarm contact (option) normally closed contact	2									

**Example of an explained model number:**

Pump model P30131810111-Grease pump, SSV 6 block mounted on the back, 230 VAC, with low level and without dry contact.

\* Note: Standard 120 and 230 VAC pump models for industry are supplied without electrical cable. Standard 12 and 24 VDC pump models for mobile applications can be supplied with 10 meter (30') electrical cable.

\*\* Note: For external divider block application only use the specific divider blocks SSV ... KNQLS.

Regarding pump models without divider block, it is not possible to close cycles without changes on the p. c. b.

\*\*\* Note: Do not use QLS 301 with SSV block in bottom-mounting position for mobile applications. Do not install the pump in areas exposed to shock.

**Accessory kits, see chapter "Technical Data"**

Subject to modifications

## Electrical Connecting Diagrams

### Electrical connection



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#### CAUTION!

115-230 V!  
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 the contacts are safe.



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#### NOTE

The protection IP6K9K (NEMA 4) is guaranteed when the socket (x1, x2) is tightened on housing cover with flat packing.

- ➔ Connect the electrical wires according to the following electrical connecting diagrams.

### Direct current (DC)

with integrated p.c.b. and attached divider block, alarm contact as normally open contactt:

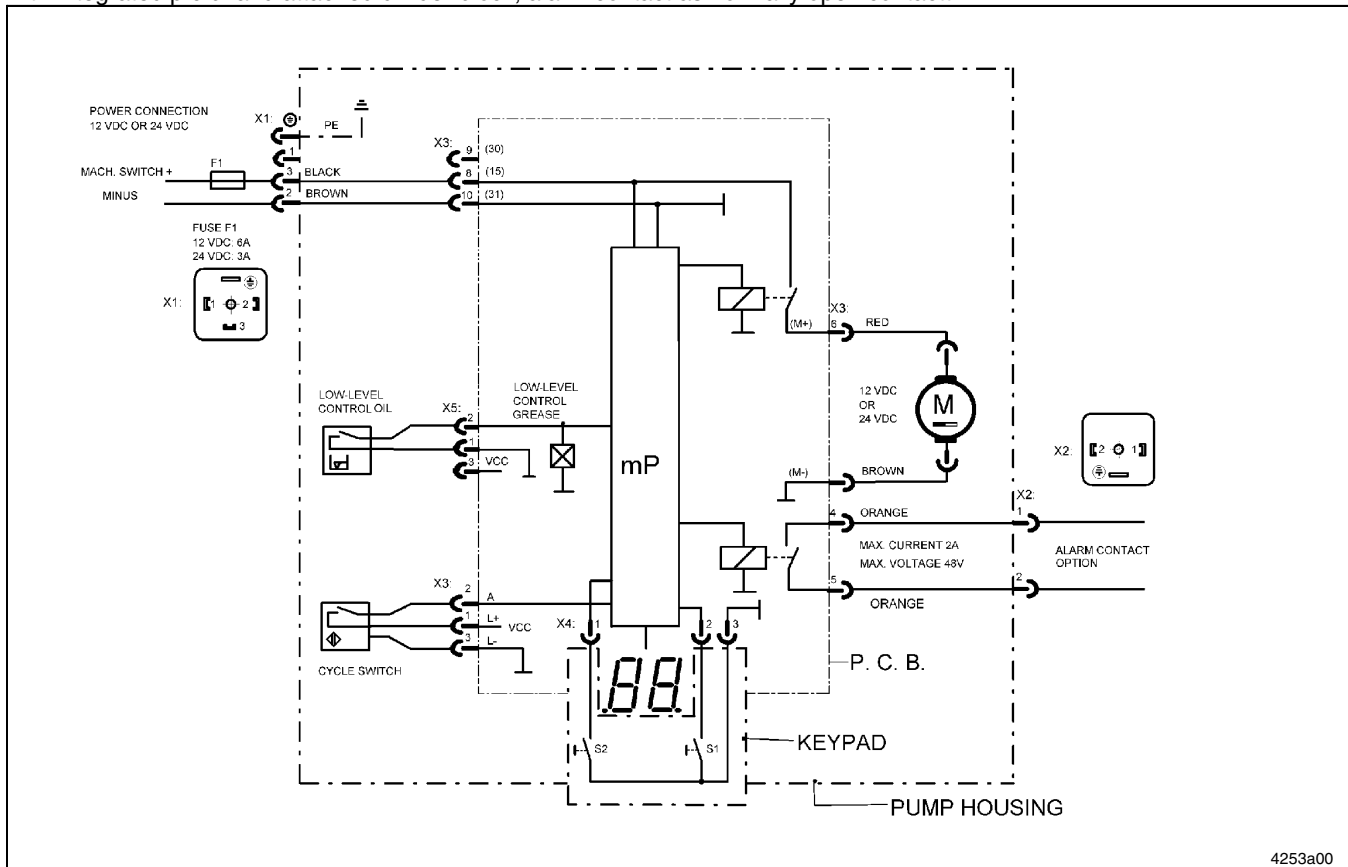


Fig. 11 Electrical Connecting Diagram, DC

### Electrical Connecting Diagrams, continuation

**Direct current (DC)**

with integrated p.c.b. and external divider block, alarm contact as normally open contact:

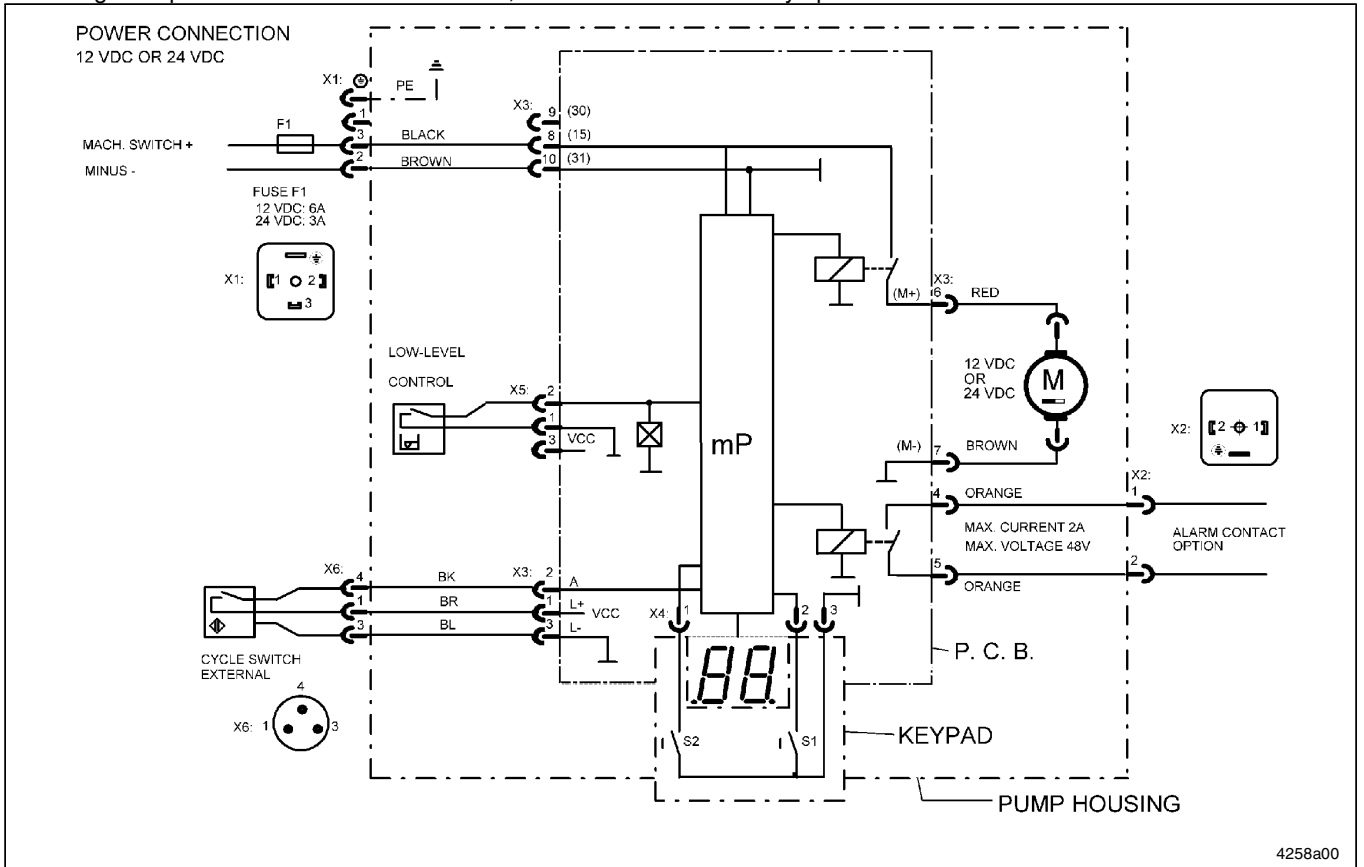
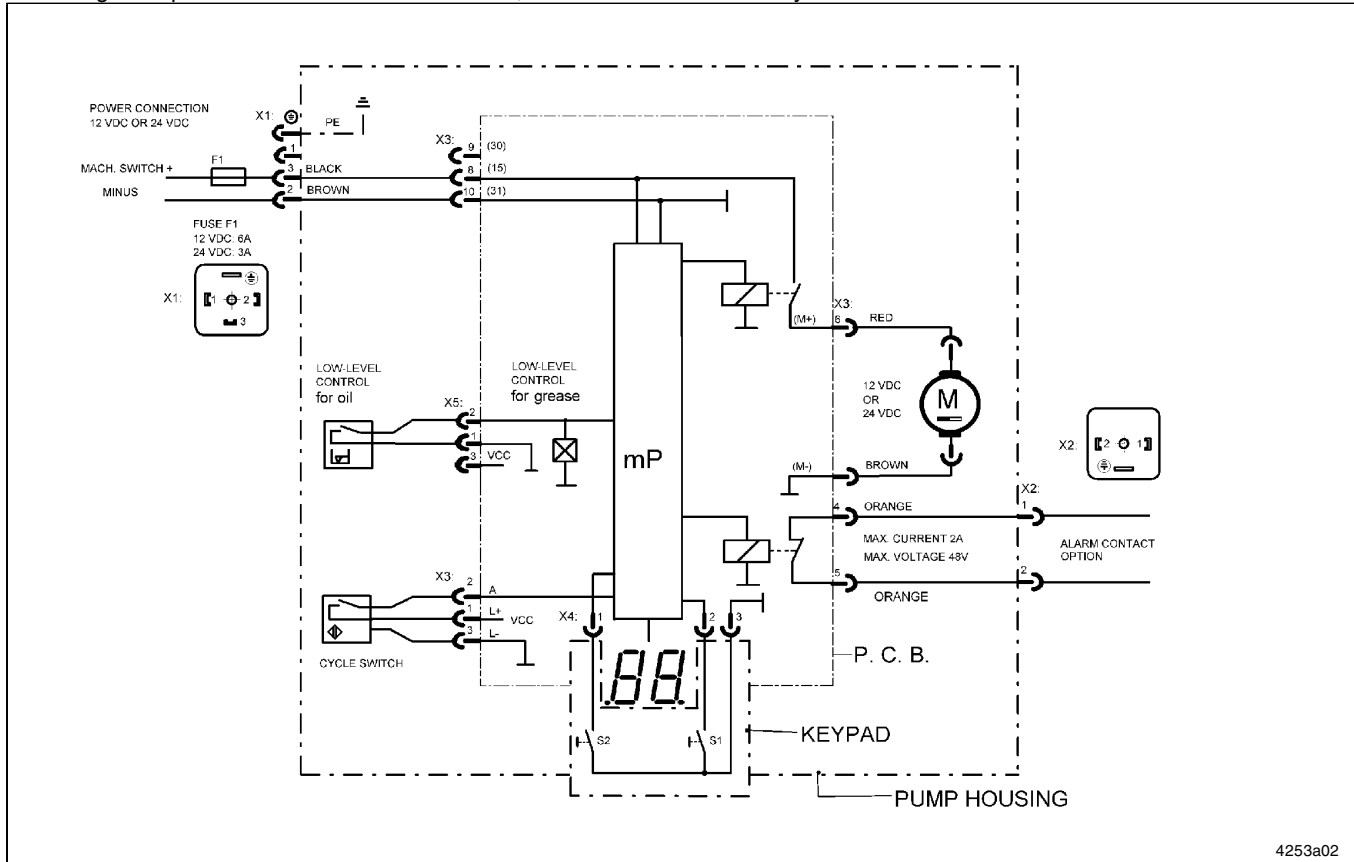


Fig. 12 Electrical Connecting Diagram, DC

## Electrical Connecting Diagrams, continuation

### Direct current (DC)

with integrated p.c.b. and attached divider block, alarm contact as normally closed contact:



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Fig. 13 Electrical Connecting Diagram, DC

### Electrical Connecting Diagrams, continuation

**Direct current (DC)**

with integrated p.c.b. and external divider block, alarm contact as normally closed contact:

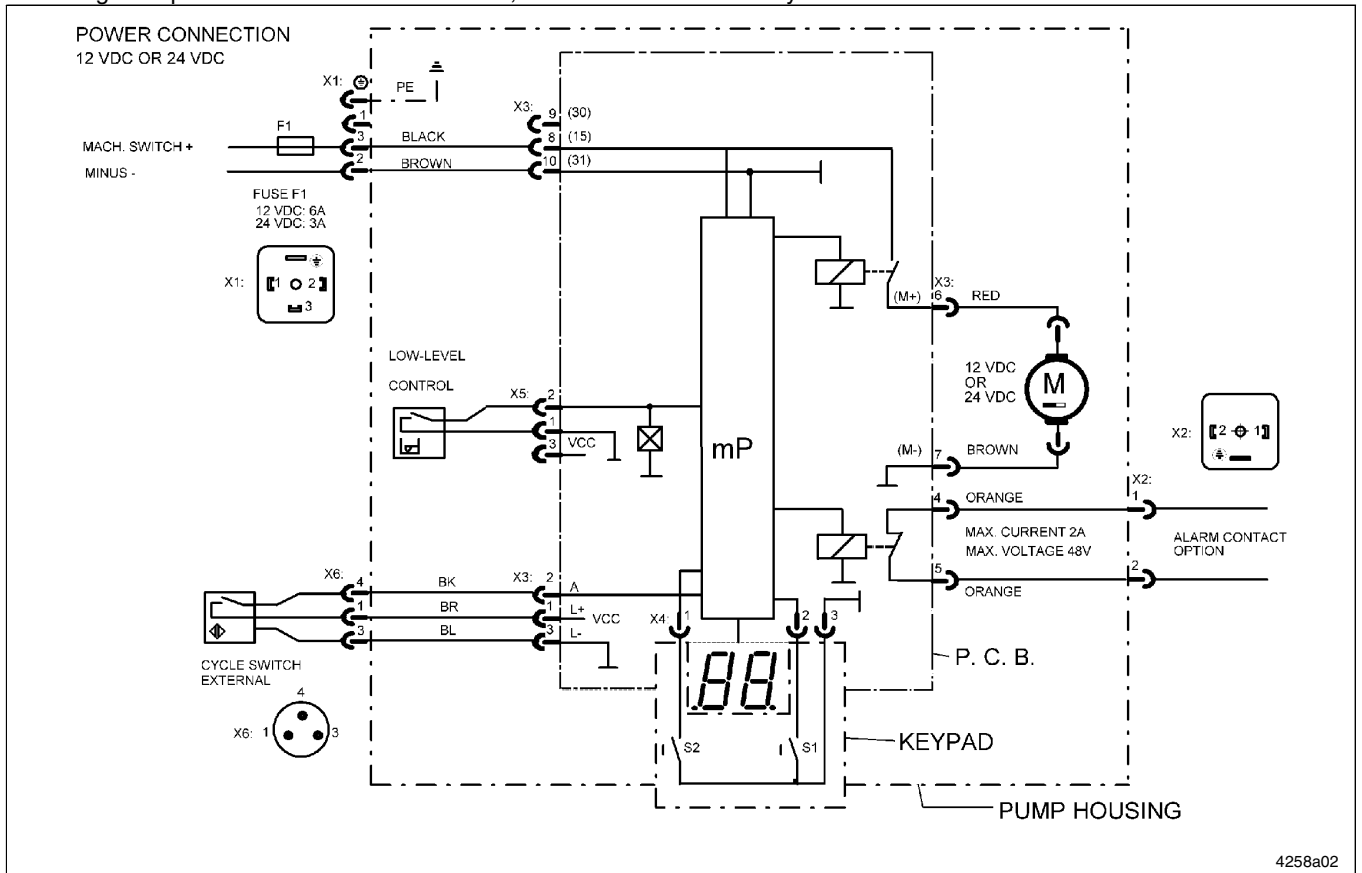


Fig. 14 Electrical Connecting Diagram, DC

## Electrical Connecting Diagrams, continuation

### Alternate current (AC)

with integrated p.c.b. and attached divider block, alarm contact as normally open contact:

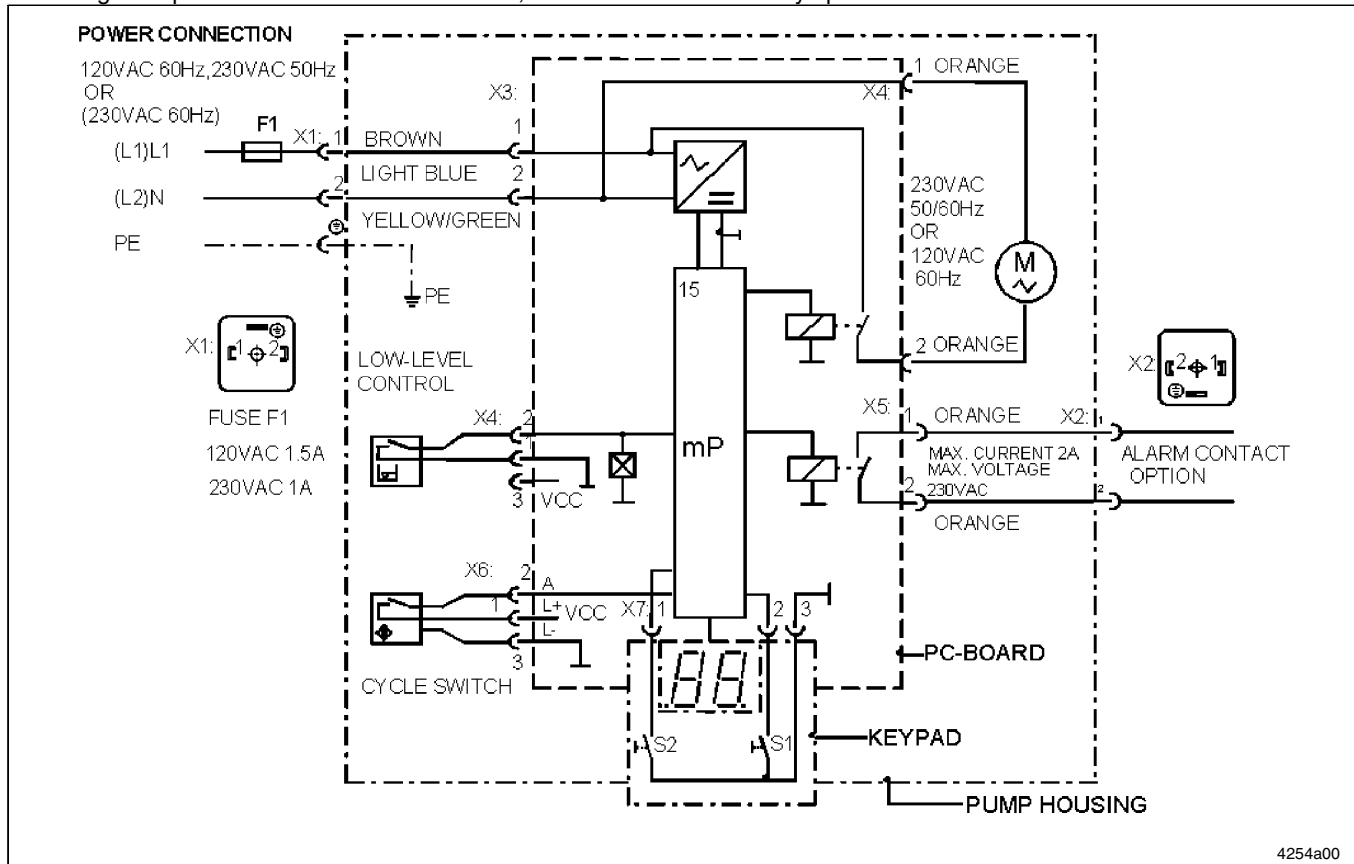


Fig. 15 Electrical connecting diagram, AC



## Electrical Connecting Diagrams, continuation

### Alternate current (AC)

with integrated p.c.b. and external divider block, alarm contact as normally open contact:

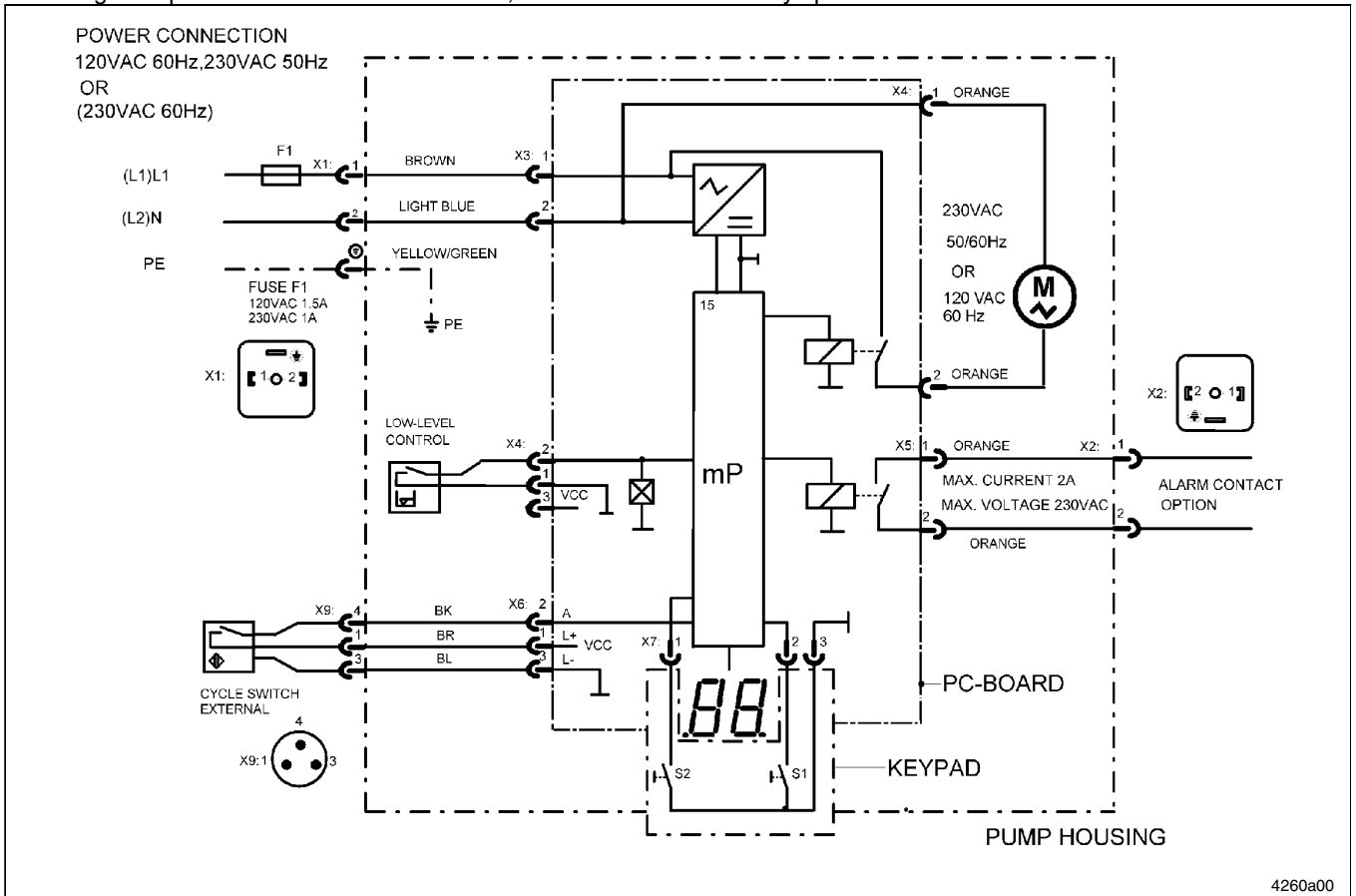


Fig. 16 Electrical connecting diagram, AC

## Electrical Connecting Diagrams, continuation

### Alternate current (AC)

with integrated p.c.b. and attached divider block, alarm contact as normally closed contact:

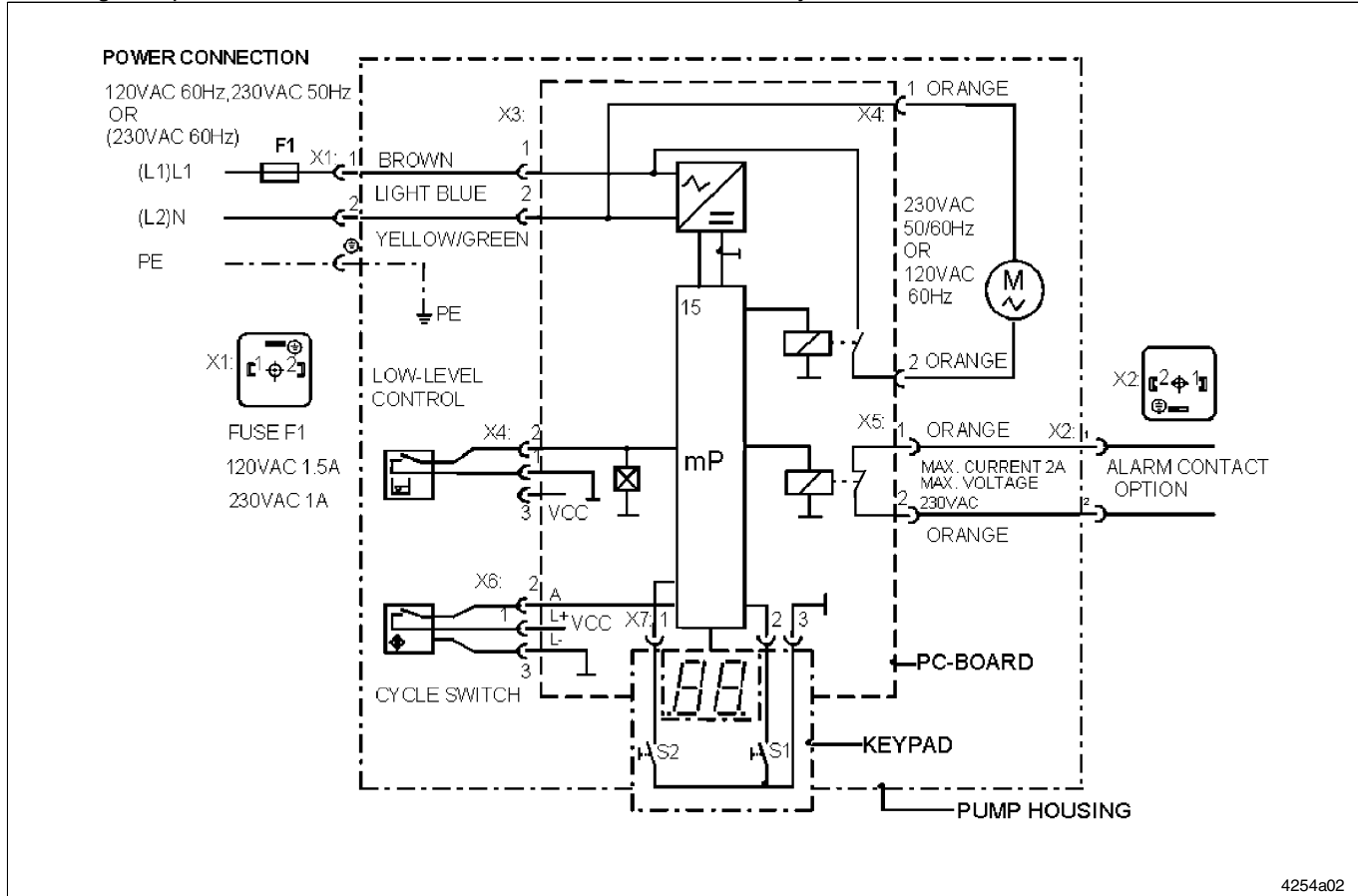


Fig. 17 Electrical connecting diagram, AC

### Electrical Connecting Diagrams, continuation

**Alternate current (AC)**

with integrated p.c.b. and external divider block, alarm contact as normally closed contact:

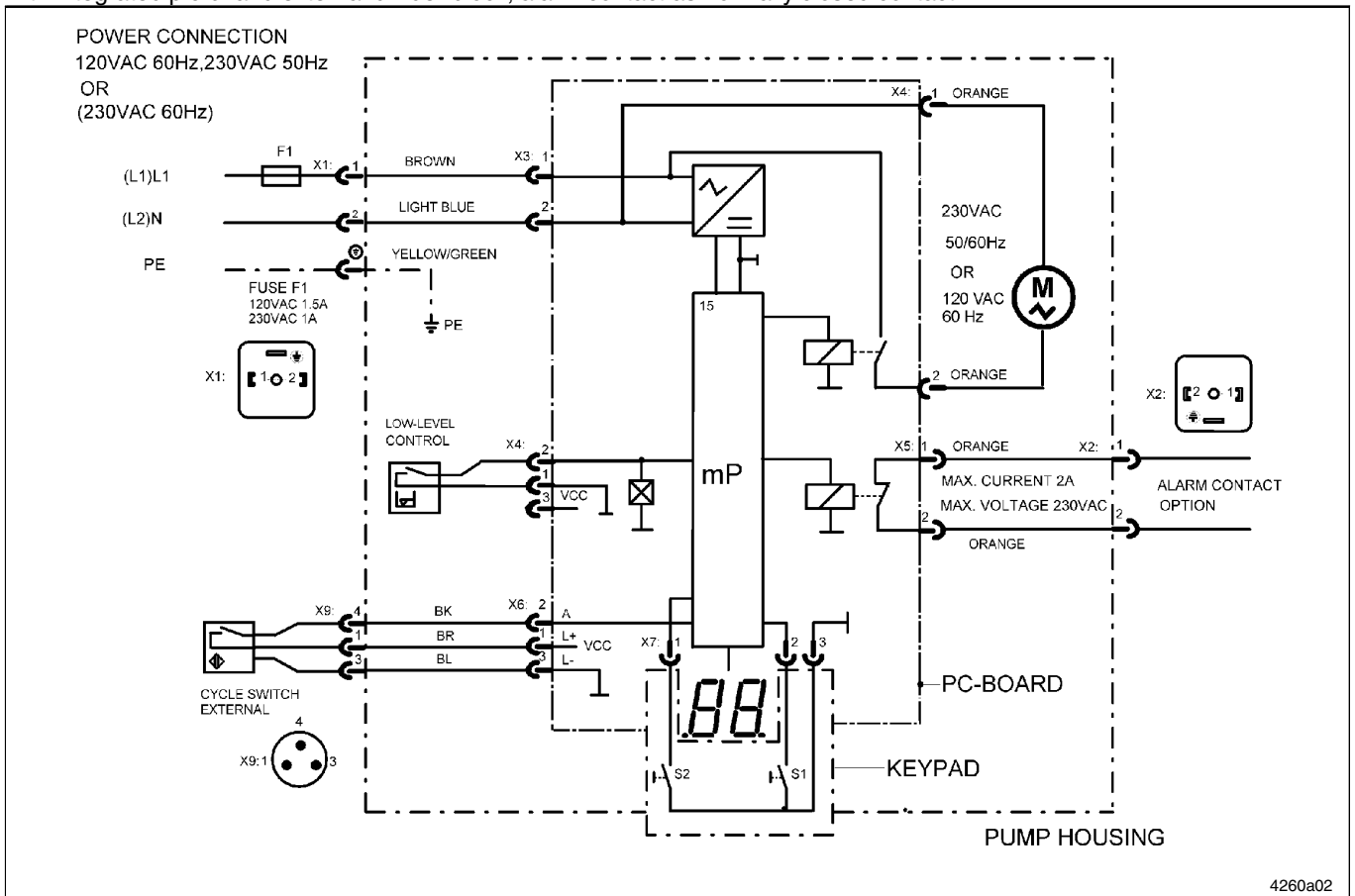


Fig. 18 Electrical connecting diagram, AC

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## Description of QLS 301

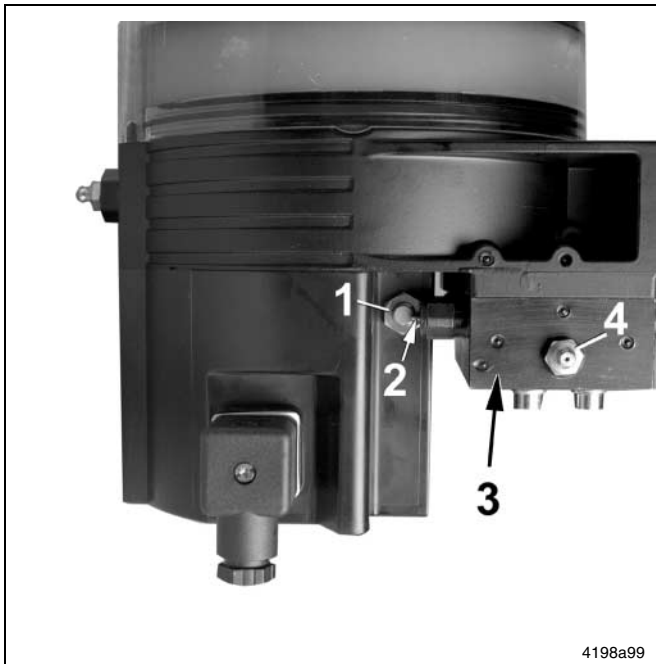


Fig. 19 QLS 301 with back position of the SSV divider block

- 1 Proximity switch
- 2 Control pin
- 3 SSV divider block
- 4 Nipple for external manual lubrication (1/8")

- The QLS 301 is a complete compact lubrication system for a **maximum of 18 lubrication points per cycle**.
- The pump has three basic configurations:
  - SSV divider block mounted on the back (see Fig. 19)
  - SSV divider block mounted on the bottom (see Fig. 20)
  - Pump without the SSV divider block attached respectively with external divider block KNQLS (see fig. 21)
- The pump 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 hoses included in the pump installation kit for pumps with the SSV divider block attached.



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### NOTE

*The function of the pump is independent of the SSV divider block's mounting position.*

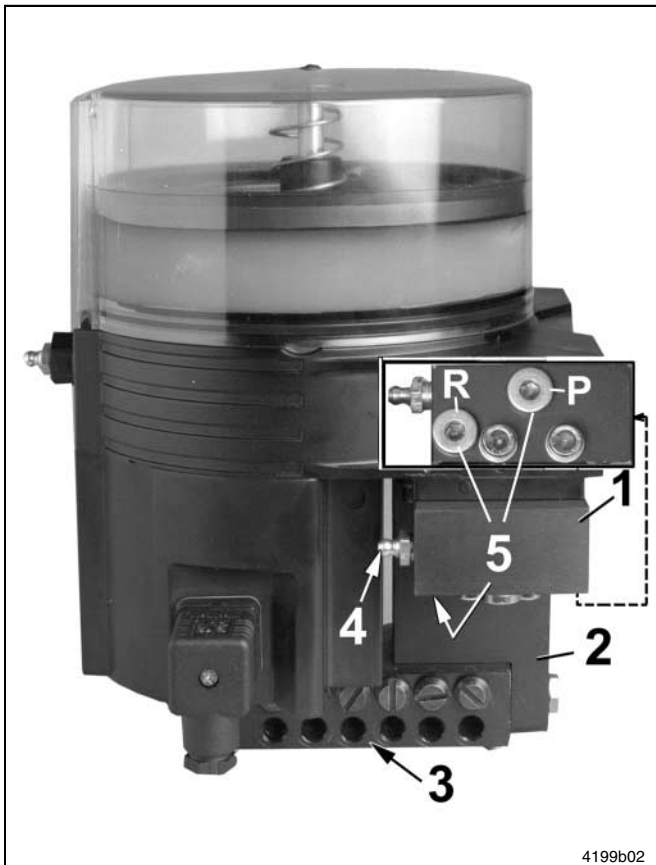


Fig. 20 QLS 301 with bottom position of the SSV divider block

- A signal from the pump timer starts the electric motor and the pumping element starts pumping the lubricant to the SSV divider block.
- When all lubrication points have received lubricant, an internal proximity switch 1 Fig. 19 (initiator) turns the motor off, completing one lubrication cycle.
- If the pump does not complete the cycle within 15 minutes of operation, the alarm message "Er" will be displayed as a flashing light in the keypad window, see fig. 26.

- 1 Connecting block
- 2 Manifold
- 3 SSV divider block
- 4 Nipple for external manual lubrication (1/8")
- 5 Plug (1/8") for
  - P external pressure line
  - R external return line

### Description of QLS 301, continuation

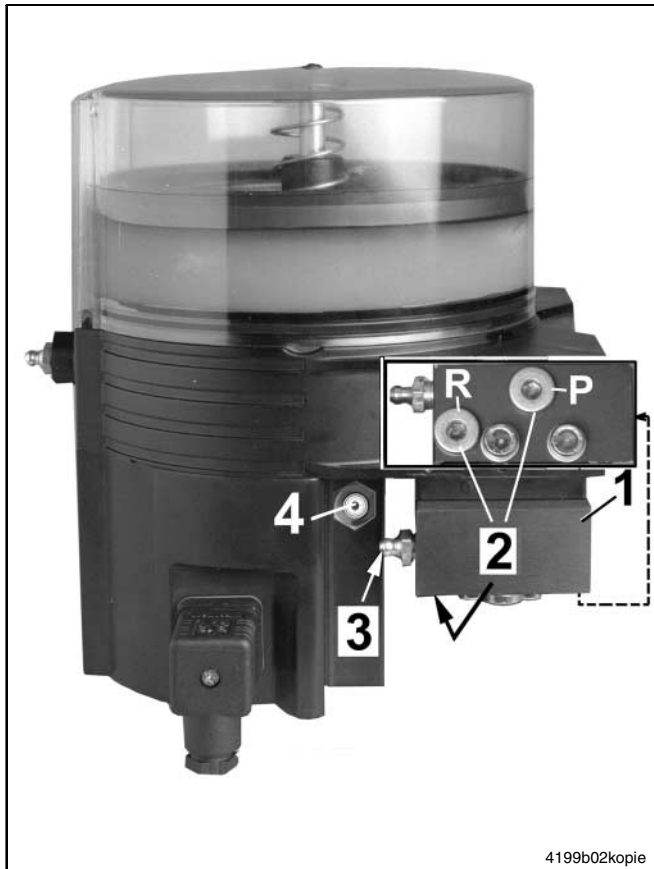


Fig. 21 QLS 301 without mounted SSV divider valve with connection for external SSV divider valve KN QLS

- 1 Connecting block
- 2 Closure plug
- 3 Nipple for emergency lubrication, R 1/8"
- 4 Connecting socket for SSV KN QLS
- P For feedline to external SSV KN QLS
- R Relief line connection

- An externally connected lubricant divider valve SSV KN QLS is equipped with the same proximity switch as the normal QLS 301.
- The proximity switch is provided with a connecting cable of 2 m lengths and a connecting plug which must be connected to the socket of the QLS 301.
- The socket is integrated in the housing instead of the proximity switch and is connected to the control p.c.b.



**NOTE**

The function of the QLS 301 is independent of the mounting position of the proximity switch.

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There are available the following externally connectable divider valves SSV KN QLS:

- |                 |             |
|-----------------|-------------|
| - SSV 6 KN QLS  | 619-28945-1 |
| - SSV 8 KN QLS  | 619-28946-1 |
| - SSV 10 KN QLS | 619-28949-1 |
| - SSV 12 KN QLS | 619-28950-1 |
| - SSV 14 KN QLS | 619-28951-1 |
| - SSV 16 KN QLS | 619-28952-1 |
| - SSV 18 KN QLS | 619-28953-1 |

## Operation of QLS 301

### Pump

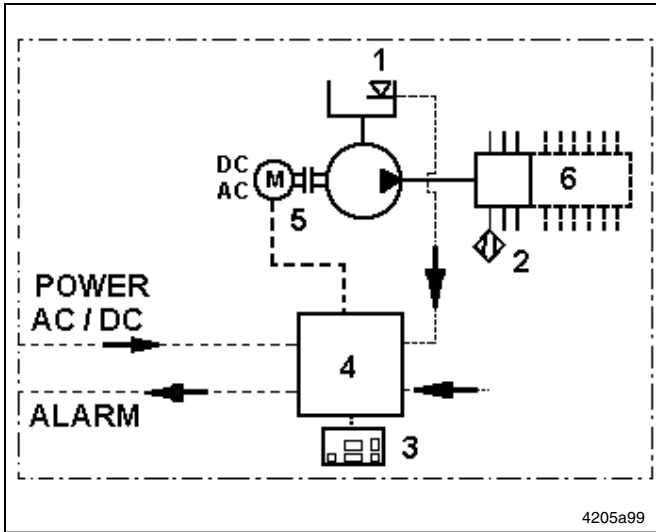


Fig. 22 QLS 301 unit

- The QLS 301 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 sub-divider blocks and one main divider block (SSV 6, SSV 8) is possible only up to **max. 18 points per cycle**. In this case, the number of the cycles of the main divider block must be set (see P3 on page 26).

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

### Pressure Relief Valve

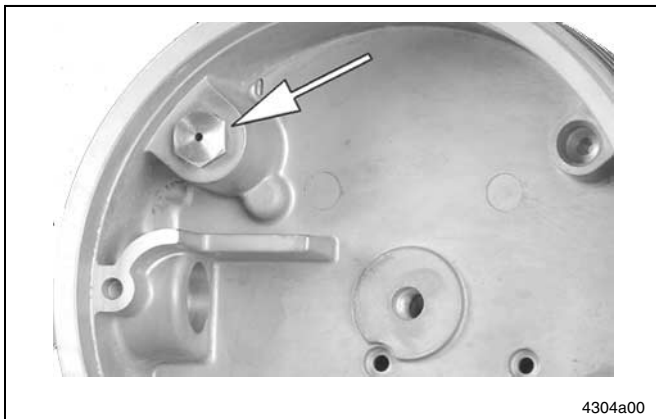


Fig. 23 Pressure relief valve (cartridge) in housing

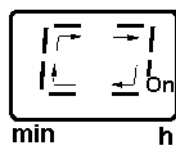
- The QLS 301 is protected with a pressure relief valve (cartridge).
- The pressure relief valve limits the pressure build-up in the QLS 301. It opens at an overpressure of 205 bar (3000 psi).
- If the pressure relief valve is actuated, this indicates that the system is malfunctioning. The lubricant flows back into the reservoir (hardly visible).
- Upon expiration of the monitoring time of 15 minutes, the pump switches off. The fault indication "Er" is displayed on the keypad of the pump. See "Display mode" under "Control unit".

### Pump Display Window



4208a99

Fig. 24 Green decimal point (pause time)



4209a99

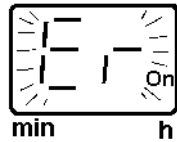
Fig. 25 Green display (operating time)

- Pump "On" is indicated on the display by an **illuminated decimal point** (pause time is running).

- Pump "running" is indicated on the display by a rotating light movement of the green display (operating time).
- If the voltage supply is interrupted during the operating time, the times already expired are stored. When the power supply is switched on again, the operating time continues operating from the point where it had been interrupted.

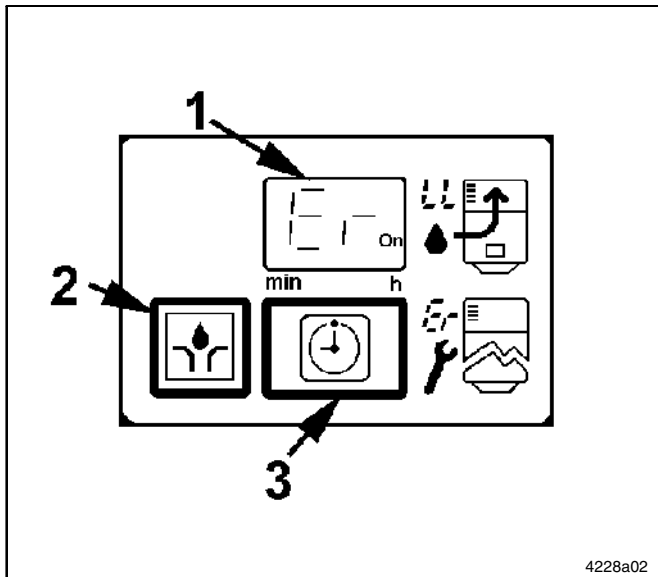
## Operation of QLS 301, continuation

### Monitoring time/ malfunction



4210a99

Fig. 26 Display of a fault indication



4228a02

Fig. 27 Keypad with showing a malfunction

- 1 Display window
- 2 Operator key
  - operating mode: trigger additional lubrication
  - programming mode: setting of times and divider cycles –terminate programming
- 3 Operator key
  - display mode: acknowledge receipt of flashing functional fault
  - operating mode: display of the set pause time and residual pause time
  - programming mode: change to the different programming levels

- If the cycle is not complete within **15 minutes** (monitoring time) after expiration of the pause time, the pump immediately switches off. The fault indication "Er" (error) is displayed as a flashing light (Fig. 26). At the same time, a potential free contact is available for the external fault indication (option).



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#### IMPORTANT

*If a **malfunction** is present, the pump **no longer switches on automatically**.*

- In this case, switch on the pump by pressing the button for additional lube cycle, see Fig. 27.
- Acknowledge the malfunction before doing so.
- When a malfunction is present, it can only be cancelled by initiating an additional lube cycle and if a proper lube cycle has been executed afterward.
- If the fault is still present after an additional lube cycle has been initiated, the fault indication "Er" is displayed again.
- The monitoring time starts at the same time as the operating time. It is a fixed time of 15 minutes.
- If the voltage supply is interrupted during the monitoring phase (operating time), the monitoring time starts from the beginning after the pump is switched on again.

## Operation of QLS 301, continuation

### Models with Low-level Control

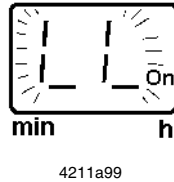


Fig. 28 Display of a low-level control

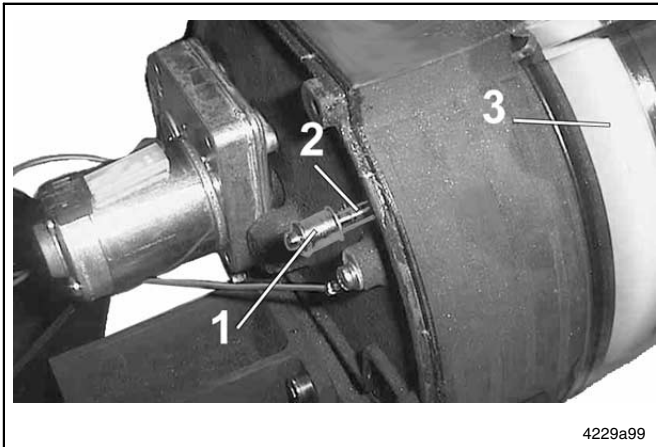


Fig. 29 Parts of the low-level control

- 1 Solenoid
- 2 Pin
- 3 Follower plate

- When the reservoir is nearly empty the pump display shows 'LL' (low level) .
  - The follower plate (3) (Fig. 29) of the reservoir moves the pin (2) with the solenoid (1) ahead of the sensor on the printed circuit board and initiates the low-level signal.
  - In this case, the pump is not switched off immediately. The current lube cycle is completed. Upon expiration of the pause time, the pump cannot be started again automatically. The flashing display 'LL' is indicated, see Fig. 28.
- ➔ Before filling the reservoir, press the button 3 Fig. 32 for acknowledging the low level indication.
- As soon as the lubricant reservoir is filled up, the 'LL' display is cancelled. The lube cycle resumes.

### Malfunction/low-level indication

- If both indications occur at the same time, then both displays 'Er' and 'LL' will flash.

### Operator keys of the keypad

#### Operator keys of the keypad in the operating mode

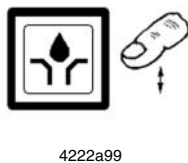


Fig. 30 Pushbutton for additional lubrication cycle

- **Additional lube cycle**
- ➔ is triggered via the button (Fig. 30). Press the button for 2 seconds.
- ➔ can be initiated at any time, provided that the power supply is applied.

If a fault signal (malfunction) is present, it will be cancelled as soon as the system is operating properly, again.



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#### NOTE

*If a malfunction is present (flashing display), first acknowledge this malfunction, see Fig. 32.*



## Operation of QLS 301, continuation

### Operator keys of the keypad, continuation

#### Operator keys of the keypad in the programming mode



4222a99

Fig. 31 Key for resetting the pause time and terminating the programming mode

- **Reset of the pause time and termination of the programming mode**

- Setting of the pause time by
  - single key activation for one hour/minute
  - permanent activation for quick run
- Setting of the divider circles
- Termination of the programming mode

#### Operator keys of the keypad in the display mode



4214a99

Fig. 32 Acknowledging receipt of a flashing fault indication

- **Acknowledging receipt of a malfunction**

- By pressing the key (Fig. 32) the flashing \*Er\* changes into a permanent light.

- **Acknowledging receipt of the low-level indication**

- By pressing the key (Fig. 32) the flashing \*LL\* changes into a permanent light.

#### Operator keys of the keypad in the operating mode



4214a99

Fig. 33 Information regarding the set pause time and residual pause time

- **Display of information regarding the set pause time and residual pause time**

- Press key >2 seconds.

#### Operator keys of the keypad in the programming mode



4214a99

Fig. 34 Changing to the different programming levels

- **Changing to the different programming levels**

- Setting:
  - hours
  - minutes
  - divider cycles
- termination of programming

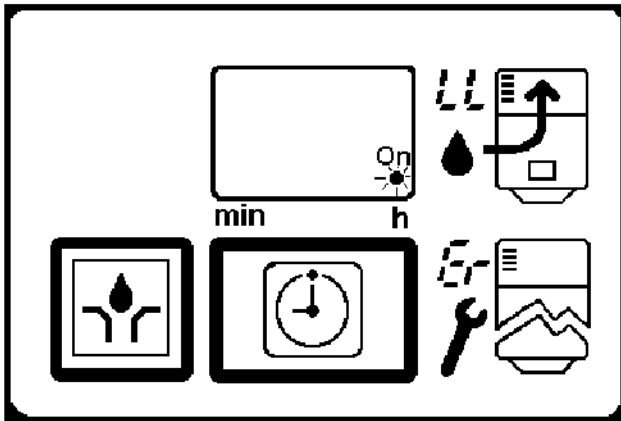
### Monitoring relay

- The monitoring relay signals a low-level condition or a malfunction (only in combination with optional connector X2, see electrical connection diagrams).
- In the first case the relay picks up (normally open contact).
- In the second case the relay releases (normally closed contact, broken-wire interlock).
- The signal is available via a potential free contact.
- The monitoring relay is released upon acknowledgement of the fault.

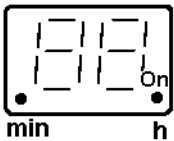
## Setting and Operation of QLS 301

Three possible modes of operation and settings can be selected on the keypad:

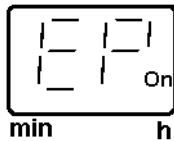
### Display Mode



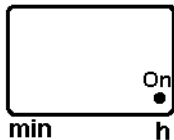
4206a99



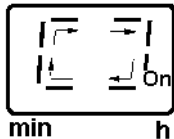
4207a99



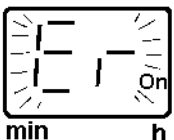
4227a99



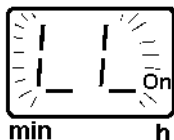
4228a99



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4211a99

- **Display mode**
- **Operating mode**
- **Programming mode**

- **In the display mode** the user receives information on functions and malfunctions.
- As soon as voltage is applied to the pump, the keypad is automatically in "display mode". The **right-hand decimal point** is illuminated on the display.
- Normally, the display is dark. Only the functions (decimal point, rotating segment display) or malfunctions (Er, LL) are displayed.

- A test display is made when the voltage is applied, all segments and decimal points are illuminated for 2 seconds.



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#### NOTE

If **\*EP\*** is displayed after the display test, this indicates that the button or the keypad is defective.

- The right-hand decimal point (On/h) indicates the available voltage supply during the pause time. As soon as another message is displayed, the decimal point turns off.

- The operating time is displayed as a rotating segment.

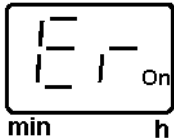
- **'Er'** is shown to indicate a malfunction
- or **'LL'** is shown to indicate low level (where applicable)

## Setting and Operation of QLS 301, continuation

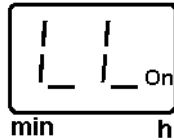
### Display Mode, continuation



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4212a99



4213a99

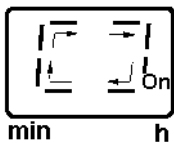
- The flashing display is changed into a continuous light by pressing the button (**acknowledging**). To **acknowledge**, press the button only briefly.
- Messages which have been acknowledged but have not yet been remedied flash again after the pump is switched off and on again.

Fig. 35 Display Mode

### Operating Mode



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#### IMPORTANT

The operating mode is accessible only during the pause time, and cannot be operated during the running time (pump operating time).

- Precondition: When the voltage supply is applied, the decimal point On/h is lit.

#### Operating option: Initiating an additional lube cycle

- ➔ Press the button. The elapsed pause time is reset. The operating time starts. A rotating segment is visible on the display during the whole operating time.

#### Operating option: Read information on how to set the pause time and remaining pause time.



4208a99

- ➔ Press the button.



4123a99



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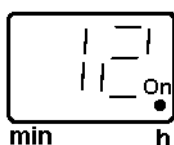


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#### NOTE

The following display sequence is shown **twice** and is cancelled after 60 seconds. The change of display occurs every two seconds. Example:

PP = 12h 30min  
rP = 5h 10min  
"PP" (set pause time)



4216a99

after two sec.

12 . (hours)

## Setting and Operation of QLS 301, continuation

### Operating Mode, continuation

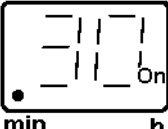
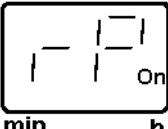
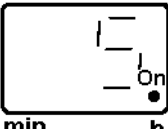
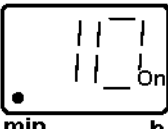
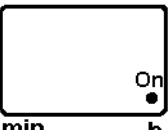
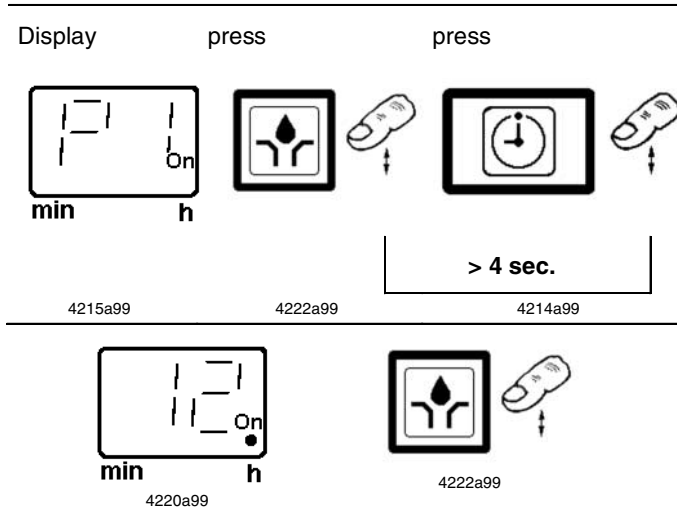
 4220a99	after two sec.	. 30 (minutes)
 4224a99	after two sec.	"rP" (remain pause time)
 4225a99	after two sec.	5 . (hours)
 4226a99	after two sec.	. 10 (minutes)
 4208a99	after 60 sec.	occurs after second sequence

Fig. 36 Operating Mode

### Programming Mode



➔ To access to the programming mode, **press both buttons** at the same time **> 4 seconds**.

Programming options	Pause time:
P1	0 - 99 hours
P2	0 - 59 minutes
Min. pause time	20 minutes
Max. pause time	99 hours 59 minutes

#### Setting hours P1

- ➔ Settings are made in one direction: 0, 1, 2, 3, ..... 99 h
- Button pressed once..... increases by 1 hour
- Button pressed continuously.....quick sequence

The fields "hour" and "minutes" are indicated by a **decimal point** on the **right - hand** for the **hours** and on the **left - hand** for the **minutes**.

## Setting and Operation of QLS 301, continuation

### Programming Mode, continuation

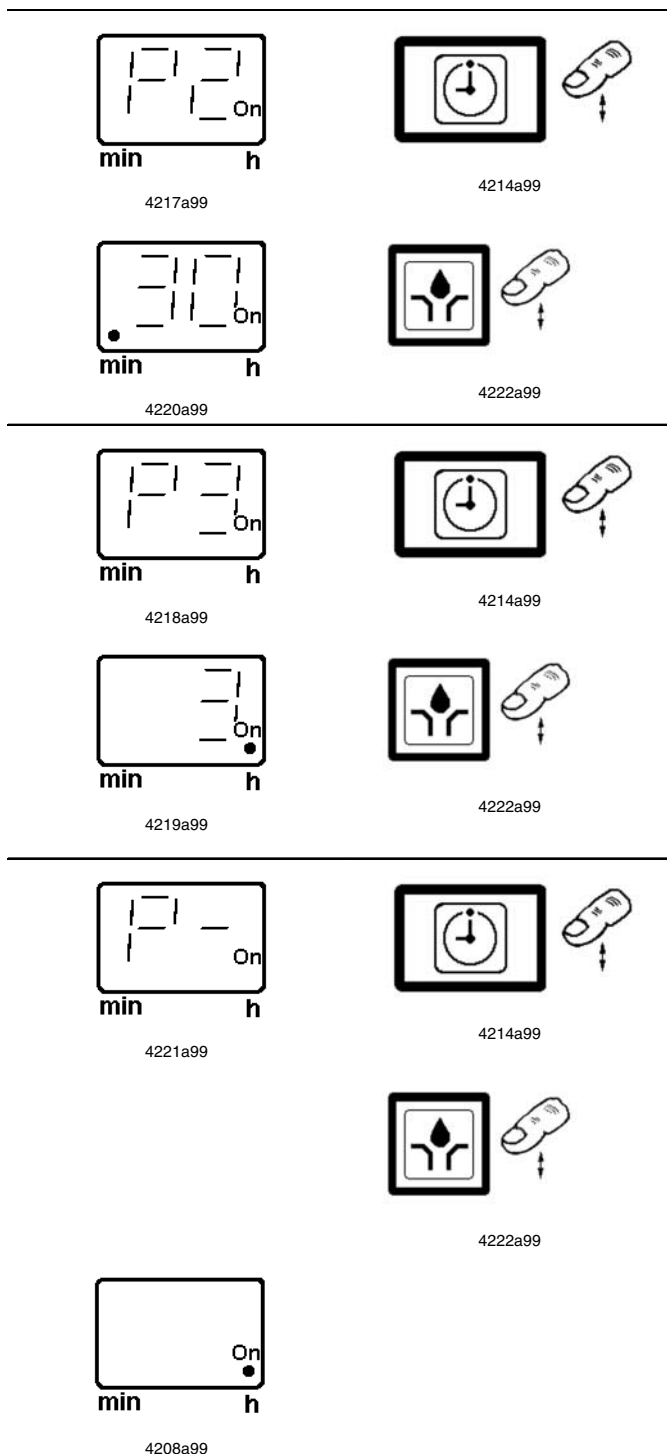


Fig. 37 Programming Mode

#### Setting minutes P2

- Settings are made in one direction: 0, 1, 2, 3...59 minutes
- Button pressed once .....increases by 1 minute
- Button pressed continuously .....quick sequence



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#### NOTE

The minimum pause time begins with 20 minutes. When pause times < 20 minutes are programmed, the display automatically shows .20.

#### Setting number of cycles P3 (Option)



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#### IMPORTANT

Settings are only possible in connection with progressive divider block SSV 6 or SSV 8 (connected as a main divider block).

If lube points are divided via sub-divider valves (SSV 6) and a main divider valve (SSV 6, SSV 8), a maximum of 18 (24) lube points must not be exceeded.

- Press the button. The selection of 'P3' (cycles) is displayed.  
Max. cycle time.....3
- Press the button and program the number of cycles (1, 2, 3) in accordance with the desired dosage.

#### Completing the programming

- Press the button. 'P-' is displayed.



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#### IMPORTANT

In order to avoid a wrong program, make sure to always carry out the programming order completely, i. e. setting of P1 (hours), P2 (minutes), P3 (number of cycles) and P- (programming end).

- Complete the programming by pressing the button, see

#### NOTE

If the button "additional lubrication" is not triggered within 30 seconds, the previous programming will remain.

#### IMPORTANT

After completion of the programming order, check the adjustment of the pause time in the operating mode, again (see chapter "Operating mode").

## 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 the lubrication points.
- Also check the feedlines for damage and replace them, if necessary.



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#### CAUTION!

**115-230 V!**  
**Turn off the voltage supply for pumps 120 VAC and 230 VAC before servicing the pump.**



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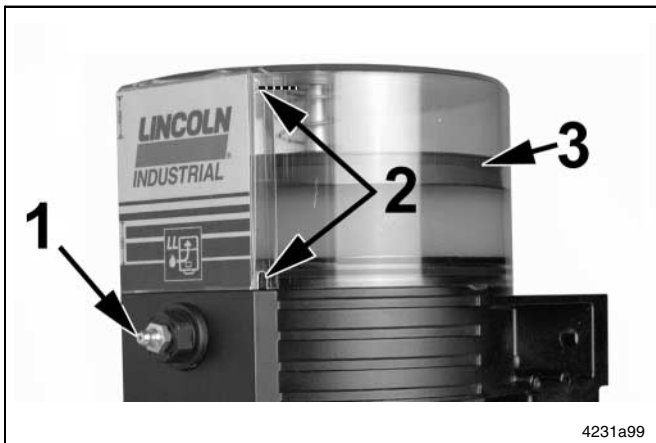
#### NOTE

*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



4231a99

Fig. 38 Filling nipple for filling reservoir

- 1 Filling nipple
- 2 Vent hole
- 3 Follower plate

### Filling of the empty reservoir

- Make sure that all air has been expelled from under the follower plate after refilling the empty reservoir.
- The follower plate seal should contact the hole located on the top of the reservoir. Small amount of grease should be refilled to ensure expelling of air from under the follower plate.

Fill the reservoir up to the "Max." mark via the filling nipple, see fig. 38.



6001a02

#### 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 priming and a longer running time to reach the full lubricant output. Therefore, trigger additional lube cycles manually.*



1013A94

#### CAUTION!

**Risk of bursting if the reservoir is overfilled!**  
**When filling the reservoir by means of pumps with a large delivery volume do not exceed the max. filling mark.**

## Maintenance, Repair and Tests, continuation

### Repair

- For repair work on the QLS 301 use only original **Lincoln** spare parts.
- Using non-**Lincoln** parts voids the pump warranty.



4273a00

#### CAUTION!

**115-230 V!**  
**Switch off the voltage supply for pumps 120 VAC and 230 VAC before servicing the pump.**



1013A94

#### CAUTION!

*By operating the drive motor without the reservoir installed, there is a **risk of injury** by the eccentric gear.*  
**Never use the Lubrication System QLS 301 without the installed reservoir!**

### Functional Test



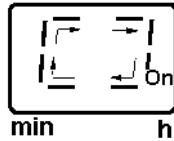
4222a99

Fig. 39 Pushbutton for additional lubrication cycle

- ➡ Press pushbutton > 2 sec. to trigger a lubrication cycle.

## Troubleshooting

### Pump of the QLS 301 system



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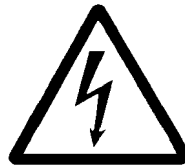
- The green rotating display indicates that the pump operates properly.

#### Fault: Pump motor doesn't run

##### Cause:

- Power supply interrupted. Green decimal point On/h on display is not lit.
- Power supply from printed circuit board to motor interrupted. Electric motor defective.
- Printed circuit board defective
- Keypad or button is defective. 'EP' display at the keypad flashes.

##### Remedy:



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##### WARNING!

115-230 V!  
In case of pumps with 120 VAC and 230 VAC, disconnect the power supply before starting any maintenance or repair works.

- ➔ Check the voltage supply to the pump/fuses. If necessary, eliminate the fault or replace the fuses.
- ➔ Check the feedline from the fuses to the plug of the pump and then to the printed circuit board.
- ➔ Trigger an additional lube cycle. Check voltage supply from the printed circuit board to the motor.
- ➔ Replace printed circuit board.
- ➔ Replace housing with keypad.

#### Fault: Pump does not deliver lubricant

##### Cause:

- Reservoir is almost empty. 'LL' display at the keypad is flashing.
- Pump lost prime and 'Er' display at the keypad is flashing.
- Air pockets in lubricant.
- Improper lubricant has been used.
- Suction hole of pump element clogged.
- Pump piston is worn.
- Check valve in pump element defective or clogged.

##### Remedy:

- ➔ Fill up the reservoir with clean grease. Let the pump run (initiate an additional lube cycle) until lubricant shows at all lube points.



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##### NOTE

Dependent on the ambient temperature and/or sort of lubricant output. Therefore, trigger several additional lube cycles.

- ➔ Trigger an additional lubrication cycle. Lubricant must dispense without air bubbles.
- ➔ Change the lubricant.
- ➔ Remove pump element. Check suction hole for foreign particles. If there are any, remove them.
- ➔ Replace pump element.
- ➔ Replace pump element.



## Troubleshooting, continuation

**Fault: Pump either does not switch off at all or only after the monitoring time of 15 min.**

**Cause:**

- Proximity switch is not dampened, i.e. the control pin does not move within the switching range of the initiator, or the distance between the control pin and the initiator surface is more than 0.5 mm (0.02 in.).

**Remedy:**

- Trigger additional lubrication. Check whether the control pin moves centrally over the switching surface of the initiator. In case the adjustments do not correspond to the indications, the fixing position of the metering device has to be corrected.
- Check the distance.
  - Between the control pin and the switching surface of the initiator (max. 0.5 mm; 0.02 in.)
 In case the adjustments do not correspond to the indications, the fixing position of the proximity switch has to be corrected.
  - Distances between the switching surface of the initiator and the upper edge of the fixing nut:
    - When the divider block is mounted at the back: 16+ / -0,2 mm (0.62+/-0.08 in.)
    - When the divider block is mounted at the bottom: 12,7 +/-0,1 mm (0.5 +/-0.004 in.)
- Tightening torque of the nut: 1,5 NM (1.10 ft-lb.).

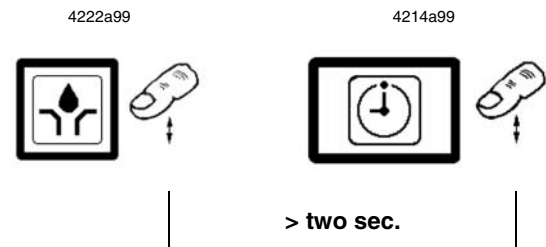
**Fault: Pump runs continuously**

**Cause:**

- Programming of pause time in step P1 was set to "00". Programming of further steps P2, P3 and P- was not carried out. Pump starts running immediately. The proximity switch switches off the cycle for two minutes. Then, pump runs continuously.

**Remedy:**

- Switch off pump (power supply) by removing left-hand socket from plug.
- Press both buttons of keypad:



- Switch on pump (power supply) by replugging left-hand socket.
- Release both pushbuttons after two seconds.
- The factory-set pause time of 6 hours is automatically reset.
- Afterwards new setting of pause time is possible.

## Troubleshooting, continuation

### SSV Divider Block

**Fault: Blockage in the downstream progressive system**

**Cause:**

- Bearings, lines or divider block clogged
  - Mounting position of divider block : bottom
    - In the case of the divider block SSV 8,12 and 18 the outlet ports 1 and/or 2 are closed.
  - Mounting position of divider block : back-side
    - In the case of the divider block SSV 6, 12 and SSV 18 the outlet 1 is closed and outlet 2 is feed to a lube point.
- The fault can be identified as follows:
- a) Fault indication 'Er' flashing on the keypad display.
  - b) Fault indication 'Er' flashing on the keypad piston does not move.

**Remedy:**

- Determine the cause of the blockage as described in the following example and eliminate it.
- ➔ Let the pump run (refer to "trigger an additional lube cycle").
- ➔ Disconnect all feedlines of the divider block one after the other. If grease shows under pressure (i. e. at outlet 3, Fig. 40) the blockage is located in the line of outlet 3 or in the connected bearing point.
- ➔ Pump through the blocked line or bearing point using a hand pump.

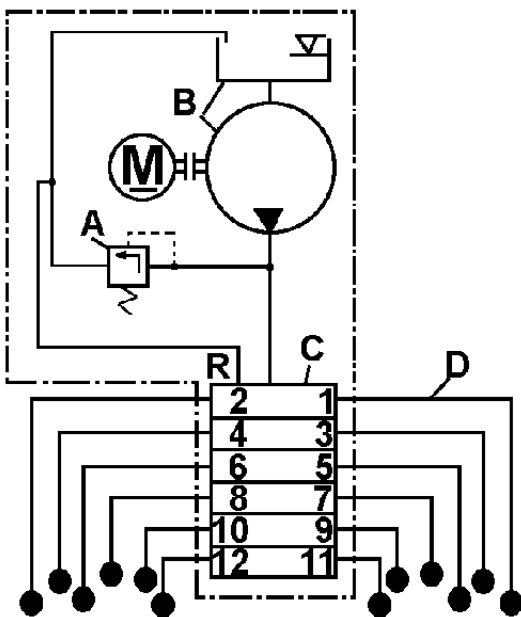


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**NOTE**

To check the individual outlets, leave all outlets disconnected for a while, since only one piston stroke is executed with each motor revolution. Several strokes are required for a full cycle of all divider blocks.

- ➔ Check pressure relief valve (Fig. 23). Replace it, if necessary.



4232b02

Fig. 40 Example of a QLS 301

- A pressure relief valve
- B pump
- C SSV 12 divider block
- D feedlines
- R return line

## Troubleshooting, continuation

### Fault: Blockage in the downstream progressive system, continuation

**Cause:**

- Divider valve is blocked

**Remedy:**

- Replace the divider block or clean it as follows:
  - Remove all threaded tube fittings.
  - Unscrew the piston closure plugs.
  - Remove the piston, if possible, with a soft mandrel (smaller than  $\varnothing$  6 mm, 0.24 in).



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**IMPORTANT**

*The pistons are individually fit in the bores 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.*

- Thoroughly clean the divider block body in a grease-dissolving detergent and dry it with compressed air.
- Clean through the material passages ( $\varnothing$  1.5 mm, 0.59 in) at the thread ends of the piston bores using a pin.
- Clean the divider block once more and dry it thoroughly.
- Reassemble the divider block.

### Fault: Differing lubricant amounts at the lubrication point

**Cause:**

- Lubricant metering not correct.
- Setting of the pause time incorrect.

**Remedy:**

- Check the lubricant metering acc. to the lubrication chart.
- Check time setting.

## Technical Data

### QLS 301, GENERAL

Operating temperature..... -25° C to 70° C (-10° F to 160° F)  
 Maximum operating pressure of pump model without divider block..... 205 bar (3,000 psig)  
 Number of outlets..... 6, 8, 12, 18  
 Output per outlet and cycle ..... ca. 0,2 cm<sup>2</sup>  
 Reservoir capacity ..... 1 l  
 Lubricant ..... up to NLGI 2 Grease  
 Weight (average) ..... 5.7 kg. (12.5 lbs.)  
 Protection.....IP6K 9K acc. to DIN 40050 T9 (NEMA 4)  
 Reverse polarity protection:  
 The operating voltage inlets are protected against reverse polarity.

### ELECTRICAL DATA AC (ALTERNATE CURRENT)

Operating voltage..... 120 VAC/60 Hz +/- 10 %  
 Operating current .....1,0 A  
 Operating voltage.....230 VAC; 50/60 Hz +/- 10 %  
 Operating current .....0,5 A

### ELECTRICAL DATA DC (DIRECT CURRENT)

Operating voltage..... 12 V, - 20%/+ 30 %  
 Operating current .....2,0 A  
 Operating voltage..... 24 V, - 20%/+ 30 %  
 Operating current .....1,0 A  
 Residual ripple in relation to the operating voltage ..... ± 5% acc. to DIN41755



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#### NOTE

*The pump motor is suitable for intermittent operation only.*

- In addition to the EMV directive, the **DC systems** also comply with the following guidelines and standards:
  - the vehicle guideline 95/245/EC
  - EMV regulation for on-road vehicles acc. EN 40839 parts 1, 3 and 4

### TIME SETTING

Factory setting  
 Pause time ..... 6 hours/cycle  
 Lubrication cycle time.....20 minutes to 100 hours, ..... increment 1 minute  
 Numbers of cycles, general..... 1 cycle with SSV 6, SSV 8 ..... 1, 2 or 3 cycles are possible  
 Timer memory..... indefinite over EEPROM

### RELAY FOR MALFUNCTION AC (OPTION)

Potential-free outlet for malfunction/low-level option  
 Switching voltage..... max. 230 VAC/ 125 VDC  
 Switching current ..... max. (resistive) 2 A  
 Switching capacity ..... max. 460 VA/80 W

### RELAY FOR MALFUNCTION DC (OPTION)

Potential-free outlet for malfunction/low level option  
 Switching voltage..... max. 48 VAC/ VDC  
 Switching current ..... max. (resistive) 2 A  
 Switching capacity ..... max. 100 VA/80 W



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#### NOTE

*All data depends on operating voltage, ambient temperature and max. operating pressure.*

### LINES

#### Plastic tube (ø 6x1,5 mm;1/4 in.)

Min. bending radius .....50 cm (2 in.)  
 Bursting pressure at 20° C ( 70°F) .....approx. 210 bar (3050 psi )  
 Min. temperature .....-25° C (-10°F)

### TIGHTENING TORQUES

#### Pump

Electric motor to housing.....3 NM (2.5 lb.-ft)  
 Pump element in housing.....25 NM ( 19.0 lb.-ft)

#### Divider block, accessories

Closure plug (piston) in divider block..... 18 NM (13.5 lb.-ft)  
 Closure plug (outlets) in divider block..... 15 NM (11.0 lb.-ft)  
 Outlet fitting in divider block  
 - screw-type ..... 17 NM (12.5 lb.-ft)  
 - push-in type..... 12 NM (9.0 lb.-ft)  
 Compression nut onto outlet fitting, screw-type:  
 - plastic tube ..... 10 NM (7.5 lb.-ft)  
 - steel tube..... 11 NM (8.0 lb.-ft)  
 Indicator pin in divider block ..... 18 NM (13.5 lb.-ft)  
 Mounting of the divider block..... 10 NM (8.0 lb.-ft)

### ACCESSORY KITS:

#### Inch- Size Kits:

SSV 6/8 part no. 550-36971-1  
 SSV 12 part no. 550-36971-2  
 SSV 18 part no. 550-36971-3

#### Metric Size Kits:

SSV 6/8 part no. 550-36970-1\*\*\*  
 SSV 12 part no. 550-36970-2\*\*\*  
 SSV 18 part no. 550-36970-3\*\*\*

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

## Dimensions

Pump and SSV divider block

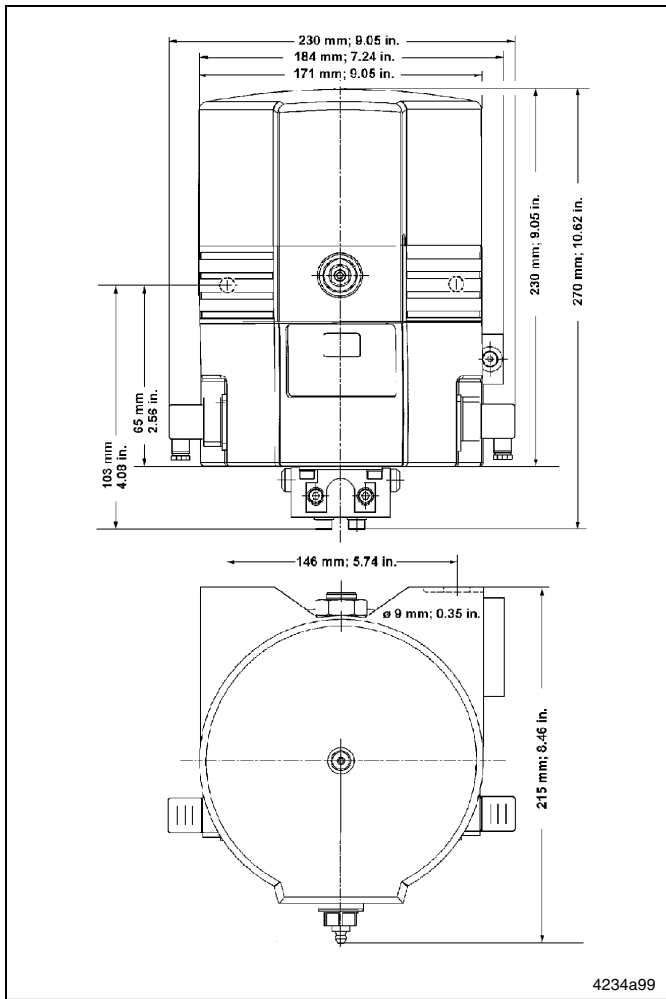


Fig. 41 Dimensions of QLS 301

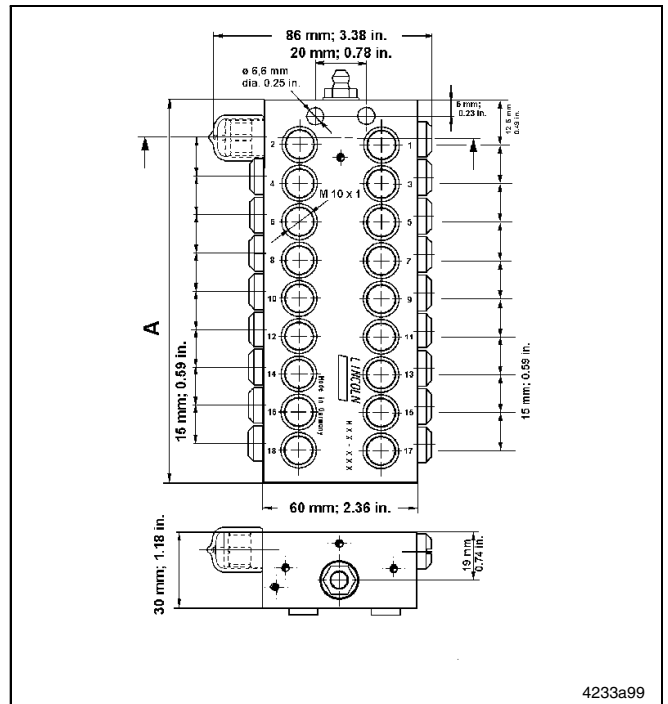


Fig. 42 Dimensions of back mounted SSV divider blocks

Number of outlets	Dimensions A in mm (in.)
6	60 (2.36)
12	105 (4.13)
18	150 (5.90)

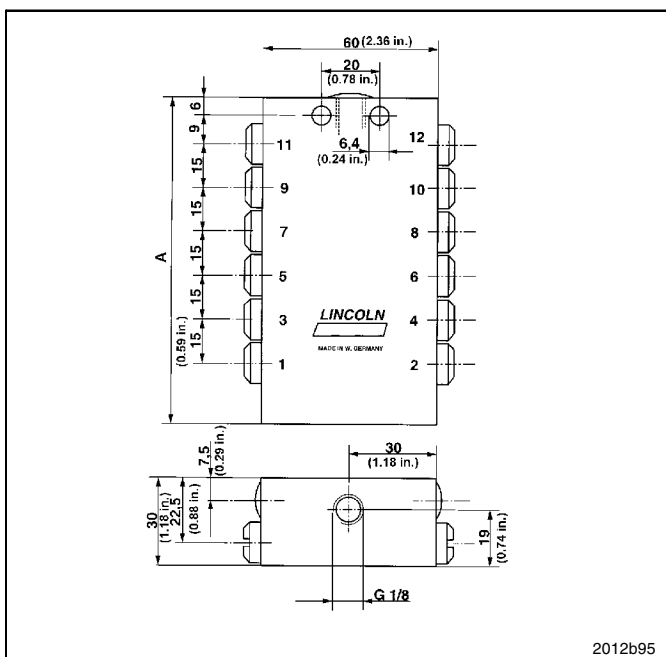


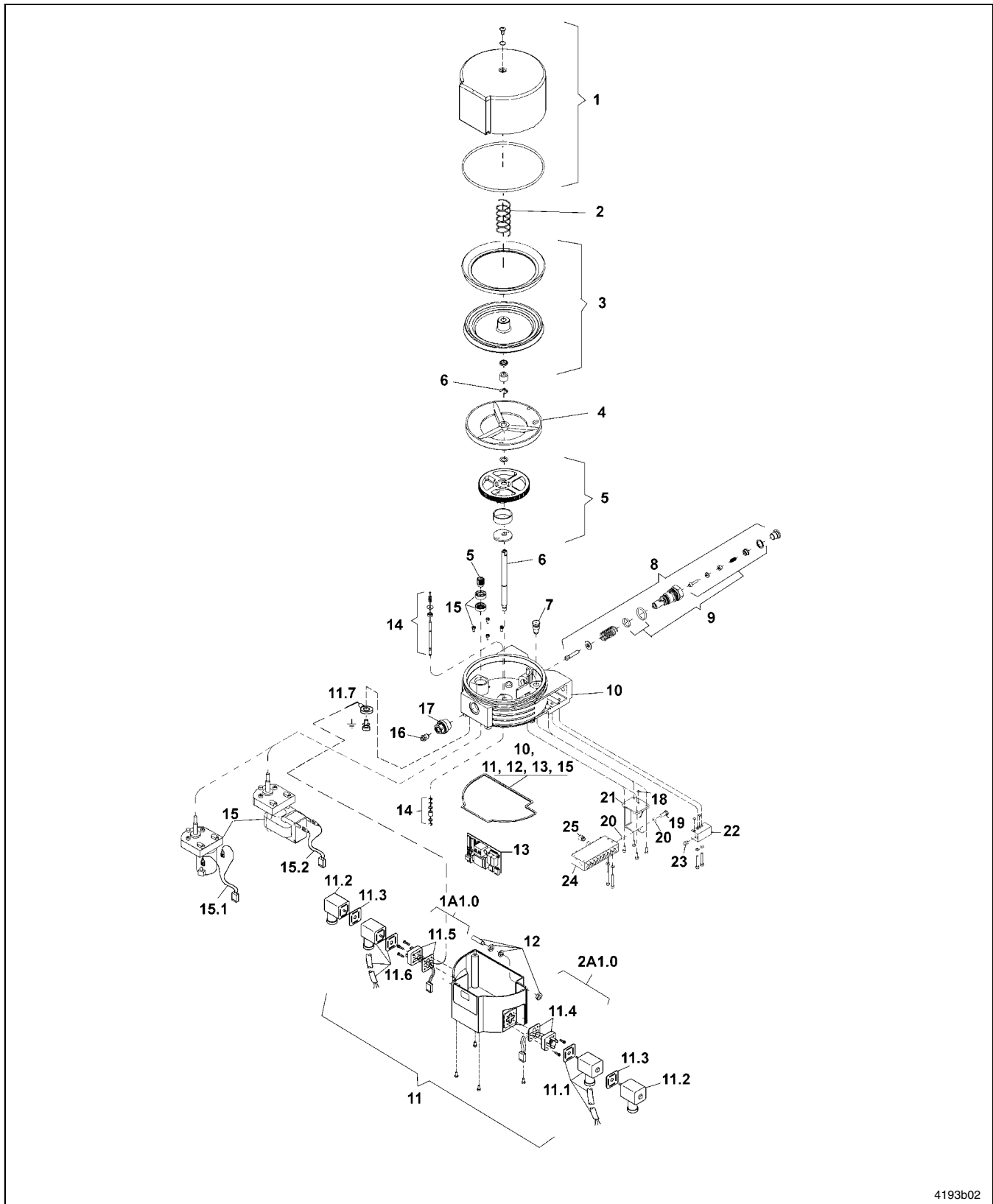
Fig. 43 Dimensions of bottom mounted SSV divider blocks

Number of outlets	Dimensions A in mm (in.)
6	75 (2.95)
12	105 (4.13)
18	150 (5.90)

Subject to modifications

### Service Parts for the QLS 301

QLS 301 with bottom mounted SSV divider block



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Fig. 44 QLS 301 with bottom mounted SSV divider block

Subject to modifications

### Service Parts for the QLS 301, continuation

#### Parts list

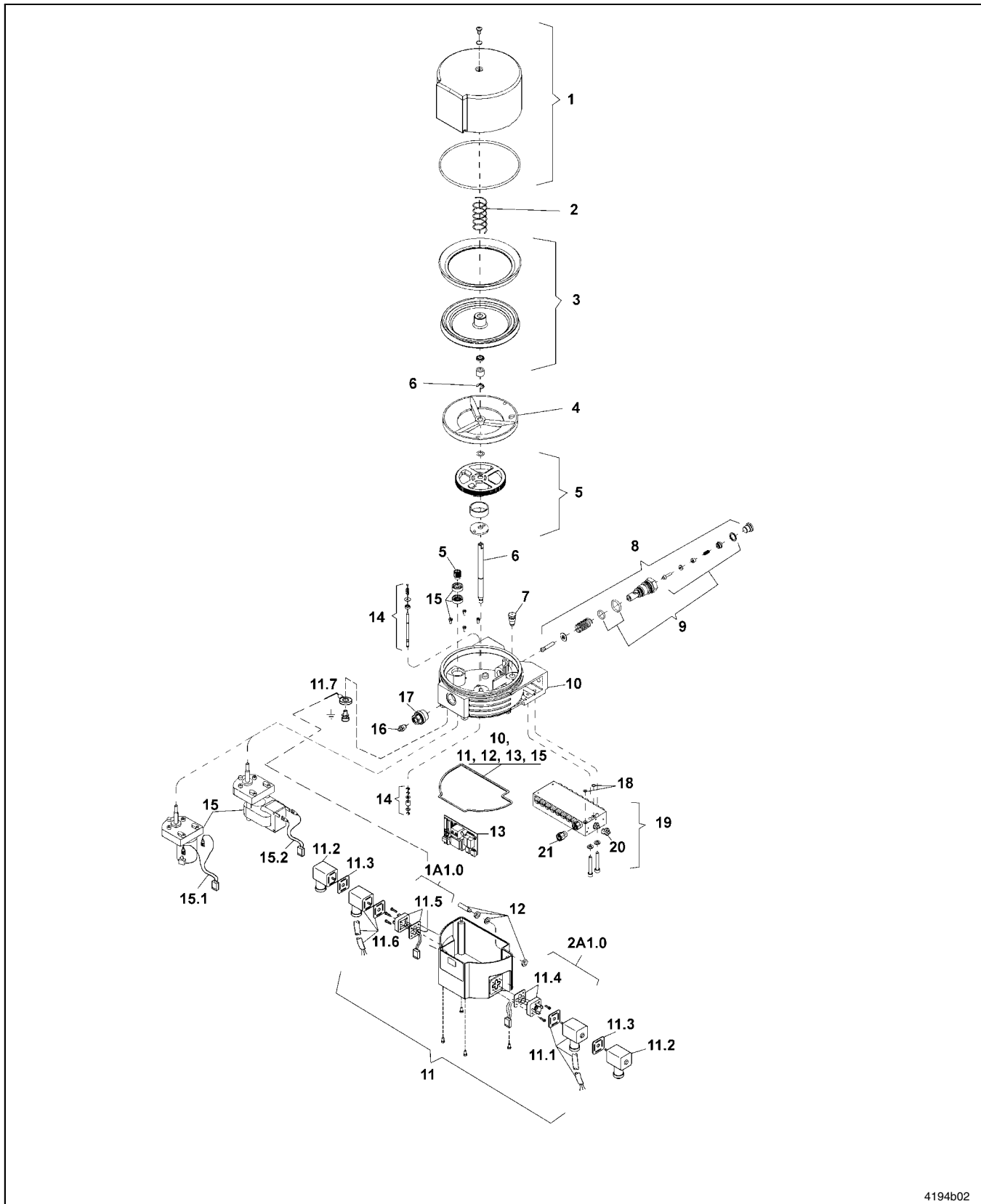
Pos.	Designation	Kit	Single Part	Qty	Part no.
1	Reservoir	x		1	550-36979-2
2	Spring (follow. plate) DA 28x1,6x106		x	1	218-14172-6
3	Follower plate	x		1	550-36979-3
4	Intermediate bottom	x		1	450-24749-1
5	Eccentric gear	x		1	550-36979-4
6	Shaft	x		1	550-36979-1
7	Pressure relief valve, cartridge		x	1	235-14343-1
8	Pump element, assy. dia. 6 mm		x	1	650-28856-1
9	Sealing parts for pump element	x		1	550-36979-5
10	Housing with low level control	x		1	550-36981-3
11	Housing cover with low level control for direct current VDC, plug 1A1.0	x		1	550-36984-1
	for direct current VDC, plug 2A1.0	x		1	550-36984-2
	Housing cover with low level control for alternate current VAC, plug 1A1.0	x		1	550-36984-3
	for alternate current VAC, plug1+2 A1.0	x		1	550-36984-4
11.1	Socket 2 with 10 m cable, for remote control	x		1	664-36078-9
11.2	Socket, black GMD- 3011		x	2	236-13277-9
11.3	Flat packing		x	2	236-13294-3
11.4	Appliance plug 2, for remote control, VDC		x	1	664-36968-6
	Appliance plug 2, for remote control, VAC		x	1	664-36968-5
11.5	Appliance plug 1, for power supply, VDC		x	1	664-36968-4
	Appliance plug 1, for power supply, VAC		x	1	664-36968-3
11.6	Socket 1 with 10 m cable, for power supply		x	1	664-36078-7

Pos.	Designation	Kit	Single Part	Qty	Part no.
11.7	Screw with washer assy.		x	1	201-14434-1
12	Proximity switch	x		1	550-36980-1
13	Printed circuit board for 1 cycle 12/24 VDC	x		1	550-36983-1
	120 VAC	x		1	550-36983-3
	230 VAC	x		1	550-36983-5
	Print. circuit board for max. 3 cycles 12/24 VDC	x		1	550-36983-2
	120 VAC	x		1	550-36983-4
	230 VAC	x		1	550-36983-6
14	Low level control	x		1	550-36979-9
15	Motor, 12 VDC	x		1	550-36982-1
	Motor, 24 VDC	x		1	550-36982-2
	Motor, 120 VAC	x		1	550-36982-3
	Motor, 230 VAC	x		1	550-36982-4
15.1	Motor connection VDC		x	1	664-36968-2
15.2	Motor connection VAC		x	1	664-36968-1
16	Hydraulic lube fitting, ST AR 1/8		x	1	251-14040-1
17	Adapter M 22x1,5 (a) x G 1/8 in.(i)		x	1	304-19619-1
18	O-Ring dia 5 x1, 5 mm		x	3	219-12222-2
19	Banjo bold		x	1	226-13777-2
20	Sealing ring alumi- num		x	2	226-13780-1
21	Manifold	x		1	550-36979-6
22	Connecting block	x		1	550-36979-7
23	Hydraulic lube fitting, ST AR 1/8		x	1	251-14040-1
24	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	Piston plug with sealing for control pin		x	1	519-32123-1
	Sealing kit for QLS 301		x	1	550-36979-8

Subject to modifications

### Service Parts for the QLS 301, continuation

#### QLS 301 with back mounted SSV divider block



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Fig. 45 QLS 301 with back mounted SSV divider block

Subject to modifications



**Service Parts for the QLS 301, continuation**

**Parts List**

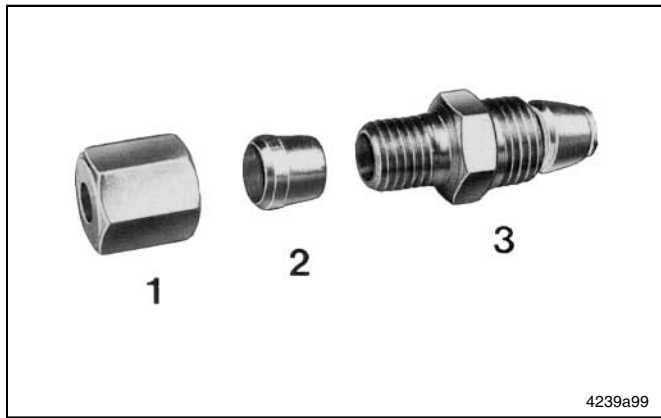
Pos.	Designation	Kit	Single Part	Qty	Part N°.
1	Reservoir	x		1	550-36979-2
2	Spring (follw. plate) DA 28x1,6x106		x	1	218-14172-6
3	Follower plate	x		1	550-36979-3
4	Intermediate bottom	x		1	450-24749-1
5	Eccentric gear	x		1	550-36979-4
6	Shaft	x		1	550-36979-1
7	Pressure relief valve, cartridge		x	1	235-14343-1
8	Pump element, assy dia. 6 mm		x	1	650-28856-1
9	Sealing parts for pump element	x		1	550-36979-5
10	Housing with low level control	x		1	550-36981-3
11	Housing cover with low level control for direct current VDC, plug 1A1.0		x	1	550-36984-1
	for direct current VDC, plug 2A1.0		x	1	550-36984-2
	Housing cover with low level control for alternate current VAC, plug 1A1.0		x	1	550-36984-3
	for alternate current VAC, plug1+2 A1.0		x	1	550-36984-4
11.1	Socket 2 with 10 m cable, for remote control	x		1	664-36078-9
11.2	Socket, black GMD- 3011		x	2	236-13277-9
11.3	Flat packing		x	2	236-13294-3
11.4	Appliance plug 2, for remote control, VDC		x	1	664-36968-6
	Appliance plug 2, for remote control, VAC		x	1	664-36968-5
11.5	Appliance plug 1, for power supply, VDC		x	1	664-36968-4
	Appliance plug 1, for power supply, VAC		x	1	664-36968-3
11.6	Socket 1 with 10 m cable, for power supply		x	1	664-36078-7

Pos.	Description	Kit	Single Part	Qty	Part N°.
11.7	Screw with washer assy.		x	1	201-14434-1
12	Proximity switch	x		1	550-36980-1
13	Printed circuit board for 1 cycle 12/24 VDC		x	1	550-36983-1
	120 VAC		x	1	550-36983-3
	230 VAC		x	1	550-36983-5
	Printed circ. board for max. 3 cycles 12/24 VDC		x	1	550-36983-2
	120 VAC		x	1	550-36983-4
	230 VAC		x	1	550-36983-6
14	Low level control	x		1	550-36979-9
15	Motor, 12 VDC	x		1	550-36982-1
	Motor, 24 VDC	x		1	550-36982-2
	Motor, 120 VAC	x		1	550-36982-3
	Motor, 230 VAC	x		1	550-36982-4
15.1	Motor connection VDC		x	1	664-36968-2
15.2	Motor connection VAC		x	1	664-36968-1
16	Hydraulic lube fitting, ST AR 1/8		x	1	251-14040-1
17	Adapter M 22x1,5 (a) x G 1/8 in.(i)		x	1	304-19619-1
18	O-Ring dia 5 x1, 5 mm		x	3	219-12222-2
19	SSV divider block SSV 6 - K		x	1	619-37589-1
	SSV 12 - K		x	1	619-37590-1
	SSV 18 - K		x	1	619-37591-1
20	Hydraulic lube fitting, ST AR 1/8		x	1	251-14040-1
21	Piston plug with sealing for control pin		x	1	519-32123-1
	Sealing kit for QLS 301			1	550-36979-8

Subject to modifications

### Option for metric fittings (not included in the accessory kits)

#### SSV Connecting tube fitting, screw-type and push-in type

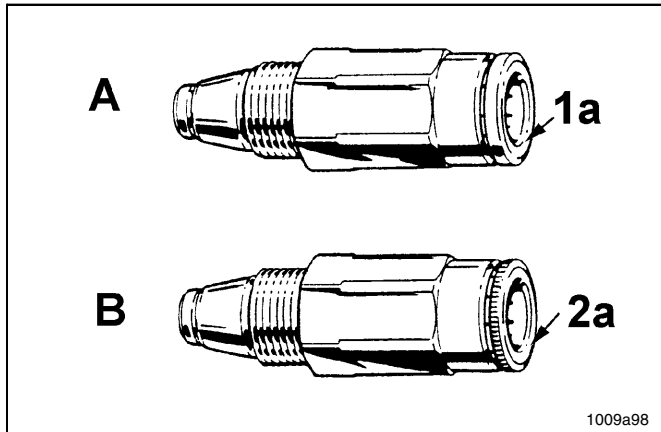


- 1 Ferrule nut
- 2 Cutting ring
- 3 Valve body with sealing and ferrule

4239a99

Fig. 46 Screw-type check valve

#### Connection of the pressure plastic tube or the high-pressure plastic hose



- For high-pressure plastic hose ( $\varnothing$  8.6x2.3 mm) use check valve A, fig. 47, with reinforced pliers 1a and smooth flange (part no. 226-14091-4)
- For pressure plastic tube ( $\varnothing$  6x1.5 mm) use check valve B, fig. 47, with standard pliers 2a and knurled flange (part no. 226-14091-2)

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

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Fig. 47 Different types of check valves



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Fig. 48 Check valve with reinforced pliers and high-pressure plastic hose



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#### NOTE

*On construction machines or agricultural machines use high-pressure plastic hoses as feedlines. In such cases, the check valves of the sub-divider blocks must have reinforced pliers and a smooth flange.*



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#### IMPORTANT

*Connect only high-pressure plastic hoses ( $\varnothing$  8.6x2.3 mm) with threaded sleeve and hose stud to the check valves with reinforced pliers.*

### Option for metric fittings (not included in the accessory kits), continuation

#### Mounting of the threaded sleeves and hose studs onto the high-pressure plastic hose

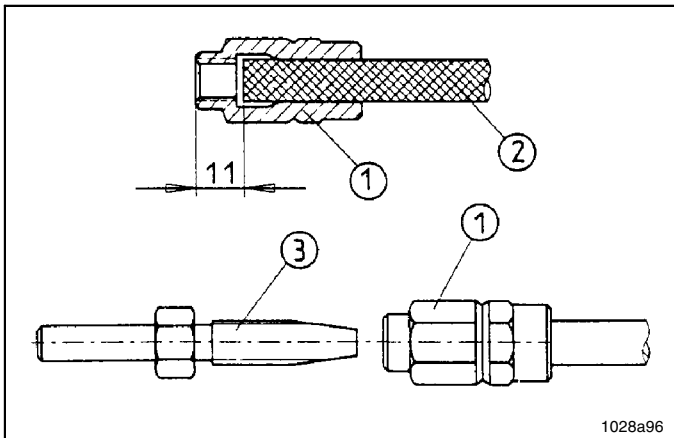


Fig. 49 Pre-assembly of the threaded sleeves and hose studs onto the main line

- Screw threaded sleeve (1, fig. 49) counterclockwise onto the high-pressure plastic hose (2) until the illustrated dimension of 11mm is reached. Then screw the hose stud (3) into the threaded sleeve (1).



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#### IMPORTANT

*Oil parts 1 and 3 well before screwing them together.*

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

**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 lubrication system**

in the version supplied by us, complies with the provisions of the 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  
EMV directive 89/336 EWG**

We declare that the model of the

**QLS 301 lubrication system**

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

**Applied harmonized standards in particular:**

- EN 55011** Specifications, limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment
- EN 50081-1** Electromagnetic compatibility  
Generic emission standard  
Part 1: residential, commercial and light industry
- EN 50082-2** Electromagnetic compatibility  
Generic immunity standard  
Part 2: industrial environment

Walldorf, 05.05.1999 , Dr. Ing. Z. Paluncic

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U.S. Patent-No. 6,244,387, German Registration Design No. 29923765.6

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