9.3EN-98003-A09

LMC 2
Lincoln Multi Controller 2

B-LMC2-000 a09

This User Manual was compiled on behalf of
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Introduction

Explanation of Symbols Used

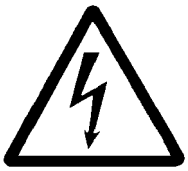
The following description standards are used in this manual:

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	 4273a00	 6001a02
- ATTENTION **- CAUTION** **- WARNING**	**- ATTENTION** **- CAUTION** **- WARNING**	**- NOTE** **- IMPORTANT**

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

ATTENTION	refers to faults or damages on machines.
CAUTION	refers to bad damages and possible injuries.
WARNING	refers to possible dangerous injuries.
NOTE	indicates improved operation of the device.
IMPORTANT	indicates special operating features of the device.

Example:


1013A94

ATTENTION!

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

Therefore, for the operation of your device always use original parts made by Lincoln GmbH.

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

- Listing of applicable statements
  - Subpoint of applicable statements

1. Determination of the number or sequence of contents

➲ 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 next chapter "Safety Instructions") 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, is the user's responsibility. Lincoln GmbH 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 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.

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Safety instructions

Intended use

- Use the LMC2 multi controller solely for controlling or monitoring Lincoln centralized lubrication-systems in stationary industrial plants.

Improper use

Any kind of use of the LMC2 not explicitly denoted in this user information as intended use is considered improper use.
If the LMC2 is used or operated in deviation from the intended use, all claims for compensation and all liability cease to exist.

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NOTE

Misappropriate use, e.g. through disregard of the safety instructions or through improper installation of the LMC2 invalidates all legal claims against Lincoln GmbH for any personal injury or damage to materials.

Exclusion of liability

- The manufacturer of the LMC2 is not liable for damage caused by
  - non-environmentally compatible disposal
  - unauthorized modifications to the system parts
  - use of spare parts not authorized by Lincoln
  - commissioning and start-up in defective condition
  - erroneous program selection by the user

General safety instructions

- The multi controller LMC2
  - is designed based on state of the art technology
  - can be assembled safe-to-operate
- Improper use can lead to damage due to under- or overlubrication of bearings and bearing points.
- Independent alterations or modifications to an installed system may only be carried out after prior consultation with the manufacturer or its contract partner.

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WARNING!

Dangerous residual voltages!

Even during a standstill the motor or valve may be applied with voltage.

Accident prevention rules

- Comply with the rules applicable in the country of use.
- Do not operate
  - using non-authorized spare parts
  - with power supplies (VAC/VDC) that do not comply with the electrical design of the LMC2

Operation, maintenance and repair

- LMC2 safety devices:
  - do not modify them or make them inoperative
  - do not remove them from the lubrication system
  - reattach them before commissioning or start-up
- Mount the LMC2 between 0.4 and 2.0 m above the access level with cable glants towards bottom (wall-mounting).
- Keep the LMC2 multi controller away from heat sources. Comply with the operating temperature.
- Replace a defective LMC2 in its entirety (see “Spare parts“ chapter, page 9).

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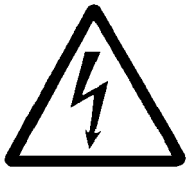
CAUTION!

The LMC2 may only be installed by qualified personnel that are familiar with its operating instructions. The connection (N/L/PE) to the power supply must be carried out according to VDE 0100 and VDE 0160. Install a safety device and interrupt facility to disconnect the LMC2. Disconnect the mains connection before starting installation and service work. Make sure to provide a safeguard to prevent unintentional reclosing of the disconnecting device.

After completion of wiring, individual cores must be secured against dislocation.



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WARNING!

Non-compliance with the safety instructions, such as contact with electrically conducting parts with an open LMC2 or improper handling the same can endanger life. The device could overheat if the technical data specified in the technical data sheet are exceeded. This can destroy the LMC2 and can impair the electrical safety.

Disposal

- Dispose of the LMC2 in an environmentally friendly way, according to the relevant and legal regulations.

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Description

Application

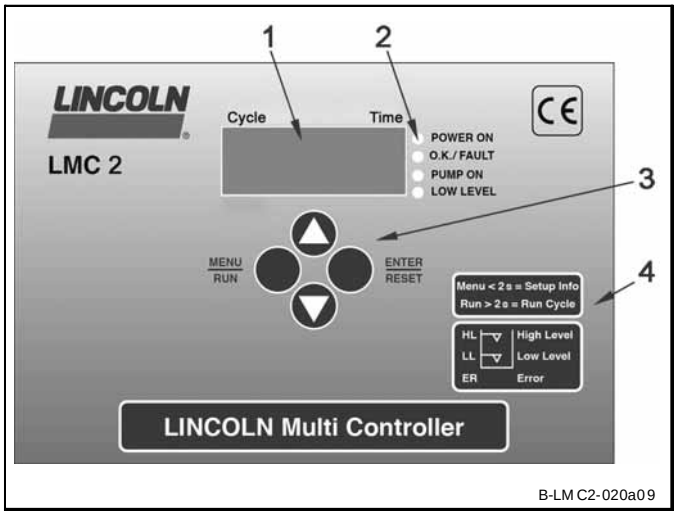

Fig. 1 LMC2 membrane keypad

1 - 4-digit 7-segment display
2 - LED status display
- Power on (white)
- Readiness for operation (green) / Malfunction (red)
- Pump is running (green)
- Low-level signal (yellow)

3 - Operating panel
- left MENU / RUN
- right ENTER / RESET
- up (**UP**) short **+ 1** count value
long + high speed
- down (**DOWN**) short **- 1** count value
long – high speed

4 - Information on handling

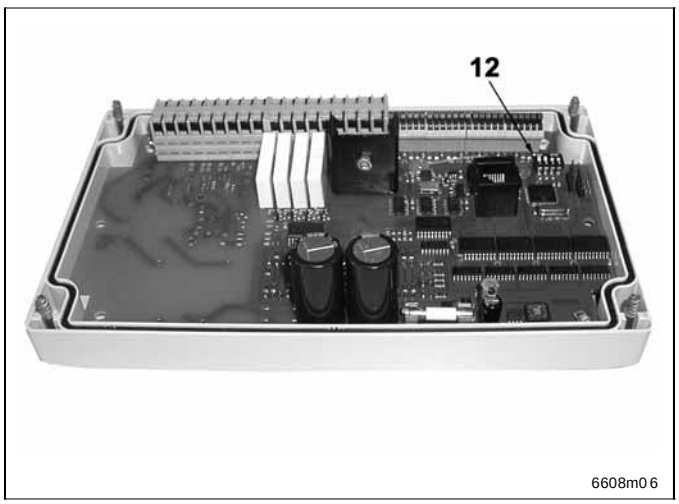

Fig. 2 The LMC2 control p.c.b. (VDC)

- The LMC2 multi controller is used to control and monitor the following stationary Lincoln lubrication systems.
  - PMA systems
  - Progressive systems
    - Railroad lubrication
  - Two-line systems
  - Centro-Matic® systems
  - COBRA chain-lubrication systems
  - Spray systems
- It combines the flexibility of freely programmable controllers with the cost effectiveness of pre-programmed control p.c.b.'s.
- Functionality and menu display in the LMC2 are set to specifically matching parameters depending on the lubrication system selected.
  Parameter name (t = time, c = counter):
  - t – MO ..... (Monitoring) Monitoring time
  - t – PS ..... Pause time
  - t – rn ..... (run) Lubrication time
  - t – od ..... (off delay) Switch-off delay
  - t – cl ..... (clean) Nipple cleaning time
  - c – rn ..... (run) Lubrication / revolution / stroke count
  - c – PS ..... Number of pause revolutions
  - c – PS (Railroad lubrication) ..... Number of axes
  - c – bl ..... (Bolts) Number of chain links
- The lubrication system and presettings for its parameters can be set (UP & DOWN keys, pos. 3, Fig. 1) using the DIP-switches (SW1, SW2, SW3 & SW4, pos. 12, Fig. 2)
- You can make additional parameter modifications with the operating panel on the LMC2 membrane keypad in the "Setup mode" (see the "Operating" section in the respective lubrication system.
- All settings and count values are saved every 30 minutes in the LMC2 EEPROM, which means they are not lost even if the mains supply fails.

12 - DIP-switch (from left: SW1, SW2, SW3, SW4)

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Description, continued

MENU Reference list

Navigation	LMC2	Centralized lubrication system	Display menu item	Parameter	Section	Count value
Through key(s)		Factory setting			Through UP or DOWN key	
ENTER + MENU		**PMA systems**				
ENTER		1	c – rn	Number of lubrication cycles	1 to 9999 lubrication cycles	±1 stroke
ENTER		1	c – PS	Number of pause cycles	1 to 9999 pause cycles	±1 pause cycle
ENTER		10	c – bl	Number of chain links	1 to 9999 chain links	±1 chain link
ENTER		Jumps back to the first parameter				
RUN		Acknowledgment of the modifications carried out & return to the operating mode				
ENTER + MENU		**Progressive systems**				
ENTER		10 min. 10	t – PS c – PS	Pause time	1 min. to 99 h. and 59 min. 1 to 9999 axes	±1 minute ± 1 axis
ENTER		1	c – rn [1)]	Number of metering device cycles	1 to 99 metering device cycles	±1 cycle
ENTER		2 min.	t – rn [1)]	Lubrication time	1 min. to 99 min. and 59 sec.	±1 second
		2 Min.	t – MO [1)]	Monitoring time	1 min. to 99 min. and 59 sec.	±1 second
ENTER		Jumps back to the first parameter				
RUN		Acknowledgement of the modifications carried out & return to the operating mode				
ENTER + MENU		**Two-line systems**				
ENTER		12 min.	t – MO	Monitoring time	1 min. to 99 min. and 59 sec.	±1 second
ENTER		10 min.	t – PS	Pause time	1 min. to 99 h. and 59 min.	±1 minute
ENTER		Jumps back to the first parameter				
RUN		Acknowledgement of the modifications carried out & return to the operating mode				
ENTER + MENU		**Centro-Matic® systems**				
ENTER		2 min.	t – MO	Monitoring time	1 min. to 99 min. and 59 sec.	±1 second
ENTER		10 min.	t – PS	Pause time	1 min. to 99 h. and 59 min.	±1 minute
ENTER		10 sec.	t – od	Switch-off delay time	1 sec. to 99 sec.	±1 second
ENTER		Jumps back to the first parameter				
RUN		Acknowledgement of the modifications carried out & return to the operating mode				
ENTER + MENU		**COBRA chain lubrication systems**				
ENTER		10 sec.	t – cl	Cleaning time per nipple	1 sec. to 99 sec.	±1 second
ENTER		1	c – rn	Number of lubrication cycles	1 to 9999 lubrication cycles	±1 lubrication cycle
ENTER		1	c – PS	Number of pause cycles	1 to 9999 pause cycles	±1 pause cycle
ENTER		10	c – bl	Number of chain links	1 to 9999 chain links	±1 chain link
ENTER		Jumps back to the first parameter				
RUN		Acknowledgement of the modifications carried out & return to the operating mode				
ENTER + MENU		**Spray systems**				
ENTER		10 Min.	t – PS	Pause time	1 min. to 99 h. and 59 min.	±1 minute
ENTER		1	c – rn [1)]	Number of metering device cycles	1 to 99 metering device cycles	±1 cycle
ENTER		2 min.	t – rn [1)]	Lubrication time	1 min. to 99 min. and 59 sec.	±1 second
		2 Min.	t – MO [1)]	Monitoring time	1 min. to 99 min. and 59 sec.	±1 second
ENTER		10 sec.	t – od	Re-spraying-time	1 sec. to 99 sec.	±1 second
ENTER		Jumps back to the first parameter				
RUN		Acknowledgement of the modifications carried out & return to the operating mode				

[1)] Are displayed or hidden depending on the parameter presetting (see “DIP-switch combinations“, page 11) in the set-up mode (see “Quicktour“, pages 16, 20 and 38).

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Installation

Connection

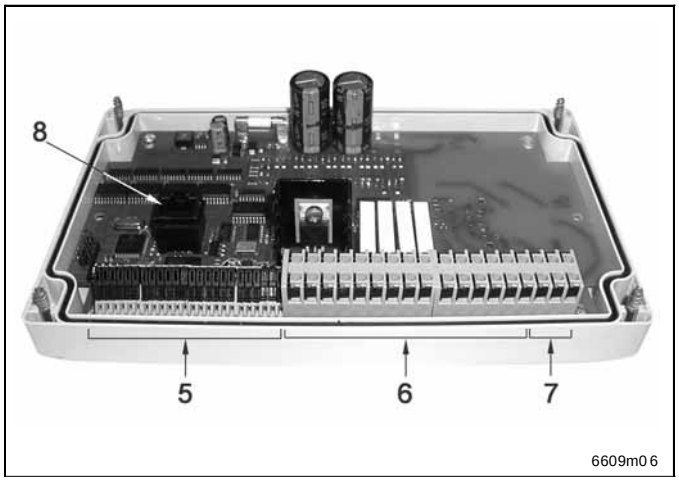

Fig. 3 LMC2 electrical connections

- The terminals for signal inputs (pos. 5), for the ACTUATOR lines (pos. 6) and for the mains supply (pos. 7) are located on the control p.c.b. (Fig. 3).

5 - Signal input
- for 3-wire initiators up to 24 V (PNP)
- for 2-wire initiators, residual voltage < 5 V

6 - Control output (ACTUATOR)
- 4 relay outputs
- 1 electronic output

7 - Voltage supply (24 VDC / 10 A or 230 VAC / 3 A)

8 - Program interface (RJ 45)

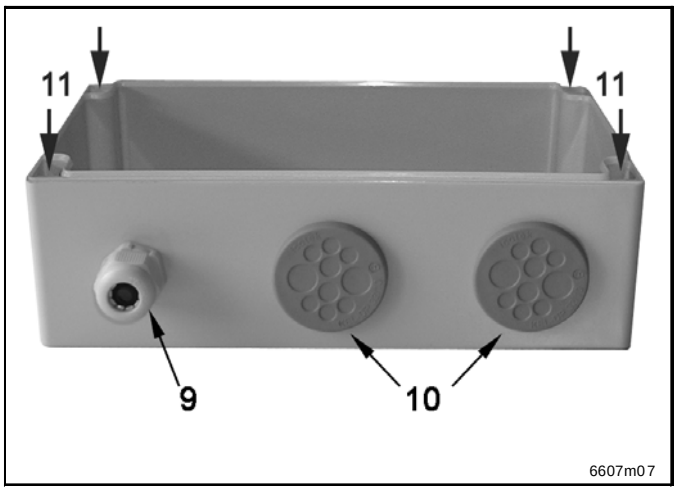

Fig. 4 Housing

- Route the LMC2 connection cables through the cable glands (item 9 and 10) on the bottom of the housing.
- Possible tensile forces on the cables have to be relieved from outside of the housing.
- Fasten on the rear of the housing using the mounting channels (pos. 11) with the cable glands towards bottom (wall-mounting).

Cable glands:
9 - Voltage supply (M16 screwed connection)
10 - Control inputs and outputs (for 0.5 mm² cable)

11 - Mounting channels for fastening (dimensions see page 36)

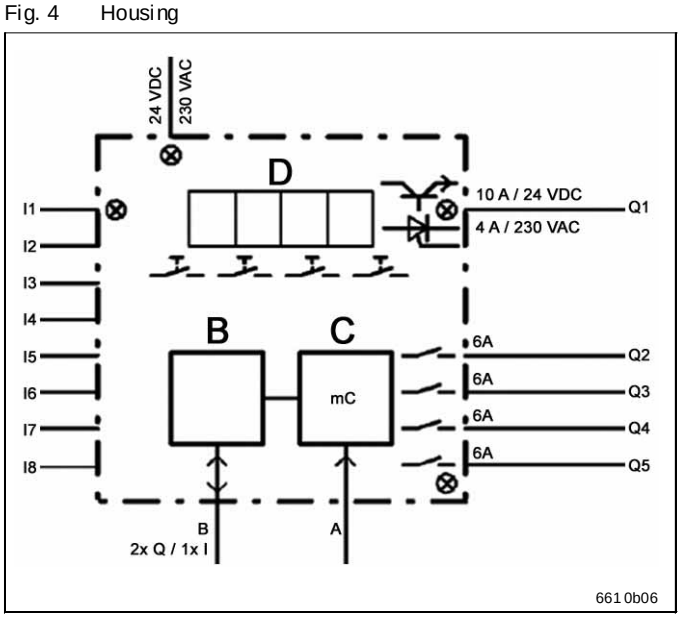

Fig. 5 Connection diagram

A- Programming
B- BUS interface, option (field bus plug)
C - Controller
D - Display
I1 - I8 Signal input connection
Q1-Q5 Control output (ACTUATOR) connection

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Technical data

LMC2 multi controller

Dimensions (L x W x H) ..... 200 x 120 x 90 mm
Display ..... 4-fold 7-segment display
Operating temperature ..... - 10 to + 70 °C
Storage temperature ..... - 40 to + 85 °C

Inputs:
Number ..... 8, short-circuit proof, non-floating
Cutoff frequency ..... 100 Hz

Outputs:
Number 5
- .....4 relay outputs NO contacts 6A, 0-240 VAC/ VDC
- overload protected ..... 1 electronic output
..... 24 VDC/10A or 230 VAC/3A

Reverse polarity protection:
Operating voltage inputs are protected against reverse polarity
Residual ripple at operating voltage:
..... ±5% according to DIN 41755


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NOTE

If the internal fuses need to be replaced, use only the original type.

Protection and monitoring:

Current limitation ..... Sustained short-circuit proof
Overload protected ..... yes
Idle protected ..... yes
Power failure backup time ..... > 15 ms at 230 VAC
Protection class ..... IP 54

AC input

Input voltage ..... 230 VAC ±10% ; 50/60 Hz ±5%
Fast fuse ..... 4 A/250 V internal

DC input

Input voltage ..... 24 VDC ±20%
Slow fuse ..... 10 A

Safety DIN EN 60204

Protection class ..... Class I

EMC

Interference suppression VDE 0875 T 11, EN 55011 Class A
Noise output ..... according to EN 61000-6-4
Immunity to electrical noise ..... according to EN 61000-6-2


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NOTE

The noise output complies with the requirements for the industrial sector. If used in residential areas, this can lead to interaction under certain circumstances.

Replacement parts

LMC2 multi controller
Type 24 VDC ..... 236-10567-5 **Type 230 VAC 236-10567-6**

Declaration of Conformity according to EMC-directive 2004/108/EC

We hereby declare that the multi controller

Lincoln Multi Controller LMC2

in the design we have delivered complies with the regulations in the above-referenced directive.

The following harmonized standards were applied:

DIN EN 60204	**Safety Test**
DIN EN 61000-6-4	**Emitted Interference**
DIN EN 61000-6-2	**Interference Immunity**

Walldorf, 05-May-06, Dr. Ing. Z. Paluncic

Subject to modifications

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Fault messages [1] and system status messages [2]

ERROR CODE	CAUSE	REMEDY
[1] **E-OL**	· Signal error from actuator	➲ Check the output connection and correct if applicable. ➲ Repair the short circuit if applicable. ➲ Check the functioning of the actuator and replace if applicable.
[1] **E-IN**	· Signal error from sensor	➲ Check the sensor connection and correct if applicable. ➲ Repair the short circuit if applicable.
[1] **E-MS**	· OFF through motor protecting switch	➲ If applicable, prevent overload on motor. ➲ Repair the short circuit if applicable. ➲ Replace incorrect / defective motor if applicable.
[1] **TYPE**	· Incorrect lubricating program set	➲ Carry out the correct DIP-switch setting to select the version (see table, page 11).
[1] **E-PD**	· Pressure switch to monitor the pressure relief did not drop, counter pressure could still be applied	➲ Check the pressure line system for counter pressure and manually bleed it if necessary. ➲ Check the pressure switch for correct operation and replace if applicable. ➲ Check the final-pressure monitor frame size and replace if applicable. ➲ Check the pressure relief valve and replace if applicable.
	· Set pause time is shorter than the lubricating time	➲ Increase the pause time. · As the pause time is also restarted at the start of the lubricating time, the following setting value applies: Pause time > Lubricating time
[1] **E-D**	· Signal error from metering device	➲ Check the pressure line system for blockage and repair it if necessary. ➲ Replace the piston detector or proximity switch on the metering device and replace if applicable.
[1] **E-OP**	· Pressure at the pressure switch of the pump is too high	➲ Check the pressure line system for blockage and repair it.
[1] **E-CD**	· Wrong moving direction of conveyor chain	➲ Swivel COBRA back into the operating position. ➲ Correct moving direction of the conveyor chain.
[1] **E-FC**	· Stroke monitor reports: Valve stroke not carried out	➲ Check the pressure line system and valve. ➲ Remove blockage or replace the valve.
[1] **T-OUT**	· Monitoring time exceeded	➲ Check for cause in the pressure line system (e.g. pipe fracture) and repair as necessary. ➲ Check signal line for interruption and replace the connection if necessary. ➲ If applicable, adapt the monitoring time if the pressure line system is free from defects.
[1] **E-FL**	· Filling time monitoring exceeded	➲ Check filler pump and filling system.
[1] **E-C**	· COBRA misaligned mechanically from operating position	➲ Realign COBRA.
[1] **E-AP**	· Supply air pressure too low	➲ Check compressed air supply. ➲ Readjust pressure regulator if necessary.
[2] **LL**	· Low-level control	➲ Fill reservoir.
[2] **HL**	· High-level control	➲ Stop reservoir filling.

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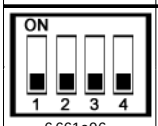
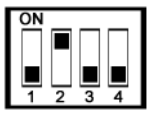
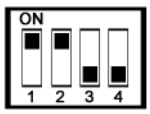
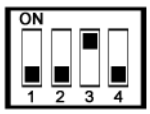
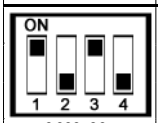
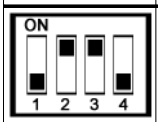
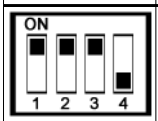
Parameters, Survey

DIP-switch combinations

Scheme	DIP switch SW 1	SW 2	SW 3	SW 4	Lubrication System / function	Versions	Parameter presetting
 6661c06	0	0	0	0	PMA	0	no stroke monitoring
						1	with stroke monitoring
 6665c06	1	0	0	0	Progressive	0	no metering device and without cycle counter
						1	with one metering device and without cycle counter
						2	with one metering device and with cycle counter
						3	with two metering devices and without cycle counter
						4	with two metering devices and with cycle counter
					- ... Railroad lubrication	5	- 1 circuit-..., with metering device without cycle counter
						6	- 1 circuit-..., with metering device with cycle counter
						7	- 2 circuit-..., with metering device without cycle counter
						8	- 2 circuit-..., with metering device with cycle counter
						9	- 3 circuit-..., with metering device without cycle counter
						10	- 3 circuit-..., with metering device with cycle counter
 6663c06	0	1	0	0	Two-line	0	EMU without monitored metering device 1)
						1	EMU with monitored metering device 1)
						2	SU without monitored metering device 2)
						3	SU with monitored metering device 2)
						4	3ZWV without monitored metering device 3)
						5	3ZWV with monitored distributor 3)
 6667c06	1	1	0	0	Centro-Matic®	0	with one pressure switch
						1	with two pressure switches
 6662c06	0	0	1	0	COBRA	0	standard setting
 6666c06	1	0	1	0	Spray lubricating system	0	no metering device and no cycle counter, clock-pulsed
						1	with metering device and no cycle counter, clock-pulsed
						2	with metering device and cycle counter, clock-pulsed
						3	no metering device, no cycle counter, not clock-pulsed
						4	with metering device and cycle counter, not clock-pulsed
						5	with metering device and cycle counter, not clock-pulsed
 6664c06	0	1	1	0	Test mode		
 6668b06	1	1	1	**0**	**Configuration mode**		

[1] EMU – electronic change-over control [2] SU – pressure-controlled change-over control [3] 3ZWV - 3/2-way valve

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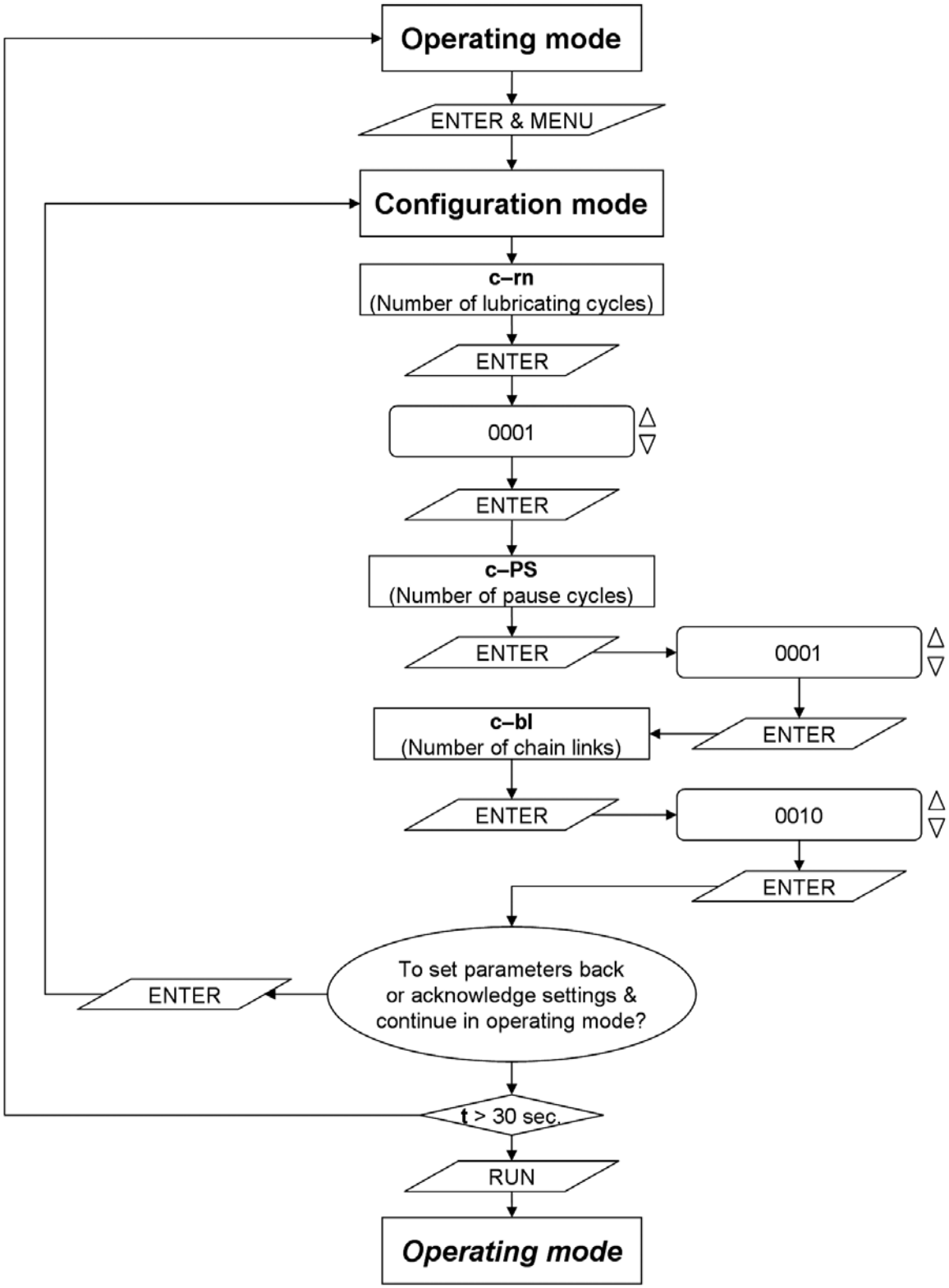
PMA lubrication systems

Quicktour



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PMA lubrication systems, continued

Operating mode

- The following parameters are controlled or monitored for PMA lubricating systems via the standard LMC 1 programming:
- Variable:
  - Cycle-dependent lubrication
  - Number of chain pause-cycles
  - Number of chain links

Connection

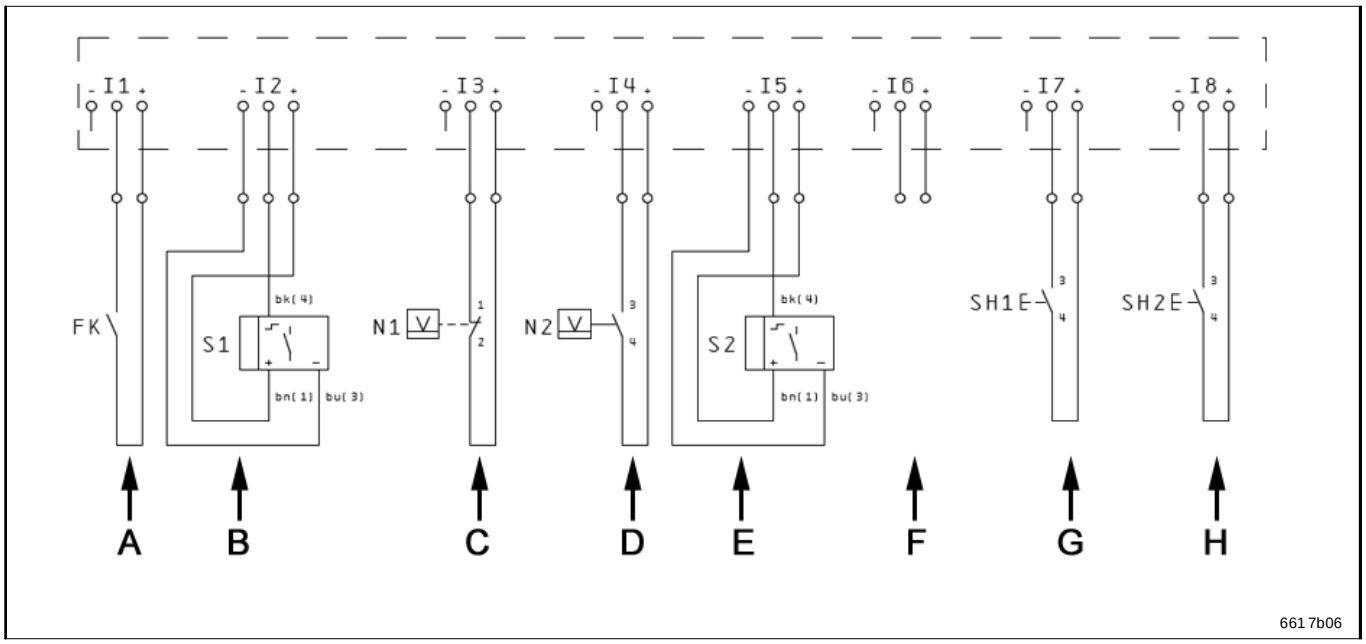

Fig. 6 Signal input connection

A - External contact [1)]
B - Chain sensor
C – Low-level signal
D – High-level signal
E - Stroke monitoring
F - Reserve
G - Additional lubrication
H - Remote reset

[1)] Time stop respectively lubrication stop

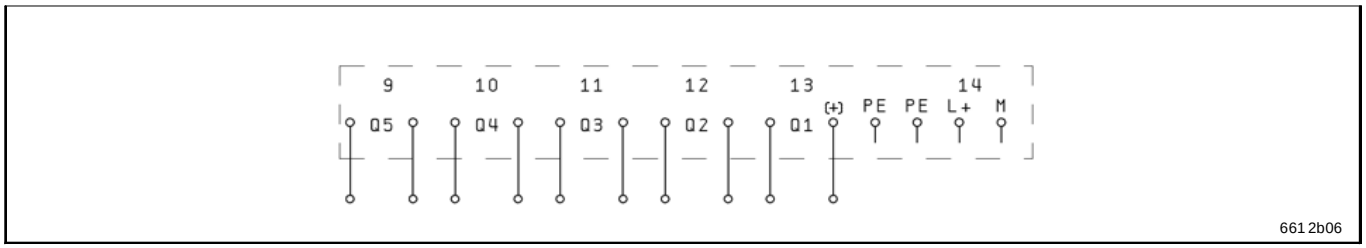

Fig. 7 Control output (ACTUATOR) connection

Q1 - Pump
Q2 - System (ready for operation)
Q3 - Lubrication active
Q4 - Reserve
Q5 - Reserve
PE - Protective earth conductor
L+ - Power supply **+**
M - Power supply **–**

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PMA lubrication systems, continued

Operation – Commissioning

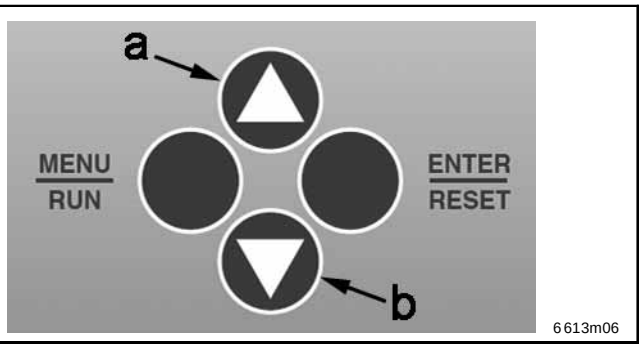

Fig. 8 Operating panel
a - „**UP**“ key b - „**DOWN**“key

6001a02

NOTE

“RESET“ as halt function:

You can interrupt the running lubrication time by pressing the “RESET“ key[1)] (> 2 sec.). The next pause cycle starts from the beginning.

1) or, if applicable, externally via switch H (see Fig. 6)

6001a02

NOTE

„RUN“ to trigger additional lubrications:

You can interrupt the running pause cycle by pressing the “RUN“ key (> 2 sec.). The lubricating time starts from the beginning.

6001a02

NOTE

As soon as you press the "UP" key (pos. a, Fig. 9) outside of the configuration mode, the actual rest of the expired pause time (Fig. D) or lubricating time (Fig. E) is shown in the display.

Parameter presetting

➲ Set the DIP switches 12 (see view Fig. 2) as shown in Fig. 9:

1-1-1-0: SW1 ON
SW2 ON
SW3 ON
SW4 OFF

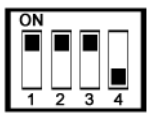

Fig. 9 DIP switch – configuration mode

The display panel of the LMC 2 shows the text „Addr“:

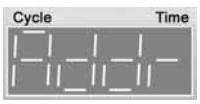

Fig. A Display „Addr“

➲ In the case of a field bus connection, set the system-related address code 0001 to 0255 by means of the UP and DOWN keys (see Fig. 8).

➲ Complete your selection with the ENTER key (Fig. 8).

Parameter presetting, continuation

➲ Select from the following versions to set the parameter presettings in your PMA lubrication system:
- no stroke monitoring 0
- with stroke monitoring 1

6001a02

NOTE

The version number setting (0 - 1) is shown in the LMC2 display and is made using the UP & DOWN keys on the operating panel (see pos. a & b, Fig. 8).

➲ Complete your selection (0 - 1) with the ENTER key. If you do not acknowledge your selection with ENTER, the standard value of “0“ is automatically set.

➲ Wait until in the display panel of the LMC 2 the text changes from „init“ (Fig. B) to „Set“ (Fig. C) or „Addr“ (Fig. A):

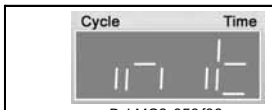

Fig. B Display „init“

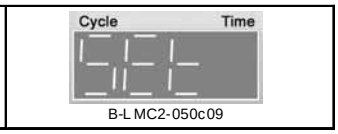

Fig. C Display „SEt“

Selecting the lubrication system

➲ First switch SW1 to SW3 to “0-0-0“ (OFF-OFF-OFF).

Then set the right-hand DIP switch (SW4) to ON:

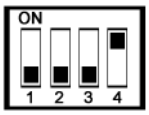

Fig. 10 DIP switch: PMA lubrication systems - settings

After that, switch SW4 back to OFF:

Fig. 11 DIP switch: PMA lubrication systems – operating mode

- The standard settings to control your PMA lubrication system are now complete and the system is ready for operation (Fig. D).

Please refer to page 15 for possible parameter adaptations.

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PMA lubrication systems, continued

Operation, continued

Adapting the parameters

➲ Press and hold the “ENTER“ key and then press “MENU“ to open the configuration mode.

· You can modify the count value of every parameter using the “UP“ and “DOWN“ keys as below:

- Press briefly ..... ± 1 count value
- Keep pressed ..... ± High speed

Presettings 0 or 1:
(see table on page 11)

· **Stroke monitoring**
The stroke monitor checks the functioning of the linear solenoid.

· **Menu item * c–rn *, Number of lubricating cycles**
(Cycle-dependent lubrication)
The number of lubricating cycles determines how often the chain must run through until it is completely lubricated.

➲ Press the “UP“ or “DOWN“ key to configure the number of lubricating cycles.
- Section 1 to 9999 lubricating cycles
- Count value 1 lubricating cycle

➲ Conclude the selection with the “ENTER“ key.

· Continue with the *** c–PS *** menu item.

· **Menu item * c–PS *, Number of pause cycles**

· The number of pause cycles sets the number of non-lubricated chain cycles that must transpire between two lubrication processes.

➲ Press the “UP“ or “DOWN“ key to configure the number of pause cycles.
- Section 1 to 9999 pause cycles
- Count value 1 pause cycle

➲ Conclude the selection with the “ENTER“ key.

· Continue with the *** c–bl *** menu item.

· **Menu item * c–bl *, Number of chain links**

· The number of chain links determines the number of lubrication strokes for one lubricating cycle.

➲ Press the “UP“ or “DOWN“ key to configure the number of chain links.
- Section 1 to 9999 chain links
- Count value 1 chain link

➲ Conclude the selection with the “ENTER“ key.

➲ Press the “RUN“ key (> 2 sec.) to incorporate the changes made to all menu items. Otherwise, after 30 seconds the program reverts back to the operating mode.

➲ If you want to change a menu item again, press the “ENTER“ key. You will once more automatically arrive at the start of the configuration mode.

Display panel in the operating mode

During the pause time the display panel of the LMC 2 shows the text „WAit“:

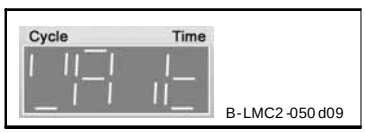

Fig. D Display „WAit“

During the lubricating time the display panel of the LMC 2 shows the text „Lub“:

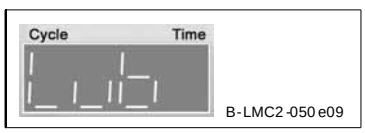

Fig. E Display „Lub“

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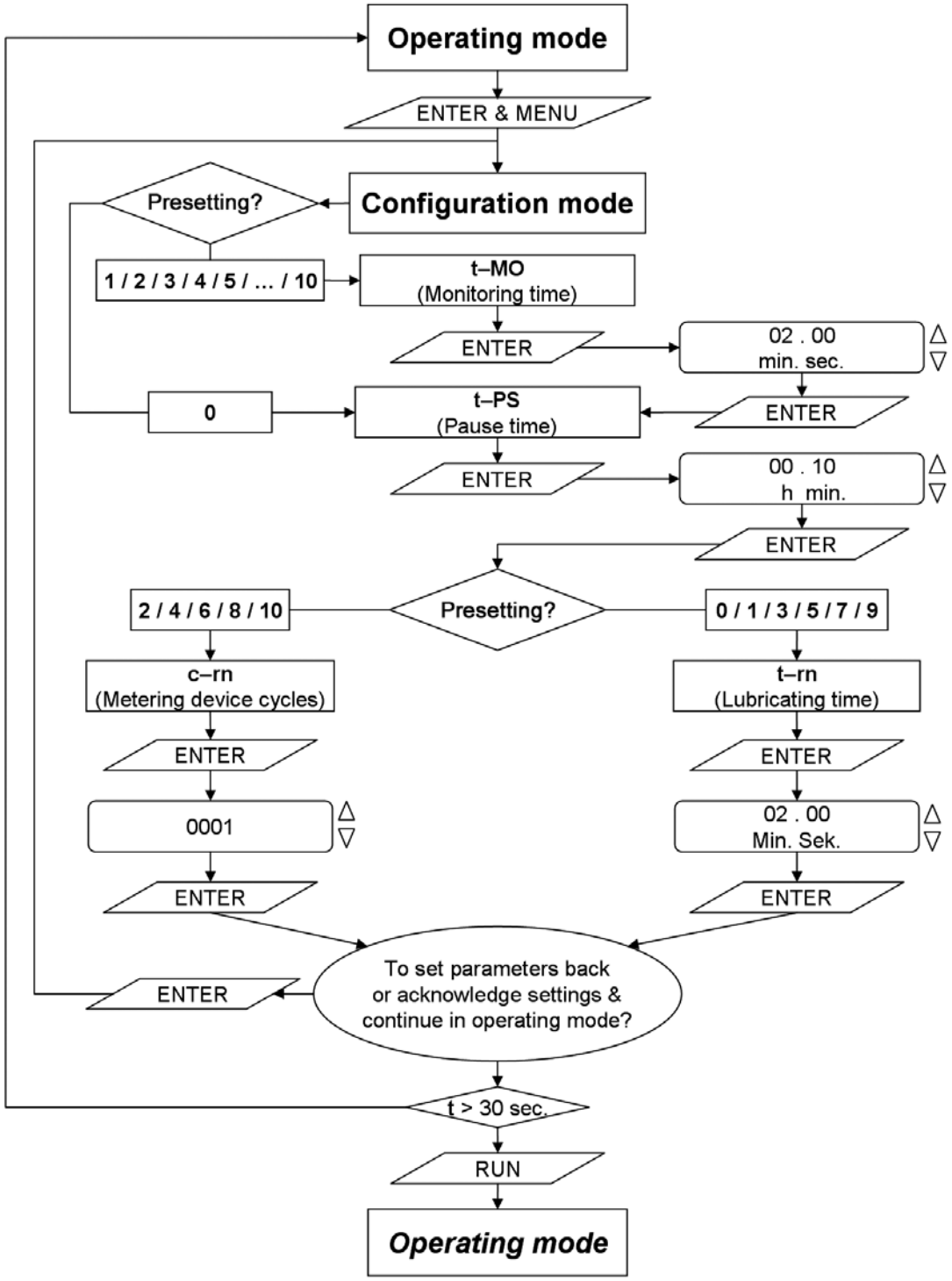
Progressive systems

Quicktour



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Progressive systems, continued

Operating mode

- The following parameters are controlled or monitored for progressive systems via the standard LMC 1 programming:
  - Variable:
    - Pause time
    - Time or cycle-dependent lubrication
    - Monitoring time
  - Fixed:
    - Filling time monitoring 15 min.

Connection

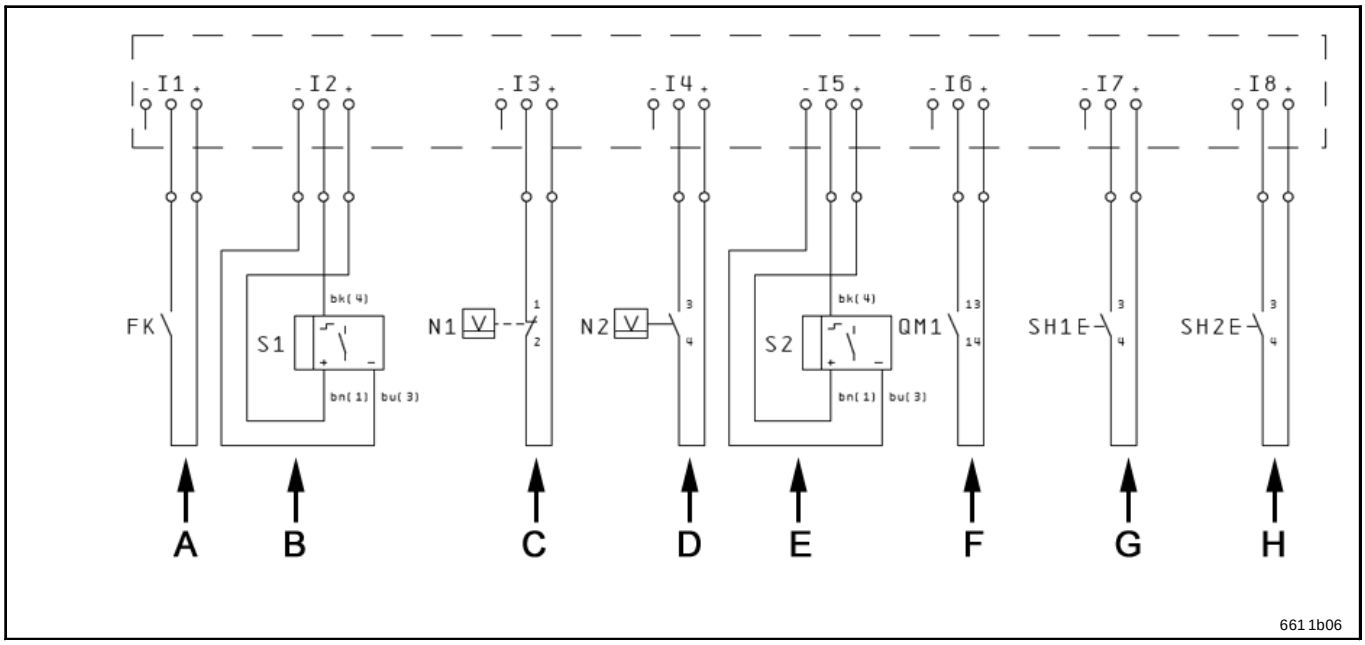

Fig. 12 Signal input connection

A - External contact [1)] B – Metering device sensor C – Low-level signal D – High-level signal
E – Metering device sensor F - Motor protection G - Additional lubrication H - Remote reset

[1)] Time stop respectively lubrication stop

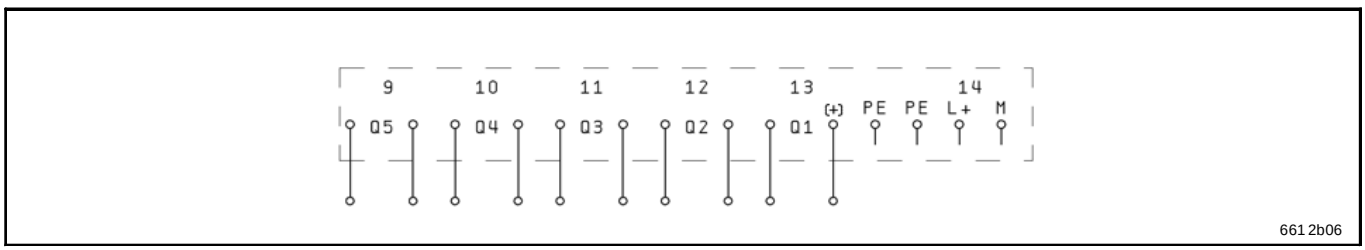

Fig. 13 Control output (ACTUATOR) connection

Q1 - Pump Q2 - System (ready for operation) Q3 - Filling Q4 - Reserved
Q5 - Reserve PE - Protective earth conductor L+ - Power supply **+** M - Power supply **–**

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Progressive systems, continued

Operation – Commissioning

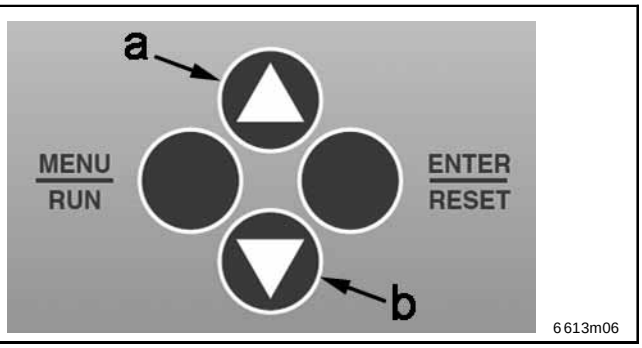

Fig. 15 Operating panel
a - „**UP**“ key b - „**DOWN**“ key

6001a02

NOTE

“RESET“ as hold function:

You can interrupt the running lubrication time by pressing the „RESET“ key[1)] (> 2 sec.). The pause time starts from the beginning.

1) or, if applicable, externally via switch H (see Fig. 12)

6001a02

NOTE

„RUN“ to trigger additional lubrications:

You can interrupt the running pause time by pressing the “RUN“ key (> 2 sec.). The lubricating time starts from the beginning.

6001a02

NOTE

As soon as you press the "UP" key (pos. a, Fig. 15) outside of the configuration mode, the actual rest of the expired pause time (Fig. D) or lubricating time (Fig. E) is shown in the display.

Parameter presetting

➲ Set the DIP switches 12 (see view Fig. 2) as shown in Fig. 16:

1-1-1-0: SW1 ON
SW2 ON
SW3 ON
SW4 OFF

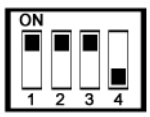

Fig. 16 DIP switch – configuration mode

The display panel of the LMC 2 shows the text „Addr“:

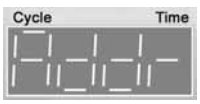

Fig. A Display „Addr“

➲ In the case of a field bus connection, set the system-related address code 0001 to 0255 by means of the UP and DOWN keys (see Fig. 15).

➲ Complete your selection with the ENTER key (Fig. 15).

Parameter presetting, continuation

➲ Select from the following versions to set the parameter presettings in your progressive system:
- no metering device and no cycle counter 0
- with one metering device and no cycle counter 1
- with one metering device and cycle counter 2
- with two metering devices, no cycle counter 3
- with two metering devices and cycle counter 4

6001a02

NOTE

The version number setting (0 - 4) is shown in the LMC2 display and is made using the UP & DOWN keys on the operating panel (see pos. a & b, Fig. 15).

➲ Complete your selection (0 - 4) with the ENTER key (Fig. 15).
If you do not acknowledge your selection with ENTER, the standard value of “0“ is automatically set.

➲ Wait until in the display panel of the LMC 2 the text changes from „init“ (Fig. B) to „Set“ (Fig. C) or „Addr“ (Fig. A):

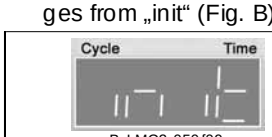

Fig. B Display „init“

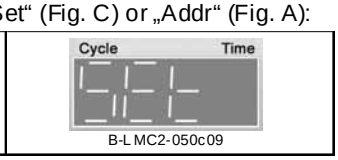

Fig. C Display „SEt“

Selecting the lubrication system

➲ First switch SW1 to SW3 to “1-0-0“ (ON-OFF-OFF).

Then set the right-hand DIP switch (SW4) to ON:

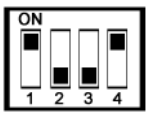

Fig. 17 DIP switch: progressive systems - settings

After that, switch SW4 back to OFF:

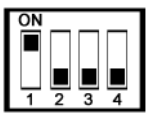

Fig. 18 DIP switch: progressive systems – ready for operation

- The standard settings to control your progressive system are now complete and the system is ready for operation (Fig. D).

Please refer to page 19 for possible parameter adaptations.

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Progressive systems, continued

Operation, continued

Adapting the parameters

➲ Press and hold the “ENTER“ key and then press “MENU“ to open the configuration mode.

· You can modify the count value of every parameter using the “UP“ and “DOWN“ keys as below:

- Press briefly ..... ± 1 count value
- Keep pressed ..... ± High speed

Presettings 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10:
(see table on page 11)

· **Menu item * t–MO *, monitoring time**
(Lubrication with monitored metering device)
Setting the monitoring time determines the time interval in which at least one metering device cycle has to have ended before a fault indication.

➲ Press the “UP“ or “DOWN“ key to configure the monitoring time.
- Section 1 sec. to 99 min. and 59 sec.
- Count value 1 sec

➲ Conclude the selection with the “ENTER“ key.

· Continue with the *** t–PS *** menu item.

Presettings 0, 1, 3, 5, 7 or 9:
(see table on page 11)

· **Menu item * t–PS *, pause time**

· The pause time determines the time interval that must expire between two lubrication sequences.

➲ Press the “UP“ or “DOWN“ key to configure the pause time.
- Section 1 min. to 99 h and 59 min.
- Count value 1 min.

➲ Conclude the selection with the “ENTER“ key.

· Continue with the *** t–rn *** or *** c–rn *** menu items.

Presettings 0, 1, 3, 5, 7 or 9:
(see table on page 11)

· **Menu item * t–rn *, Lubricating time**
(time-dependent lubrication)

· The lubricating time determines how long a lubrication sequence takes to provide all the lubrication points in the progressive system with sufficient lubricant.

➲ Press the “UP“ or “DOWN“ key to configure the lubrication time.
- Section 1 sec. to 99 min. and 59 sec.
- Count value 1 sec

➲ Conclude the selection with the “ENTER“ key.

Presettings 2, 4, 6, 8 or 10:
(see table on page 11)

· **Menu item * c–rn *, number of metering device cycles**
(cycle-dependent lubrication)
The number of metering device cycles determines how often all metering pistons in the monitored metering device must convey their amounts of lubricant to provide all lubrication points in the progressive system with sufficient lubricant.

➲ Press the “UP“ or “DOWN“ key to configure the number of distributor cycles.
- Section 0 to 99 distributor cycles
- Count value 1 Distributor cycle

6001 a02

NOTE

As the pause time is also restarted at the start of the lubricating time, the following setting value applies:

Pause time > Lubricating time

*If the ratio is reversed, the fault indication * **E-PD** * appears in the LMC 1 display (see page 10).*

➲ Conclude the selection with the “ENTER“ key.

➲ Press the “RUN“ key (> 2 sec.), to incorporate the changes made to all menu items. Otherwise, after 30 seconds the program reverts back to the operating mode (run).

➲ If you want to change a menu item again, press the “ENTER“ key. You will once more automatically arrive at the start of the configuration mode.

Display panel in the operating mode

During the pause time the display panel of the LMC 2 shows the text „WAit“:

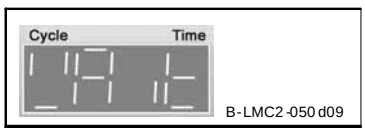

Fig. D Display „WAit“

During the lubricating time the display panel of the LMC 2 shows the text „Lub“:

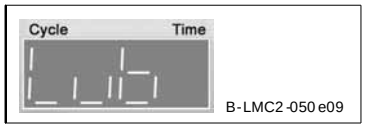

Fig. E Display „Lub“

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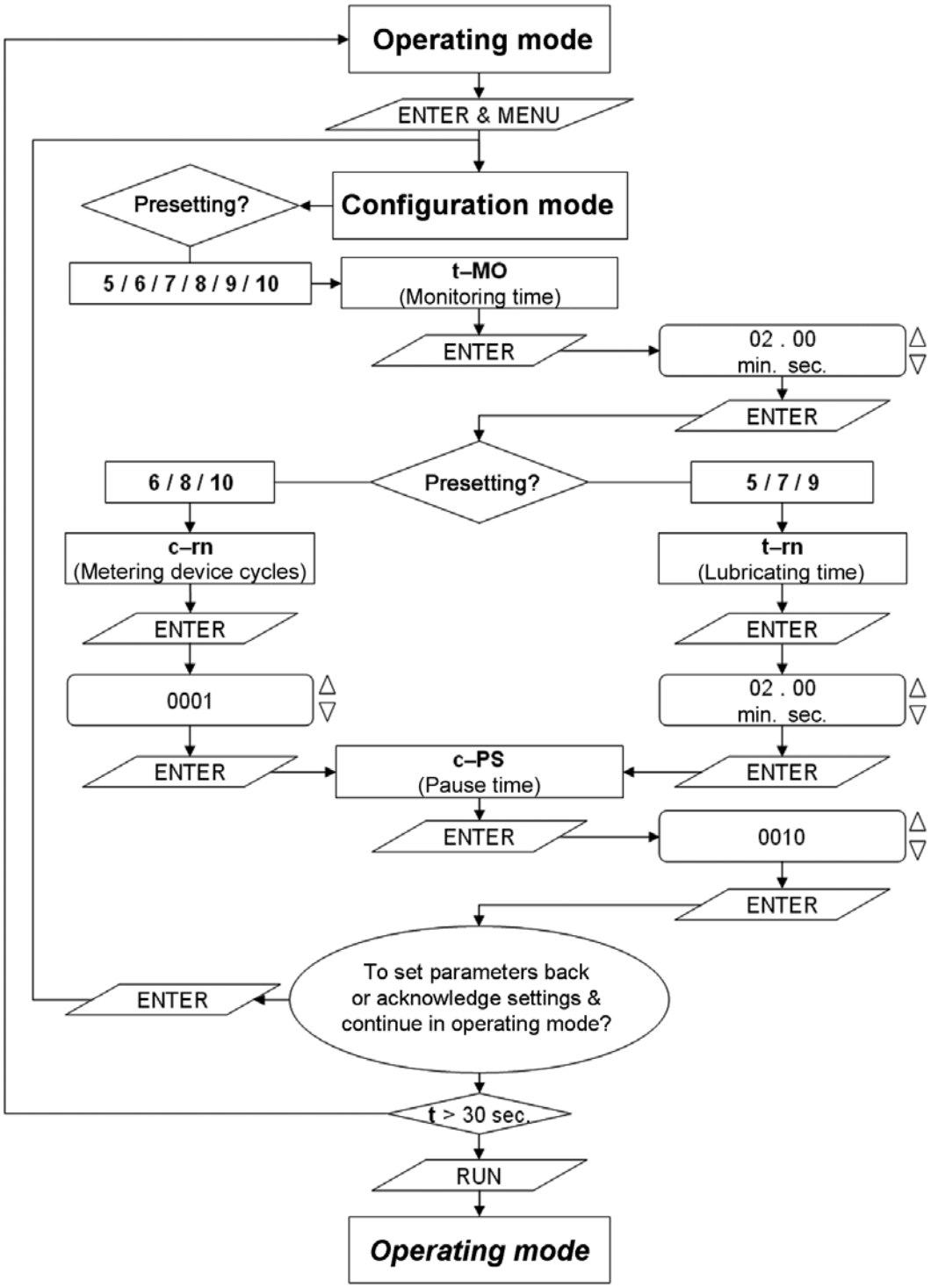
Progressive systems for Railroad lubrication

Quicktour



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Progressive systems for railroad lubrication, continued

Operating mode

- The following parameters are controlled or monitored for progressive systems via the standard LMC 1 programming:
  - Variable:
    - Pause time (c-PS)
    - Time or cycle-dependent lubrication
    - Monitoring time
  - Fixed:
    - Filling time monitoring 15 min.

Connection

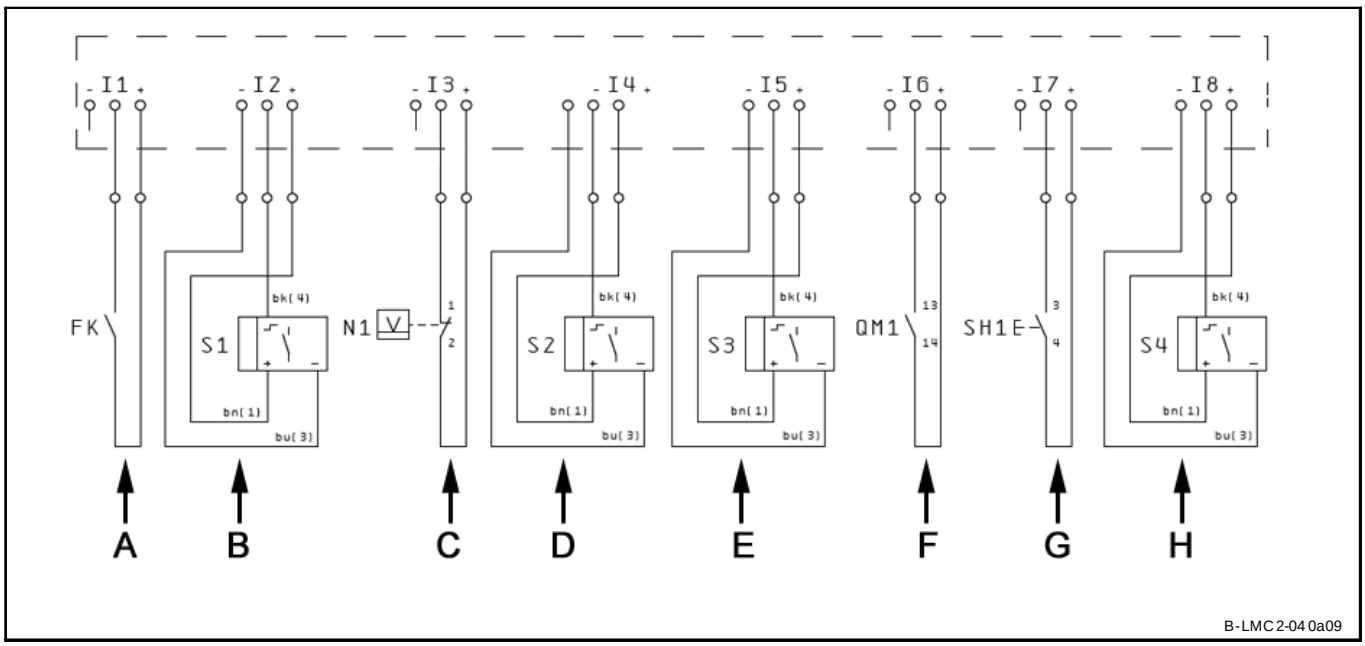

Fig. 12a Signal input connection

A - External contact [1)] | B - Metering device sensor | C - Low-level control | D - Sensor, rail 1
E - Sensor, rail 2 | F - Motor protection | G - Additional lubrication | H - Sensor, rail 3

[1)] Counting or lubricating stop e.g. via rain sensor; then operation continues with stored times or counting status (EEPROM)

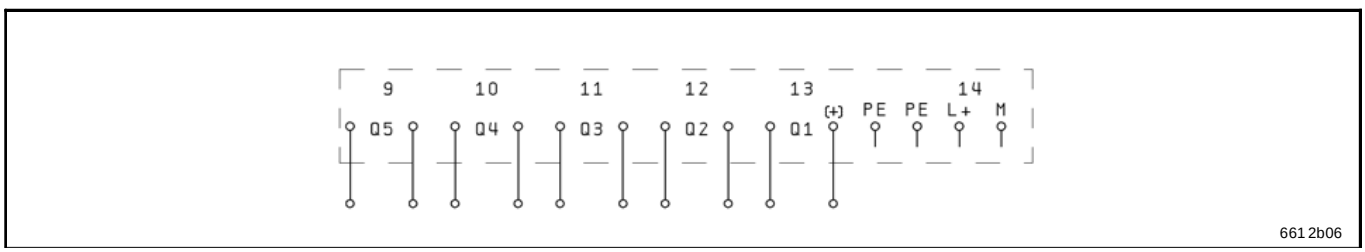

Fig. 13a Control output (ACTUATOR) connection

Q1 - Pump | Q2 - System (ready for operation) | Q3 - Valve circuit rail 1 | Q4 - Valve circuit rail 2
Q5 - Valve circuit rail 3 | PE - Protective earth conductor | L+ - Power supply **+** | M - Power supply **–**

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Progressive systems for railroad lubrication, continued

Connection, continued

Railroad Lubrication

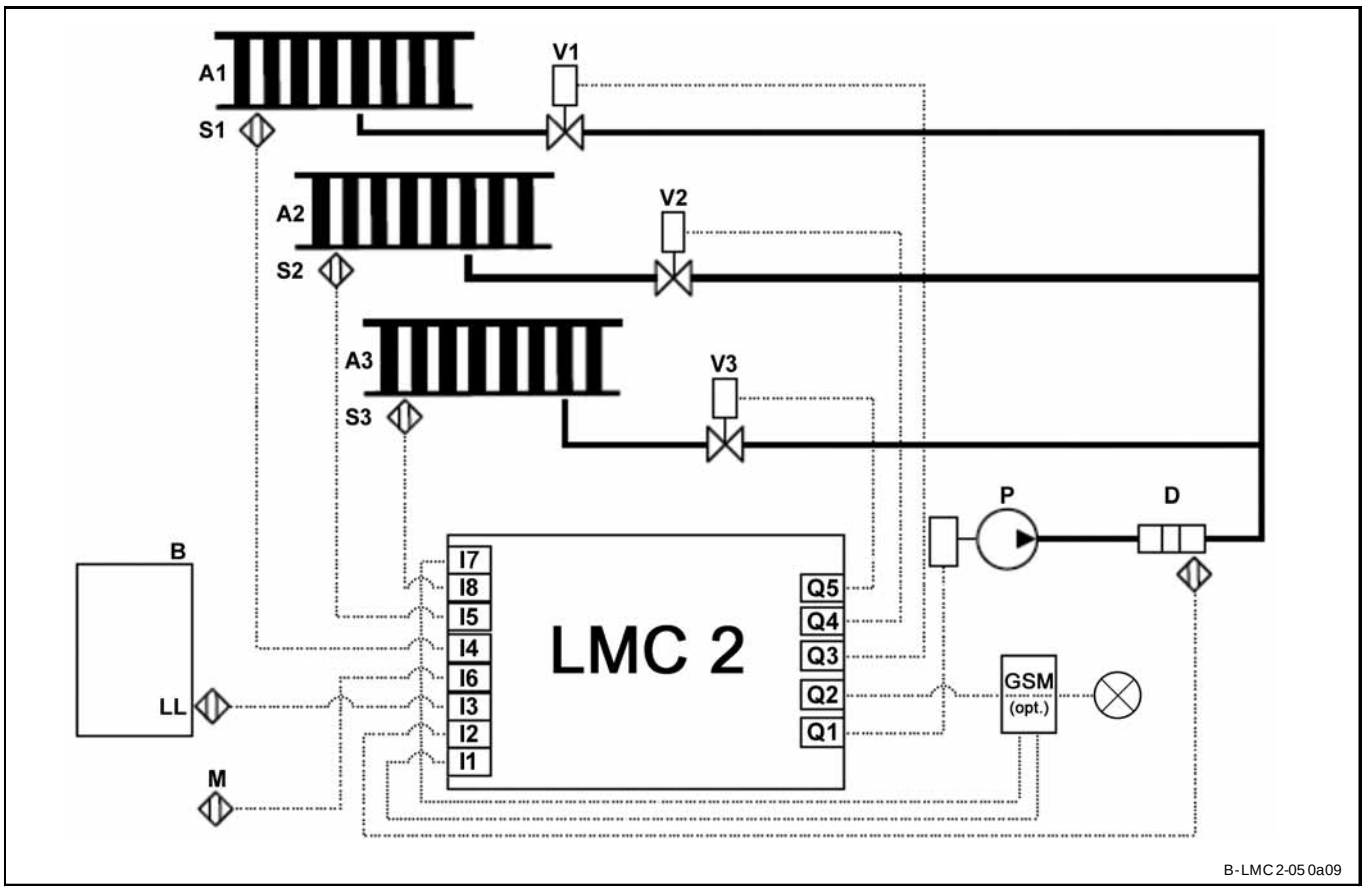

Fig. 14a Connections – Signal input & control output (actuator)

A1 - Rail 1	A2 - Rail 2	A3 - Rail 3
S1 - Sensor 1	S2 - Sensor 2	S3 - Sensor 3
V1 - Valve 1	V2 - Valve 2	V3 - Valve 3
B - Reservoir	D - Metering device	GSM – Data transfer standard (as an option)
LL - Low-level control	M - Motor protection	P - Pump
I1-I8 - Signal input (see Fig. 12a)		Q1-Q5 - Controller output, actuator (see Fig. 13a)

Particularities of railroad lubrication

Mode of operation

- On up to 3 tracks the rail sensors D, E & H (Fig. 12a) detect the number of passing axes.
- The pause time of the centralized lubrication system results from the counted measurand of axes (1 to 9999) determined by the rail sensors.
- The stop contact A (Fig. 12a, e. g. rain sensor) allows to interrupt counting of the axes (pause time) as well as to interrupt the lubricating time. Later, operation continues from the point of interruption.

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Progressive systems for Railroad lubrication, continued

Operation – Commissioning

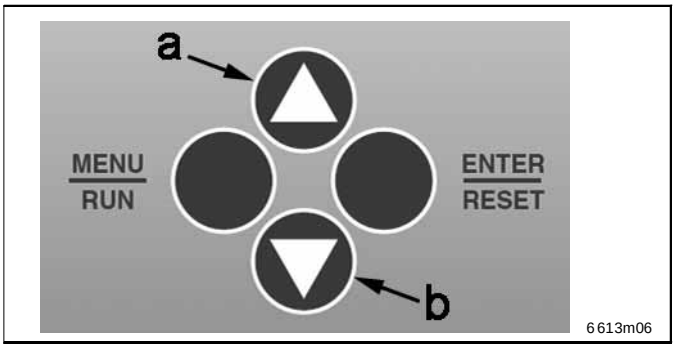

Fig. 15a Bedienfeld
a - „**UP**“ key b - „**DOWN**“ key

6001a02

NOTE

“RESET“ as hold function:

You can interrupt the running lubrication time by pressing the „RESET“ key (> 2 sec.). The pause time starts from the beginning.

6001a02

NOTE

„RUN“ to trigger additional lubrications:

You can interrupt the running pause time by pressing the “RUN“ key (> 2 sec.). The lubricating time starts from the beginning.

6001a02

NOTE

As soon as you press the "UP" key (pos. a, Fig. 15a) outside of the configuration mode, the actual rest of the expired pause time (Fig. D) or lubricating time (Fig. E) is shown in the display.

Parameter presetting

➲ Set the DIP switches 12 (see view Fig. 2) as shown in Fig. 16a:

1-1-1-0: SW1 ON
SW2 ON
SW3 ON
SW4 OFF

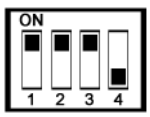

Fig. 16a DIP switch – configuration mode

The display panel of the LMC 2 shows the text „Addr“:

Fig. A Display „Addr“

➲ In the case of a field bus connection, set the system-related address code 0001 to 0255 by means of the UP and DOWN keys (see Fig. 15a).

➲ Complete your selection with the ENTER key (Fig. 15a).

Parameter presetting, continuation

➲ Select from the following versions to set the parameter presettings in your progressive system for railroad lubrication:

- 1 circuit-..., with met. dev. without cycle counter 5
- 1 circuit-..., with met. dev. with cycle counter 6
- 2 circuit-..., with met. dev. without cycle counter..... 7
- 2 circuit-..., with met. dev. with cycle counter 8
- 3 circuit-..., with met. dev. without cycle counter 9
- 3 circuit-..., with met. dev. with cycle counter 10

6001a02

NOTE

The version number setting (5 - 10) is shown in the LMC2 display and is made using the UP & DOWN keys on the operating panel (see pos. a & b, Fig. 15a).

➲ Complete your selection (5 - 10) with the ENTER key (Fig. 15a).
If you do not acknowledge your selection with ENTER, the standard value of “5“ is automatically set.

➲ Wait until in the display panel of the LMC 2 the text changes from „init“ (Fig. B) to „Set“ (Fig. C) or „Addr“ (Fig. A):

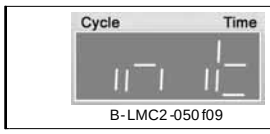

Fig. B Display „init“

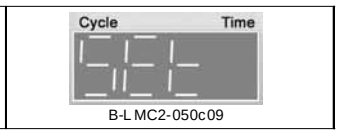

Fig. C Display „SEt“

Selecting the lubrication system

➲ First switch SW1 to SW3 to “1-0-0“ (ON-OFF-OFF).

Then set the right-hand DIP switch (SW4) to ON:

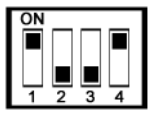

Fig. 17a DIP switch: progressive systems - settings

After that, switch SW4 back to OFF:

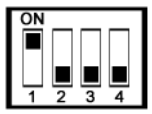

Fig. 18a DIP switch: progressive systems – ready for operation

- The standard settings to control your progressive system are now complete and the system is ready for operation (Fig. D).

Please refer to page 24 for possible parameter adaptations.

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Progressive systems for railroad lubrication, continued

Operation – Adapting the parameters

➲ Press and hold the “ENTER“ key and then press “MENU“ to open the configuration mode.

· You can modify the count value of every parameter using the “UP“ and “DOWN“ keys as below:

- Press briefly ..... ± 1 count value
- Keep pressed ..... ± High speed

Presetting 5, 6, 7, 8, 9 or 10:
(see table on page 11)

· **Menu item * t–MO *, monitoring time**
(Lubrication with monitored metering device)
Setting the monitoring time determines the time interval in which at least one metering device cycle has to have ended before a fault indication.

➲ Press the “UP“ or “DOWN“ key to configure the monitoring time.
- Section 1 sec. to 99 min. and 59 sec.
- Count value 1 sec

➲ Conclude the selection with the “ENTER“ key.

· Continue with the *** t–rn *** or *** c–rn *** menu item.

Presetting 5, 7 or 9:
(see table on page 11)

· **Menu item * t–rn *, Lubricating time**
(time-dependent lubrication)

· The lubricating time determines how long a lubrication sequence takes to provide all the lubrication points in the progressive system with sufficient lubricant.

➲ Press the “UP“ or “DOWN“ key to configure the lubrication time.
- Section 1 sec. to 99 min. and 59 sec.
- Count value 1 sec

➲ Conclude the selection with the “ENTER“ key.

➲ Continue with the *** c–PS *** menu item.

Presetting 6, 8 or 10:
(see table on page 11)

· **Menu item * c–rn *, number of metering device cycles**
(cycle-dependent lubrication)
The number of metering device cycles determines how often all metering pistons in the monitored metering device must convey their amounts of lubricant to provide all lubrication points in the progressive system with sufficient lubricant.

➲ Press the “UP“ or “DOWN“ key to configure the number of distributor cycles.
- Section 0 to 99 distributor cycles
- Count value 1 Distributor cycle

➲ Conclude the selection with the “ENTER“ key.

➲ Continue with the *** c–PS *** menu item.

Presetting 5, 6, 7, 8, 9 or 10:
(see table on page 11)

· **Menu item * t–PS *, pause time**

· The number of axes counted determines the pause time that has to lapse until the next lubrication cycle can take place.

➲ Press the “UP“ or “DOWN“ key to configure the pause time.
- Section 1 to 9999 axes
- Count value 1 axis

➲ Conclude the selection with the “ENTER“ key.

➲ Press the “RUN“ key (> 2 sec.), to incorporate the changes made to all menu items. Otherwise, after 30 seconds the program reverts back to the operating mode (run).

➲ If you want to change a menu item again, press the “ENTER“ key. You will once more automatically arrive at the start of the configuration mode.

Display panel in the operating mode

During the pause time the display panel of the LMC 2 shows the text „WAit“:

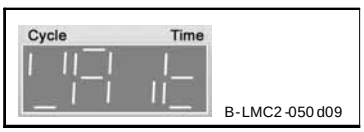

Fig. D Display „WAit“

During the lubricating time the display panel of the LMC 2 shows the text „Lub“:

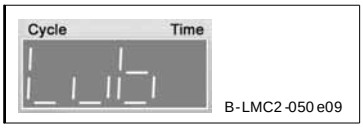

Fig. E Display „Lub“

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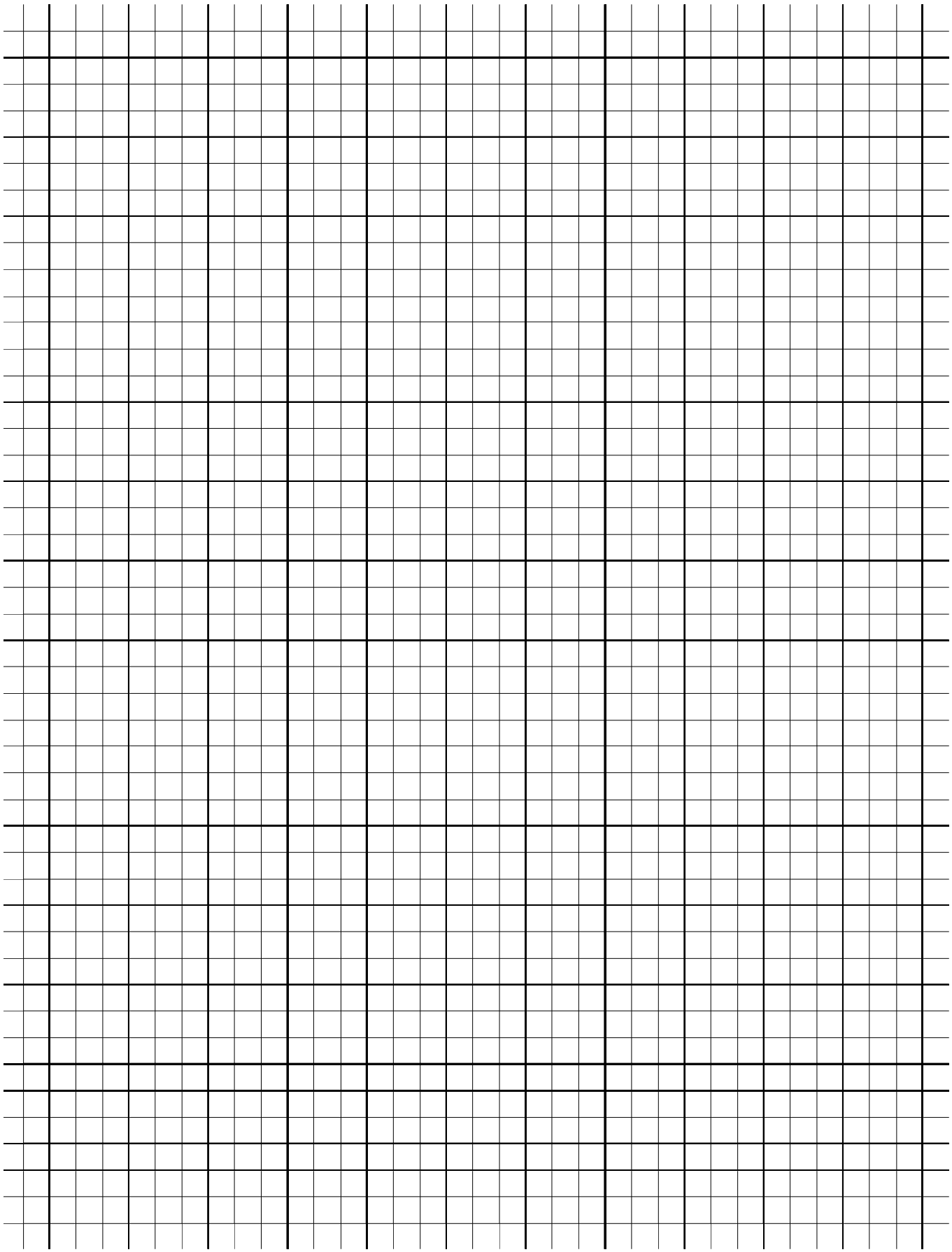
Note:



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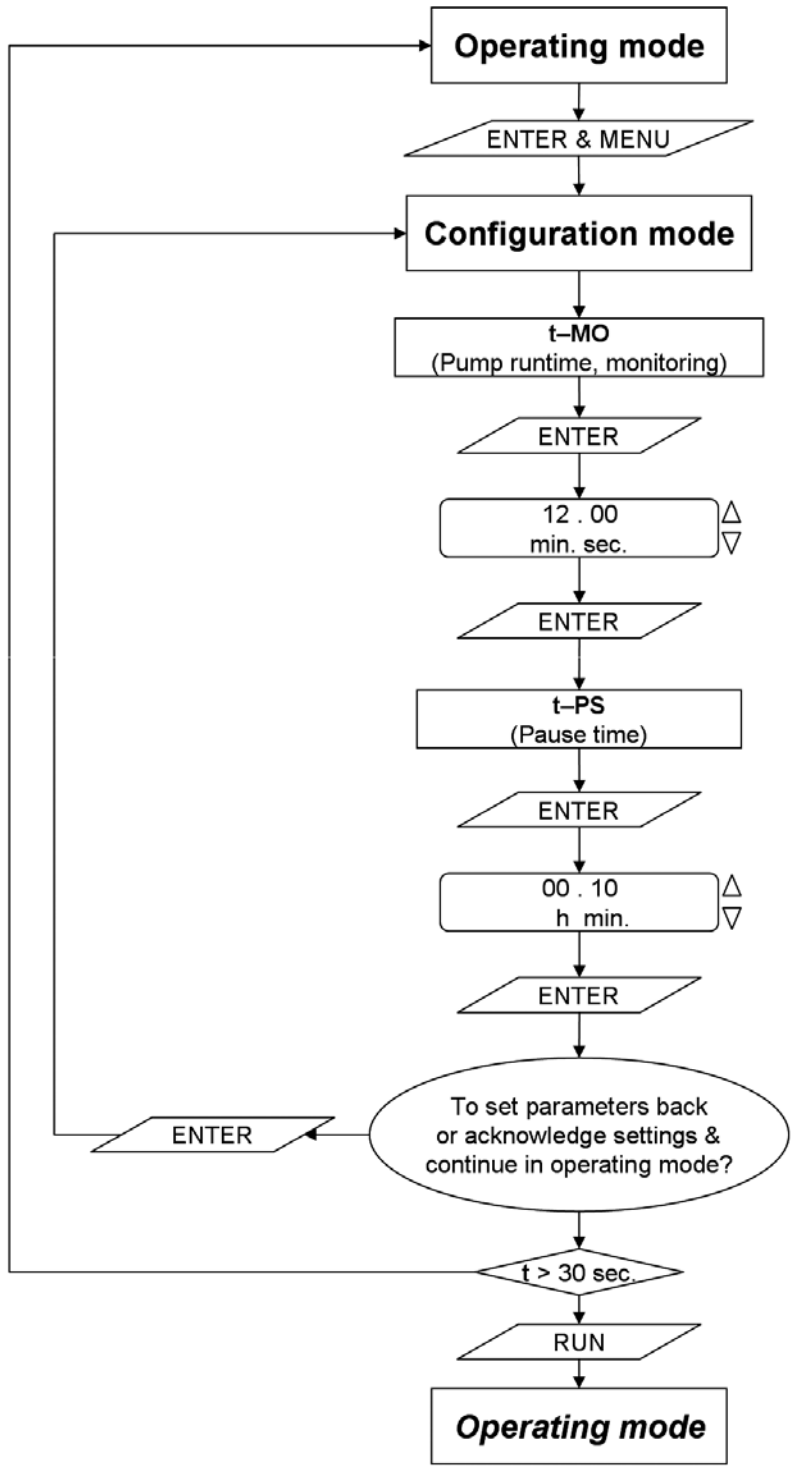
Two-line systems

Quicktour



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Two-line systems, continued

Operating mode

- The following parameters are controlled or monitored via the standard LMC 1 programming for two-line systems:
  - Variable:
    - Pause time
    - Monitoring time
  - Fixed:
    - Filling time monitoring 15 min.

Connection

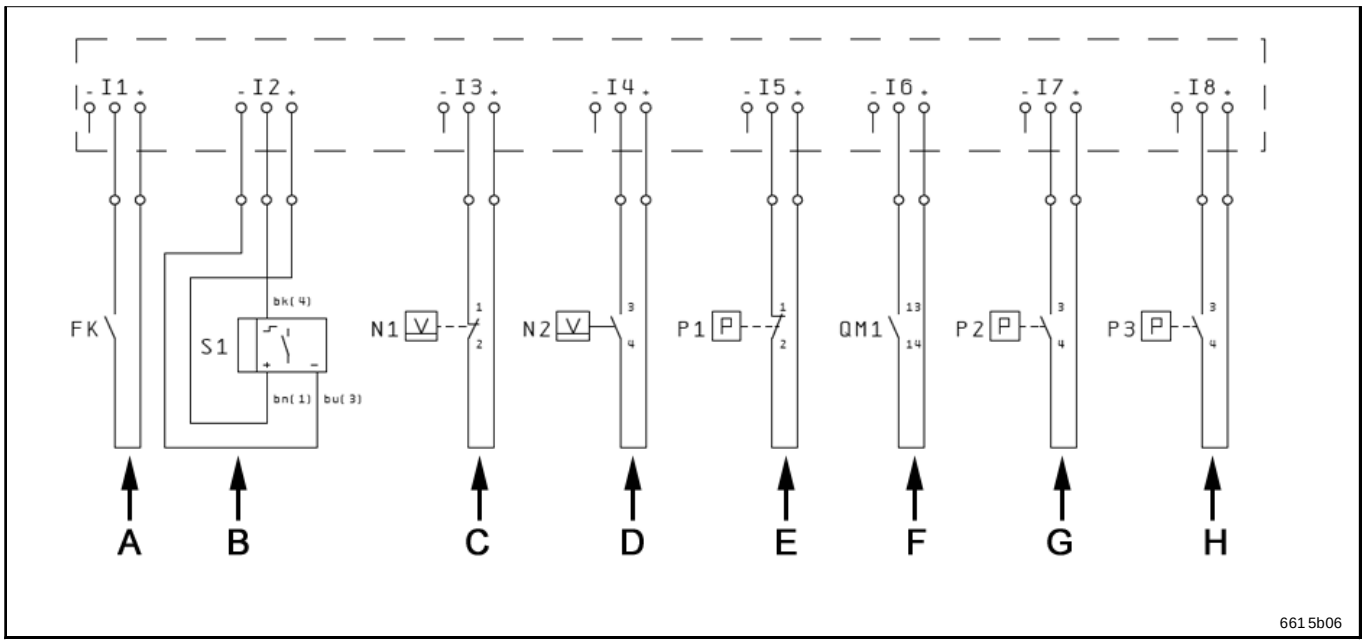

Fig. 19 Signal input connection

A - External contact [1)] B – Metering device sensor C – Low-level signal D – High-level signal
E – Pressure switch, pump F - Motor protection G – End-of-line pressure switch 1 (DU1) H – End-of line pressure switch 2

[1)] Time stop respectively lubrication stop

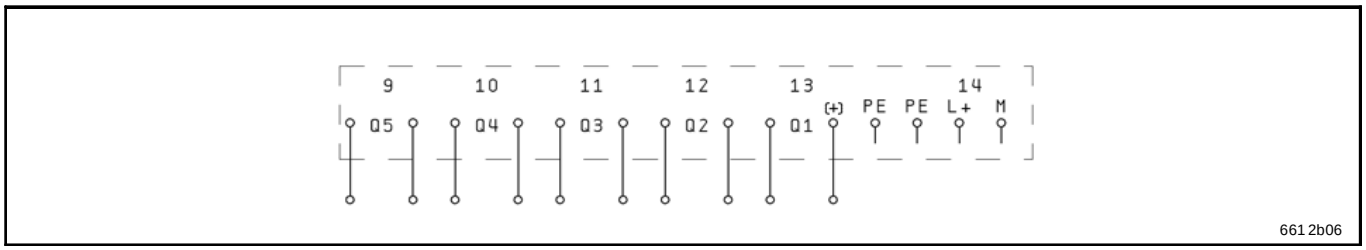

Fig. 20 Control output (ACTUATOR) connection

Q1 - Pump Q2 - System (ready for operation) Q3 - Filling Q4 - Change-over device 1
Q5 - Change-over device 2 PE - Protective earth conductor L+ - Power supply **+** M - Power supply **–**

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Two-line systems, continued

Operation – Commissioning

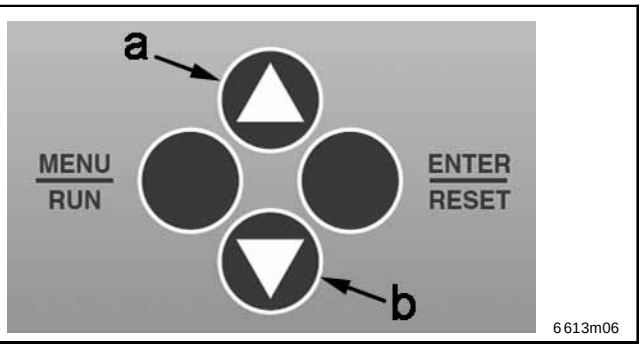

Fig. 21 Operating panel
a - „**UP**“ key b - „**DOWN**“ key

6001a02

NOTE

“RESET“ as hold function:

You can interrupt the running lubrication time by pressing the “RESET“ key (> 2 sec.). The pause time starts from the beginning.

6001a02

NOTE

„RUN“ to trigger additional lubrications:

You can interrupt the running pause time by pressing the “RUN“ key (> 2 sec.). The lubricating time starts from the beginning.

6001a02

NOTE

As soon as you press the "UP" key (pos. a, Fig. 21) outside of the configuration mode, the actual rest of the expired pause time (Fig. D) or lubricating time (Fig. E) is shown in the display.

Parameter presetting

➲ Set the DIP switches 12 (see view Fig. 2) as shown in Fig. 22:

1-1-1-0: SW1 ON
SW2 ON
SW3 ON
SW4 OFF

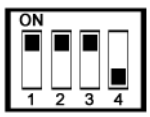

Fig. 22 DIP switch – configuration mode

The display panel of the LMC 2 shows the text „Addr“:

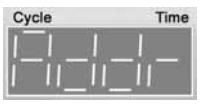

Fig. A Display „Addr“

➲ In the case of a field bus connection, set the system-related address code 0001 to 0255 by means of the UP and DOWN keys (see Fig. 21).

➲ Complete your selection with the ENTER key (Fig. 21).

Parameter presetting, continuation

➲ Select from the following versions to set the parameter presettings in your two-line plant:
- electronic change-over
  without metering device monitoring 0
- electronic change-over
  with metering device monitoring 1
- pressure controlled change-over
  without metering device monitoring 2
- pressure controlled change-over
  with metering device monitoring 3
- 3/2-way valve
  without metering device monitoring 4
- 3/2-way valve
  with metering device monitoring 5

6001a02

NOTE

The version number setting (0 - 5) is shown in the LMC2 display and is made using the UP & DOWN keys on the operating panel (see pos. a & b, Fig. 21).

➲ Complete your selection (0 - 5) with the ENTER key (Fig. 21).
If you do not acknowledge your selection with ENTER, the standard value of “0“ is automatically set.

➲ Wait until in the display panel of the LMC 2 the text changes from „init“ (Fig. B) to „Set“ (Fig. C) or „Addr“ (Fig. A):

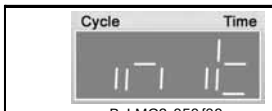

Fig. B Display „init“

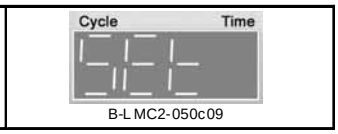

Fig. C Display „SEt“

Selecting the lubrication system

➲ First switch SW1 to SW3 to “0-1-0“ (OFF-ON-OFF).

Then set the right-hand DIP switch (SW4) to ON:

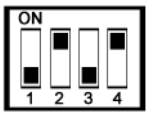

Fig. 23 DIP switch: Two-line systems - settings

After that, switch SW4 back to OFF:

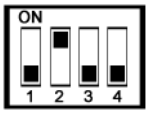

Fig. 24 DIP switch: Two-line systems – ready for operation

- The standard settings to control your two-line system are now complete and the system is ready for operation (Fig. D).

Please refer to page 29 for possible parameter adaptations.

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Two-line systems, continued

Operation, continued

Adapting the parameters

➲ Press and hold the "ENTER" key and then press "MENU" to open the configuration mode.

· You can modify the count value of every parameter using the "UP" and "DOWN" keys as below:

- Press briefly ……………………………. ± 1 count value
- Keep pressed ……………………………. ± High speed

Presettings 0, 1, 2, 3, 4 or 5::
(see table on page 11)

· **Menu item * t–MO *, monitoring time**
(Lubrication with monitored metering device)
Setting the monitoring time determines the time interval in which the corresponding final pressure monitor has to be acknowledged before a fault indication.
If a monitored metering device is present, a signal change has to be completed before the end of a lubrication cycle (full pulse).

➲ Press the "UP" or "DOWN" key to configure the monitoring time.
- Section 1 sec. to 99 min. and 59 sec.
- Count value 1 sec

➲ Conclude the selection with the "ENTER" key.

· Continue with the *** t–PS *** menu item.

6001a02

NOTE

As the pause time is also restarted at the start of the lubrication time, the following setting value applies:
Pause time > Lubrication time

*If the ratio is reversed, the fault indication * **E-PD** * appears in the LMC 1 display (see page 10).*

Presettings 0, 1, 2, 3, 4 or 5:
(see table on page 11)

· **Menu item * t–PS *, pause time**

· The pause time determines the time interval that must expire between two lubrication sequences.

➲ Press the "UP" or "DOWN" key to configure the pause time.
- Section 1 min. to 99 h and 59 min.
- Count value 1 min.

➲ Conclude the selection with the "ENTER" key.

➲ Press the "RUN" key (> 2 sec.), to incorporate the changes made to all menu items. Otherwise, after 30 seconds the program reverts back to the operating mode.

➲ If you want to change a menu item again, press the "ENTER" key. You will once more automatically arrive at the start of the configuration mode.

Display panel in the operating mode

During the pause time the display panel of the LMC 2 shows the text „WAit":

B-LMC2-050d09

Fig. D Display „WAit"

During the lubricating time the display panel of the LMC 2 shows the text „Lub":

B-LMC2-050e09

Fig. E Display „Lub"

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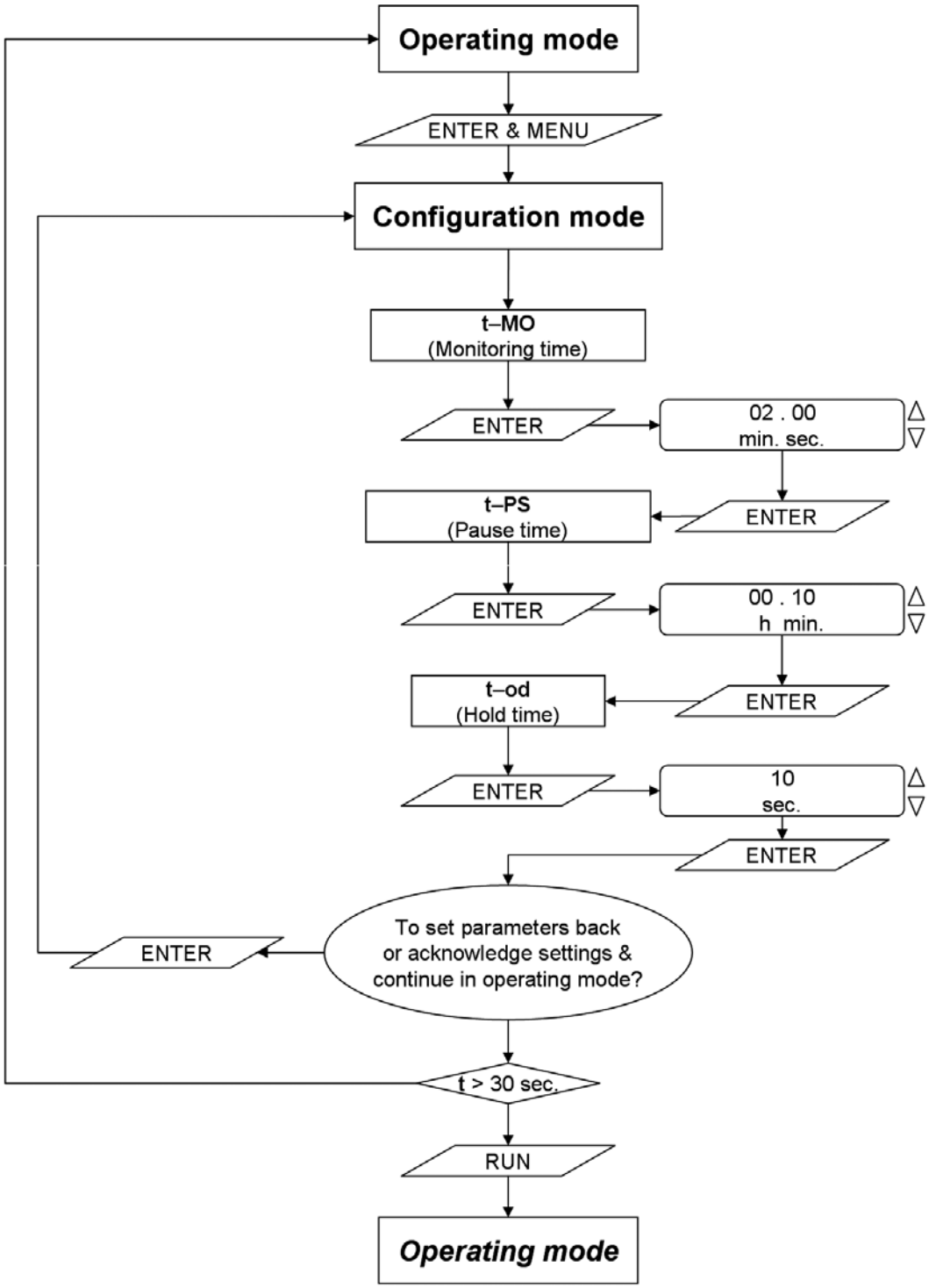
Centro-Matic® systems

Quicktour



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Centro-Matic® systems, continued

Operating mode

- The following parameters are controlled or monitored via the standard LMC 1 programming for Centro-Matic® systems:
- Variable:
  - Pause time
  - Monitoring time
  - Switch-off delay time

Connection

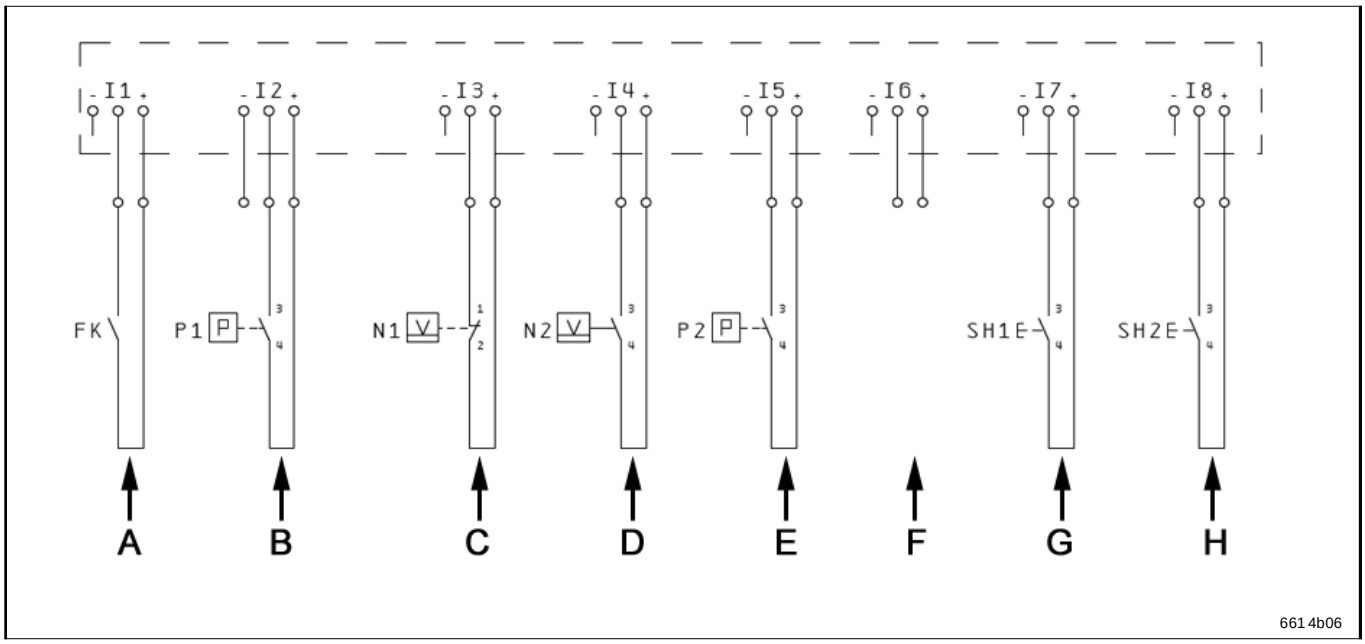

Fig. 25 Signal input connection

A - External contact [1)]
B – Pressure switch 1
C – Low-level signal
D – High-level signal
E – Pressure switch 2
F - Reserve
G - Additional lubrication
H - Remote reset

[1)] Time stop respectively lubrication stop

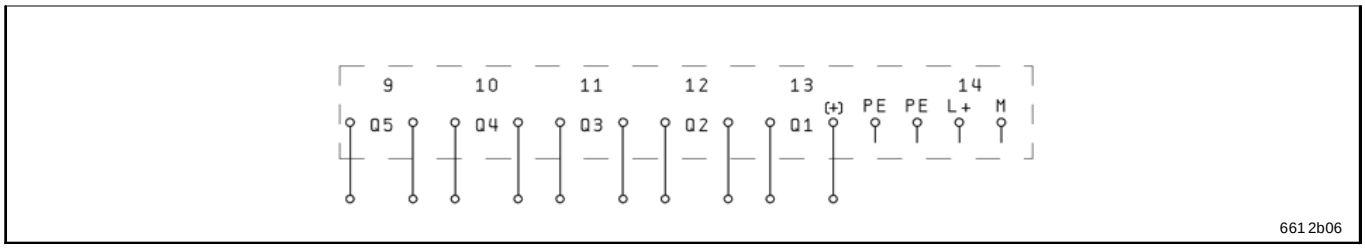

Fig. 26 Control output (ACTUATOR) connection

Q1 - Pump
Q2 - System (ready for operation)
Q3 - Lubrication active
Q4 - Relief
Q5 - Reserve
PE - Protective earth conductor
L+ - Power supply **+**
M - Power supply **–**

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Centro-Matic® systems, continued

Operation – Commissioning

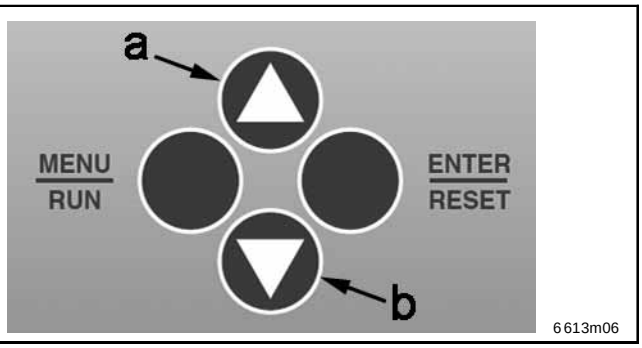

Fig. 27 Operating panel
a - „**UP**“ key b - „**DOWN**“ key


6001a02

NOTE

“RESET“ as hold function:

You can interrupt the running lubrication time by pressing the “RESET“ key[1)] (> 2 sec.). The pause time starts from the beginning.

1) or, if applicable, externally via switch H (see Fig. 25)


6001a02

NOTE

„RUN“ to trigger additional lubrications:

You can interrupt the running pause time by pressing the “RUN“ key (> 2 sec.). The lubricating time starts from the beginning.


6001a02

NOTE

As soon as you press the "UP" key (pos. a, Fig. 27) outside of the configuration mode, the actual rest of the expired pause time (Fig. D) or lubricating time (Fig. E) is shown in the display.

Parameter presetting

➲ Set the DIP switches 12 (see view Fig. 2) as shown in Fig. 28:

1-1-1-0: SW1 ON
SW2 ON
SW3 ON
SW4 OFF

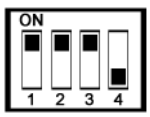

Fig. 28 DIP switch – configuration mode

The display panel of the LMC 2 shows the text „Addr“:

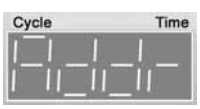

Fig. A Display „Addr“

➲ In the case of a field bus connection, set the system-related address code 0001 to 0255 by means of the UP and DOWN keys (see Fig. 27).

➲ Complete your selection with the ENTER key (Fig. 27).

Parameter presetting, continuation

➲ Select from the following versions to set the parameter presettings in your Centro-Matic® system:
- with one pressure switch 0
- with two pressure switches 1


6001a02

NOTE

The version number setting (0 - 1) is shown in the LMC2 display and is made using the UP & DOWN keys on the operating panel (see pos. a & b, Fig. 27).

➲ Complete your selection (0 - 1) with the ENTER key (Fig. 27).
If you do not acknowledge your selection with ENTER, the standard value of “0“ is automatically set.

➲ Wait until in the display panel of the LMC 2 the text changes from „init“ (Fig. B) to „Set“ (Fig. C) or „Addr“ (Fig. A):

Fig. B Display „init“

Fig. C Display „SEt“

Selecting the lubrication system

➲ First switch SW1 to SW1 to SW3 to “1-1-0“ (ON-ON-OFF).

Then set the right-hand DIP switch (SW4) to ON:

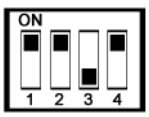

Fig. 29 DIP switch: Centro-Matic® systems - settings

After that, switch SW4 back to OFF:

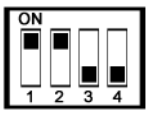

Fig. 30 DIP switch: Centro-Matic® systems – operating mode

- The standard settings to control your Centro-Matic® system are now complete and the system is ready for operation (Fig. D).

Please refer to page 33 for possible parameter adaptations.

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Centro-Matic® systems, continued

Operation, continued

Adapting the parameters

➲ Press and hold the „ENTER“ key and then press „MENU“ to open the configuration mode.

· You can modify the count value of every parameter using the „UP“ and „DOWN“ keys as below:

- Press briefly ..... ± 1 count value
- Keep pressed ..... ± High speed

Presettings 0 or 1:
(see table on page 11)

· **Menu item * t–MO *, monitoring time**
Setting the monitoring time determines the time interval in which an acknowledgement needs to be made before a fault indication appears for the pressure switch(es).

➲ Press the „UP“ or „DOWN“ key to configure the monitoring time.
- Section 1 sec. to 99 min. and 59 sec.
- Count value 1 sec

➲ Conclude the selection with the „ENTER“ key.

· Continue with the *** t–PS *** menu item.

· **Menu item * t–PS *, pause time**

· The pause time determines the time interval that must expire between two lubrication sequences.

➲ Press the „UP“ or „DOWN“ key to configure the pause time.
- Section 1 min. to 99 h and 59 min.
- Count value 1 min.

➲ Conclude the selection with the „ENTER“ key.

· Continue with the *** t–od *** menu item.

6001a02

NOTE

As the pause time is also restarted at the start of the lubrication time, the following setting value applies:

Pause time > Lubrication time

*If the ratio is reversed, the fault indication * **E-PD** * appears in the LMC 1 display (see page 10).*

· **Menu item * t–od *, hold time**

· The hold time determines the time interval, how long the relief valve will remain closed through the switch-off delay after lubrication has finished.

➲ Press the „UP“ or „DOWN“ key to configure the re-spraying time.
- Section 1 sec. to 99 sec.
- Count value 1 sec

➲ Conclude the selection with the „ENTER“ key.

➲ Press the „RUN“ key (> 2 sec.), to incorporate the changes made to all menu items. Otherwise, after 30 seconds the program reverts back to the operating mode.

➲ If you want to change a menu item again, press the „ENTER“ key. You will once more automatically arrive at the start of the configuration mode.

Display panel in the operating mode

During the pause time the display panel of the LMC 2 shows the text „WAit“:

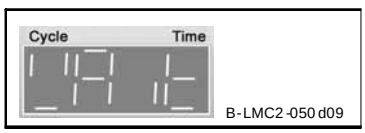

Fig. D Display „WAit“

During the lubricating time the display panel of the LMC 2 shows the text „Lub“:

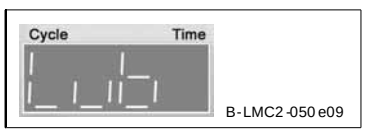

Fig. E Display „Lub“

During the hold time the display panel of the LMC 2 shows the text „HoLd“:

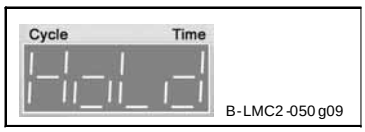

Fig. D Display „HoLd“

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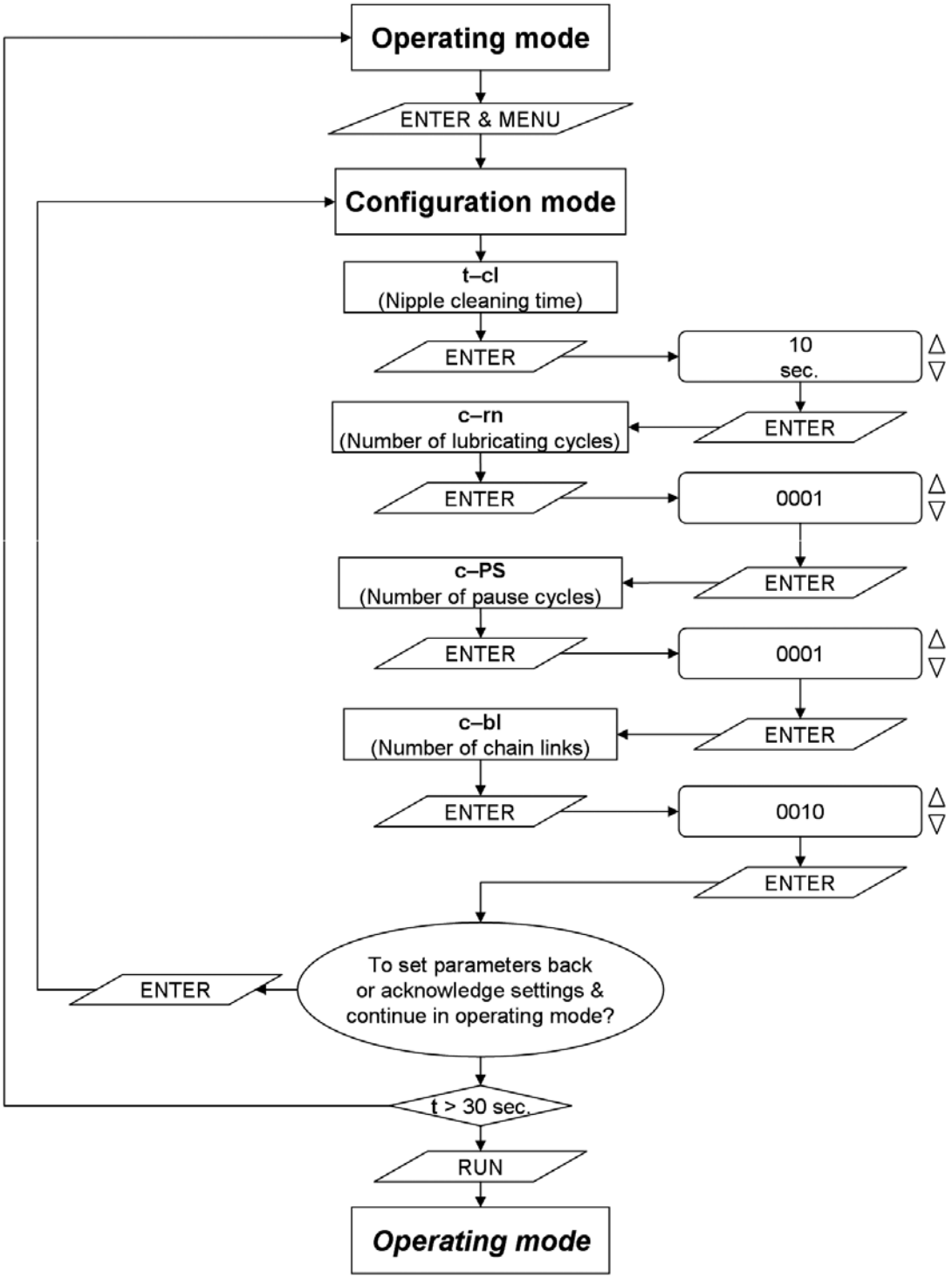
COBRA chain-lubrication systems

Quicktour



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COBRA chain-lubrication systems, continued

Operating mode

- The following parameters are controlled or monitored for COBRA chain-lubrication systems via the standard LMC 1 programming:
  - Variable:
    - Nipple cleaning time
    - Cycle-dependent lubrication
    - Number of pause cycles
    - Number of chain links
  - Fixed:
    - Filling time monitoring 1 min.

Connection

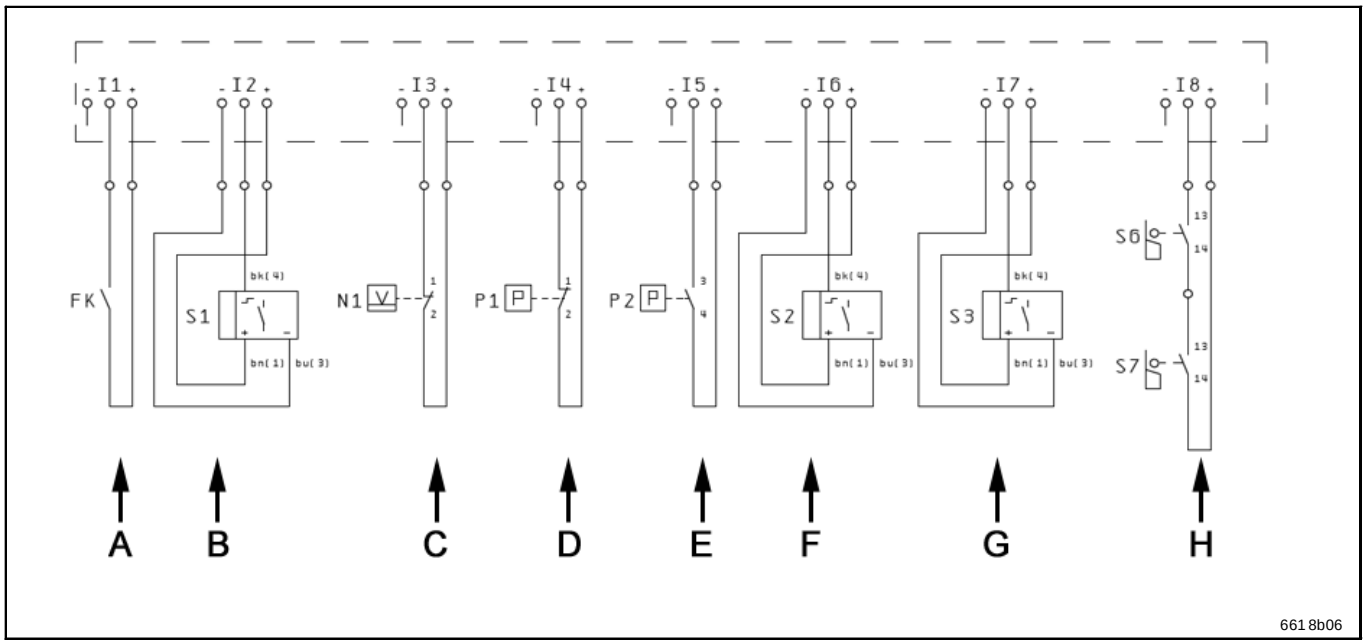

Fig. 31 Signal input connection

A - External contact, chain forwards
B - Chain sensor
C - Low-level signal
D - Lubricant pressure
E - Air pressure switch
F - Malfunction, right side
G - Malfunction, left side
H - Locking

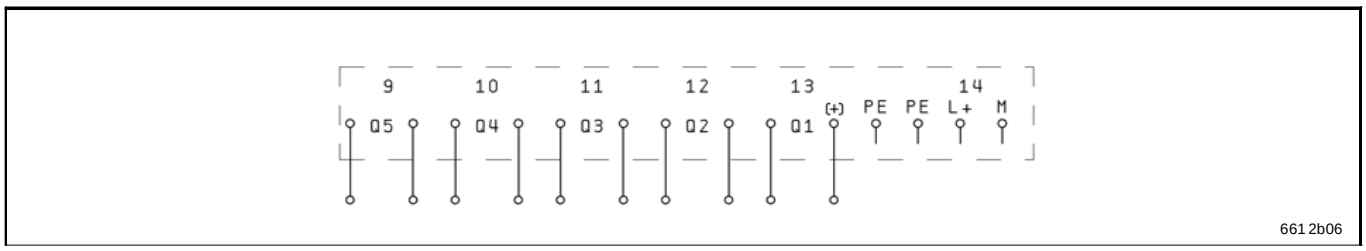

Fig. 32 Control output (ACTUATOR) connection

Q1 - Pump
Q2 - System (ready for operation)
Q3 - Clean
Q4 - COBRA 1X-1
Q5 - COBRA 1X-2
PE - Protective earth conductor
L+ - Power supply **+**
M - Power supply **–**

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COBRA chain-lubrication systems, continued

Operation – Commissioning

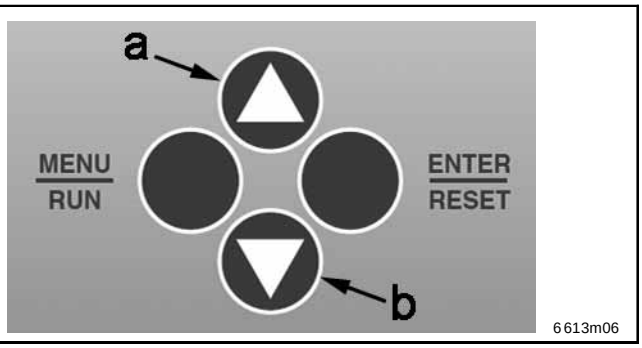

Fig. 33 Operating panel
a - „**UP**"-Taste b - „**DOWN**"-Taste

6001a02

NOTE

"RESET" as halt function:

You can interrupt the running lubrication time by pressing the "RESET" key (> 2 sec.). The next pause cycle starts from the beginning.

6001a02

NOTE

„RUN" to trigger additional lubrications:

You can interrupt the running pause cycle by pressing the "RUN" key (> 2 sec.). The lubricating time starts immediately.

6001a02

NOTE

As soon as you press the "UP" key (pos. a, Fig. 33) outside of the configuration mode, the actual rest of the expired pause time (Fig. D) or lubricating time (Fig. E) is shown in the display.

Parameter presetting

➲ Set the DIP switches 12 (see view Fig. 2) as shown in Fig. 34:

1-1-1-0: SW1 ON
SW2 ON
SW3 ON
SW4 OFF

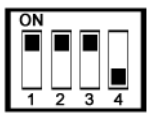

Fig. 34 DIP switch – configuration mode

The display panel of the LMC 2 shows the text „Addr":

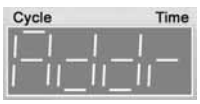

Fig. A Display „Addr"

➲ In the case of a field bus connection, set the system-related address code 0001 to 0255 by means of the UP and DOWN keys (see Fig. 33).

➲ Complete your selection with the ENTER key (Fig. 33).

Parameter presetting, continuation

6001a02

NOTE

No parameter presettings can be set for COBRA chain-lubrication systems.

The standard setting "0" applies.

➲ Complete your selection (0) with the ENTER key (Fig. 33). If you do not acknowledge your selection with ENTER, the standard value of "0" is automatically set.

➲ Wait until in the display panel of the LMC 2 the text changes from „init" (Fig. B) to „Set" (Fig. C) or „Addr" (Fig. A):

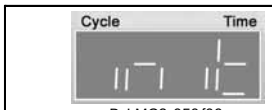

Fig. B Display „init"

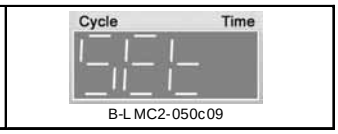

Fig. C Display „SEt"

Selecting the lubrication system

➲ First switch SW1 to SW3 to "0-0-1" (OFF-OFF-ON).

Then set the right-hand DIP switch (SW4) to ON:

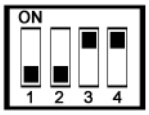

Fig. 35 DIP switch: COBRA chain-lubrication systems - settings

After that, switch SW4 back to OFF:

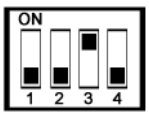

Fig. 36 DIP switch:
COBRA chain-lubrication systems – operating mode

- The standard settings to control your COBRA chain-lubrication system are now complete and the system is ready for operation (Fig. D).

Please refer to page 37 for possible parameter adaptations.

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COBRA chain-lubrication systems, continued

Operation, continued

Adapting the parameters

➲ Press and hold the “ENTER“ key and then press “MENU“ to open the configuration mode.

· You can modify the count value of every parameter using the “UP“ and “DOWN“ keys as below:

- Press briefly ..... ± 1 count value
- Keep pressed ..... ± High speed

· **Menu item * t–cl *, Nipple cleaning time**

· The nipple cleaning time determines the time interval of the duration of the cleaning of a lubrication nipple.

➲ Press the “UP“ or “DOWN“ key to configure the nipple cleaning time.
- Section 1 sec. to 99 sec.
- Count value 1 sec

➲ Conclude the selection with the “ENTER“ key.

➲ Continue with menu item *** c–rn ***.

· **Menu item * c–rn *, Lubricating cycles**
(Cycle-dependent lubrication)
The number of lubricating cycles determines how often the chain must run through until it is completely lubricated.

➲ Press the “UP“ or “DOWN“ key to configure the number of lubricating cycles.
- Section 1 to 9999 lubricating cycles
- Count value 1 lubricating cycle

➲ Conclude the selection with the “ENTER“ key.

· Continue with the *** c–PS *** menu item.

· **Menu item * c–PS *, Number of pause cycles**

· The number of pause cycles sets the number of non-lubricated chain cycles that must transpire between two lubrication processes.

➲ Press the “UP“ or “DOWN“ key to configure the number of pause cycles.
- Section 1 to 9999 pause cycles
- Count value 1 pause cycle

➲ Conclude the selection with the “ENTER“ key.

· Continue with the *** c–bl *** menu item.

· **Menu item * c–bl *, Number of chain links**

· The number of chain links determines the number of lubrication strokes for one chain cycle.

➲ Press the “UP“ or “DOWN“ key to configure the number of chain links.
- Section 1 to 9999 chain links
- Count value 1 chain link

➲ Conclude the selection with the “ENTER“ key.

➲ Press the “RUN“ key (> 2 sec.) to incorporate the changes made to all menu items. Otherwise, after 30 seconds the program reverts back to the operating mode.

➲ If you want to change a menu item again, press the “ENTER“ key. You will once more automatically arrive at the start of the configuration mode.

Display panel in the operating mode

During the pause time the display panel of the LMC 2 shows the text „WAit“:

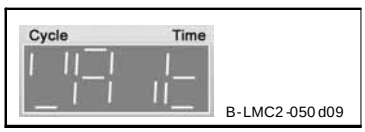

Fig. D Display „WAit“

During the lubricating time the display panel of the LMC 2 shows the text „Lub“:

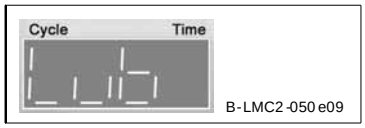

Fig. E Display „Lub“

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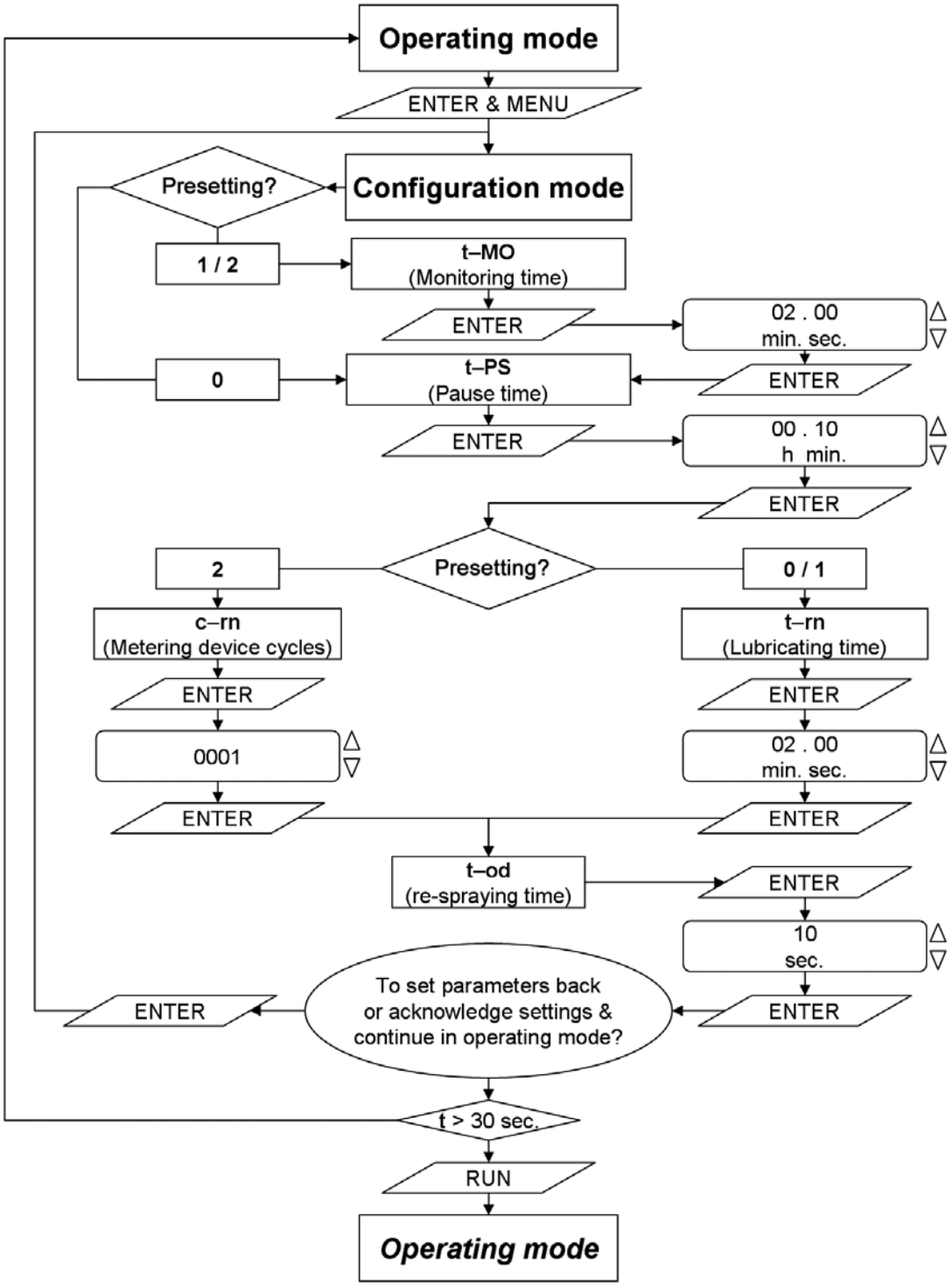
Spray lubrication system

Quicktour



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Spray lubrication system, continued

Operating mode

- The following parameters are controlled or monitored via the standard LMC 1 programming for spray lubrication systems:
  - Variable:
    - Pause time
    - Time or cycle-dependent lubrication
    - Monitoring time
    - Re-spraying time
  - Fixed:
    - Filling time monitoring 15 min.

Connection

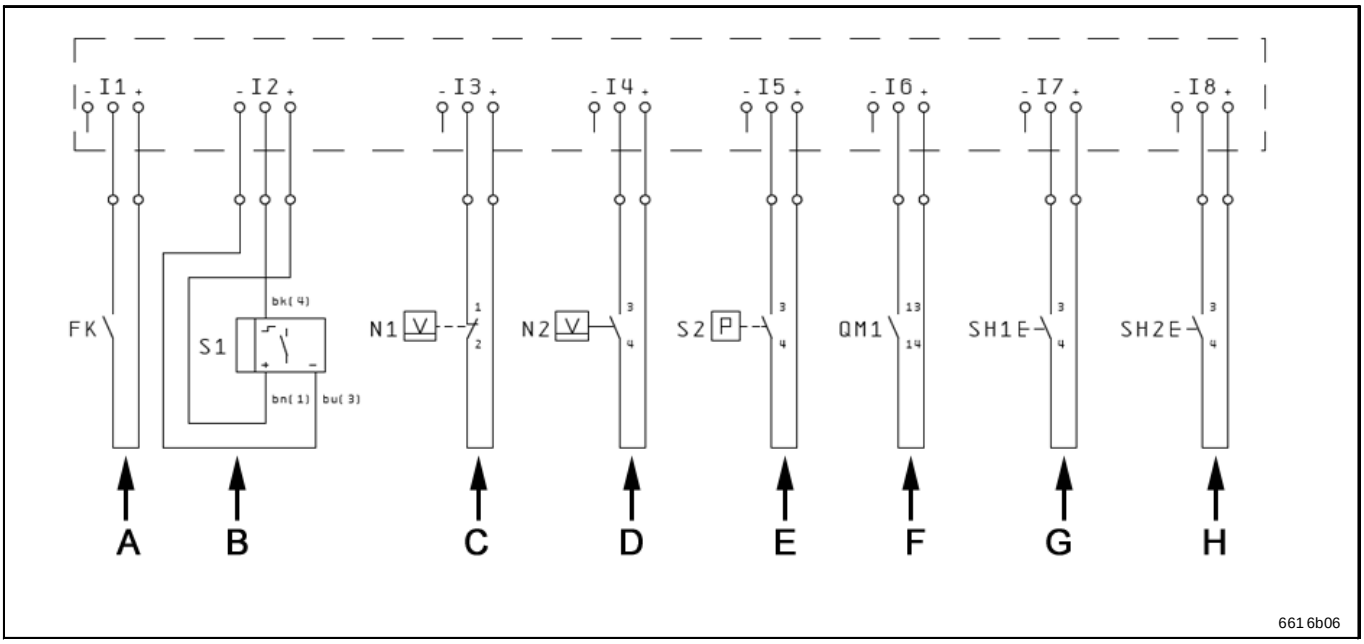

Fig. 37 Signal input connection

A - External contact [1)]
B – Metering device sensor
C – Low-level signal
D – High-level signal
E - Compressed air switch
F - Motor protection
G - Additional lubrication
H - Remote reset

[1)] Time stop respectively lubrication stop

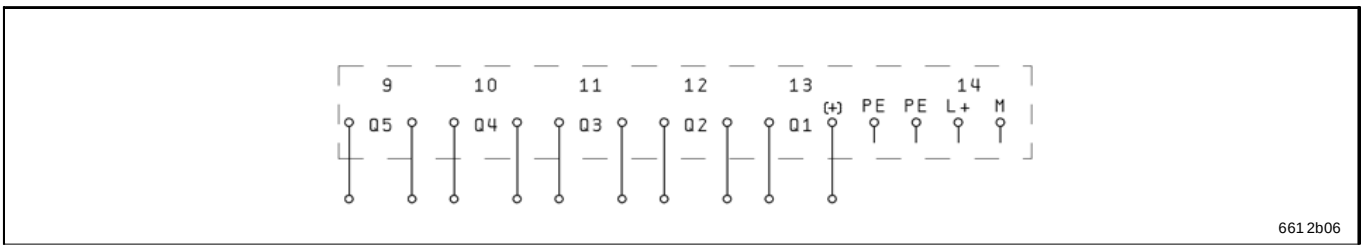

Fig. 38 Control output (ACTUATOR) connection

Q1 - Pump
Q2 - System (ready for operation)
Q3 - Filling
Q4 - Air valve
Q5 - Reserve
PE - Protective earth conductor
L+ - Power supply **+**
M - Power supply **–**

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Spray lubrication systems, continued

Operation – Commissioning

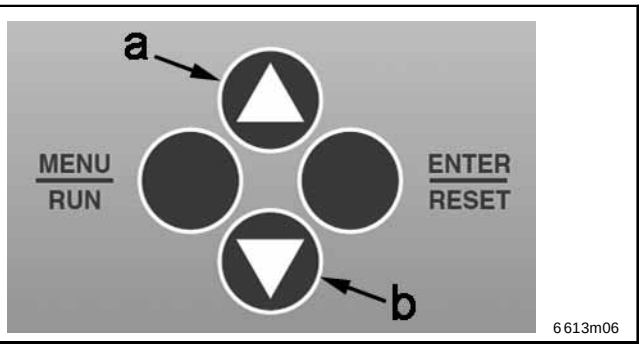

Fig. 39 Operating panel
a - „**UP**“ key b - „**DOWN**“ key


6001a02

NOTE

“RESET“ as hold function:

You can interrupt the running lubrication time by pressing the “RESET“ key[1)] (> 2 sec.). The pause time starts from the beginning.

1) or, if applicable, externally via switch H (see Fig. 37)


6001a02

NOTE

„RUN“ to trigger additional lubrications:

You can interrupt the running pause time by pressing the “RUN“ key (> 2 sec.). The lubricating time starts from the beginning.


6001a02

NOTE

As soon as you press the "UP" key (pos. a, Fig. 39) outside of the configuration mode, the actual rest of the expired pause time (Fig. D) or lubricating time (Fig. E) is shown in the display.

Parameter presetting

➲ Set the DIP switches 12 (see view Fig. 2) as shown in Fig. 40:

1-1-1-0: SW1 ON
SW2 ON
SW3 ON
SW4 OFF

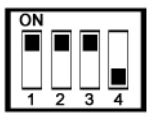

Fig. 40 DIP switch – configuration mode

The display panel of the LMC 2 shows the text „Addr“:

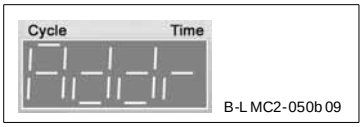

Fig. A Display „Addr“

➲ In the case of a field bus connection, set the system-related address code 0001 to 0255 by means of the UP and DOWN keys (see Fig. 39).

➲ Complete your selection with the ENTER key (Fig. 39).

Parameter presetting, continuation

➲ Select from the following versions to set the parameter presettings in your spray lubrication system:
- no metering device, no cycle counter, clock-pulsed 0
- with metering device, no cycle counter, clock-pulsed 1
- with metering device and cycle counter, clock-pulsed ... 2
- no metering dev., no cycle counter, not clock-pulsed 3
- with metering dev., no cycle counter, not clock-pulsed .. 4
- with metering dev. and cycle counter, not clock-pulsed 5


6001a02

NOTE

The version number setting (0 - 5) is shown in the LMC2 display and is made using the UP & DOWN keys on the operating panel (see pos. a & b, Fig. 39).

➲ Complete your selection (0 - 5) with the ENTER key (Fig. 39).
If you do not acknowledge your selection with ENTER, the standard value of “0“ is automatically set.

➲ Wait until in the display panel of the LMC 2 the text changes from „init“ (Fig. B) to „Set“ (Fig. C) or „Addr“ (Fig. A):

Fig. B Display „init“

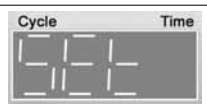

Fig. C Display „SEt“

Selecting the lubrication system

➲ First switch SW1 to SW3 to “1-0-1“ (ON-OFF-ON).

Then set the right-hand DIP switch (SW4) to ON:

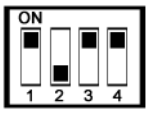

Fig. 41 DIP switch: Spray lubrication systems - settings

After that, switch SW4 back to OFF:

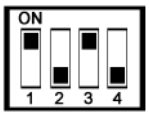

Fig. 42 DIP switch: Spray lubrication systems – ready for operation

- The standard settings to control your spray lubrication system are now complete and the system is ready for operation (Fig. D).

Please refer to page 41 for possible parameter adaptations.

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Spray lubrication systems, continued

Operation, continued

Adapting the parameters

➲ Press and hold the “ENTER“ key and then press “MENU“ to open the configuration mode.

· You can modify the count value of every parameter using the “UP“ and “DOWN“ keys as below:

- Press briefly ..... ± 1 count value
- Keep pressed ..... ± High speed

Presettings 1 or 2:
(see table on page 11)

· **Menu item * t–MO *, monitoring time**
(Lubrication with monitored metering device)
Setting the monitoring time determines the time interval in which at least one metering device cycle has to have ended before a fault indication.

➲ Press the “UP“ or “DOWN“ key to configure the monitoring time.
- Section 1 sec. to 99 min. and 59 sec.
- Count value 1 sec

➲ Conclude the selection with the “ENTER“ key.

· Continue with the *** t–PS *** menu item.

Presetting 0:
(see table on page 11)

· **Menu item * t–PS *, pause time**

· The pause time determines the time interval that must expire between two lubrication sequences.

➲ Press the “UP“ or “DOWN“ key to configure the pause time.
- Section 1 min. to 99 h and 59 min.
- Count value 1 min.

➲ Conclude the selection with the “ENTER“ key.

· Continue with the *** t–rn *** or *** c–rn *** menu items.

Presettings 0 or 1:
(see table on page 11)

· **Menu item * t–rn *, Lubrication time**
(time-dependent lubrication)

· The lubrication time determines how long a lubrication sequence takes to provide all the lubrication points in the spray lubrication system with sufficient lubricant.

➲ Press the “UP“ or “DOWN“ key to configure the lubrication time.
- Section 1 sec. to 99 min. and 59 sec.
- Count value 1 sec

· Continue with the *** t–od *** menu item.

Presetting 2:
(see table on page 11)

· **Menu item * c–rn *, number of metering device cycles**
(cycle-dependent lubrication)
The number of metering device cycles determines how often all metering pistons in the monitored metering device must convey their amounts of lubricant to provide all lubrication points in the spray lubrication system with sufficient lubricant.

➲ Press the “UP“ or “DOWN“ key to configure the number of metering device cycles.
- Section 0 to 99 metering device cycles
- Count value 1 metering device cycle

➲ Conclude the selection with the “ENTER“ key.

· Continue with the *** t–od *** menu item.

Presettings 0, 1, or 2:
(see table on page 11)

· **Menu item * t–od *, re-spraying time**

· The re-spraying time determines the time interval of how long the spraying procedure is to last after lubrication has finished in order to clean the nozzles by delaying switch-off.

➲ Press the “UP“ or “DOWN“ key to configure the re-spraying time.
- Section 1 sec. to 99 sec.
- Count value 1 sec

➲ Conclude the selection with the “ENTER“ key.

➲ Press the “RUN“ key (> 2 sec.), to incorporate the changes made to all menu items. Otherwise, after 30 seconds the program reverts back to the operating mode (run).

➲ If you want to change a menu item again, press the “ENTER“ key. You will once more automatically arrive at the start of the configuration mode.

Display panel in the operating mode

During the pause time the display panel of the LMC 2 shows the text „WAit“:

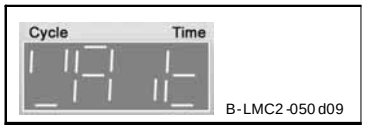

Fig. D Display „WAit“

During the lubricating time the display panel of the LMC 2 shows the text „Lub“:

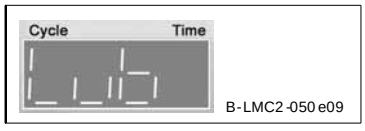

Fig. E Display „Lub“

During the hold time the display panel of the LMC 2 shows the text „HoLd“:

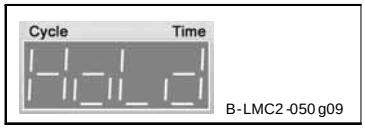

Fig. D Display „HoLd“

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Installation, continuation

Mounting channels for fastening

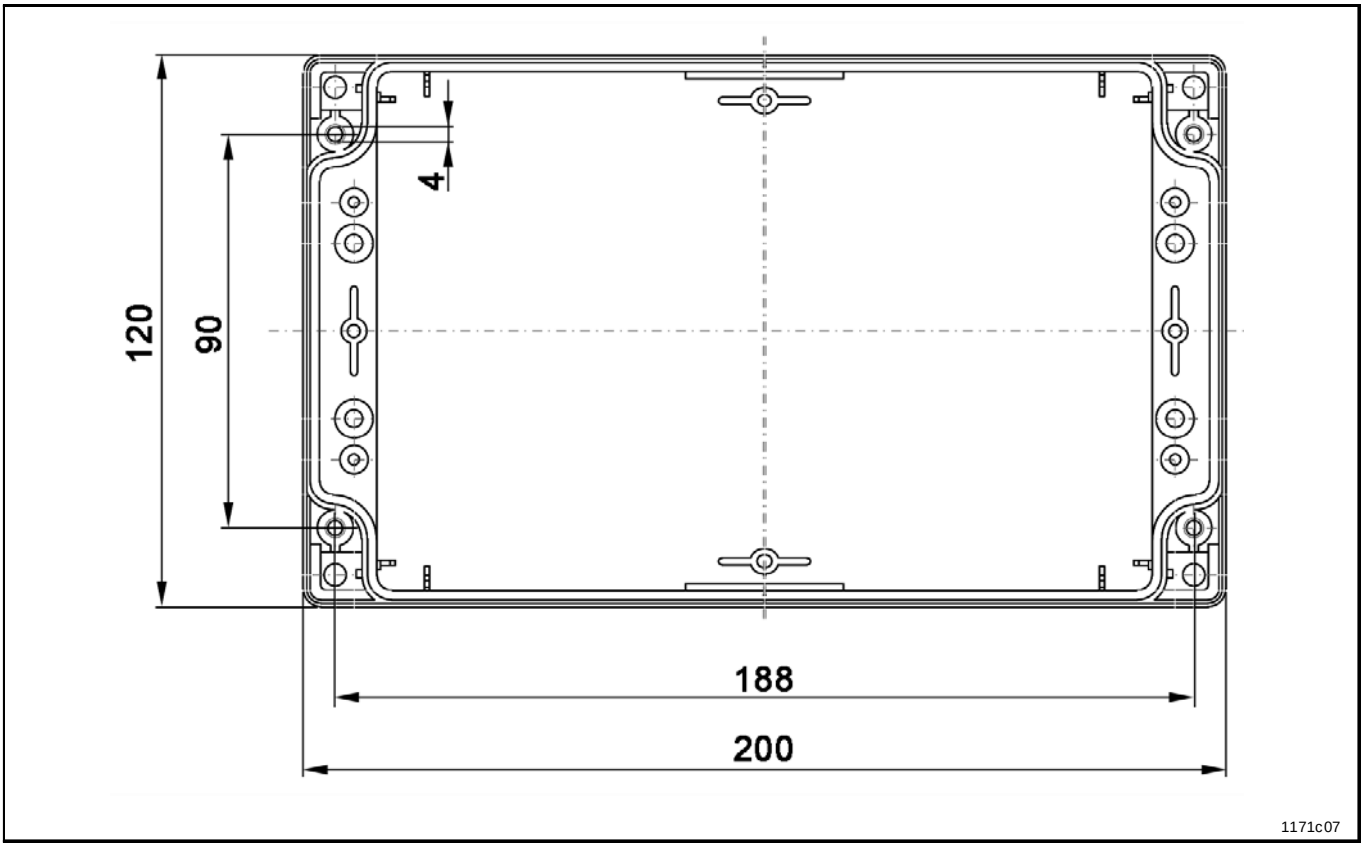

Fig. 43 Mounting channels for fastening

Dimensions (L x W x H) ..... 200 x 120 x 90 mm

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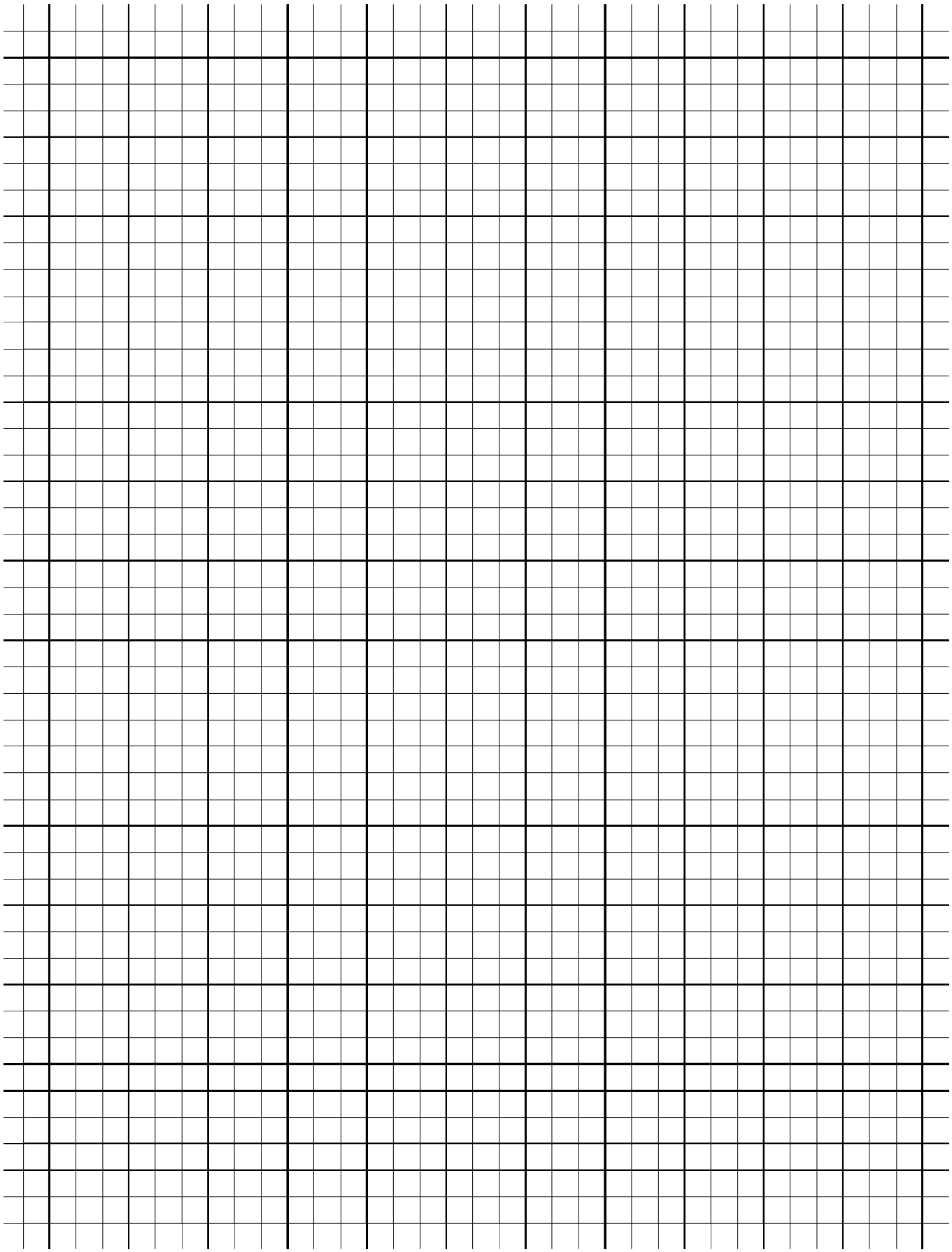
Note:



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Lincoln's Global Distribution and Service Network – The Best in Our Industry –

Whatever service is required – selecting a lubricating system, customised system installation or the supply of top quality products – you will always be best advised by the staff of the Lincoln offices, representatives and contract dealers.

Systems dealers

Our systems dealers have the most extensive specialised knowledge in our industry. They plan your installations to suit your specifications with exactly the combination of Lincoln components that you need. They then build the installations at your operation with experienced technicians or work closely with your personnel to ensure that everything goes smoothly.
All dealers have the complete range of pumps, distributers, monitoring devices and accessories in stock and meet our exacting demands with their specialised knowledge about products, installations and service. Whenever and wherever you need our experts, from St. Louis to Singapore, Walldorf and worldwide, Lincoln's first-class systems dealers are at your service.

Find out where the nearest Lincoln distribution and service office to you is located:

America:	**Lincoln Industrial**	One Lincoln Way St. Louis, MO 63120-1578 USA	Phone: (+1) 314 679 4200 Fax: (+1) 800 424 5359 Home: www.lincolnindustrial.com
Europe/Africa/Asia:	**Lincoln GmbH**	Heinrich-Hertz Straße 2-8 69190 Walldorf Germany	Tel: (+49) 6227 33-0 Fax: (+49) 6227 33-259 E-Mail: lincoln@lincolnindustrial.de
Asia/Australia/Pacific:	**Lincoln Industrial Corporation**	3 Tampines Central 1 # 04-05 Abacus Plaza Singapore 529540	Phone: (+65) 6588-0188 Fax: (+65) 6588-3438 E-Mail: sales@lincolnindustrial.com.sg

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