

# Operation and service manual

## SKF Multilube



Central lubrication system

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# SKF Multilube central lubrication system

## General system description

### Safety instructions

#### Operation

Safemobe lubrication devices and systems are designed and manufactured for centralized and automatic lubrication of vehicles and machines. No other use is allowed.

#### Pumps

The pumps in central lubrication systems are pneumatically or electrically (12 V or 24 V DC) operated. When servicing the system, the operating power of the pump must be switched off.

#### Piping, hoses and connectors

Opening of piping, hoses, and connectors is allowed only when unpressurized. Before opening, make sure that you also switch off the operating power of the pump.

#### Springs

The lubricant reservoir contains a guide piston spring. Remember this when opening the reservoir!

## General information on centralized lubrication system

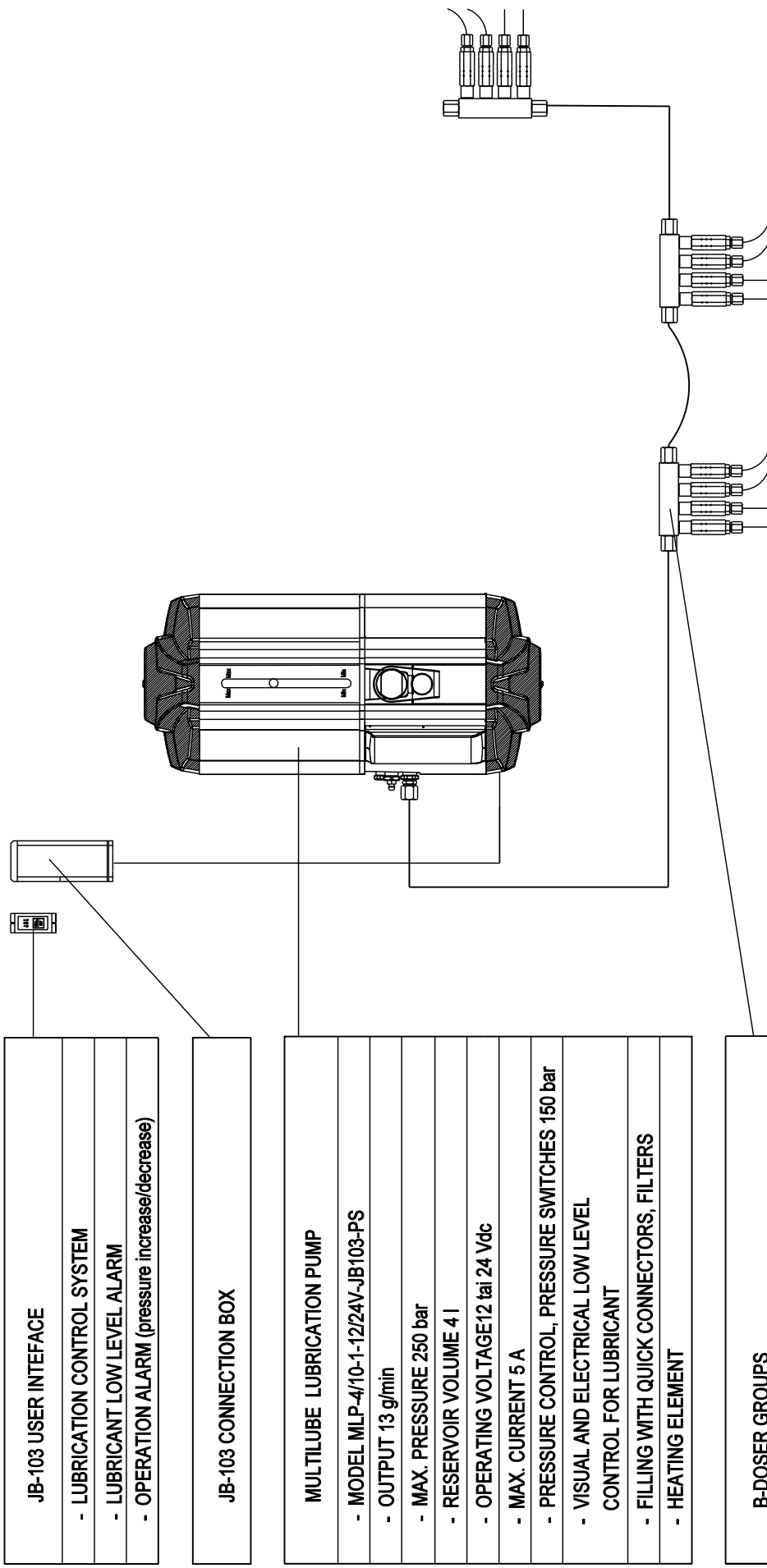
Accurate lubrication prevents damages and shutdowns caused by inadequate lubrication. The service life of process equipment and machinery is extended and both energy consumption and the used amount of lubricant are reduced. Thanks to automation, optimum lubrication is achieved and the burden of the environment is minimized. All this brings savings. Automation increases work safety, as equipment and machinery does not have to be lubricated manually during operation.

## SKF Multilube-central lubrication system

SKF Multilube system is a single- or dual-line (Heavy- or Twinheavy) central lubrication system, in which the lubricant is pumped through piping to the dosers. Dosers feed the preset amount of lubricant to the lubrication points.

The system operation is controlled and monitored by a control unit. Control unit controls the system according to preset starting interval and monitors system pressurization and the amount of lubricant. If the pressure does not reach the preset value during the maximum pressurization time or if the amount of lubricant drops to the low level limit, the control unit will inform of a malfunction. The control unit has an interlocking feature.

# HEAVY-SYSTEM SINGLE LINE CENTRALISED LUBRICATION SYSTEM



<b>JB-103 USER INEFTACE</b>
- LUBRICATION CONTROL SYSTEM
- LUBRICANT LOW LEVEL ALARM
- OPERATION ALARM (pressure increase/decrease)

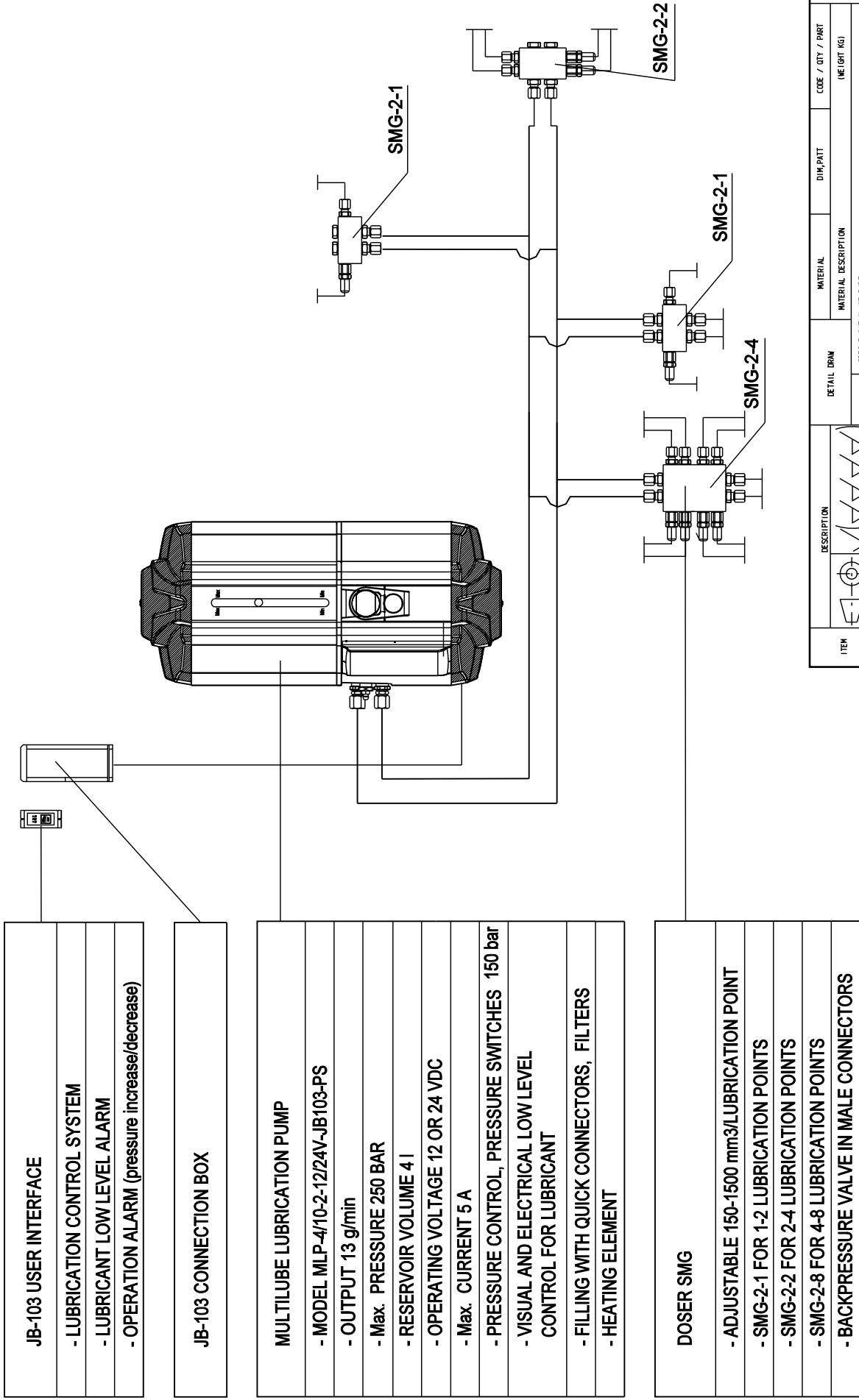
<b>JB-103 CONNECTION BOX</b>
------------------------------

<b>MULTILUBE LUBRICATION PUMP</b>
- MODEL MLP-4/10-1-12/24V-JB103-PS
- OUTPUT 13 g/min
- MAX. PRESSURE 250 bar
- RESERVOIR VOLUME 4 l
- OPERATING VOLTAGE 12 tai 24 Vdc
- MAX. CURRRENT 5 A
- PRESSURE CONTROL, PRESSURE SWITCHES 150 bar
- VISUAL AND ELECTRICAL LOW LEVEL CONTROL FOR LUBRICANT
- FILLING WITH QUICK CONNECTORS, FILTERS
- HEATING ELEMENT

<b>B-DOSER GROUPS</b>
- B1 - B5 FIXED DOSAGES 20-200 mm <sup>3</sup>
- B6 ADJUSTABLE DOSAGE 200-500 mm <sup>3</sup>
- MATERIAL OF MOUNTING RAILS, STAINLESS STEEL

ITEM	DESCRIPTION	DETAIL DRAW	MATERIAL	DIM. PART	CODE / QTY / PART	QTY
DESIGNED	DRAWN	LeL	SPECIFICATION OF PART		(WEIGHT KG)	
HEAVY-SYSTEM			PREVIOUS DRG			
SINGLE LINE CENTRALISED LUBRICATION SYSTEM			DATE 19.8.2004			
Oy SKF AB MUIURAME FINLAND			SCALE			
DRAWING NUMBER			361214			
SHEET/SHEETS						

# TWINHEAVY-SYSTEM DUAL LINE CENTRALISED LUBRICATION SYSTEM



<b>JB-103 USER INTERFACE</b>
- LUBRICATION CONTROL SYSTEM
- LUBRICANT LOW LEVEL ALARM
- OPERATION ALARM (pressure increase/decrease)

<b>JB-103 CONNECTION BOX</b>
------------------------------

<b>MULTILUBE LUBRICATION PUMP</b>
- MODEL MLP-4/10-2-12/24V-JB103-PS
- OUTPUT 13 g/min
- Max. PRESSURE 250 BAR
- RESERVOIR VOLUME 4 l
- OPERATING VOLTAGE 12 OR 24 VDC
- Max. CURRENT 5 A
- PRESSURE CONTROL, PRESSURE SWITCHES 150 bar
- VISUAL AND ELECTRICAL LOW LEVEL CONTROL FOR LUBRICANT
- FILLING WITH QUICK CONNECTORS, FILTERS
- HEATING ELEMENT

<b>DOSER SMG</b>
- ADJUSTABLE 150-1500 mm <sup>3</sup> /LUBRICATION POINT
- SMG-2-1 FOR 1-2 LUBRICATION POINTS
- SMG-2-2 FOR 2-4 LUBRICATION POINTS
- SMG-2-3 FOR 4-8 LUBRICATION POINTS
- BACKPRESSURE VALVE IN MALE CONNECTORS

ITEM	DESCRIPTION	DETAIL DRAW	MATERIAL	DIM./PART	CODE / QTY / PART	QTY
DESIGNED	DRAWN	LeL	SPECIFICATION OF PART		WEIGHT (KG)	FUTURE DRG
TWINHEAVY-SYSTEM			PREVIOUS DRG			
DUAL LINE CENTRALISED			DATE 19.8.2004			
LUBRICATION SYSTEM			SCALE			
Oy SKF Ab MUIRAME FINLAND			DRAWING NUMBER			
			361215			

# SKF Multilube pumping unit

## General description

The pumping unit is designed for pumping lubricant into central lubrication system.

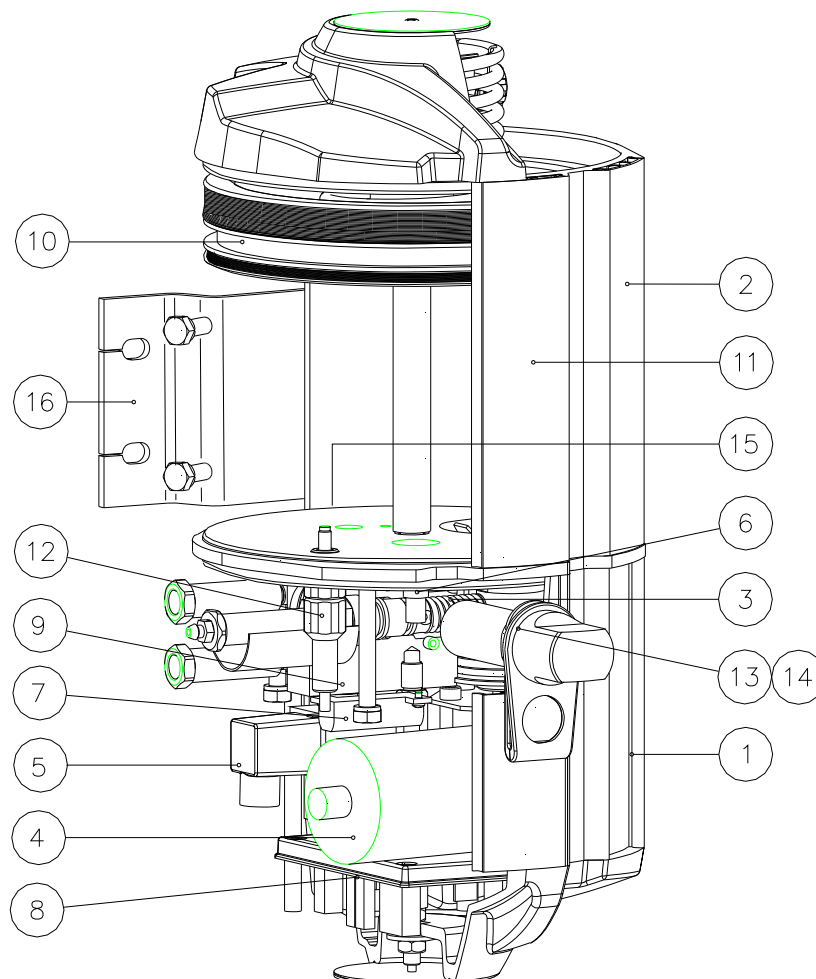
## Design

Pumping unit comprises of a body (pos. 1) and a lubricant reservoir (pos. 2).

The body comprises of a pump element (pos. 3), an electric motor (pos. 4), a line valve (pos. 5), a pressure relief valve (pos. 6) and a heating element (pos. 7). Pumping unit is controlled by a circuit board (pos. 8). (If external control is used, user interface and circuit board are replaced with relays.) Pumping unit is equipped with a pressure sensor (pos. 9) for each line which can be replaced with an external pressure control unit.

Lubricant reservoir is equipped with a follower piston (pos. 10), a level indicator (pos. 11) and a low level switch (pos. 12). Filling connector (pos. 13) of the lubricant reservoir is equipped with a filter (pos. 14) and a safety valve (pos. 15).

Pumping unit is equipped with a supporting block (pos. 16).



## Operation

When pressurization begins, the control starts the pump and opens the line valve. In pressure switch operation the pump stops, when the pressure switch closes and restarts, when the pressure switch opens. After the set pressurization time, the control stops the pump and pressure discharges from the line to the lubricant reservoir.

If the lubricant level in the reservoir drops to the low limit level during pumping, the reservoir low level switch sends an alarm to the control and pumping is stopped. The alarm can be disabled by filling the lubricant reservoir and resetting the alarm.

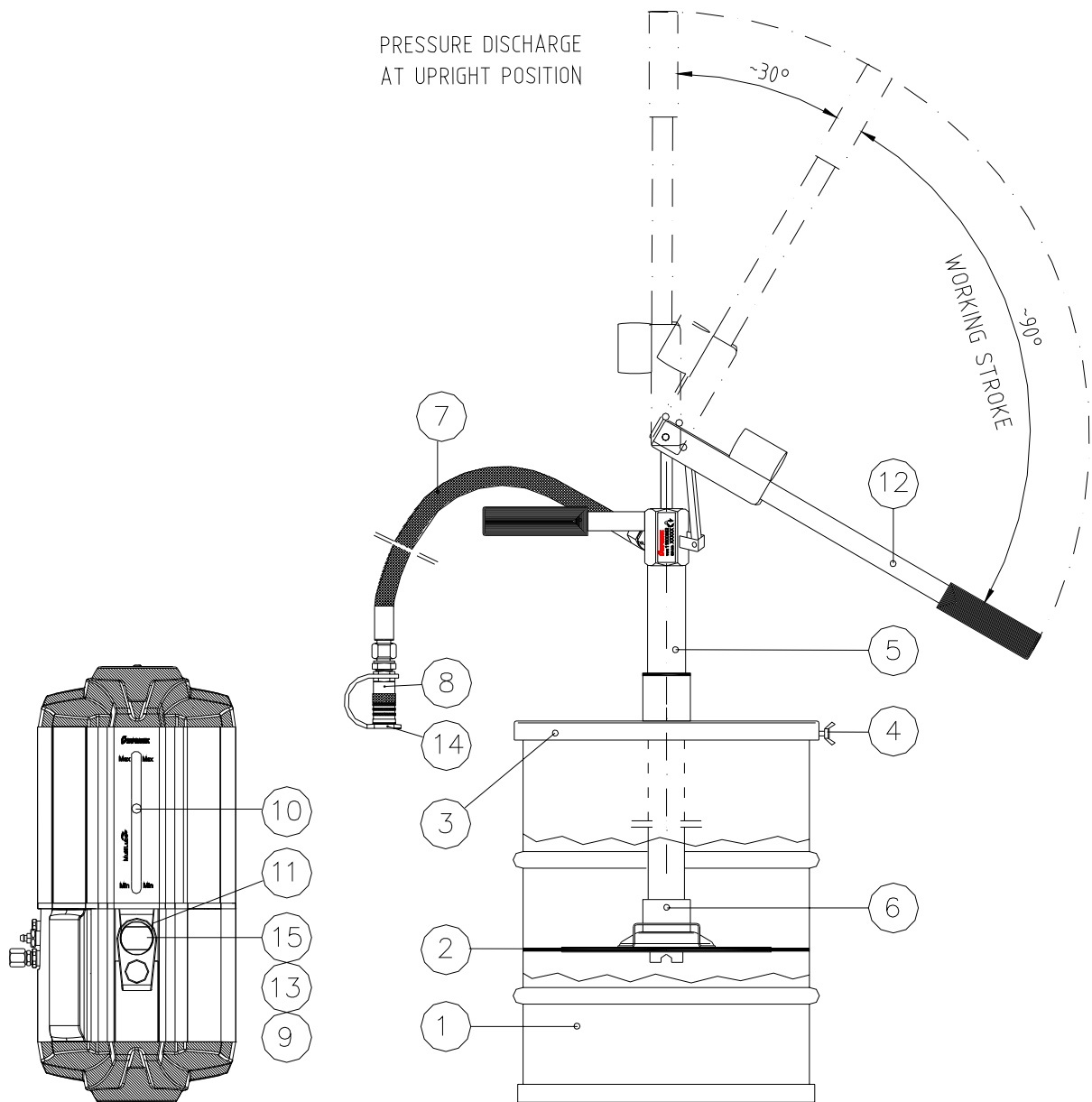
## Filling the lubricant reservoir of the pumping unit

Lubricant reservoir of the pumping unit is filled through the filling connector which is equipped with a filter.

### Use of filling device (Safematic code 11600350 or 11600352)

1. Ensure that the surroundings of the pumping unit are clean. Impurities in the system prevent trouble-free operation and cause damage when reaching the lubrication point.
2. Remove the lid from the lubricant reservoir (1) and press the follower plate (2) tightly to the reservoir above the lubricant. Follower plate is not used with fluid lubricants, as it does not remain on the surface.
3. Place the lid (3) on top of the lubricant reservoir. Fasten the lid with wing screws (4) on the lubricant reservoir.
4. Place the pump (5) through the lid into the follower plate central unit (6).
5. Connect the lubricant hose (7) to the pump.
6. Fill the lubricant hose by pumping by hand.
7. Connect the quick connector (8) to the lubricant hose.
8. Connect the quick connector to the pumping unit filling connector (9).
9. Fill the lubricant reservoir of the pumping unit by pumping slowly by hand.
10. Filling of the lubricant reservoir can be followed at the level indicator (10). To prevent overfilling, the pumping unit is equipped with a safety valve (11).
11. Turn the pump handle (12) to upright position so that pressure discharges to the lubricant reservoir.
12. Disconnect the quick connector from the pumping unit filling connector.
13. Fasten the protecting cap (13) of the pumping unit filling connector.
14. Fasten the protecting cap (14) of the filling device quick connector.

**Caution** Filter (15) of the filling connector has to be cleaned regularly and replaced if necessary.





## Removing air from the pumping unit

Remove air from the pumping unit, if there is air mixed with the lubricant e.g. in connection with the filling of the lubricant reservoir.

Removing air from the pumping unit:

1. Disconnect the main line connections.
2. Start the pumping unit.
3. Open the pumping element deaerating screw.
4. Pump until only lubricant is coming out of the deaerating screw (no air).
5. Tighten the deaerating screw.
6. Connect the main line connections.



**Figure 1.** Opening the deaerating screw

## Technical specification

	<b>4 l reservoir</b>	<b>10 l reservoir</b>
Max. output	13 g/min	13 g/min
Reservoir	4 l	10 l
Max. pressure	250 bar / 3626 psi	250 bar / 3626 psi
Operation temperature range	-30 °C ... +70 °C / -22 °F ... +158 °F	- 30 °C ... +70 °C / -22 °F ... +158 °F
Lubrication line connections	R 1/4"	R 1/4"
Lubricant	Up to NLGI 2	Up to NLGI 2
Operating voltage	12/24 VDC	12/24 VDC
Power consumption	150 W	150 W
Protection classification	IP65	IP65
Weight, (full reservoir)	16 kg / 44,1 lb	24 kg / 61,7 lb
Height of pump	448 mm / 17,64 "	688 mm / 27,09"
Width of	230 mm / 9,06 "	230 mm / 9,06 "
Depth of pump	235 mm / 9,25 "	235 mm / 9,25 "
Material	Aluminium	Aluminium

### Connections

#### Input

- pressure switch, 2 pcs, closing contact
- or pressure transmitter, 2 pcs, 4–20 mA / 0–250 bar, 2-wire type

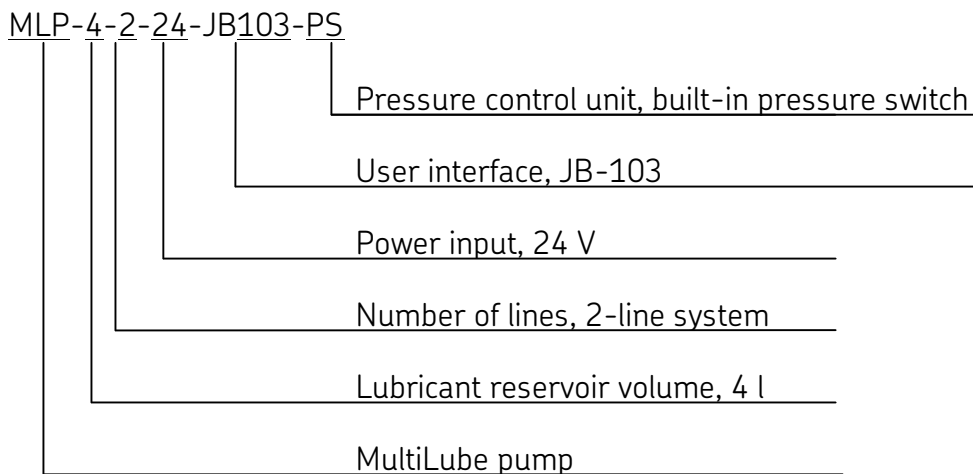
#### Output

- lubricant, 1 or 2 pcs, female thread R 1/4"

## Symbols

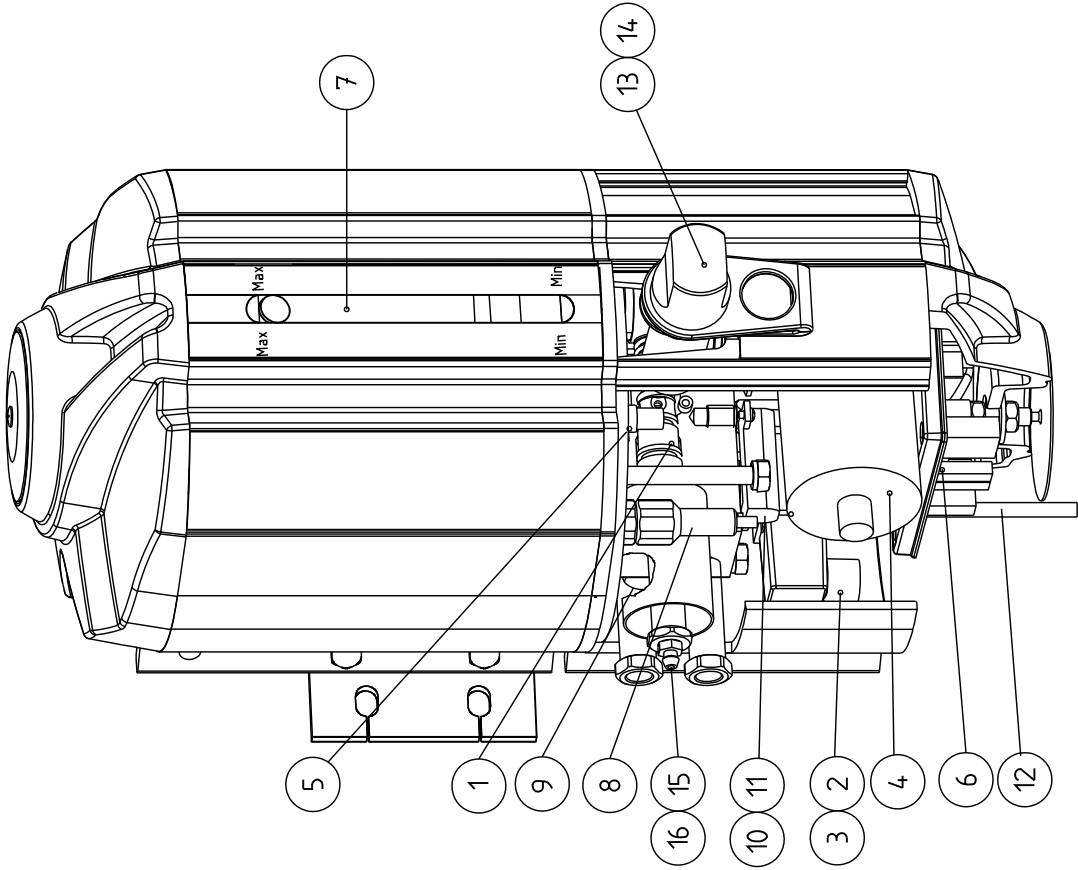
MLP – A – B –C – D –E	Abbreviation	Description
MLP	MLP	Multilube-pump
A	4	Lubricant reservoir volume, 4 l
	10	Lubricant reservoir volume, 10 l
B	1	Number of lines, 1-line system
	2	Number of lines, 2-line system
C	12	Power input 12 V
	24	Power input 24 V
D	JB-103	User interface, JB-103
	IF-103	User interface, IF-103
E	PS	Pressure control unit, built-in pressure switch
	PSE	Pressure control unit, built-in pressure sensor

Example:



## Spare parts

See MLP-pumping unit spare parts (drawing no. 361304 in the next page).



16	VENTING SCREW BPSG1-ZN	BPSG1-ZN			12407848	1
15	EXTENSION NIPPLE FOR VENTING SCREW	461727			11408620	1
14	FILLING CONNECTOR PROTECTING CAP				11400790	1
13	FILTER	461380	250 MIC		11770415	1
12	FILLING SAFETY VALVE-ML MOBE	462154			11396580	1
11	THERMOSTAT		US-602 SXRFFF 040/030		10543105	1
10	HEATING ELEMENT		CONTAINS INTERNAL WIRING SET		11500130	1
9	PRESSURE SWITCH		HPK-150 BAR		11601517	1
	PRESSURE SWITCH		HPK-120 BAR		11601512	1
8	LOW LEVEL SWITCH	462244			11770477	1
7	LEVEL INDICATOR		I=185		11771545	1
	LEVEL INDICATOR		I=365		11771548	1
6	CIRCUIT BOARD		ST-103		11500700	1
	CIRCUIT BOARD		ST-103-12V		11500705	1
5	PRESSURE RELIEF VALVE	460230			11403030	1
4	ELECTRIC MOTOR		0D.02.11-01.30-0C 24VDC		11540100	1
3	LINE VALVE COIL		0D.02.11-01.30-0B 12VDC		11601065	1
	LINE VALVE COIL		0D.14.40.58-30-00		11601066	1
2	LINE VALVE BODY				11600964	1
1	PUMP ELEMENT				11771032	1
ITEM	DESCRIPTION	DETAIL DRAW	MATERIAL	DIM.PART	CODE / QTY / PART	QTY
			MATERIAL DESCRIPTION		(WEIGHT KG)	
			SPECIFICATION OF PART			
DESIGNED: KUV	DRAWN: KUV	MLP-PUMPING UNIT		PREVIOUS DRG	FUTURE DRG	
		MOBE		DATE	12.12.2006	
		SPARE PARTS		SCALE	DRAWING NUMBER	
					361304 A	

OY SKF AB  
MUURAME  
FINLAND



## B-doser groups, Heavy-system

### General description

<b>Note</b>	Numbers in brackets are part numbers of drawings 461780 in the page 16.
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A doser group consists of a mounting rail (pos. 1) and one or several dosers (pos. 2) fastened to it. The mounting rail divides the lubricant to the dosers, which feed the adjusted amount of lubricant to the lubrication points.

### Design

The doser includes a charging valve (pos. 3), a dosing chamber (pos. 4), a dosing piston (pos. 5) and a spring (pos. 6). B6 doser is equipped with a dosage adjustment screw (pos. 7).

### Operation

#### B-doser

The pressure in the line increases during pressurization and the doser charging valve moves to its upper position. At the same time lubricant flows past the charging valve and moves the dosing piston to its upper position. When the dosing piston moves to its upper position, it pushes the adjusted lubricant dosage from the dosing chamber to the lubrication point.

After pressurization the line pressure decreases and the charging valve moves to its lower position and closes. The spring returns the dosing piston to its lower position and at the same time lubricant flows above the dosing piston to the dosing chamber.

The line can be pressurized again when the pressure in the line has decreased and the dosing pistons of the dosers have returned to the lower position.

#### The unfastening and fastening of dosers

The dosers are unfastened and fastened with a socket wrench.

<b>Caution</b>	When changing the dosers, make sure that there is no pressure in the system.
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## Adjustments

Adjustments of B6-doser

1. Turn open the pipe connector of the doser's lubrication piping outlet.
2. Turn open the locking nut in the upper part of the doser.
3. Adjust the dosage by turning the adjustment screw located above the locking nut.
4. Tighten the locking nut in the upper part of the doser.
5. Tighten the pipe connector of doser's lubrication piping outlet.

## Technical specification

Technical specifications

**Tabel 1.** Technical specifications for dosers

Quantity	Range	Unit	Description
t	-25 ... +80	°C	Operation temperature
p <sub>max</sub>	150	bar	Max. operation pressure
w x h x d	15 x 90 x 15 17 x 110 x 17	mm	B1-B5 doser dimensions, B6 doser dimensions

## Connections

Inlet, mounting rail

- lubricant (1 pc), header piping inlet, pipe connector Ø 8 mm

Outlet, doser

- lubricant (1 pc), lubrication piping outlet, pipe connector Ø 4 mm or Ø 6 mm

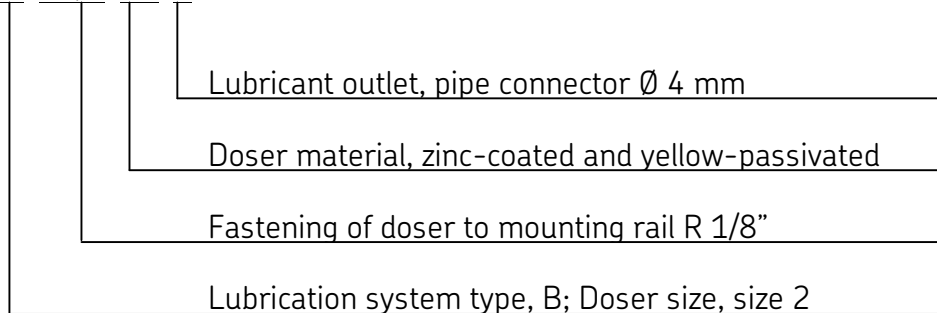
## Symbols

**Tabel 2.** The symbols of dosers

BX-xxx-Y-Z-U	Abbreviation	Description
B:	B	Lubrication system type, B
X:	1	Doser size, size 1
	2	Doser size, size 2
	3	Doser size, size 3
	4	Doser size, size 4
	5	Doser size, size 5
	6	Doser size, size 6
xxx:	R1/8	Fastening of doser to mounting rail R 1/8"
Y:	ZN	Doser material, zinc-coated and yellow-passivated steel
Z:	4	Lubricant outlet, pipe connector Ø 4 mm
	6	Lubricant outlet, pipe connector Ø 6 mm

Example:

B2-R1/8-ZN-4



**Tabel 3.** Doser codes

Doser	Code
B1-R1/8-ZN-4	11391000
B2-R1/8-ZN-4	11391050
B3-R1/8-ZN-4	11391100
B4-R1/8-ZN-4	11391150
B5-R1/8-ZN-4	11391200
B6-R1/8-ZN-4	11391250
B1-R1/8-ZN-6	11391300
B2-R1/8-ZN-6	11391350
B3-R1/8-ZN-6	11391400
B4-R1/8-ZN-6	11391450
B5-R1/8-ZN-6	11391500
B6-R1/8-ZN-6	11391255

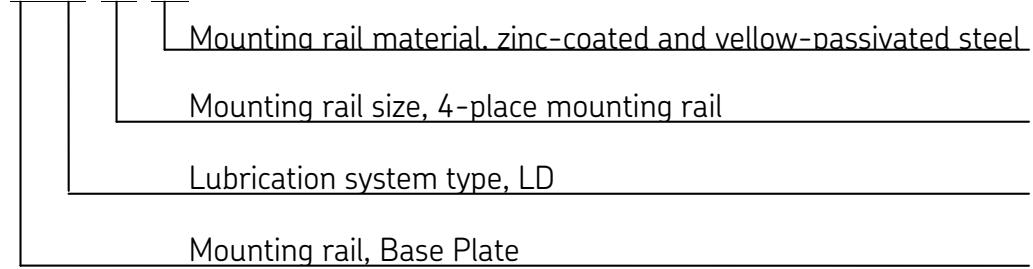
**Tabel 4.** Symbols of mounting rails

BPLD-XX-YY	Abbreviation	Description
BP:	BP	Mounting rail, Base Plate
LD:	LD	Lubrication system type, LD
XX:	02	2-place mounting rail
:	0202	4-place mounting rail, 2 places for dosers on opposite sides
	0303	6-place mounting rail, 3 places for dosers on opposite sides
	04	4-place mounting rail
	06	6-place mounting rail
	08	8-place mounting rail
	0808	16-place mounting rail, 8 places for dosers on opposite sides
YY:	ZN	Mounting rail material, zinc-coated and yellow-passivated steel
	S	Mounting rail material, stainless steel



Example:

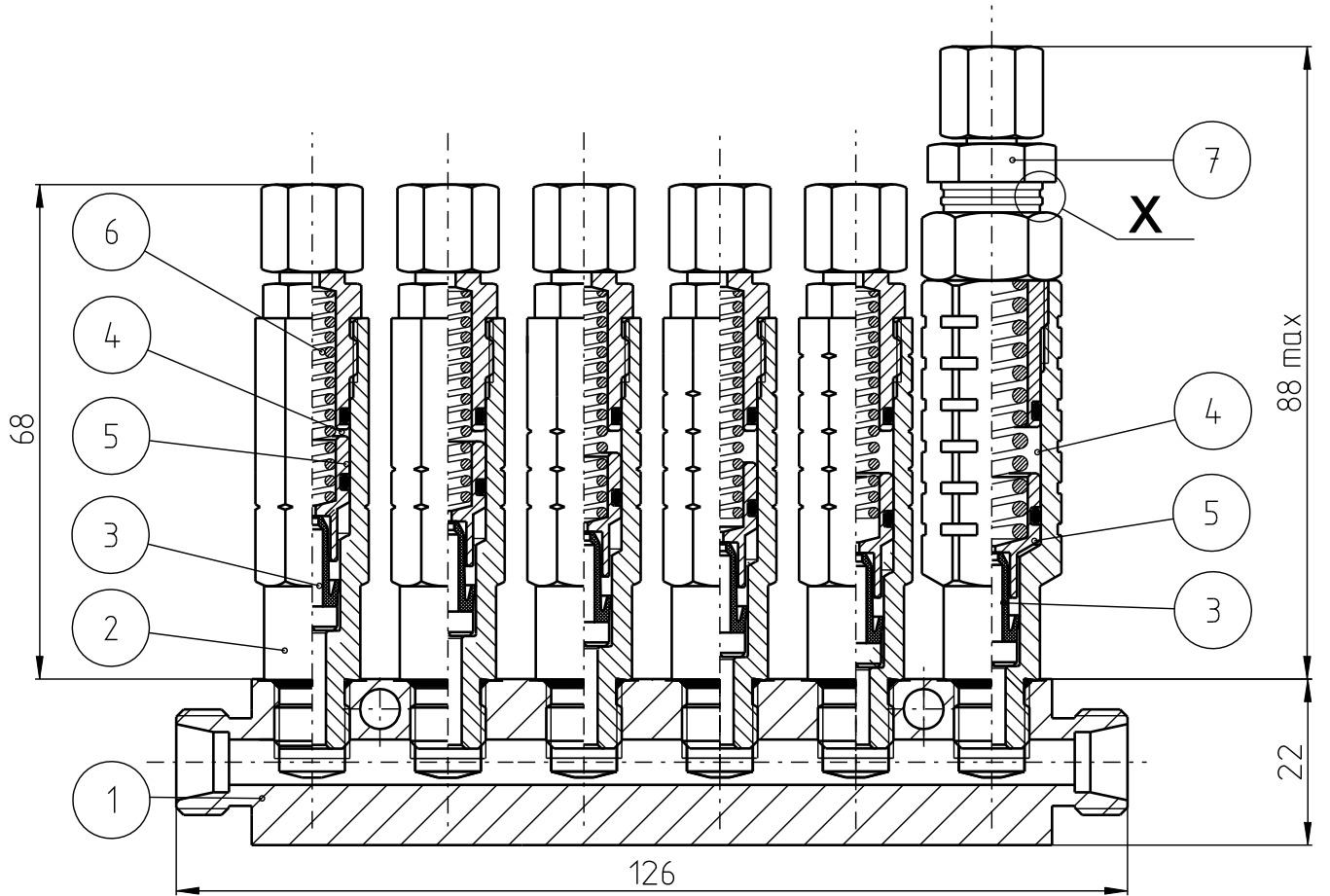
BPLD-04-ZN



Lubricant inlet, pipe connector  $\varnothing$  8 mm

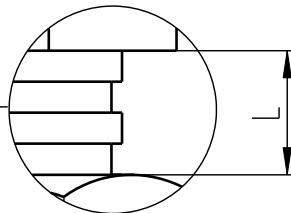
**Tabel 5.** Mounting rail codes

Mounting rail type	Code
BPLD-0202-ZN	11392310
BPLD-0303-ZN	11392320
BPLD-04-ZN	11392330
BPLD-06-ZN	11392340
BPLD-08-ZN	11392350
BPLD-0808-ZN	11392360
BPLD-02-S	11392400
BPLD-0303-S	11392750
BPLD-04-S	11392500
BPLD-06-S	11392600

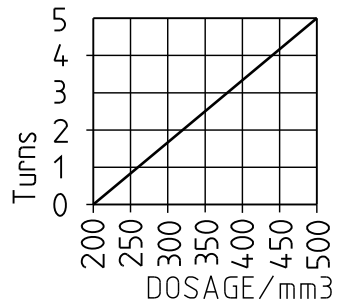


DOSAGE ADJUSTMENT B6

DETAIL X



L max. = 5 turns



DOSERS B1 - B5

MODEL	DOSAGE/mm <sup>3</sup>
B1	20
B2	50
B3	100
B4	150
B5	200

ITEM	DESCRIPTION	DETAIL DRAW	MATERIAL	DIM,PATT	CODE / QTY / PART	QTY
					(WEIGHT KG)	
SPECIFICATION OF PART						

DESIGNED	DRAWN	LeL	B-DOSERS DESIGN AND ADJUSTMENTS	PREVIOUS DRG	FUTURE DRG	
Oy SKF Ab MUURAME FINLAND				DATE	10.9.2002	SHEET/SHEETS
				SCALE	DRAWING NUMBER	461780

# SMG-dosers, Twinheavy-system

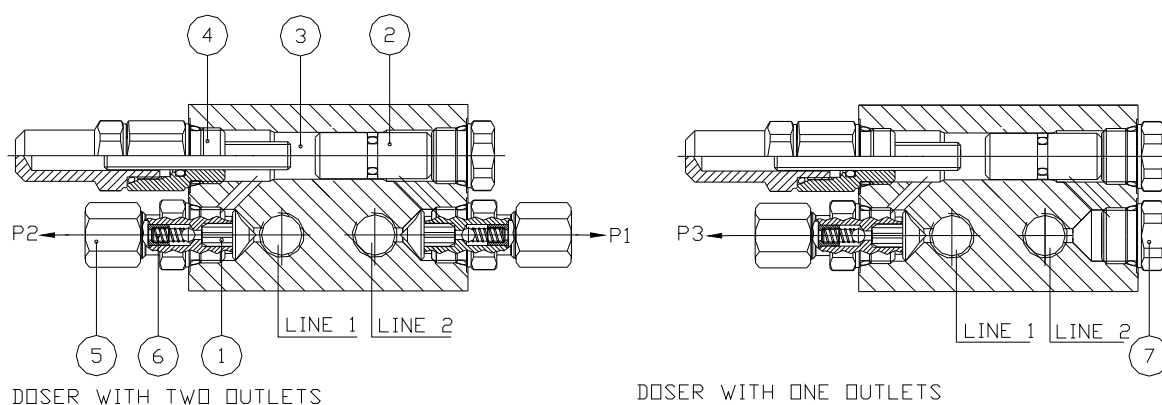
## General description

SMG-2 doser feeds the preset amount of lubricant to one to eight (1 – 8) lubrication points.

## Design

The doser includes a disk valve (pos. 1) and a dosage cylinder (pos. 3) which is equipped with sealed piston (pos. 2). The movement of the piston is adjusted with the adjusting screw (pos. 4).

The doser lubrication outlet connections (pos.5) are equipped with check valves (pos. 6). The design of the dosers makes it possible to feed small amounts of lubricant from dosers.



## Operation

### Dosers with two outlets

During normal sequential operation, dosers with two outlets feed lubricant to opposite sides of the outlet connections.

The pressure in the line 1 increases during pressurization and the disk valve moves to its extreme position, whereupon the lubricant moves the piston. When the piston moves, it pushes the lubricant through the check valve to the lubrication pipe or lubrication hose and further to the lubrication point P1.

When the pumping starts again, the check valve directs the lubricant to line 2, whereupon the lubricant is directed to the opposite side of the piston. When the piston moves, it pushes the lubricant through the check valve and further to the lubrication point P2.

## Dosers with one outlet

The doser with two outlets is modified to doser with one outlet by removing the disk valve and the lubrication outlet connection and replacing them with blocking plug (pos. 7).

During normal sequential operation, doser with one outlet feeds the lubricant in turns to lubrication outlet connection and to one of the main lines.

The pressure in the line 1 increases during pressurization and the disk valve moves to its extreme position, whereupon the lubricant moves the piston. When the piston moves, it pushes the lubricant to the line 2.

When the pumping starts again, the check valve directs the lubricant to line B, whereupon the lubricant is directed to the opposite side of the piston. When the piston moves, it pushes the lubricant through the check valve and further to the lubrication point P3.

## The unfastening and fastening of the doser

<b>Caution</b>	When changing the dosers, make sure that there is no pressure in the system.
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## Adjustment

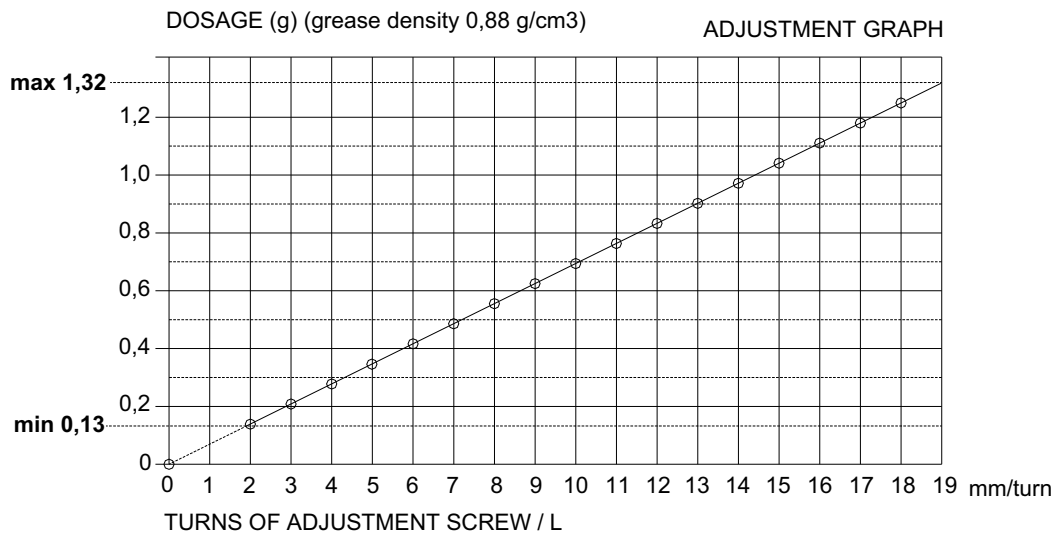
### General

The lubricant dosage is adjusted by changing the movement of the piston with the adjusting screw.

### Doser adjustments

SMG-dosers are adjusted with an allen screw, which is located inside of a metal cover. The other end of the allen screw is located in the dosage cylinder, so the adjustment affects direct to the piston.

1. Make sure that there is no pressure in the lines.
2. Remove the metal cover.
3. Turn the allen screw to its closing position.
4. Look at the adjustment graph for the number of adjustment screw turns that correspond to the desired lubrication dosage.
5. Turn the adjustment screw outward as many turns as instructed from the doser body.
6. Replace the cover.



## Technical specification

### Technical specifications

**Tabel 6.** Technical specifications of a doser group

Value	Range	Unit	Description
t	-35 ... +80	°C	Operation temperature range
p <sub>max</sub>	200	bar	Max. pressure

### Connections

Input and output connections are in the doser body.

#### Input

- lubricant (2 pcs), main line inputs, female thread R 1/8"

#### Output

- lubricant (2 pcs), main line outputs, female thread R 1/8"
- lubricant (2-4 pcs), lubrication piping outputs, 1-4 pcs in both sides, outlet connection Ø 6 mm.

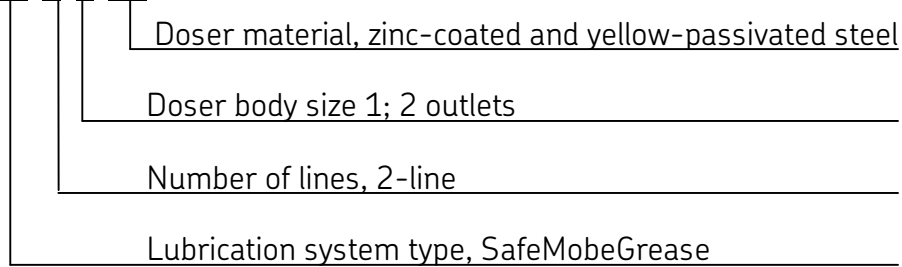
## Symbols

**Table 7.** The symbols of dosers

<b>SMG-X-Y-zz</b>	<b>Abbreviation</b>	<b>Description</b>
SMG:	SMG	The type of the lubrication system, SafeMobeGrease
X:	2	Number of the lines, dual line
Y:	1	Doser body size 1; 2 outlets
	2	Doser body size 2; 4 outlets
	4	Doser body size 4; 8 outlets
zz:	ZN	Doser material, zinc-coated and yellow-passivated steel

Example:

SMG-2-1-ZN

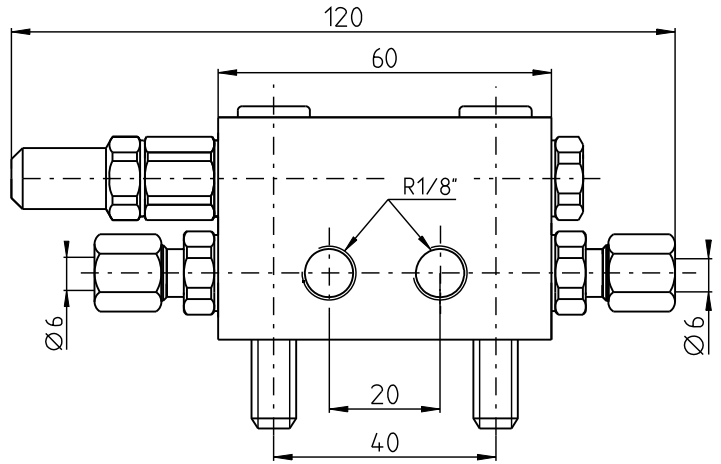
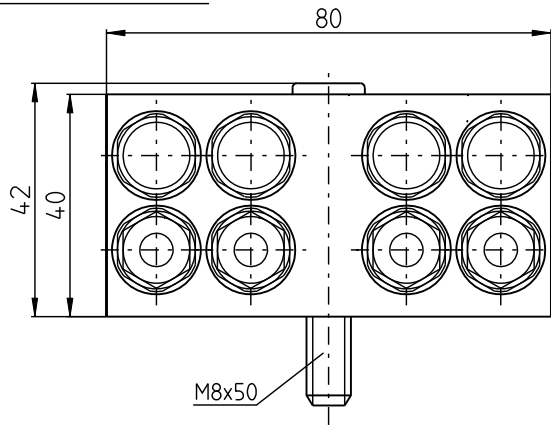


Lubricant outlet: pipe connector  $\varnothing$  6 mm

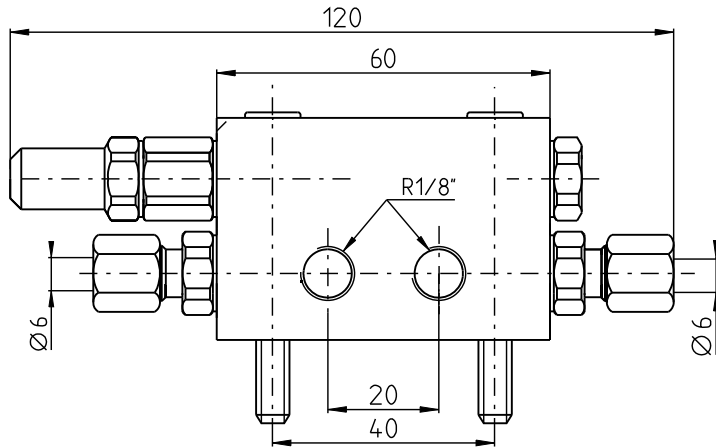
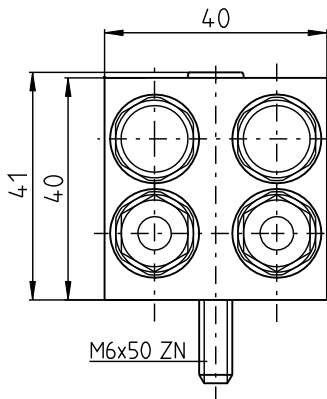
## Spare parts

See *SMG-doser spare parts (drawing 461812)*.

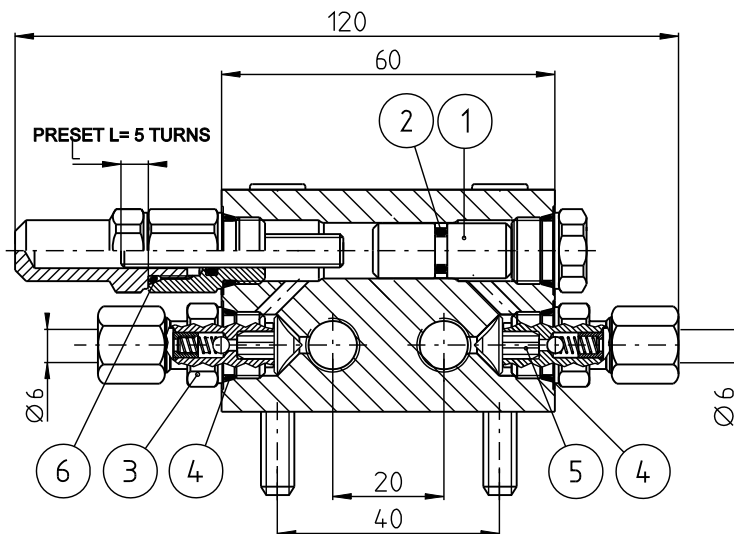
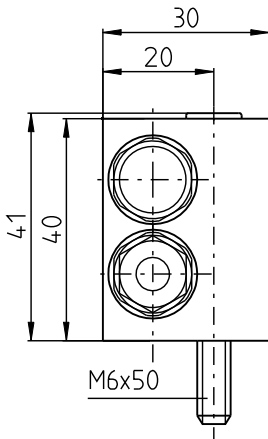
# SMG-2-4-ZN



# SMG-2-2-ZN



# SMG-2-1-ZN



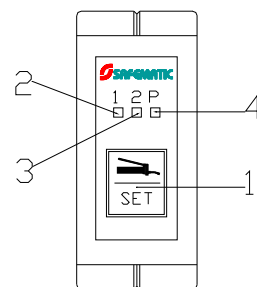
## REPAIRING KIT, CODE 11391520:

ITEM	DESCRIPTION	DRAWING NUMBER	CODE	PCS
1	PISTON SMG	461319	11408266	1
2	SHAMBAN SEAL PT-0000100-T46		11681740	1
3	OUTLET CONNECTOR SMG	461318	11770420	2
4	O-RING 10,1 X 1,6		12680150	2
5	DISC VALVE SMG	461323	11771480	2
6	O-RING 9,1X1,6		11680200	1

ITEM	DESCRIPTION	DETAIL DRAW	MATERIAL	DIM,PATT	CODE / QTY / PART	QTY
			MATERIAL DESCRIPTION		(WEIGHT KG)	
			SPECIFICATION OF PART			
DESIGNED	DRAWN LeL	SMG-2 DOSERS SPARES, DIMENSIONS REPAIRING KIT		PREVIOUS DRG	FUTURE DRG	
Oy SKF Ab MUURAME FINLAND				DATE 27.10.2003	SHEET/SHEETS	
				SCALE	DRAWING NUMBER	461812 A

## Operation of user interface JB-103

There are a SET-button and three LED-signals 1, 2 and P on the user interface JB-103.



### Normal functions

#### Button for lubrication

Depending on the lubrication program status the SET-button can be used for different functions:

Lubrication program status	Functions
Lubrication interval	Extra lubrication
Pressurization	Interruption of pressurization
Alarm	Alarm reset

#### LED-signals

When the power is on at the pump, one of the LED-signals 1, 2 or P (pos 2, 3 or 4) is always lit.

Status.	Function
LED-signal 1 is lit.	Lubrication interval, line 1 has been pressurized last.
LED-signal 2 is lit.	Lubrication interval, line 2 has been pressurized last.
LED-signals 1 and P are lit.	Pressurization is in progress in line 1.
LED-signals 2 and P are lit.	Pressurization is in progress in line 2.
LED-signals 1 and 2 are lit.	There is a waiting time of 30 seconds between an extra pressurization in line 1 and in line 2. or if the button for an extra lubrication is pressed immediately after an automatic lubrication.
Led-signal 1 is flashing.	Pressure alarm in line 1
LED-signal 2 is flashing.	Pressure alarm in line 2
LED-signal P is flashing.	Reservoir low level alarm
None of the LED-signals is lit.	The timer is turned off or there is a cable fault.

#### Note

If the power is switched off during pressurization, LED-signal 2 is lit for 10 s when the power is switched back on. This ensures that there is no pressure in the system when the pump starts.



## Functions

With SET-button lubrication interval, maximum pressurization time and the number of lines line, 1 or 2 (heavy or twinheavy lubrication system) can be set.

### Setting the lubrication cycle

Press the SET-button for about 5 seconds in normal operation mode until the LED-signal 1 begins to flash quickly.

Now lubrication interval can be set.

The LED-signal P shows the current value of the lubrication cycle. P flashes 1...10 times. After that there is a pause of 2 seconds and P will again flash 1...10 times. The current set value of the lubrication cycle can be found in the following table.

Flashes	Lubrication cycle minutes)
1	5
2	10
3	15
4	20
5	30
6	45
7	60
8	80
9	100
10	120

Setting of lubrication cycle changes from smaller to bigger by pressing the button according to the table. After reaching the biggest reading unit, start again from the beginning of the table.

Return from the setting mode of lubrication cycle and save a new setting by pressing the SET-button for 5 seconds until all three LED-signals are lit.

<b>Note</b>	To exit setting mode without saving settings, switch off operating voltage for Multilube for a moment.
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### Setting the maximum pressurization time

Press SET-button for 10 seconds in normal operation mode until the LED-signal 2 begins to flash quickly.

Now max. pressurization time can be set. The number of flashes of LED-signal P shows the current lubrication cycle according the following table.

Flashes	Max pressurization time (minutes)
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

Setting of pressurization time changes from smaller to bigger by pressing the button. After reaching the biggest reading unit, start again from the beginning of the table.

Return from setting mode of pressurization time and save a new setting by pressing the SET-button for 5 seconds until all three LED-signals are lit.

<b>Note</b>	To exit setting mode without saving settings, switch off operating voltage for Multilube for a moment.
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### Setting of the lubrication system

Press SET-button for 15 seconds in normal operation mode until the LED-signals 1 and 2 begin to flash quickly.

Now you can select the lubrication system. Single- or dual-line lubrication system can be selected.

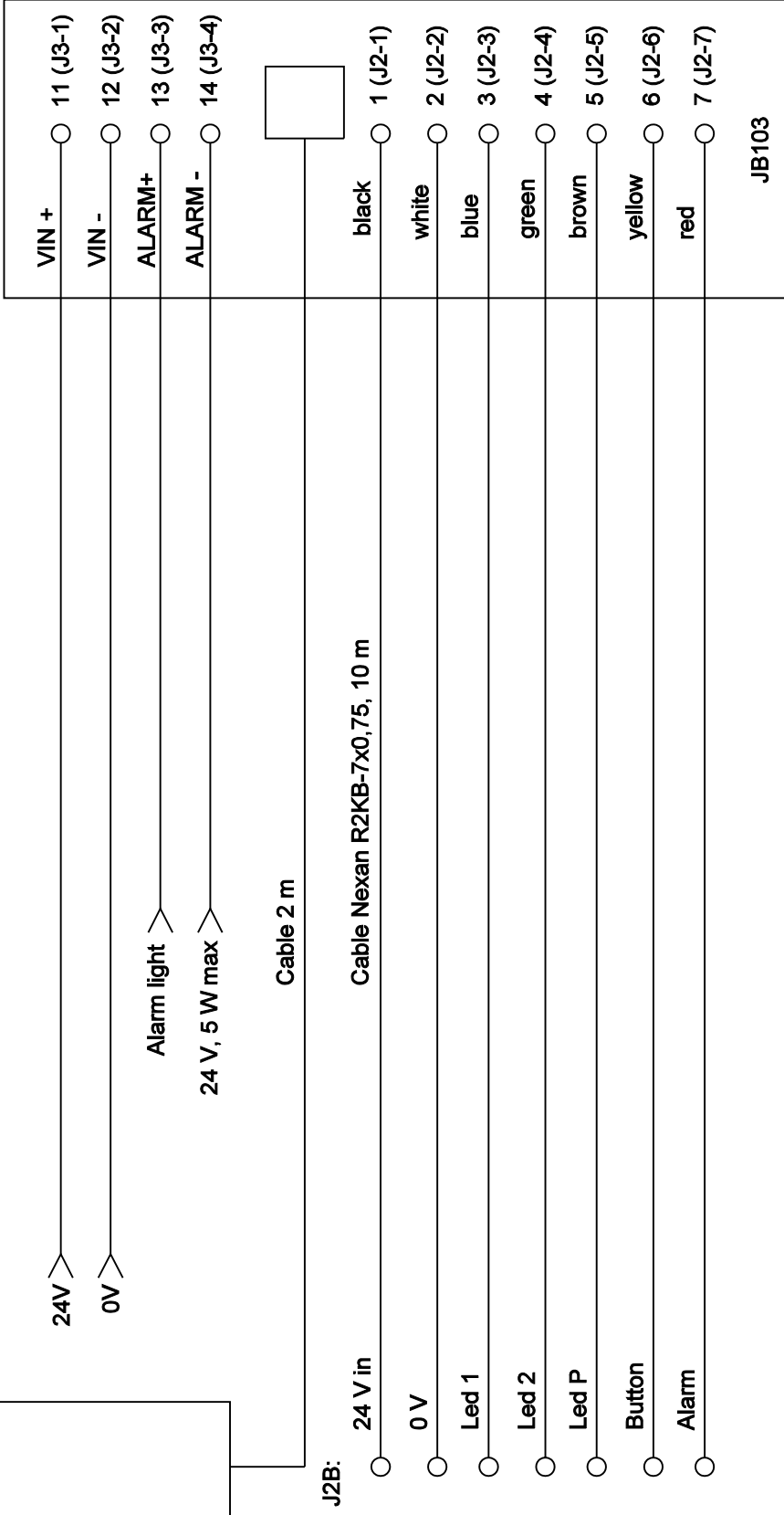
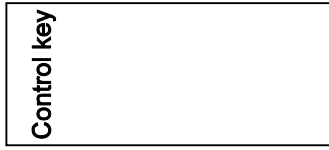
When the single-line system is selected P LED-signal flashes once and alternatively when the dual-line system is selected P LED-signal flashes twice before a pause for 2 seconds. The system can be selected with the button.

Return from setting mode of lubrication system and save a new setting by pressing the SET-button for 5 seconds until all three LED-signals are lit

<b>Note</b>	To exit setting mode without saving settings, switch off operating voltage for Multilube for a moment.
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### Settings, general

If the button is left in the setting mode, it returns to normal mode automatically after 3 minutes without saving new settings.



J2B Bulgin PX0746/S/07

JB103: J2 and J3 joining by screws

ITEM	DESCRIPTION	DETAIL DRAW		MATERIAL	DIM/PAT	CODE / QTY / PART	QTY
		SPECIFICATION OF PART		MATERIAL DESCRIPTION		(WEIGHT KG)	
RESERVED	RM/0	DRAWN	JPK	ELECTRIC CONNECTIONS, CABIN			PREVIOUS DRG
				MULTITUBE			DATE 20.12.2005
				OY SKF AB MUURAME FINLAND			SHEET/SHEETS
				SCALE			DRAWING NUMBER
							361303

# Multilube-system monitoring

## General

Daily inspections

- control unit for trouble-free operation

Monthly inspections

- check piping in locations which are exposed for external damages

Annual inspections (more often if needed)

- cleaning of the filter of the filling connector

## Doser inspections

Check the dosers after approximately one (1) month after system start-up and after that check depending on the operating conditions, but at least after every 6 months. Check for potential excessive or insufficient lubrication and adjust dosers, if necessary.

### SMG dosers

#### Steps

1. Disconnect the lubrication pipes and hoses from the lubrication points.
2. Pressurize the lines.
3. Check that lubricant comes out of the lubrication pipes and hoses.
4. Connect the lubrication pipes and hoses to the lubrication points.

*If lubricant does not come out of lubrication pipes or hoses, see Multilube / Troubleshooting.*

### B-dosers

#### Steps

1. Disconnect the lubrication pipes and hoses from the lubrication points.
2. Pressurize the line.
3. Check that lubricant comes out of the lubrication pipes and hoses.
4. Connect the lubrication pipes and hoses to the lubrication points.

*If lubricant does not come out of lubrication pipes or hoses, see Multilube / Troubleshooting.*

## Choosing the lubricant

Traditionally, equipment or bearing manufacturers recommend a lubricant based on manual lubrication. Characteristics of manual lubrication are large amounts of lubricant and long intervals between lubrications. This means that in addition to the lubricating quality, another requirement for the lubricant is durability at the lubrication point.

Characteristics of centralised lubrication are small amounts of lubricant and short intervals between lubrications with each lubrication point fed separately. In this case, choose the lubricant according to the basic oil viscosity, additives and thickening agent recommended by the manufacturer while ensuring that the lubricant can be pumped at the operating temperature and that its pressure tolerance is adequate.

A lubricant fed with short intervals also removes impurities very efficiently from the lubrication point. New lubricant displaces the used grease and the moisture, dirt and wear remains it has collected.

A lubricant is composed of basic oil, thickening agent and additives. The basic oil, forming the majority of the composition of a lubricant, determines the properties of the lubricant. The basic oil together with the thickening agent determines the rheological properties of the lubricant. (Rheology = a science dealing with the deformation and flow of matter.) The viscosity of the basic oil is a temperature-dependent magnitude that indicates the fluidness of liquid: the smaller the viscosity value, the more fluid the basic oil is.

By choosing the correct lubricant and lubrication system settings, you can also prevent semi-fluid lubricant from running out from the lubrication point. For Safematic HEAVY lubrication systems, we recommend grade NLGI 00 - 1 lubricants in summer and grade NLGI 00 - 0 lubricants in winter. For Safematic TWINHEAVY systems, we recommend max. grade NLGI 2 lubricants in summer and max. grade NLGI 1 lubricants in winter.

When choosing a lubricant, you should pay attention to the viscosity of the basic oil and the high quality of the lubricant in addition to the NLGI classification.

### **Note**

Check the lubricant requirements from the manufacturer of the vehicle and the properties of the lubricant from the lubricant manufacturer. Note that in addition to the application, also operating temperature, rotation speed and operating environment are relevant factors in choosing the lubricant. For more information on pumping of different lubricants, contact Oy SKF Ab.

# SKF Multilube-system troubleshooting

## System troubleshooting

### User interface does not operate

Operation disturbance	Cause of operation disturbance	Solution
Display and LED signals of user interface are not lit.	No supply voltage on pumping unit.	Check supply voltage.

### User interface triggers an alarm

Operation disturbance	Cause of operation disturbance	Solution
The P LED-signal of user interface is blinking	Lubricant reservoir is empty.	Fill the lubricant reservoir. Reset the alarm.
The LED-signal <b>1</b> or <b>2</b> for line is blinking at the user interface.	Header piping leaks.  There is air in the pumping unit or in the header piping.  Wrong lubricant.	Locate and repair the leakage.  Remove air from the pumping unit or from the header piping. Reset the alarm.  <i>See " choosing the lubricant "</i>

A lubrication point gets too little lubricant or nothing at all

Operation disturbance	Cause of operation disturbance	Solution
The rotation of the bearing makes noise, is trembling or the temperature is rising.	The dosage adjustment of the doser is too small.	Increase the dosage.
Doser does not operate	The lubrication point has clogged.  Lubrication pipe or hose has clogged.  The doser is damaged.	Clean the lubrication point.  Clean or replace lubrication pipe or hose.  Replace the doser.
Grease leakage in the area of lubrication piping.	Lubrication piping between the doser and lubrication point is damaged.	Check and repair the lubrication piping.

A lubrication point gets too much lubricant

Operation disturbance	Cause of operation disturbance	Solution
Considerable grease leakage in the lubrication point.	The dosage adjustment of the doser is too large.	Adjust the dosage to a smaller amount.
The temperature of the bearing rises.	The doser is damaged.	Replace the doser.

## Warnings

<b>Caution</b>	The lubrication disturbances of the critical lubrication points must be repaired immediately, since inadequate lubrication rapidly damages the equipment or machinery being lubricated.
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<b>Note</b>	In the event that the operation disturbance can not be repaired with the help of these instructions, please contact the supplier immediately.
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## Contact information

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