SKF Electro-pneumatic Barrel Pump – EPB-Pump-ECO

(Original operating and maintenance instructions according to EU Directive 2006/42/EC)

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1 EC Declaration of incorporation

Original declaration of incorporation for partly completed machinery (Machinery Directive 2006/42/EC, Annex II, part 1, section B)

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Person authorised to compile the relevant technical documentation:
Technical Manager and Product Manager, Centralized Lubrication Systems, Muurame Unit.

Herewith declares that for the partly completed machinery:

SKF Electro-pneumatic Barrel Pump
SKF-EPB-PUMP-X/X-XXX

- The following essential requirements of the Machinery Directive 2006/42/EC are applied and fulfilled: 1.1.2. 1.1.3, 1.1.5, 1.1.6, 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.6, 1.3.1, 1.3.2, 1.3.4, 1.3.7, 1.5.1, 1.5.4, 1.5.6, 1.5.7, 1.5.13, 1.6.1, 1.6.2, 1.6.3, 1.6.4, 1.7.1, 1.7.2, 1.7.3, 1.7.4

The relevant technical documentation is compiled in accordance with part B of Annex VII of the Machinery Directive and that this documentation or parts hereof will be transmitted by post or electronically in response to a reasoned request by the national authorities.

- And that this partly completed machinery is in conformity with the provisions of the following other EC-Directives:
  - EMC directive 2004/108/EC

- And furthermore, declares that this partly completed machinery complies with the following European harmonised standards:
  - Machinery Directive 2006/42/EC: EN ISO 12100-1/A1, EN ISO 12100-2/A1
  - EMC Directive 2004/108/EC: EN 61000-6-4:2007, for emissions; EN 61000-6-2:2005, for immunity

This partly completed machinery must not be put into service until, where appropriate, the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive 2006/42/EC.

Muurame — *Place*
December 14, 2012 — *Date*

Tuomo Helminen
General Manager

	**Warning** Read and follow the safety precautions and general instructions in this manual and also in the SKF manual *"Safety and general instructions for lubrication systems."* Failure to follow these instructions could result in serious injury or damage to the lubrication system or the equipment that is lubricated.

2 General description

SKF-EPB-Pump-ECO is an electro-pneumatic barrel pump, in which the traditional mechanical valve control has been replaced with an electronic control. The main purpose of the pump is to feed lubricant into a centralized lubrication system. The pump can also be used as a separate transfer or filling pump. In such a case, it must be connected to a separate 24 V power supply and a pressure air supply.

The pump is connected to a follower plate placed inside the lubricant barrel. This allows the pump to follow the lubricant level. A complete pumping set consists of a pump, a lid set and a pressure air regulator. A separate installation kit is required for installing the pump in an existing system. The installation kit contains components to adapt the existing pneumatic and electrical connections to the EPB-pump.

Note!	The SKF-EPB-Pump-ECO is intended for use with ECO lid sets, which are suitable for greases in NLGI grades 1 and 2.

3 Design

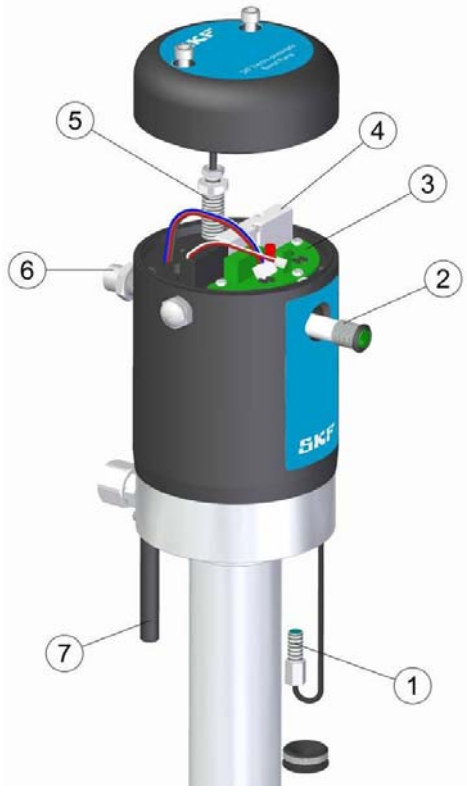


Figure 1 SKF-EPB-PUMP-ECO barrel pump

Position	Description
1	Inductive sensor
2	LED lamp
3	Circuit board
4	Pneumatic valve
5	Inductive sensor
6	M12 connector
7	Low level switch

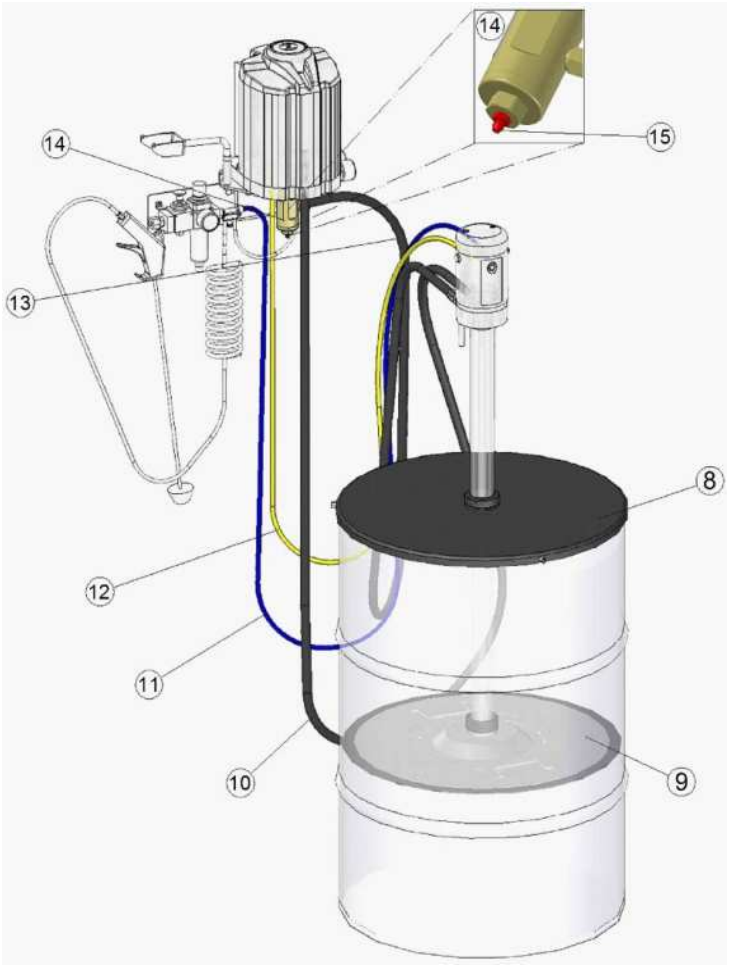


Figure 2 MAX-LIDSET-XXX-ECO-EPBP lid set

Position	Description
8	Lid
9	Follower plate
10	Tank hose
11	Pressure air hose
12	M12 cable
13	Pressure hose
14	Grease filter
15	Venting screw

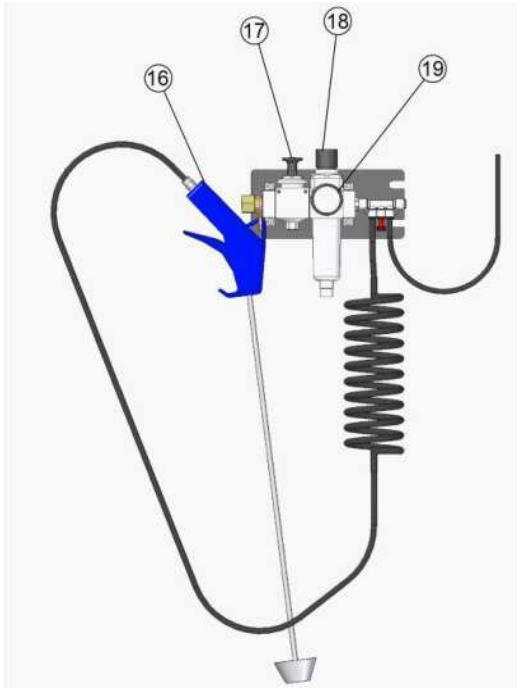


Figure 3 MAXILUBE-SET-ECO-EPBP pressure air regulator

Position	Description
16	Pressure air gun
17	Shut-off valve
18	Pressure regulator
19	Pressure gauge

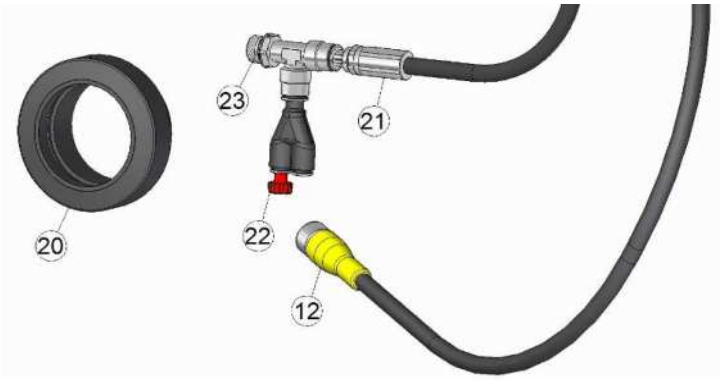


Figure 4 INSTALLATION KIT ECO-EPBP
installation kit

Position	Description
12	M12 cable
20	Barrel nut G2
21	Pressure air hose for the pump
22	Plug
23	Pressure air connector
	Plug **(→ Figure 14, page 18)**
	Wiring set **(→ Figure 18, page 20)**
	Installation kit SG-2102 **(→ Figure 26, page 26)**

4 Operation

The pump is operational when the power supply is connected and the green LED-signal is lit. The pump's operation is controlled by an internal circuit board. Signals sent by inductive sensors control the operation of the pneumatic valve. The sensors identify the direction of movement of the air motor piston. The pump is equipped with an integrated low level switch. The pump must be connected to a pressure air supply and a 24 VDC power supply. If the pump is used in a centralized lubrication system, power is fed through the M12 connector, either from the internal control unit of the hydraulic part or from an external control unit.

The pump can also be used as a separate transfer or filling pump. In such a case, it must be connected to a separate 24 V power supply through the M12 connector and to a pressure air supply. *See section 7.2 Connections* **(→ page 15).**

Figure 5 Warning labels on SKF-EPB-PUMP-ECO

4.1 Start-up

4.1.1 Start-up – in a centralized lubrication system

Warning Electrical connections must only be made by qualified electricians. To minimize risk of electric shock or electrocution, ensure that the pumping center is turned off before making any connections. Operating voltage must be shut off before touching electrically conductive parts or opening any parts of the system or component.

Warning Ensure that there is no pressure in the system. Before opening the grease filter, remove pressure by opening the venting screw (15) in the filter plug. Turn off the pressure air supply by lifting up the shut-off valve button (17) or set the air pressure to 0 bar using the pressure regulator (18) and the pressure gauge (19). Detach the M12 cable (12) from the pump. If the system is under pressure when the components are being disconnected or opened, the components or lubricant might be flung in the air causing injury to people or damage to the environment

Note! Ensure that the surroundings are clean. Make sure that no impurities enter the pump, the follower plate or the barrel. Impurities may cause damage to the lubrication system or to the machine or device it lubricates.

Note! The numbers in brackets indicate position numbers in Figures 1, 2 and 3 **(→ pages 2 and 3)**.

1 Check the condition of the lubricant barrel. Damage in the barrel will prevent the follower plate (9) from lowering.

2 Remove the barrel's original lid and press the follower plate closely on top of the lubricant in the barrel. Ensure that air is removed from below the follower plate and that the central unit of the follower plate is filled with lubricant.

3 Fasten the lid (8) onto the lubricant barrel with wing screws.

4 Place the pump through the lid into the central unit of the follower plate. Ensure that the pump is firmly attached to the follower plate.

5 Connect the pump to a power supply through the M12 connector (6). *See sections 7.2 Connections* **(→ page 15)** *and 7.3. Electrical connections to SKF pumping centers* **(→ page 17).** If connected to other centers, confirm that the connections comply with the center's electrical drawings.

6 Connect the pressure air hose (11) to the pressure air regulator (18) and to the pump's inlet A.

7 Using the pressure regulator (18) and the pressure gauge (19), set air pressure to 3.5–4.5 bar.

8 Connect the tank hose (10) to the pump's pressure connection (P), and the other end of the hose to the grease filter (14).

9 Start the pump at the control or pumping center.

10 Remove air from the tank hose by opening the venting screw (15) of the grease filter.

11 Stop the pump at the control or pumping center.

12 Move the tank hose to the pump's tank connection (T), and the other end of the hose to the pumping center's tank connection (T). Before attaching the hose, make sure that only grease is coming out of the hose (not air).

13 Connect the pressure hose (13) to the pump's pressure connection (P) and the other end of the hose to the grease filter (14).

14 Start the pump at the control or pumping center.

15 Remove air from the pressure hose by opening the venting screw (15) of the grease filter.

16 Stop the pump at the control or pumping center.

17 Fill the header piping with lubricant by starting the pump at the control or pumping center.

18 Stop the pump when the header piping is filled and air is removed.

19 Check the header piping for leaks by pressurizing it. Make sure that the pressure is suitable for the system and for the used piping material.

20 Using the pressure regulator (18) and the pressure gauge (19), set the air pressure of the pumping center to 3.5–4.5 bar. At this pressure, the pump feeds lubricant through its pressure connection P at a pressure of 220–290 bar (3200–4200 psi / 22–29 MPa).

4.1.2 Start-up – as a transfer or filling pump

Warning Electrical connections must only be made by qualified electricians. Operating voltage must be shut off before touching electrically conductive parts or opening any parts of the system or component.

Warning Ensure that there is no pressure in the system. Before opening the grease filter, remove pressure by opening the venting screw (15) in the filter plug. Turn off the pressure air supply by lifting up the shut-off valve button (17) or set the air pressure to 0 bar using the pressure regulator (18) and the pressure gauge (19). Detach the M12 cable (12) from the pump. If the system is under pressure when the components are being disconnected or opened, the components or lubricant might be flung in the air causing injury to people or damage to the environment

Note! The tank connection (T) and the tank hose (10) are not normally used when the pump is used as a transfer or filling pump. A separate power supply is required (24 VDC / min 0.2 A, e.g. SKF code 12381505).

Note! Ensure that the surroundings are clean. Make sure that no impurities enter the pump, the follower plate or the barrel. Impurities may cause damage to the lubrication system or to the machine or device it lubricates.

Note! The numbers in brackets indicate position numbers in Figures 1, 2 and 3 **(→ pages 2 and 3)**.

1 Check the condition of the lubricant barrel. Damage in the barrel will prevent the follower plate (9) from lowering.

2 Remove the barrel's original lid and press the follower plate closely on top of the lubricant in the barrel. Ensure that air is removed from below the follower plate and that the central unit of the follower plate is filled with lubricant.

3 Fasten the lid (8) onto the lubricant barrel with wing screws.

4 Place the pump through the lid into the central unit of the follower plate. Ensure that the pump is firmly attached to the follower plate.

5 Connect the pump to a power supply through the M12 connector (6). *See section 7.2 Connections* **(→ page 15).**

6 Connect the pressure air hose (11) to the pressure regulator (18) and to the pump's inlet A.

7 Using the pressure regulator (18) and the pressure gauge (19), set air pressure to 3.5–4.5 bar.

8 Connect the pressure hose (13) to the pump's pressure connection (P) and the other end of the hose to the grease filter (14).

9 Start the pump by turning on the power.

10 Remove air from the pressure hose by opening the venting screw (15) of the grease filter.

11 Stop the pump by turning off the power.

12 Using the pressure regulator (18) and the pressure gauge (19) set the pump's air pressure to 3.5–4.5 bar.

4.2 Replacing the lubricant barrel

4.2.1 Replacing the lubricant barrel – in a centralized lubrication system

Caution Ensure that the system is not under pressure while you are replacing a lubricant barrel. Before opening the grease filter, remove pressure by opening the venting screw in the filter plug **(→ Figure 2, pos. 15)**. If the system is under pressure when the components are being disconnected or opened, the components or lubricant might be flung in the air causing injury to people or damage to the environment.

Note! Ensure that the surroundings are clean. When replacing the lubricant barrel, make sure that no impurities enter the pump, the follower plate or the barrel. Impurities may cause damage to the lubrication system or to the machine or device it lubricates.

Note! The numbers in brackets indicate position numbers in Figures 1, 2 and 3 **(→ pages 2 and 3)**.

1 Turn off the power at the control or pumping center.

2 Turn off the pressure air supply by lifting up the shut-off valve button (17) or set the air pressure to 0 bar using the pressure regulator (18) and the pressure gauge (19).

3 Detach the M12 cable (12) from the pump.

4 Lift the pump out of the lubricant barrel and place it on the pump bracket or on a clean base. Be careful not to damage the suction head at the bottom of the pump.

5 Remove the lid (8) from the top of the barrel.

6 Turn on the pressure air supply by pressing down the shut-off valve button (17) or set the air pressure to 3.5–4.5 bar using the pressure regulator (18) and the pressure gauge (19).

7 Use the pressure air gun (16) to remove the follower plate (9) from the bottom of the barrel. Loosen the follower plate by feeding pressure air under the follower plate through the central unit.

8 Turn off the pressure air supply by lifting up the shut-off valve button (17) or set the air pressure to 0 bar using the pressure regulator (18) and the pressure gauge (19).

9 Use the handles to lift the follower plate out of the barrel.

10 Replace the old lubricant barrel with a new one.

11 Press the follower plate closely on top of the lubricant in the barrel. Ensure that air is removed from below the follower plate and that the central unit of the follower plate is filled with lubricant.

12 Fasten the lid onto the lubricant barrel with wing screws.

13 Place the pump through the lid into the central unit of the follower plate. Ensure that the pump is firmly attached to the follower plate.

14 Remove pressure from the grease filter (14) by opening the venting screw (15) in the filter plug.

15 Clean the grease filter and the filter cartridge, replace when necessary.

16 Turn on the pressure air supply by pressing down the shut-off valve button (17) or set the air pressure to 3.5–4.5 bar using the pressure regulator (18) and the pressure gauge (19).

17 Connect the M12 cable to the pump.

18 Turn on the power at the control or pumping center. Reset possible low level alarm.

19 Perform a test run.

4.2.2 Replacing the lubricant barrel – as a transfer or filling pump

Caution Ensure that the pump does not start while you are replacing a lubricant barrel. Remove pressure from the system. If the system is under pressure when the components are being disconnected or opened, the components or lubricant might be flung in the air causing injury to people or damage to the environment

Note! Ensure that the surroundings are clean. When replacing the lubricant barrel, make sure that no impurities enter the pump, the follower plate or the barrel. Impurities may cause damage to the lubrication system or to the machine or device it lubricates.

Note! The numbers in brackets indicate position numbers in Figures 1, 2 and 3 **(→ pages 2 and 3)**.

1 Turn off the pressure air supply by lifting up the shut-off valve button (17) or set the air pressure to 0 bar using the pressure regulator (18) and the pressure gauge (19).

2 Detach the M12 cable (12) from the pump.

3 Lift the pump out of the lubricant barrel and place it on the pump bracket or on a clean base. Be careful not to damage the suction head at the bottom of the pump.

4 Remove the lid (8) from the top of the barrel.

5 Turn on the pressure air supply by pressing down the shut-off valve button (17) or set the air pressure to 3.5–4.5 bar using the pressure regulator (18) and the pressure gauge (19).

6 Use the pressure air gun (16) to remove the follower plate (9) from the bottom of the barrel. Loosen the follower plate by feeding pressure air under the follower plate through the central unit.

7 Turn off the pressure air supply by lifting up the shut-off valve button (17) or set the air pressure to 0 bar using the pressure regulator (18) and the pressure gauge (19).

8 Use the handles to lift the follower plate out of the barrel.

9 Replace the old lubricant barrel with a new one.

10 Press the follower plate closely on top of the lubricant in the barrel. Ensure that air is removed from below the follower plate and that the central unit of the follower plate is filled with lubricant.

11 Fasten the lid onto the lubricant barrel with wing screws.

12 Place the pump through the lid into the central unit of the follower plate. Ensure that the pump is firmly attached to the follower plate.

13 Remove pressure from the grease filter (14) by opening the venting screw (15) in the filter plug.

14 Clean the grease filter and the filter cartridge, replace when necessary.

15 Turn on the pressure air supply by pressing down the shut-off valve button (17) or set the air pressure to 3.5–4.5 bar using the pressure regulator (18) and the pressure gauge (19).

16 Perform a test run.

5 Regular inspections

Monthly inspections

- pressure air regulator and water removal
- operation of the pump

While replacing a lubricant barrel

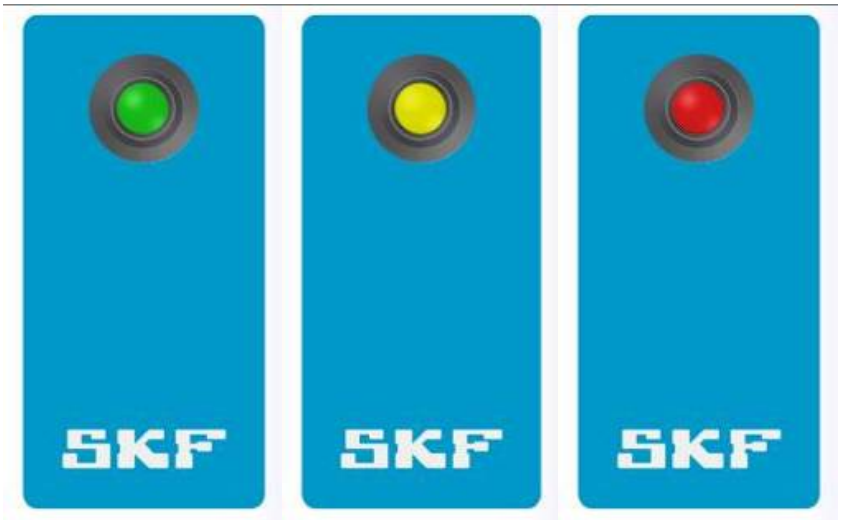
- Clean the grease filter and the filter cartridge, replace when necessary.

6 Troubleshooting

6.1 LED-signals for self-diagnostics

Self-diagnostics is an automatic function. During the first working stroke, the system checks that the piston works correctly:

- Both inductive sensors confirm movement within 5 seconds → **green** LED-signal is lit
- Only one of the sensors sends a confirmation → **yellow** LED-signal is lit. Replace the inductive sensors.
- Neither of the inductive sensors sends a confirmation → **red** LED-signal starts blinking. First, check the pressure of the pressure air supply. If the fault is not cleared, replace the inductive sensors.



6.2 Troubleshooting

Operation disturbance	Cause of operation disturbance	Solution
The pump does not start.	The pressure air supply is closed.	Turn on the pressure air supply by pressing down the shut-off valve button **(→ Figure 6, pos. e)** or set the air pressure to 3,5-4,5 bar using the pressure regulator (18) and the pressure gauge (19).
	The pressure air level is not high enough.	Check that the pressure at the pressure air regulator is 3,5-4,5 bar. Check the pressure air supply piping for leaks.
	Supply voltage is not on.	Check that the LED-signal of the pump is lit. Check that the supply voltage is on. Check that the M12 cable is connected and the condition of the M12 cable.
The pump starts but the pressure does not rise.	The pressure air level is not high enough.	Check that the pressure at the pressure air regulator is 3,5-4,5 bar. Check the pressure air supply piping for leaks.

Warning Before solving the following operation disturbances, turn off the power at the control and pumping center. Turn off the pressure air supply by lifting up the shut-off valve button **(→ Figure 6, pos. e)** or set the air pressure to 0 bar using the pressure regulator (18) and the pressure gauge (19). Before opening the grease filter, remove pressure from the system by opening the venting screw in the filter plug.**(→ Figure 7, pos. 15)**. If the system is under pressure when the components are being disconnected or opened, the components or lubricant might be flung in the air causing injury to people or damage to the environment.

Operation disturbance	Cause of operation disturbance	Solution
The pump starts but the pressure does not rise.	The grease filter has clogged.	Clean or replace the grease filter cartridge.
	There is air in the suction piping of the pump.	Remove air from the pump by opening the venting screw **(→ Figure 7, pos. 15)** of the grease filter or pressure connection (P) of the pump. Make sure that only grease is coming out of the venting screw or pressure connection (not air).
	There are impurities in the suction head of the pump.	Contact Oy SKF Ab.

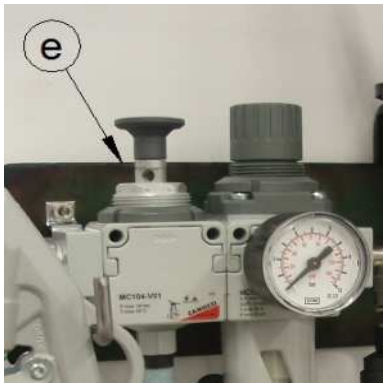


Figure 6 Shut-off valve button (e)

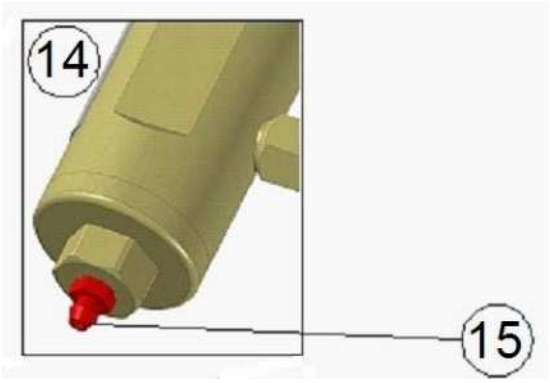


Figure 7 Grease filter (14), venting screw (15)

7 Technical data

Table 1 SKF-EPB-PUMP-ECO, technical data

Value	Unit	Description
0...+50 32...120	°C °F	Operating temperature range
300 4350 30	bar psi MPa	Maximum pressure
1:65	bar	Pressure ratio
20...32	V DC	Operating voltage
1,5	W	Power consumption
850	grams/min	Max. pump output (→ **Figure 9, page 14**)
5,5	grams/stroke	Pump output per stroke
3,5-4,5	bar	Pressure air supply
300	l/min	Max. air consumption (→ **Figure 9, page 14**)
10000	cSt	Maximum viscosity
1-2	NLGI	Lubricant grade
18 50 180	kg	Lubricant barrel size, 1/8 pump Lubricant barrel size, 1/4 pump Lubricant barrel size, 1/1 pump
6,3 7,6 8,8	kg	Weight, 1/8 pump Weight, 1/4 pump Weight, 1/1 pump
650 x 130 x 130 920 x 130 x 130 1020 x 130 x 130	mm (h x l x w)	Dimensions, 1/8 pump□ Dimensions, 1/4 pump Dimensions, 1/1 pump
Aluminium, plastic and steel		Body material
50	mm	Pump tube diameter
IP65		Protection class
80	dB	Peak noise level

Table 2 Low level switch, technical data

Value	Unit	Description
2 wire sensor, NO		Type
5...60	VDC	Operating voltage
< 5	VDC	Voltage drop
2...100	mA	Load current
0...0,5	mA	Leak current

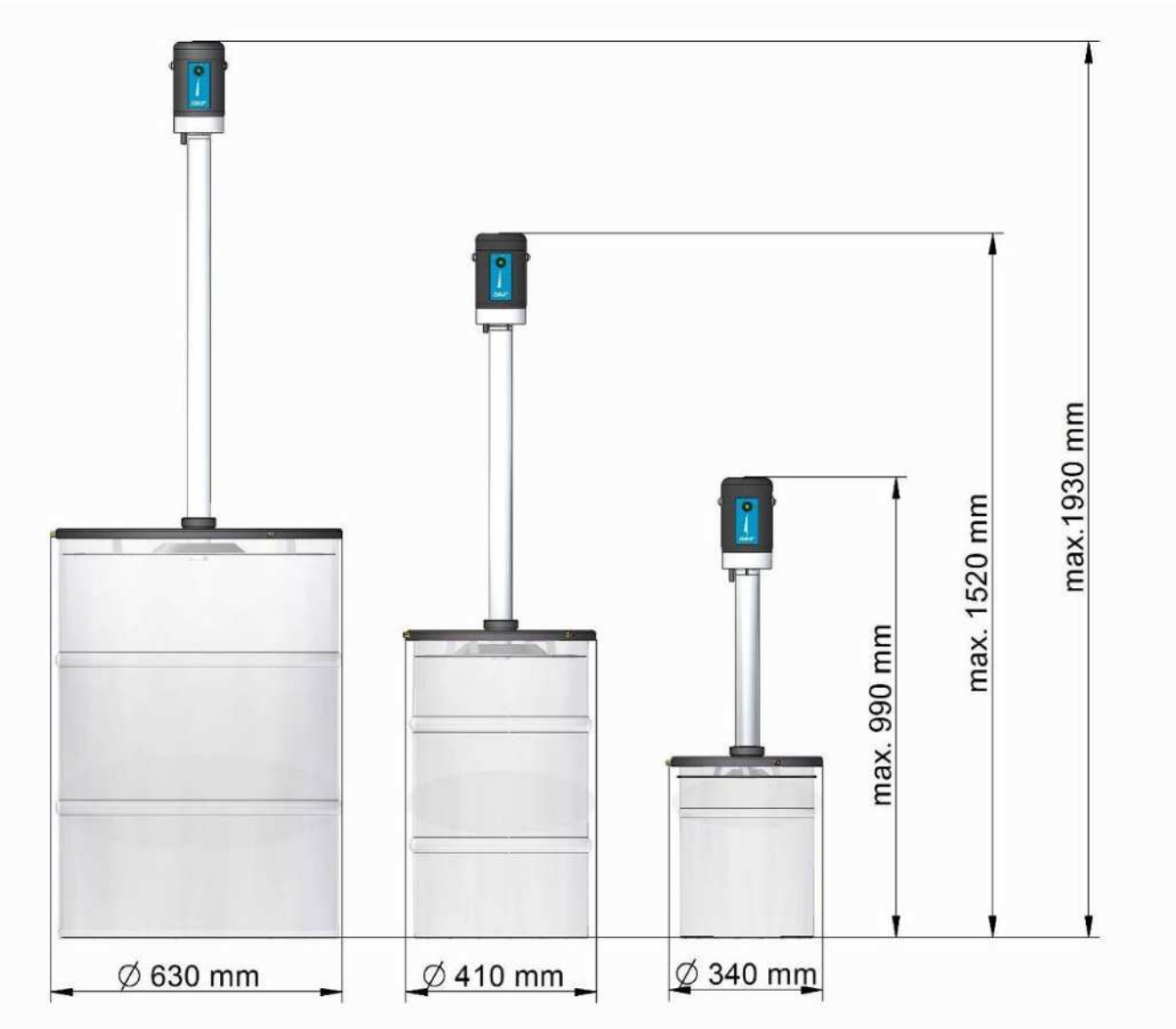


Figure 8 Dimensions, pump with barrel (1/1, 1/4, 1/8)

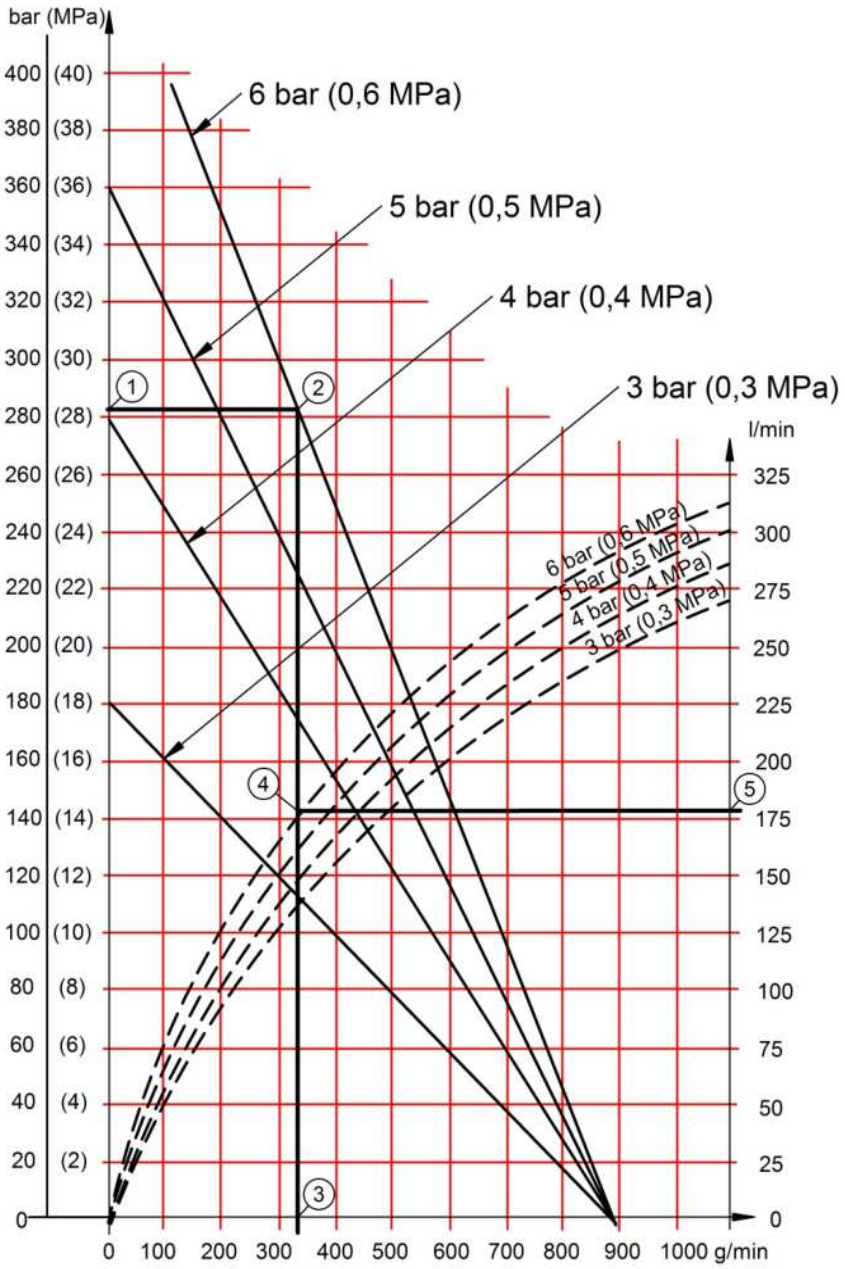


Figure 9 Pump output curve

Unit	Description
bar	Lubricant counter pressure
grams/min	Pump output
l/min	Pump air consumption

Example:
In Indication (1), the pressure air input is 6 bar, and the counter pressure (Indication 2) is 285 bar, which gives a lubricant output of 330 g/min (Indication 3). To determine the air consumption, follow the 6 bar dashed line to Indication 4 and draw a horizontal line to the air consumption scale (Indication 5; 180 l/min).

7.1 Symbols

Table 3 SKF-EPB-PUMP-ECO, symbols

SKF-EPB-PUMP-A-B	Abbreviation	Description
SKF-EPB-PUMP:	SKF-EPB-PUMP	SKF Electro-pneumatic Barrel Pump
A:	1/8	Lubricant barrel size: 18 kg
	1/4	Lubricant barrel size: 50 kg
	1/1	Lubricant barrel size: 180 kg
B:	ECO	The pump is connected to a follower plate placed inside the lubricant barrel. This allows the pump to follow the lubricant level.

Example:

SKF EPB-PUMP-1/1-ECO

- The pump follows the lubricant level
- Lubricant barrel size 1/1=180 kg
- SKF Electro-pneumatic Barrel Pump

7.2 Connections

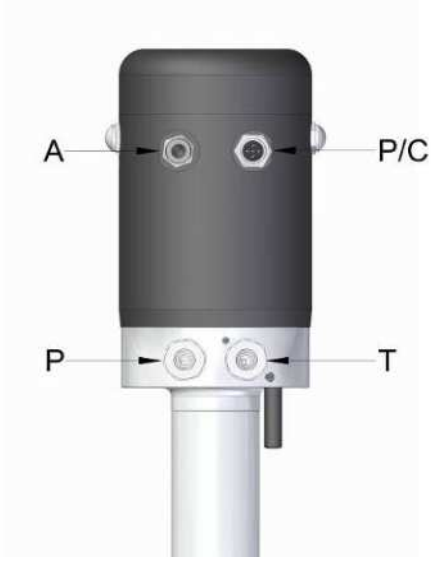


Figure 10 Connections

Hydraulic connections (P, T):

- P = pressure, lubricant outlet, pipe connector Ø 12 mm
- T = tank, lubricant inlet, pipe connector Ø 12 mm

Pressure air connection (A)

- Quick connector 8 mm, 1/4 nylon reinforced hose

Electrical connections (P/C)

- M12 connector (female)

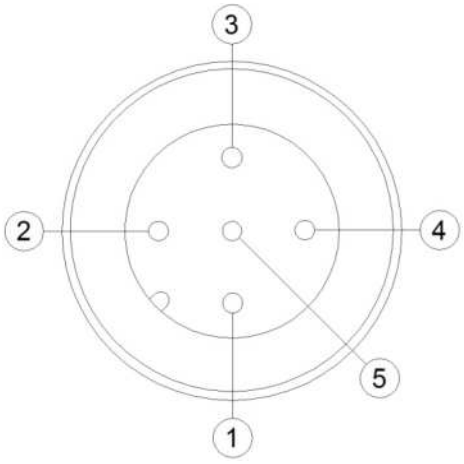


Figure 11 The pump's M12 connector

Table 4

M12 pin	M12 cable, wire colours	Description	
1	brown	low level switch	(+)
2	white	pump control	0 VDC
3	blue	pump control	24VDC
4	black	low level switch	(-)
5	grey	control (optional)	

7.3 Electrical and pneumatic connections to SKF pumping centers

7.3.1 SKF Maxilube, delivered after 1 April 2012

1 Turn off the pressure air supply by lifting up the shut-off valve button (17) or set the air pressure to 0 bar using the pressure regulator (18) and the pressure gauge (19).

2 Remove the old pump and attach the plug delivered with the installation kit to SKF Maxilube pumping center's pressure air connection (Figure 12, connection A2).

Figure 12 Pressure air connection A2

3 Connect the pressure air connector (f) delivered with the installation kit to the outlet of the pressure air regulator (e), see Figure 13.

4 Connect the following components to the pressure air connector: pressure air gun to connection (g); pressure air supply pipe of the SKF Maxilube pumping center to connection (h); and the pressure air supply hose of the EPB pump to connection (i), see Figure 13.

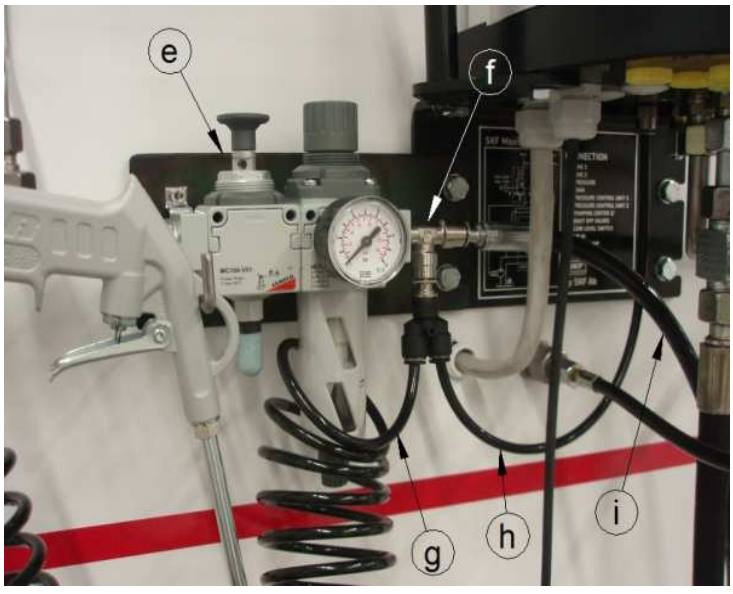


Figure 13 Pressure air connections

5 Connect the M12 cable (3 m) delivered with the installation kit to connector P/C at the pump and to connector D at Maxilube.

6 Turn on the pressure air supply by pressing down the shut-off valve button (17) or set the air pressure to 3.5–4.5 bar using the pressure regulator (18) and the pressure gauge (19).

7 Turn on the power at the control and pumping center.

7.3.2 SKF Maxilube/IF-105 pumping center, delivered prior to 1 April 2012

Warning Electrical connections must only be made by qualified electricians. To minimize risk of electric shock, operating voltage must be shut off before touching electrically conductive parts or opening any parts of the system or component.

Note! A separate installation kit **(→ Figure 4, page 4)** is needed for installing the pump in an existing pumping center (SKF code: 12381354).

1 Turn off the power at the control and pumping center.

2 Turn off the pressure air supply by lifting up the shut-off valve button (17) or set the air pressure to 0 bar using the pressure regulator (18) and the pressure gauge (19).

3 Remove the old pump and attach the plug delivered with the installation kit to SKF Maxilube pumping center's pressure air connection (Figure 14, connection A2).

Figure 14 Pressure air connection A2

4 Connect the pressure air connector (f) delivered with the installation kit to the outlet of the pressure air regulator (e), see Figure 15.

5 Connect the following components to the pressure air connector: pressure air gun to connection (g); pressure air supply pipe of the SKF Maxilube pumping center to connection (h); and the pressure air supply hose of the EPB pump to connection (i), see Figure 15.

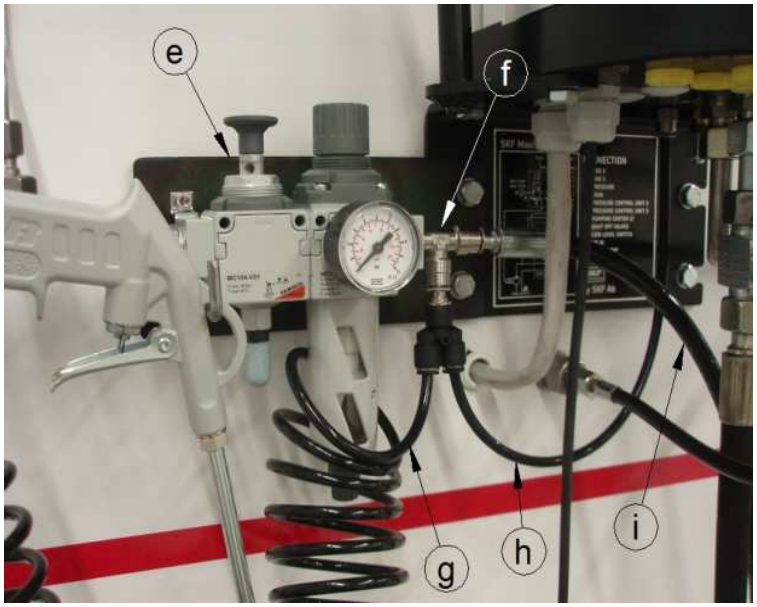


Figure 15 Pressure air connections

6 Open the metal cover (a) of the SKF Maxilube pumping center and unscrew the nut (b) below it, see Figure 16. Then lift off the cover (c) and the shell (d).

Figure 16 Accessing the inner parts of the pumping center

7 Detach connectors (j) and (k) from the circuit board, see Figure 17. Remove the low level switch's M12 connector and the detached wiring set from connection D at the bottom of the SKF Maxilube pumping center.

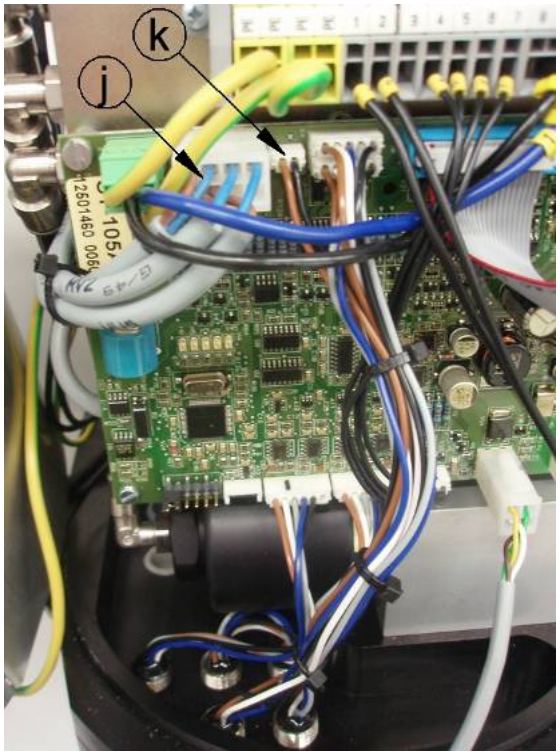


Figure 17 Removing the wiring set

8 Detach solenoid valve plugs MV1, MV2 and MV3, see Figure 17. Remove the detached wiring set.

9 Connect solenoid valve plugs MV1, MV2 and MV3 of the wiring set (Figure 18, delivered with the installation kit) in the order shown in Figure 19.

Note! The plugs must be placed in the correct sockets. Each plug's cable shell is marked with the corresponding MV marking. Check also that the gaskets under the plugs are in the correct position. Change the gaskets as necessary.

Figure 18 Wiring set

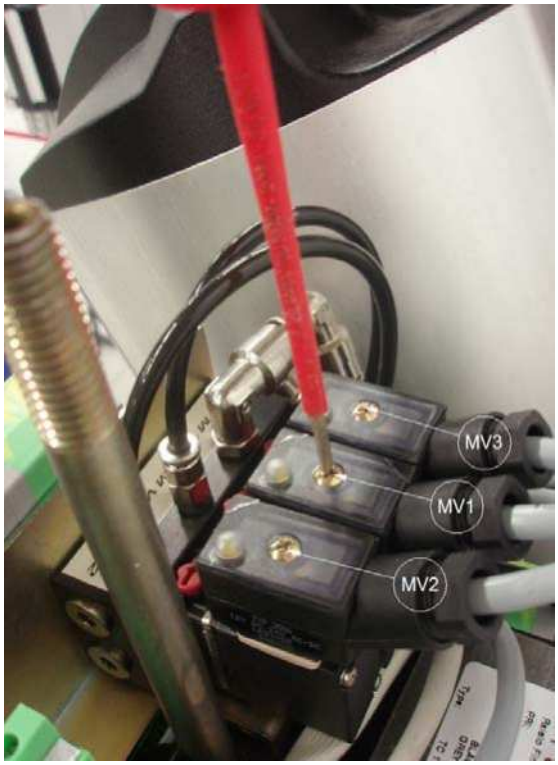


Figure 19 Solenoid valve connections

10 Connect the wiring set's circuit board connector to socket (l) as shown in Figure 20.

11 First, open the wiring set's connector (n). Then, plug the wiring set's M12 connector (m) in connection D at the bottom of SKF Maxilube pumping center.

12 When the wiring set has been connected, close the connector (n).

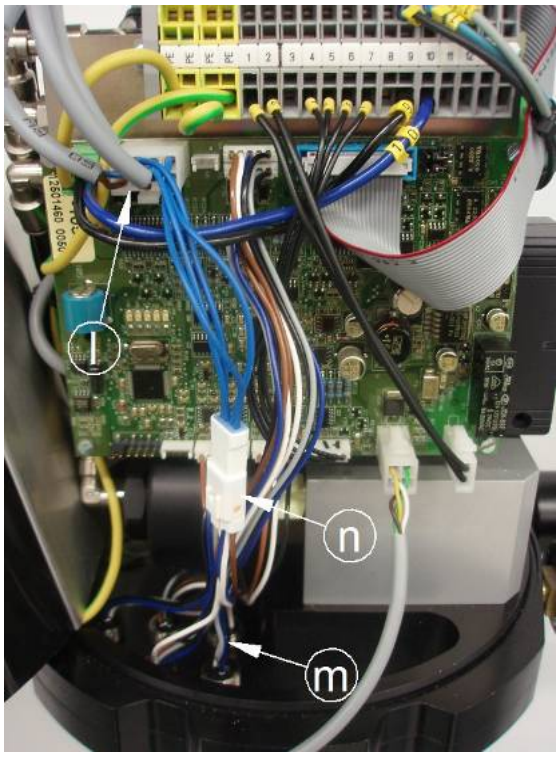


Figure 20 Connecting the wiring set

13 Connect the M12 cable (3 m) delivered with the installation kit to connector P/C at the pump and to connector D at Maxilube.

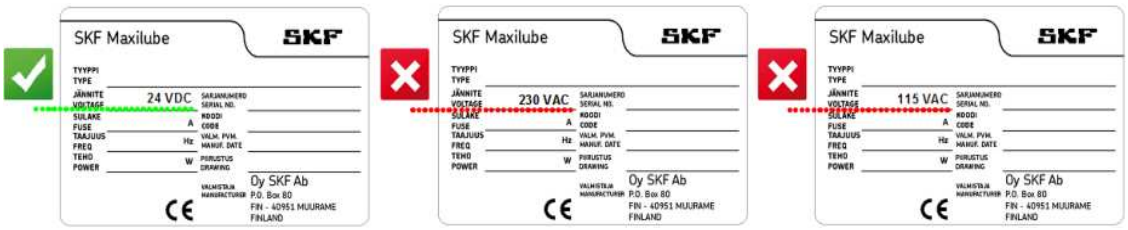
14 Install the pumping center's shell (d), cover (c), nut (b) and metal cover (a) in their original positions (see Figure 16).

15 Turn on the pressure air supply by pressing down the shut-off valve button (17) or set the air pressure to 3.5–4.5 bar using the pressure regulator (18) and the pressure gauge (19).

16 Turn on the power at the control and pumping center.

7.3.3 SKF Maxilube hydraulic part 24V, delivered prior to 1 April 2012

Warning Do not make the connections, if the operating voltage of the hydraulic part is 115 VAC or 230 VAC. The operating voltage of the hydraulic part must always be confirmed at the type plate of the hydraulic part before making any connections.



Warning Electrical connections must only be made by qualified electricians. To minimize risk of electric shock, operating voltage must be shut off before touching electrically conductive parts or opening any parts of the system or component.

Note! A separate installation kit **(→ Figure 4, page 4)** is needed for installing the pump in an existing pumping center (SKF code: 12381354).

1 Turn off the power at the control and pumping center.

2 Turn off the pressure air supply by lifting up the shut-off valve button (17) or set the air pressure to 0 bar using the pressure regulator (18) and the pressure gauge (19).

3 Remove the old pump and attach the plug delivered with the installation kit to SKF Maxilube pumping center's pressure air connection (Figure 21, connection A2).

Figure 21 Pressure air connection A2

4 Connect the pressure air connector (f) delivered with the installation kit to the outlet of the pressure air regulator (e), see Figure 22.

5 Connect the following components to the pressure air connector: pressure air gun to connection (g); pressure air supply pipe of the SKF Maxilube hydraulic part to connection (h); and the pressure air supply hose of the EPB pump to connection (i), see Figure 22.

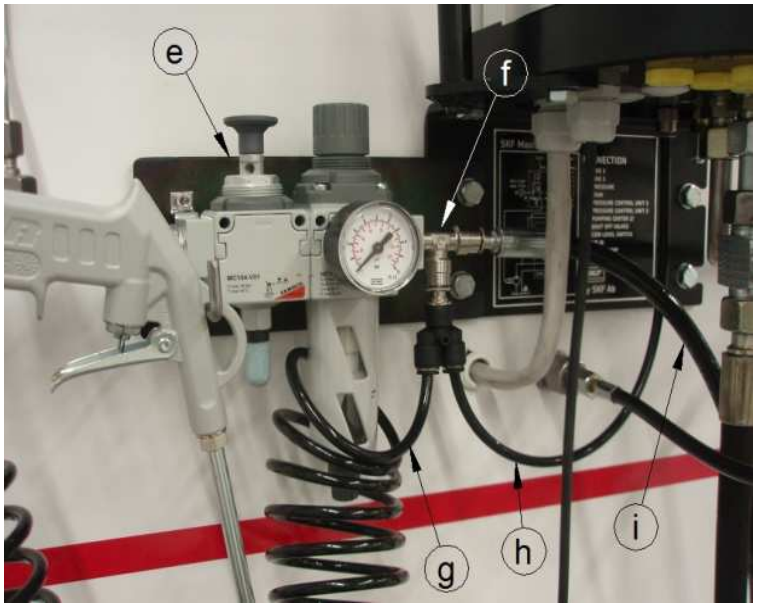


Figure 22 Pressure air connections

6 Open the metal cover (a) of the SKF Maxilube hydraulic part and unscrew the nut (b) below it, see Figure 23. Then lift off the cover (c) and the shell (d).

Figure 23 Accessing the inner parts of the hydraulic part

7 Detach the wires of the low level switch, i.e. o: white and p: black, see Figure 24. Remove the cable of the low level switch from the SKF Maxilube hydraulic part. Wires q (brown) and r (blue) will remain connected in parallel with new wires.

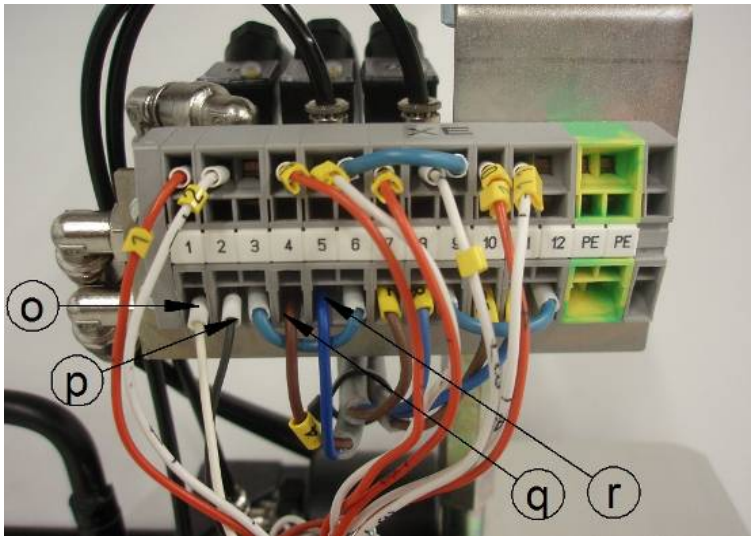


Figure 24 SKF Maxilube hydraulic part before new connections

8 Connect the M12 cable (3 m) delivered with the installation kit to the pump's P/C socket.

9 Cut off the plug on the other end of the M12 cable. Pass the cable through the low level switch's cable entry at the bottom of the SKF Maxilube hydraulic part.

10 Remove the outer jacket of the cable to a 60 mm distance from the cut. Remove the insulation of wires to a 10 mm distance. Using ferrules on the tips is recommended.

11 Connect the free wires of the M12 cable to the hydraulic part's terminal block in the order indicated in Table 5.

Table 5 SKF Maxilube hydraulic unit, terminal connections

Maxilube terminal block	**M12 wire colours**	**Description**	
1	brown	low level switch	(+)
5	white	pump control	0 VDC
4	blue	pump control	24VDC
2	black	low level switch	(-)
Not connected	grey	control (optional)	

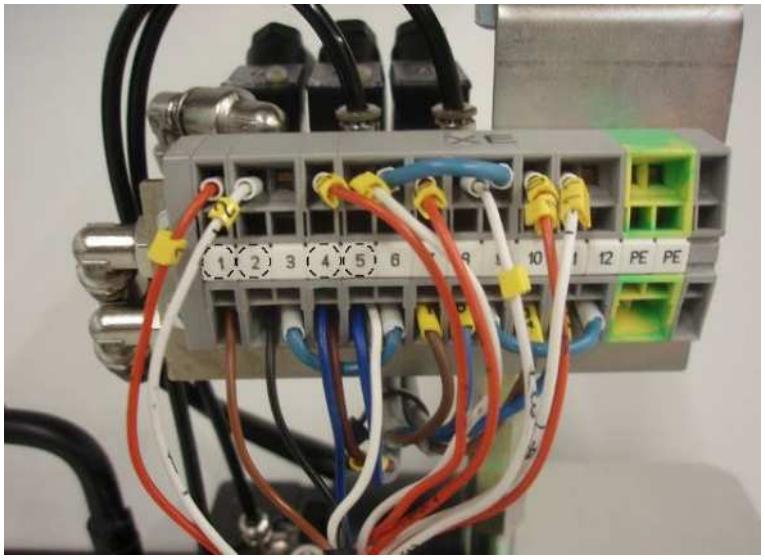


Figure 25 SKF Maxilube hydraulic part, terminal connections ready

12 Install the hydraulic part's shell (d), cover (c), nut (b) and metal cover (a) in their original positions (see Figure 23).

13 Turn on the pressure air supply by pressing down the shut-off valve button (17) or set the air pressure to 3.5–4.5 bar using the pressure regulator (18) and the pressure gauge (19).

14 Turn on the power at the control and pumping center.

7.3.4 SG-2102 hydraulic part

Warning Electrical connections must only be made by qualified electricians. To minimize risk of electric shock, operating voltage must be shut off before touching electrically conductive parts or opening any parts of the system or component.

Note! A separate installation kit **(→ Figure 4, page 4)** is needed for installing the pump in an existing pumping center (SKF code: 12381354).

1 Turn off the power at the control and pumping center.

2 Turn off the pressure air supply by lifting up the shut-off valve button (17) or set the air pressure to 0 bar using the pressure regulator (18) and the pressure gauge (19).

3 Connect the pressure air connector delivered with the installation kit to the outlet of the pressure air regulator. If necessary, use adapter (Figure 26, pos. s).

4 Connect the pressure air pipe to connection (u) as shown in Figure 26. Connect the other end of the pressure air pipe either to the inlet of the pressure air gun's tee connector or to the pressure air inlet connection of SG-2102 hydraulic part.

5 Connect EPB pump's pressure air supply hose to connection (v), see Figure 26.

6 Plug unused connections (t) with the plugs delivered with the installation kit.

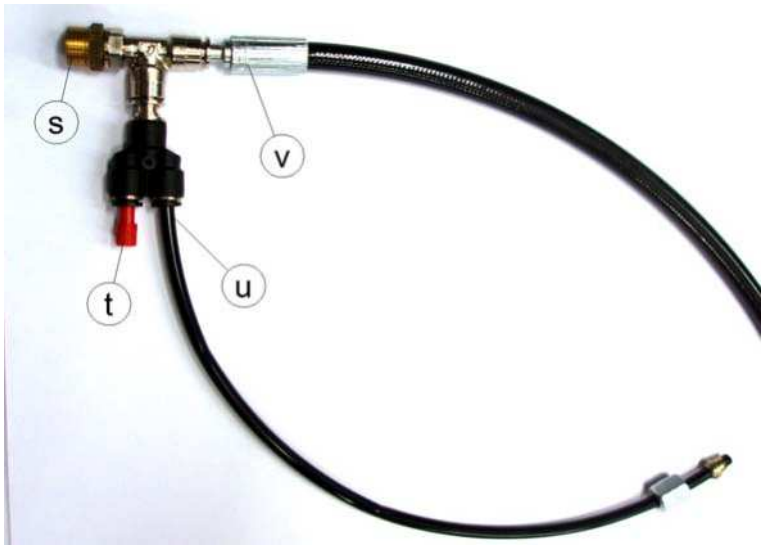


Figure 26 Pressure air connections

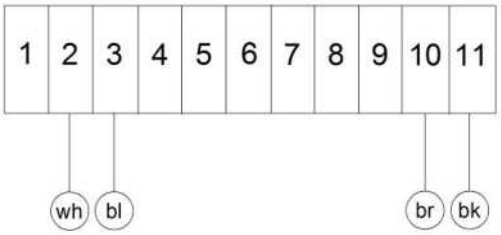
7 Cut off the plug on the other end of the M12 cable. Pass the cable into SG-2102 hydraulic part.

8 Remove the outer jacket of the cable to a 60 mm distance from the cut. Remove the insulation of wires to a 10 mm distance. Using ferrules on the tips is recommended.

9 Connect the free wires of the M12 cable to the SG-2102 hydraulic part's terminal block in the order indicated in Table 6.

Table 6 SG-2102 hydraulic part, terminal connections

SG-2102 terminal block	**M12 wire colours**	**Description**	
10	brown (br)	low level switch	(+)
2	white (wh)	pump control	0 VDC
3	blue (bl)	pump control	24VDC
11	black (bk)	low level switch	(-)
Not con-nected	grey	control (optional)	



10 Turn on the pressure air supply by pressing down the shut-off valve button (17) or set the air pressure to 3.5–4.5 bar using the pressure regulator (18) and the pressure gauge (19).

11 Turn on the power at the control and pumping center.

8 Spare parts

Table 7 Spare parts for SKF-EPB-PUMP-ECO. *See Figure 27.*

Item	Description	Order code
1	Inductive sensor M8x1 L225	12381066
2	LED-lamp, 3-colour	12502334
3	Circuit board	12501370
4	Pneumatic valve	12602120
5	Inductive sensor M8x1 L100	12381068
6	M12 connector	12502338
7	Low level switch	12381064

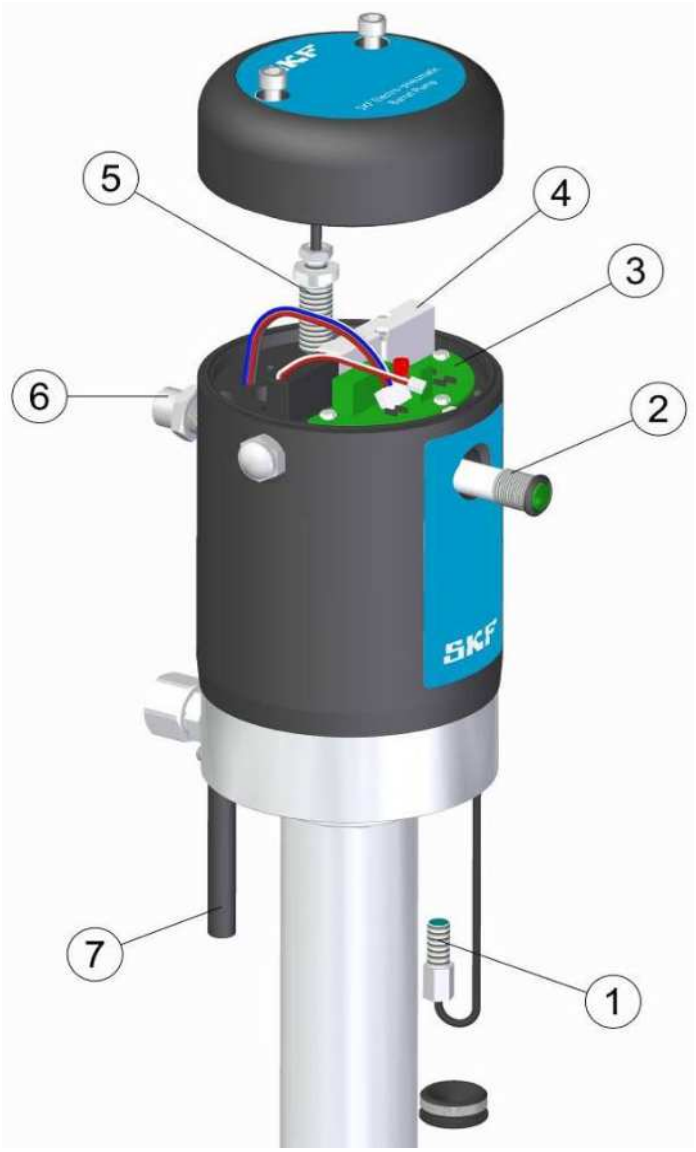


Figure 27 Spare parts for SKF-EPB-PUMP-ECO

Table 8 Spare parts for MAX-LIDSET-XXX-ECO-EPBP lid sets. *See Figure 28.*

Item	Description	Order code
8	Barrel lid 1/1 (180 kg) Barrel lid 1/4 (50 kg) Barrel lid 1/8 (18 kg)	12603700 12603750 12603775
9	Follower plate 1/1 (180 kg) Follower plate 1/4 (50 kg) Follower plate 1/8 (18 kg)	12603804 12603802 12603800
10	Hose assembly	12651232
11	Pressure air hose	12389728
12	M12 cable	12502336
13	Hose assembly	12651232
14	Grease filter (complete)	12386250
14	Grease filter cartridge	12606550
15	Grease filter venting screw	12407848

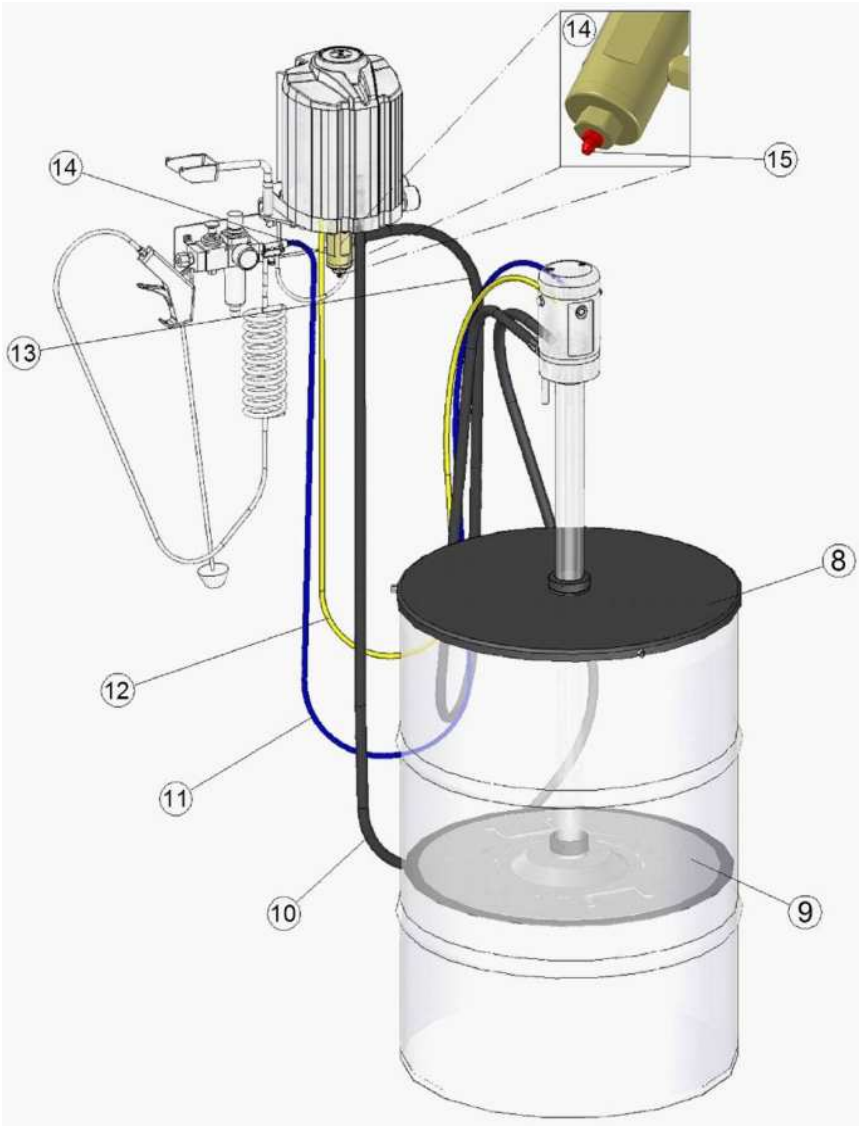


Figure 28 Spare parts for the MAX-LIDSET-XXX-ECO-EPBP lid sets

Table 9 Spare parts for pressure air regulator. *See Figure 29.*

Item	Description	Order code
16	Pressure air gun	12381390
17	Shut-off valve	12381392
18	Pressure regulator	12381394
19	Pressure gauge	12381396

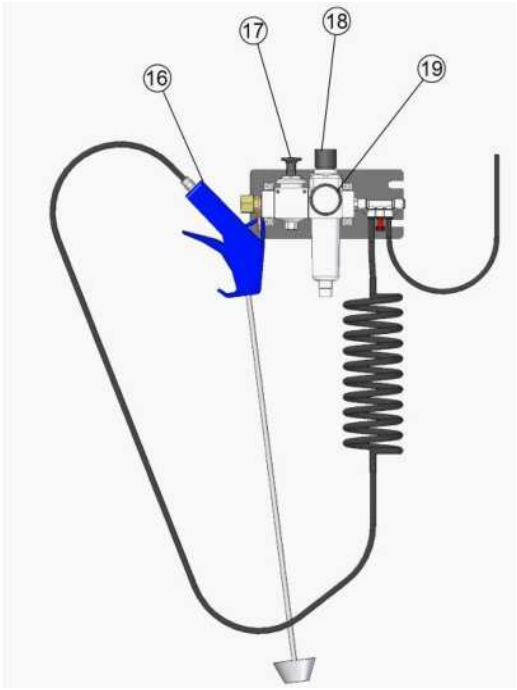


Figure 29 MAXILUBE-SET-ECO-EPBP pressure air regulator

Table 10 Order codes

Item	Order code	Prodmast code
Pumps		
SKF-EPB-PUMP-1/1-ECO	12381510	VGBN 12381510
SKF-EPB-PUMP-1/4-ECO	12381520	VGBN 12381520
SKF-EPB-PUMP-1/8-ECO	12381530	VGBN 12381530
Installation kit (contains components to adapt the existing pneumatic and electrical connections to the EPB-pump)		
INSTALLATION KIT ECO-EPBP	12381354	VGBV 12381354
Lid sets		
MAX-LIDSET-1/1-ECO-EPBP	12381325	VGBV 12381325
MAX-LIDSET-1/4-ECO-EPBP	12381315	VGBV 12381315
MAX-LIDSET-1/8-ECO-EPBP	12381305	VGBV 12381305
Pressure air regulator		
MAXILUBE-SET-ECO-EPBP	12382677	VGBV 12382677
Power supply unit		
EPBP-UNIPOWER 24V 0,63A 100-240VAC	12381505	VGBV 12381505

9 Contact information

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