

Electrically driven lubricator EDL1

Installation instructions
following machinery directive 2006/42/EC

EN



951-171-010-EN
2016/10/27
Version 05



EC Declaration of incorporation following machinery directive 2006/42/EC, annex II, part 1 B

The manufacturer, SKF Lubrication Systems Germany GmbH, Walldorf Facilities, Heinrich-Hertz-Str. 2-8, DE - 69190 Walldorf, hereby declares that the partly completed machinery

Designation: Electrically driven lubricator to supply lubricant during intermittent operation

Type: EDL1

Part number: EDL1-XXX-XX-XX-XXX

Year of construction: See type identification plate

complies with the following basic safety and health requirements of the EC machinery directive 2006/42/EC at the time when first being launched in the market.

1.1.2, 1.1.3, 1.3.2, 1.3.4, 1.5.1, 1.5.6, 1.5.8, 1.5.9, 1.6.1, 1.7.1, 1.7.3, 1.7.4

The special technical documents were prepared following Annex VII part B of this directive. Upon justifiable request, these special technical documents can be forwarded electronically to the respective national authorities. The person empowered to assemble the technical documentation on behalf of the manufacturer is the head of standardization, See manufacturer's address.

Furthermore, the following directives and harmonized standards were applied in the respective applicable areas:

2011/65/EU RoHS II

2014/30/EU Electromagnetic compatibility | Industry

Standard	Edition	Standard	Edition	Standard	Edition	Standard	Edition
DIN EN ISO 12100	2011	DIN EN 60947-5-1	2010	DIN EN 61000-6-2	2006	DIN EN 61000-6-4	2011
DIN EN ISO 809	2012	DIN EN 61131-2	2008	Amendment	2011	DIN EN 60947-5-1	2010
DIN EN 60204-1	2007	Amendment	2009	DIN EN 61000-6-3	2011		
Amendment	2010	DIN EN 60034-1	2011	Amendment	2012		
DIN EN ISO 50581	2013	DIN EN 61000-6-1	2007				

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of machinery directive 2006/42/EC and any other applicable directives.

Walldorf, January 14, 2016

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Training courses

In order to provide a maximum of safety and economic viability, SKF carries out detailed training courses. It is recommended that the training courses are attended. For more information please contact the respective SKF Service address.

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Warranty

The instructions do not contain any information on the warranty. This can be found in our general terms and conditions.

Disclaimer

The manufacturer shall not be held responsible for damages caused by:

- non appropriate use
faulty assembly, operation, setting, maintenance, repair, negligence or accidents
- improper or late response to malfunctions
- unauthorized modifications of the product
- intent or negligence
- the use of non-original SKF spare parts

Liability for loss or damage resulting from the use of our products is limited to the maximum purchase price. Liability for consequential damages of whatever kind is excluded.

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Explanation of symbols, signs and abbreviations

The following abbreviations may be used within these instructions. Symbols within safety notes mark the kind and source of the hazard.

	General warning		Dangerous electrical voltage		Risk of falling		Hot surfaces
	Unintentional intake		Crushing hazard		Pressure injection		Suspended load
	Electrostatically sensitive components		Potentially explosive atmosphere				
	Wear personal protective equipment (goggles)		Wear personal protective equipment (face shield)		Wear personal protective equipment (gloves)		Wear personal protective equipment (protective clothes)
	Wear personal protective equipment (safety shoes)		Release the product.		General obligation		
	Keep unauthorized persons away.		Protective earth				
	CE marking		Disposal, recycling		Disposal of waste electrical and electronic equipment		

	Warning level	Consequence	Probability	Symbol	Meaning
	DANGER	Death, serious injury	imminent	●	Chronological guidelines
	WARNING	Death, serious injury	possible	○	Lists
	CAUTION	Minor injury	possible	☞	Refers to other facts, causes, or consequences
	ATTENTION	Property damage	possible		

Abbreviations and conversion factors

re.	regarding	°C	degrees Celsius	°F	degrees Fahrenheit
approx.	approximately	K	Kelvin	Oz.	Ounce
i.e.	that is	N	Newton	fl. oz.	fluid ounce
etc.	et cetera	h	hour	in.	inch
poss.	possibly	s	second	psi	pounds per square inch
if appl.	if applicable	d	day	sq.in.	square inch
a.a.r.	as a rule	Nm	Newtonmeter	cu. in.	cubic inch
incl.	including	ml	millilitre	mph	miles per hour
min.	minimum	ml/d	millilitre per day	rpm	revolutions per minute
max.	maximum	cc	cubic centimetre	gal.	gallon
min.	minute	mm	millimetre	lb.	pound
etc.	et cetera	l	litre	hp	horse power
e.g.	for example	dB (A)	Sound pressure level	kp	kilopound
kW	kilowatt	>	greater than	fpsec	feet per second
U	Voltage	<	less than	Conversion factors	
R	resistance	±	plus/minus	length	1 mm = 0.03937 in.
I	current	Ø	diameter	Area	1 cm ² = 0.155 sq.in
V	volt	kg	kilogram	Volume	1 ml = 0.0352 fl.oz.
W	watt	rh	relative humidity		1 l = 2.11416 pints (US)
AC	alternating current	≈	about	Mass	1 kg = 2.205 lbs
DC	direct current	=	equal to		1 g = 0.03527 oz.
A	ampere	%	per cent	Density	1 kg/cc = 8.3454 lb./gal(US)
Ah	Ampere hour	‰	per mille		1 kg/cc = 0.03613 lb./cu.in.
Hz	Frequency [Hertz]	≥	greater than	Force	1 N = 0.10197 kp
nc	normally closed	≤	less than	Pressure	1 bar = 14.5 psi
no	normally open contact	mm ²	square millimetre	Temperature	°C = (°F - 32) x 5/9
OR	logical OR	rpm ⁻¹	revolutions per minute	output	1 kW = 1.34109 hp
&	logical AND			acceleration	1 m/s ² = 3.28084 ft./s ²
				speed	1 m/s = 3.28084 fpsec.
					1 m/s = 2.23694 mph

1. Safety instructions

1.1 General safety instructions

- The owner must ensure that safety information has been read by any persons entrusted with works on the product or by those persons who supervise or instruct the before-mentioned group of persons. In addition, the owner must also ensure that the relevant personnel are fully familiar with and have understood the contents of the Instructions. It is prohibited to commission or operate the product prior to reading the Instructions.
- These Instructions must be kept for further use.
- The described products were manufactured according to the state of the art. Risks may, however, arise from a usage not according to the intended purpose and may result in harm to persons or damage to material assets.
- Any malfunctions which may affect safety must be remedied immediately. In addition to these Instructions, general statutory regulations for accident prevention and environmental protection must be observed.

1.2 General behaviour when handling the product

- The product may only be used in awareness of the potential dangers, in proper technical condition, and according to the information in these instructions.
- Familiarize yourself with the functions and operation of the product. The specified assembly and operating steps and their sequences must be observed.
- Any unclear points regarding proper condition or correct assembly/ operation must be clarified. Operation is prohibited until issues have been clarified.
- Keep unauthorized persons away.
- Wear personal protective equipment always.
- Precautionary operational measures and instructions for the respective work must be observed.
- Responsibilities for different activities must be clearly defined and observed. Uncertainty seriously endangers safety.
- Safety-related protective and emergency devices must not be removed, modified or affected otherwise in their function and are to be checked at regular intervals for completeness and function.
- If protective and safety equipment has to be dismantled, it must be reassembled immediately after finishing the work, and then be checked for correct function.
- Remedy occurring faults in the frame of responsibilities. Immediately inform your superior in the case of faults beyond your competence.
- Never use parts of the centralized lubrication system or of the machine as standing or climbing aids.

1.3 Intended use

Supply of lubricants within a centralized lubrication system following the specifications, technical data and limits stated in these Instructions:

Usage is allowed exclusively for professional users in the frame of commercial and economic activities.

1.4 Foreseeable misuse

Any usage differing from the one stated in these Instructions is strictly prohibited, particularly a usage:

- outside the indicated temperature range
- of non-specified means of operation
- without adequate pressure relief valve
- in continuous operation
- in areas with aggressive or corrosive materials (e.g. high ozone pollution)
- in areas with harmful radiation (e. g. ionising radiation)

- to supply, transport, or store hazardous substances and mixtures in accordance with annex I part 2-5 of the CLP regulation (EG 1272/2008) and marked with GHS 01 to GHS 09 hazard pictograms.
- to feed, forward, or store gases, liquefied gases, dissolved gases, vapours, or fluids whose vapour pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at the maximum permissible operating temperature.
- in an explosion protection zone

1.5 Painting of plastic parts

Painting of any plastic parts or seals of the described products is expressly prohibited. Remove or completely tape parts concerned before painting the superior machine.

1.6 Modifications of the product

Unauthorized conversions or modifications may result in unforeseeable impacts on safety. Therefore, any unauthorized conversions or modifications are expressly prohibited.

1.7 Prohibition of certain activities

Due to potential sources of faults that may not be visible or due to legal regulations the following activities may be carried out by manufacturer specialists or authorized persons only:

- Repairs, changes to the drive

1.8 Inspections prior to delivery

The following inspections were carried out prior to delivery:

- Safety and functional tests
- In case of electrically driven products: electrical inspections following DIN EN 60204-1:2007 / VDE 0113-1:2007.

1.9 Other applicable documents

In addition to these instructions, the following documents must be observed by the respective target group:

- Operational instructions and approval rules
- Safety data sheet of the lubricant used

Where appropriate:

- Project planning documents
- Instructions of the suppliers of purchased parts
- Any documents of other components required to set up the centralized lubrication system
- Other relevant documents for the integration of the product into the machine or system

1.10 Markings on the product



Equipotential bonding connections
on the product

1.11 Notes related to the type identification plate

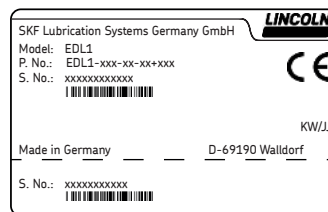
The type identification plate states important characteristics such as type designation, order number, etc.
To ensure that the loss of data due to an illegible type identification plate is avoided, the characteristics should be entered in the Instructions.

Model _____

P. No. _____

S. No. _____

Year of construction (WW/YY)



1.12 Notes related to the CE marking

CE marking is effected following the requirements of the applied directives:

- 2014/30/EU
Electromagnetic compatibility
- 2011/65/EU
(RoHS II) Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment

Reference on Low Voltage Directive 2014/35/EU

The protective regulations of Low Voltage Directive 2014/35/EU are fulfilled according to annex I (1.5.1) of Machinery Directive 2006/42/EC.

Reference on Pressure Equipment Directive 2014/68/EU

Because of its performance data the product does not achieve the limit values defined in Article 4 (1) (a) (i) and is therefore excluded from the scope of application of Pressure Equipment Directive 2014/68/EU following Article 4 (3).

1.13 Persons authorized to operate the pump

1.13.1 Operator

A person who is qualified by training, knowledge and experience to carry out the functions and activities related to normal operation. This includes avoiding possible hazards that may arise during operation.

1.13.2 Specialist in mechanics

Person with appropriate professional education, knowledge and experience to detect and avoid the hazards that may arise during transport, installation, start-up, operation, maintenance, repair and disassembly.

1.13.3 Specialist in electrics

Person with appropriate professional education, knowledge and experience to detect and avoid the hazards that may arise from electricity.

1.14 Briefing of external technicians

Prior to commencing the activities, external technicians must be informed by the operator of the company safety provisions, the applicable accident prevention regulations to be maintained, and the functions of the superordinate machine and its protective devices.

1.15 Provision of personal protective equipment

The operator must provide suitable personal protective equipment for the respective location of operation and the purpose of operation.

1.16 Operation

The following must be observed during commissioning and operation.

- Any information within this manual and the information within the referenced documents.
- All laws and regulations to be complied with by the user.

1.17 Emergency stopping of the pump station

In case of an emergency stop the pump station by:

- Switching off the superior machine or system in which the pump station has been integrated.

- Actuating the emergency stop switch of the superior machine.

1.18 Transport, installation, maintenance, malfunctions, repair, shutdown, disposal.

- All relevant persons must be informed of the activity prior to starting any work. Observe the precautionary operational measures and work instructions.
- Carry out transport using suitable transport and hoisting equipment on suitable ways only.
- Maintenance and repair work can be subject to restrictions in low or high temperatures (e.g. changed flow properties of the lubricant). Therefore, where possible, try to carry out maintenance and repair work at room temperature.
- Prior to performing work, the product and the machine, into which the product will be integrated, must be depressurized and secured against unauthorized activation.
- Ensure through suitable measures that movable or detached parts are immobilized during the work and that no limbs can be caught in between by inadvertent movements.
- Assemble the product only outside of the operating range of moving parts, at an adequate distance from sources of heat or cold. Other units of the machine or vehicle must not be damaged or impaired in their function by the installation.
- Dry or cover wet, slippery surfaces accordingly.
- Cover hot or cold surfaces accordingly.
- Work on electrical components must be carried out by electrical specialists only. Observe any waiting periods for discharging, if necessary. Carry out works on electrical components only while the system is depressurized and use voltage isolated tools suitable for electrical works only.

- Carry out electrical connections only according to the information in the valid wiring diagram and taking the relevant regulations and the local connection conditions into account.
- Do not touch cables or electrical components with wet or damp hands.
- Fuses must not be bypassed. Replace defective fuses always by fuses of the same type.
- Undertake drilling at non-critical, non-load bearing parts only. Use any available boreholes. Do not damage lines and cables when drilling.
- Observe possible abrasion points. Protect the parts accordingly.
- All components used must be designed for:
 - the maximum operating pressure
 - the maximum/ minimum ambient temperature
- No parts of the centralized lubrication system may be subjected to torsion, shear, or bending.
- Check all parts prior to their usage for contamination and clean, if necessary.
- Lubricant lines should be primed with lubricant prior to installation. This makes the subsequent ventilation of the system easier.
- Observe the specified tightening torques. When tightening, use a calibrated torque wrench.
- When working with heavy parts use suitable lifting tools.
- Avoid mixing up or wrong assembly of dismantled parts. Mark these parts accordingly.
- All safety devices are completely available and functional
- All connections are correctly connected
- All parts are correctly installed
- All warning labels on the product are present completely, highly visible and undamaged
- Illegible or missing warning labels are to be replaced without delay

1.19 Initial commissioning / daily start-up

Ensure that:

1.20 Cleaning

- Risk of fire and explosion when using inflammable cleaning agents. Only use non-flammable cleaning agents suitable for the purpose.
- Do not use aggressive cleaning agents.
- Do not use steam jet or high pressure cleaners. Electrical components may be damaged.
Observe the IP protection class.
- Cleaning work may not be carried out on energized components.
- Mark damp areas accordingly.

1.21 Residual risks

Residual risk	Possible in life cycle											Prevention/ remedy
Personal injury/ material damage due to falling of raised parts	A	B	C					G	H	K		Keep unauthorized persons away. No people may remain under suspended loads. Lift parts with adequate lifting devices.
Personal injury/ material damage due to tilting or falling of the product because of non-observance of the stated tightening torques		B	C					G				Observe the specified tightening torques. Fix the product to components with adequate load-bearing capacities only. If no tightening torques are stated, apply tightening torques according to the screw size characteristics for 8.8 screws.
Personal injury/ material damage due to electric shock in case of damage to the connection cable		B	C	D	E	F	G	H				Check the connection cable with regard to damages before the first usage and then at regular intervals. Do not mount cable to moving parts or friction points. If this cannot be avoided, use spring coils respectively protective conduits.
Personal injury/ damage to material due to spilled or leaked lubricant		B	C	D		F	G	H	K			Be careful when filling the reservoir and when connecting or disconnecting lubricant feed lines. Always use suitable hydraulic screw connections and lubrication lines for the stated pressures. Do not mount lubrication lines to moving parts or friction points. If this cannot be avoided, use spring coils respectively protective conduits.
Damage to the control pcb when setting the DIP switches with inappropriate tool			C	D			G					Use appropriate tools. Exercise special care when setting the DIP switches
Life cycles: A = transport, B = installation, C = initial start-up, D = operation, E = cleaning, F = maintenance, G = fault, repair, H = shutdown K = Disposal												

2. Lubricants

2.1 General information

Lubricants are used specifically for certain application purposes. In order to fulfil their tasks, lubricants must fulfil various requirements to varying extents.

The most important requirements for lubricants are:

- reduction of abrasion and wear
- Corrosion protection
- noise minimisation
- protection against contamination or penetration of foreign objects
- cooling (primarily with oils)
- longevity (physical/ chemical stability)
- economic and ecological aspects

2.2 Selection of lubricants

SKF considers lubricants to be an element of system design. A suitable lubricant is selected already when designing the machine and forms the basis for the planning of a centralized lubrication system.

The selection is made by the manufacturer or operator of the machine, preferably together with the lubricant supplier based on the requirement profile defined.

Should you have little or no experience with the selection of lubricants for centralized lubrication systems, please contact SKF.

If required we will be glad to support customers to select suitable components for feeding the selected lubricant and to plan and design their centralized lubrication system.

You will avoid possible downtimes through damage to your machine or system or damage to the centralized lubrication system.

2.3 Material compatibility

Lubricants must generally be compatible with the following materials:

- steel, grey iron, brass, copper, aluminium
- NBR, FPM, ABS, PA, PU

2.4 Temperature characteristics

The lubricant used must be suitable for the specific operating temperature of the product. The viscosity required for proper operation of the product must be adhered to and must not be exceeded in case of low temperatures nor fall below specification in case of high temperatures. Specified viscosities, see chapter Technical data.

2.5 Ageing of lubricants

After a prolonged downtime of the machine, the lubricant must be inspected prior to re-commissioning as to whether it is still suitable for use due to chemical or physical ageing. We recommend that you undertake this inspection already after a machine downtime of 1 week.

If doubts arise as to a further suitability of the lubricant, please replace it prior to re-commissioning and, if necessary, undertake initial lubrication manually.

It is possible for lubricants to be tested in the company's laboratory for their suitability for being pumped in centralized lubrication systems (e.g. "bleeding").

Please contact SKF if you have further questions regarding lubricants.

You may request an overview of the lubricants tested by SKF.



Only lubricants specified for the product may be used. Unsuitable lubricants may lead to a failure of the product.



Do not mix lubricants. This may have unforeseeable effects on the usability and therefore on the function of the centralized lubrication system.



When handling lubricants the relevant safety data sheets and hazard designations, if any, on the packaging have to be observed.



Due to the multitude of possible additives, individual lubricants, which according to the manufacturer's data sheets fulfil the necessary specification, may not, in fact, be suitable for use in centralized lubrication systems (e.g. incompatibility between synthetic lubricants and materials). In order to avoid this, always use lubricants tested by SKF.

3. Overview, functional description

1 Housing

Includes the motor, the control pcb and the electrical connections of the EDL1.

2 Cover plate (pcb access)

The transparent cover plate allows to immediately detect operating and fault status messages by the LED on the control pcb.

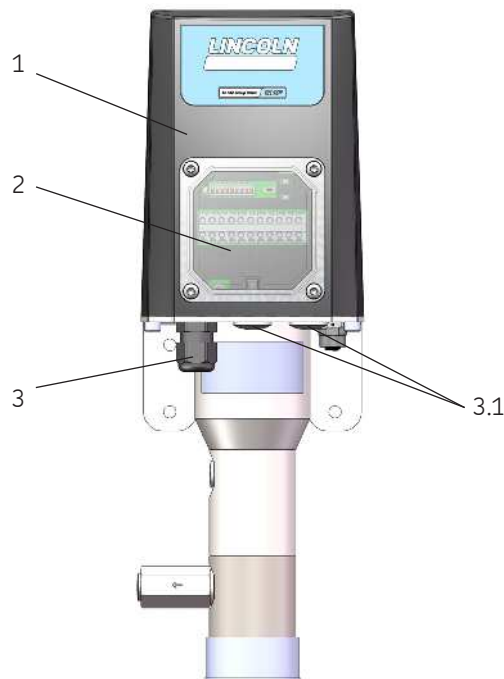
The cover plate must be disassembled by removing the 4 screws in order to:

- change the position of the DIP switches
- install the power and control lines to the respective connecting terminals
- carry out an additional lubrication cycle or a reset of the EDL1

3 Cable gland

Serves to duct and fix the connection and control lines. The EDL1 has 3 cable ducts. Two of them are closed by blind plugs (3.1). If these cable glands are required, corresponding cable fittings (3) can be ordered as accessories.

Overview Fig. 1



4 Inlet fitting

The pressurized lubricant (e.g. from a barrel pump) is fed to the EDL1 through an inlet fitting.

5 Outlet fitting

The metered lubricant volume is fed to the lube point or to a metering device through the outlet fitting. The outlet fitting must be provided with an appropriate pressure reducing valve to protect the downstream system against too high pressure.

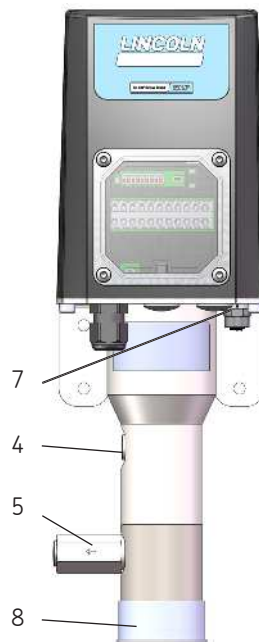
7 Connection for external pressure switch

This connection serves to connect an external pressure switch.

8 Collecting sleeve

Serves as a reservoir for possible leak grease.

Depending on the EDL1 version selected, it is possible to have the inlet fitting and the outlet fitting on the left or the right side.



Overview inlet and outlet fittings Fig. 2

6 Control pcb

The control pcb serves to:

- display operating states and fault messages
- set parameters, e.g. pause time and output volume
- trigger an additional lubrication by pressing the key for additional lubrication (6.4) < 5 seconds
- trigger an additional lubrication by pressing the key for additional lubrication (6.4) > 5 seconds.

The control pcb is protected in the housing of the EDL1.

6.1 Green LED (operating voltage)

Is lit as soon as operating voltage is present.

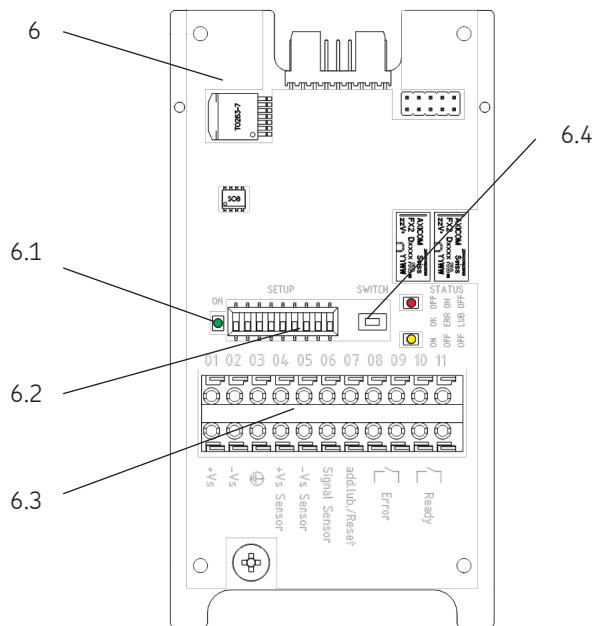
6.2 DIP switch

Serve to set the individual operating modes, lubrication and pause times and to activate and deactivate a connected external pressure switch. (Function of the DIP switches, see chapter 4.3)

6.3 Connecting terminals

Serve to electrically connect the power supply as well as control and signal wires. (Assignment, see chapter 4.8).

Overview Fig. 3



6.4 "Additional lubrication/ Reset" key

Additional lubrication

An additional lubrication cycle is triggered by pressing the key < 5 seconds.

Reset

An reset is triggered by pressing the key > 5 seconds.

6.5 Red LED (Fault signal terminal 8/9)

Is lit when:

- a malfunction is present.

6.6 Yellow LED (Feedback terminal 10/11)

Is lit when:

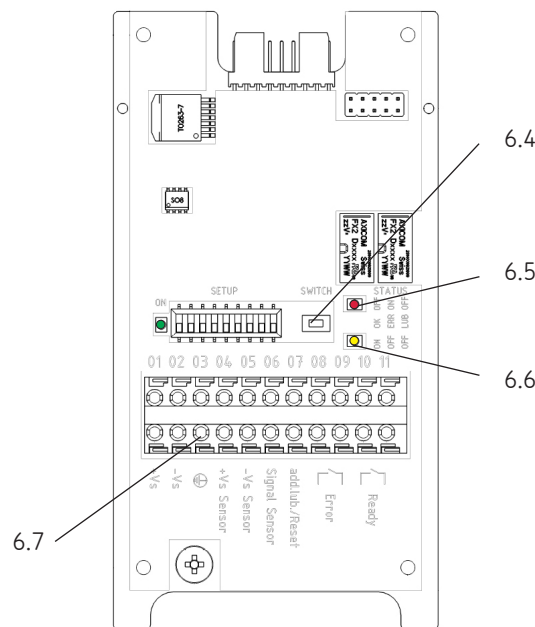
- the last lubrication cycle has been completed successfully and EDL1 is ready for operation.

6.7 Protective conductor terminal

- Serves to connect the protective conductor

For details regarding the operating states and fault messages, see chapter 10.1

Overview Fig. 4



4. Technical data

4.1 General technical data

Admissible operating temperature	-25 °C to 70 °C
Operating pressure	280 bar max.*
Inlet pressure of lubrication greases	min. 2 bar max. 270 bar
Inlet/ outlet fitting	G 1/4"
Operating frequency	maximum 1 cycle per minute
Installation position	any, but not rotating
Sound pressure level	< 70 dB (A)
Type of protection	IP 65
Weight	approx. 4 kg
Corrosion protection (DIN EN ISO 12944-2)	C3
Output volume	approx. 1.0 cc/ stroke (full stroke) approx. 0.5 cc/ stroke (half stroke)
Approved lubricants	Greases of NLGI I and NLGI II

* A protection against inadmissibly high pressure must be provided by the owner, e. g. by means of pressure switch DSB1-S30000X-1A-01 (see chapter Spare parts and accessories)

4.2 Electrics and control unit

Operating voltage	24 V DC \pm 10 % (reverse-polarity protected up to 32 V DC)
Current input (standby)	typ. 40 mA
Current input (maximum)	\leq 4 A
Power input (standby)	typ. 1 W
Power input (maximum)	96 W
Motor starting current	typ. 2.4 A for typ. 250 ms max. 6 A for 500 ms (in case of motor blockage)
Switching capacity Error / Ready	potential-free, max. 2 A max. 60 W / 62.5 VA max. 50 V AC / 120 V DC
Protection class	PELV
Duration of sensor activity	4 ms minimum
Duration of sensor inactivity	1 ms minimum
Sensor and external additional lubrication / Reset switching level for logic 1	$>$ 12 V DC
Sensor and external additional lubrication / Reset switching level for logic 0	$<$ 6 V DC
Internal protection of power supply to sensor	typ. 400 mA reversible
Terminal bar appropriate for cable cross sections	0.08 to 2.5 mm ²
Recommended back-up fuse	2.5 A (T)
Maximum admissible back-up fuse	4 A (T)
Pressure switch (option)	
Connection	M12 plug
Switching type	Normally closed contact
Switching voltage	typ. 5 V DC
Switching voltage	min. 1 mA - max. 2 mA

4.3 Functions of the DIP switches

DIP switches 1-4

Serve to set the definite value for the pause.
(Details see chapters 4.4, 4.5, 4.6)

DIP switch 5

Serves to set the pause time to seconds or hours

0 = seconds

1 = hours

DIP switch 6

Serves to adjust the metering quantity

1 = 1.0 ccm/ stroke (full stroke)

0 = 0.5 ccm/ stroke (full stroke)

DIP switches 7-8

Serve to set the different operating modes.

DIP switch 7

0 = Setting to the ON/OFF mode

1 = Pre-selection of machine contact mode or pulse mode

DIP switch 8

0 = machine contact mode

1 = pulse mode

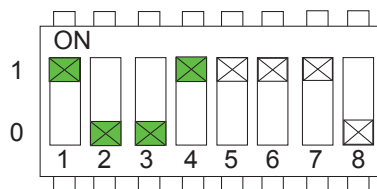
DIP switch 9

Serves to set the external pressure switch

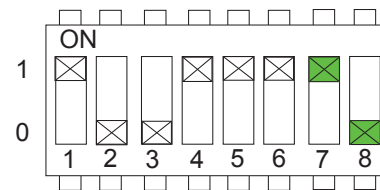
0 = OFF

1 = ON

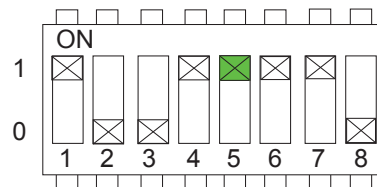
Setting of pause time DIP 1-4 Fig. 5



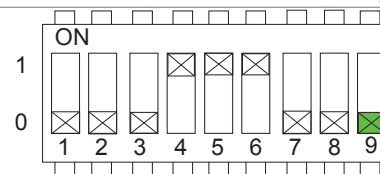
Setting of pause time DIP 7-8 Fig. 8



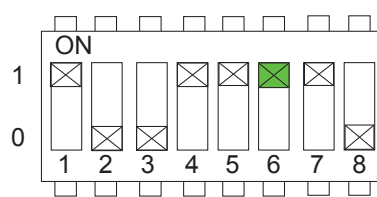
Setting of pause time DIP 5 Fig. 6



Pressure switch ON/
OFF DIP 9 Fig. 9



Setting of pause time DIP 6 Fig. 7



4.4 Setting range for pauses in seconds

Setting of definite value in seconds									
	DIP switch								
sec	1	2	3	4	5	6	7	8	
60*	0	0	0	1	0	1/0	1	0	
70*	0	0	1	0	0	1/0	1	0	
80*	0	0	1	1	0	1/0	1	0	
90*	0	1	0	0	0	1/0	1	0	
100*	0	1	0	1	0	1/0	1	0	
110*	0	1	1	0	0	1/0	1	0	
130*	0	1	1	1	0	1/0	1	0	
150*	1	0	0	0	0	1/0	1	0	
190*	1	0	0	1	0	1/0	1	0	
250*	1	0	1	0	0	1/0	1	0	
480	1	0	1	1	0	1/0	1	0	
750	1	1	0	0	0	1/0	1	0	
1000	1	1	0	1	0	1/0	1	0	
1250	1	1	1	0	0	1/0	1	0	
1600	1	1	1	1	0	1/0	1	0	

4.5 Setting range for pauses in hours

Setting of definite value in hours									
	DIP switch								
hrs	1	2	3	4	5	6	7	8	
1	0	0	0	1	1	1/0	1	0	
2	0	0	1	0	1	1/0	1	0	
3	0	0	1	1	1	1/0	1	0	
4	0	1	0	0	1	1/0	1	0	
5	0	1	0	1	1	1/0	1	0	
6	0	1	1	0	1	1/0	1	0	
7	0	1	1	1	1	1/0	1	0	
8	1	0	0	0	1	1/0	1	0	
9	1	0	0	1	1	1/0	1	0	
10	1	0	1	0	1	1/0	1	0	
11	1	0	1	1	1	1/0	1	0	
12	1	1	0	0	1	1/0	1	0	
13	1	1	0	1	1	1/0	1	0	
14	1	1	1	0	1	1/0	1	0	
15	1	1	1	1	1	1/0	1	0	

4.6 Setting range for pauses in pulses

Setting of definite value in pulses									
	DIP switch								
Pulses	1	2	3	4	5	6	7	8	
1	0	0	0	1	1/0	1/0	1	1	
2	0	0	1	0	1/0	1/0	1	1	
3	0	0	1	1	1/0	1/0	1	1	
4	0	1	0	0	1/0	1/0	1	1	
5	0	1	0	1	1/0	1/0	1	1	
6	0	1	1	0	1/0	1/0	1	1	
8	0	1	1	1	1/0	1/0	1	1	
10	1	0	0	0	1/0	1/0	1	1	
20	1	0	0	1	1/0	1/0	1	1	
30	1	0	1	0	1/0	1/0	1	1	
40	1	0	1	1	1/0	1/0	1	1	
50	1	1	0	0	1/0	1/0	1	1	
60	1	1	0	1	1/0	1/0	1	1	
80	1	1	1	0	1/0	1/0	1	1	
100	1	1	1	1	1/0	1/0	1	1	

* These pause time values in the machine contact mode are admissible only, if the daily runtime of the EDL1 does not exceed the following values.

Adjusted pause time of the EDL1 in seconds	60*	70*	80*	90*	100*	110*	130*	150*	190*	250*
Maximum daily runtime of the EDL1 in hours	4.5	5	5.5	6	6.5	7.5	9	10	13	17

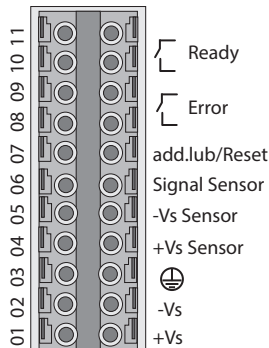
1/0 = DIP switch position 1 or 0 adjustable for this mode

4.7 Nominal output volume per 24 hours

Pause time seconds	DIP switch 6 in position			Pause time hours	DIP switch 6 in position		
	1	0			1	0	
60	1440	720	cc	1	24	12	cc
70	1234	617	cc	2	12	6	cc
80	1080	540	cc	3	8	4	cc
90	960	480	cc	4	6	3	cc
100	864	432	cc	5	4.8	2.4	cc
110	786	393	cc	6	4	2	cc
130	666	328	cc	7	3.4	1.7	cc
150	576	288	cc	8	3	1.5	cc
190	456	228	cc	9	2.7	1.3	cc
250	346	173	cc	10	2.4	1.2	cc
480	180	90	cc	11	2.2	1.1	cc
750	116	58	cc	12	2.0	1	cc
1000	86	43	cc	13	1.8	0.9	cc
1250	70	35	cc	14	1.7	0.9	cc
1600	54	27	cc	15	1.6	0.8	cc

4.8 Assignment of connecting terminals

Terminal	
1	Power supply (+ 24 V DC)
2	Mass (-)
3	PE (protective earth)
4	Power supply of sensor (+ 24 V DC)
5	Mass of sensor (-)
6	Sensor signal (capacitive, inductive, ultrasonic, mechanical as digital output, normally open contact)
7	External input for additional lubrication / reset
8/9	Fault signal (potential-free)
10/11	Feedback (lubrication cycle successfully completed) (potential-free)



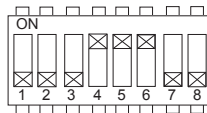
For details, see connecting diagrams chapter 12

4.10 Tightening torques

Adhere to the following tightening torques when installing or repairing the pump.	
EDL1 to base plate, machine or control box	10 Nm \pm 1.0
Pressure relief valve	8 Nm \pm 1,0 Nm
Cover plate for pcb access	1 Nm \pm 0.1 Nm
Housing cover plate	2 Nm \pm 0.5 Nm
Inlet and outlet fitting	25 Nm \pm 2.0 Nm
Cable fittings	2 Nm \pm 0.5 Nm
Connection of pressure switch	2 Nm \pm 0.5 Nm
Protective conductor cable	2 Nm \pm 0.5 Nm

4.9 Factory settings

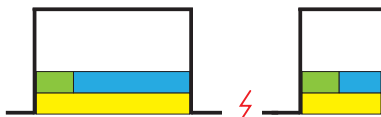
Mode	Machine contact mode
Pause time	1 hour
Metering volume	1.0 cc/ stroke
external pressure switch	deactivated



4.11 Operating modes of the EDL1

The EDL1 has 3 operating modes. These facilitate an adaptation to the different operating modes and controls.

4.12 ON/OFF mode



Cycle time	approx. 60 seconds
Lubrication time	approx. 15 seconds
Lock-out time	45 seconds
Duty cycle	> 60 seconds

Additional lubrication cycle possible within lock-out time YES

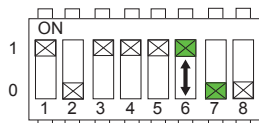
Pause time KEINE

Setting the mode via DIP switches

DIP switch 7 Position 0

Variable DIP switches for this mode

DIP switch 6 Position 0 or 1



Application example:

Each time the power supply of the EDL1 is switched on, a lubrication cycle shall be performed.

Setting the ON/OFF mode, see chapter 6.7.

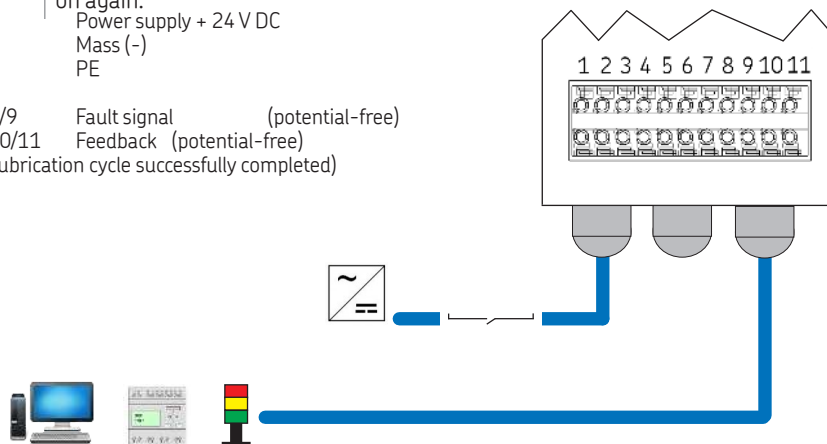


To carry out another lubrication cycle, the power supply of the EDL1 must be switched off and on again.

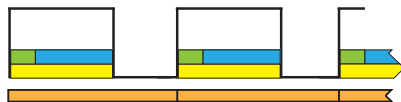
- 1 Power supply + 24 V DC
- 2 Mass (-)
- 3 PE

- 8/9 Fault signal (potential-free)
- 10/11 Feedback (potential-free)
(lubrication cycle successfully completed)

ON/OFF mode Fig. 10




4.13 Machine contact mode



Cycle time  approx. 60 seconds

Lubrication time  approx. 15 seconds

Lock-out time  45 seconds

Duty cycle > 60 seconds

Additional lubrication cycle possible within lock-out time YES

Adjustable pause  YES
minutes/hours

Residual pause after switching off Time counter (persistent)

Setting the mode via DIP switches

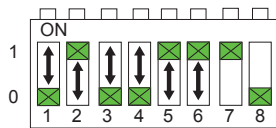
DIP switch 7 Position 1

DIP switch 8 Position 0

Variable DIP switches for this mode

DIP switches 1-4 Position 0 or 1

DIP switches 5, 6 Position 0 or 1



Application example:

The EDL1 shall carry out a lubrication cycle according to the pause time value (example = 4 hours) set via DIP switches 1-5.

Setting the machine contact mode, see chapter 6.10.

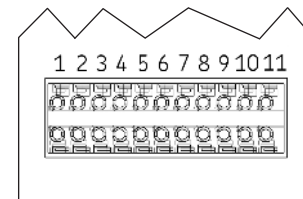


If terminals 4 and 6 are bridged, the EDL1 can be operated also autonomously without machine contact.

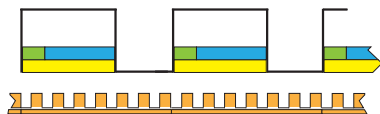
4

Machine contact mode Fig. 11

- 1 Power supply + 24 V DC
 - 2 Mass (-)
 - 3 PE
 - 4 Power supply of sensor + 24 V DC
 - 5 Mass of sensor (-)
 - 6 Signal of sensor
-
- 8/9 Fault signal (potential-free)
 - 10/11 Feedback (potential-free)
(lubrication cycle successfully completed)



4.14 Pulse mode



Processed signal falling edge

Cycle time approx. 60 seconds

Lubrication time approx. 15 seconds

Lock-out time 45 seconds

Duty cycle > 60 seconds

Additional lubrication cycle possible within lock-out time YES

Adjustable pause YES
pulses

Residual pause after switching off Pulse counter (persistent)

Setting the mode via DIP switches

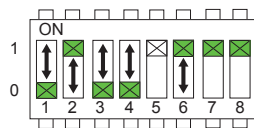
DIP switch 7 Position 1

DIP switch 8 Position 1

Variable DIP switches for this mode

DIP switches 1-4 Position 0 or 1

DIP switch 6 Position 0 or 1

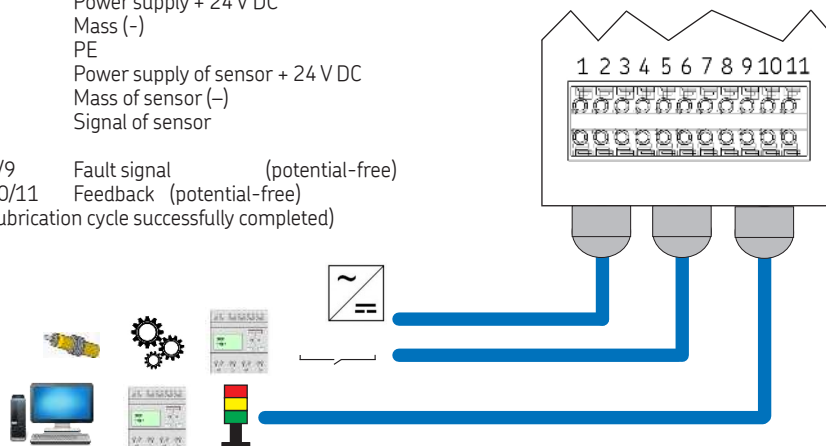


Application example:

A sensor detects the number of arriving parts, chain links or train axles. After reaching the number of pulses (example = 4 pulses) preset via DIP switches 1-4, the EDL1 carries out a lubrication cycle. Setting the pulse mode, see chapter 6.14.

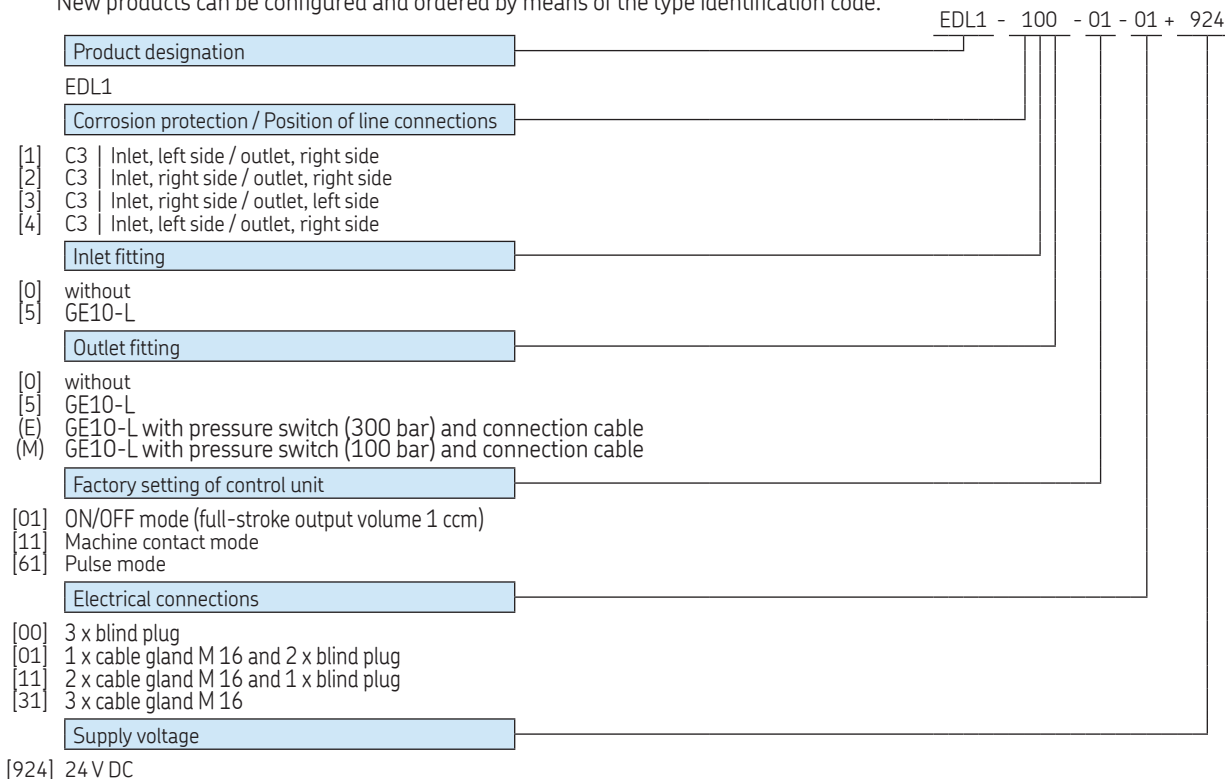
Pulse mode Fig. 12

- 1 Power supply + 24 V DC
- 2 Mass (-)
- 3 PE
- 4 Power supply of sensor + 24 V DC
- 5 Mass of sensor (-)
- 6 Signal of sensor
- 8/9 Fault signal (potential-free)
- 10/11 Feedback (potential-free)
(lubrication cycle successfully completed)



4.15 Type identification code

The type identification code facilitates identification of important equipment features of the product. New products can be configured and ordered by means of the type identification code.



5. Delivery, returns, and storage

5.1 Delivery

After receipt of the shipment, check the shipment for damage and completeness according to the shipping documents. Immediately report any transport damages to the forwarding agent. Keep the packaging material until any discrepancies are resolved. During in-house transport ensure safe handling.

5.2 Returns

Clean all parts and pack them properly (i.e. following the regulations of the recipient country) before returning them. Protect the product against mechanical influences such as impacts. There are no restrictions for land, sea or air transport. Mark returns on the packaging as follows.



5.3 Storage

SKF products are subject to the following storage conditions:

- dry, dust- and vibration-free in closed premises
- no corrosive, aggressive materials at the place of storage (e. g. UV rays, ozone)
- protected against pests and animals (insects, rodents, etc.)

- possibly in the original product packaging
- shielded from nearby sources of heat and coldness
- in case of high temperature fluctuations or high humidity take adequate measures (e. g. heater) to prevent the formation of condensation water
- the admissible storage temperature range corresponds to that of the operating temperature (see Technical data)



Before application inspect the products with regard to possible damages occurred during their storage. This particularly applies for parts made out of plastic and rubber (embrittlement) as well as for components primed with lubricant (ageing).

6. Assembly

6.1 General information

Only qualified technical personnel may install the products described in these Instructions.

During assembly pay attention to the following:

- Other units must not be damaged by the assembly.
- The product must not be installed within the range of moving parts.
- The product must be installed at an adequate distance from sources of heat and coldness.
- Observe the product's IP type of protection.
- Adhere to safety distances and legal prescriptions on assembly and prevention of accidents.

- Possibly existing visual monitoring devices, e.g. pressure gauges, MIN/MAX markings, oil-level sight glasses or piston detectors must be clearly visible.
- Observe prescriptions in the Technical data (chapter 4) regarding the installation position.

6.2 Place of installation

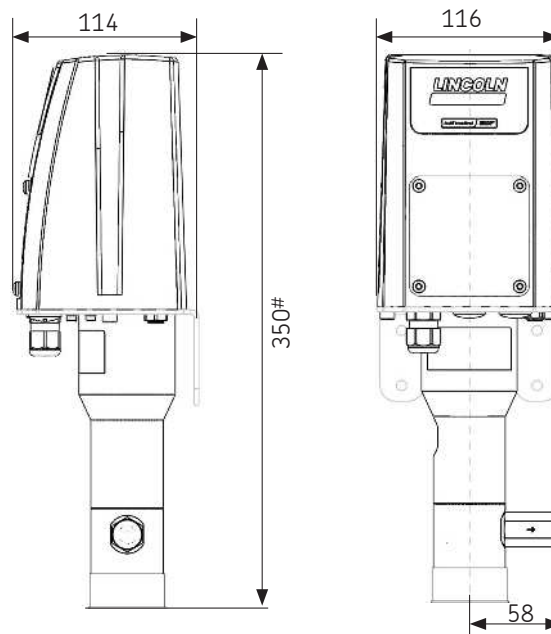
Protect the product against humidity, dust and vibrations and install it in an easily accessible position to ensure all other installations can be carried out without any problem.

6.3 Minimum assembly dimensions

Ensure sufficient space for maintenance work or for a possible disassembly of the product by leaving a free space of at least 50 mm into each direction in addition to the stated dimensions.

additional free space requirement above the housing to remove the housing lid = 170 mm

Minimum assembly dimensions Fig. 13

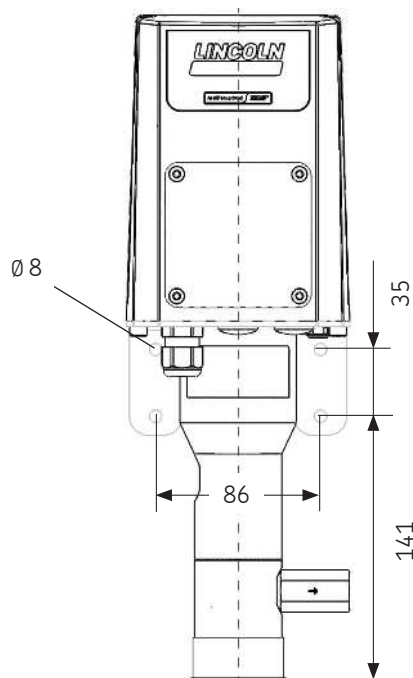


6.4 Mechanical connection

The pump is fastened on the 4 mounting bores. Fastening is done by means of the screws 4 x M6 x 20C (hexagonal socket) included in the scope of delivery.

Tightening torque = 10 Nm \pm 1 Nm

Connecting dimensions Fig. 14



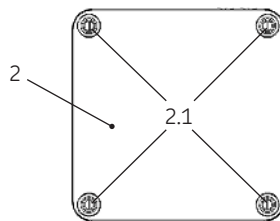
6.5 Electrical connection

Electrical connections must be done in such way that no forces are transferred to the connecting cables (tension-free connection). For electrical connection proceed as follows:

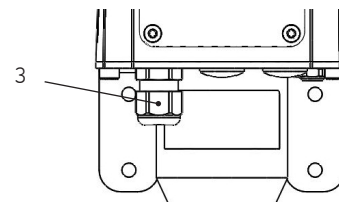
- Unscrew the 4 screws (2.1) and keep them for future use.
- Carefully remove the cover plate (2).
- Pass the cable through the cable gland (3). If necessary, remove a blind plug (3.1) and install another cable gland.
- If required, configure the cable for installation in the connecting terminal.
- Connect the connection cable accordingly on the terminal bar (see table).

Electrical connection of the EDL1 to the operator's network is done in dependency of the local connection conditions. To do so, observe the electrical characteristics (see chapter 4).

Cover plate Fig. 15



Electrical connection of the EDL1 Fig. 16



Terminal		
1	Power supply (+ 24 V DC)	
2	Mass (-)	
3	PE (protective earth)	
4	Power supply of sensor (+ 24 V DC)	
5	Mass of sensor (-)	
6	Sensor signal (capacitive, inductive, ultrasonic, mechanical as digital output, normally open contact)	
7	External input for additional lubrication / reset	
8/9	Fault signal (potential-free)	
10/11	Feedback (lubrication cycle successfully completed) (potential-free)	

For details, see connecting diagrams chapter 12

6.6 Configuration of the EDL1

The EDL1 has 3 operating modes. These facilitate an adaptation to the different operating conditions.

6.7 ON/OFF mode

To set the ON/OFF mode proceed as follows:

- Unscrew the screws (2.1) and keep them for future use.
- Remove the cover plate (2).

ATTENTION

Damage to the pcb is possible by slipping off with an inappropriate adjusting tool. Ensure that the adjusting tool is firmly seated in the respective DIP switch.



The positions of DIP switches 1-5 and 8 are not relevant for this operating mode.

6.8 Setting the ON/OFF mode

- Bring DIP switch 7 into position 0.

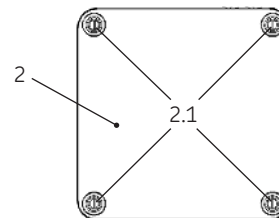
6.9 Adjusting the output volume

- Bring DIP switch 6 into position 1 or 0, as desired.
Position 1 = approx. 1.0 ccm/ stroke
Position 0 = approx. 0.5 ccm/ stroke
- Reinstall the cover plate (2).

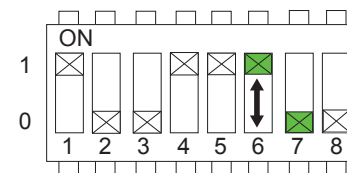
6.10 Machine contact mode

To set the mode proceed as follows:

Cover plate Fig. 17



Setting of the ON/OFF mode Fig. 18



- Unscrew the screws (2.1) and keep them for future use.
- Remove the cover plate (2).

ATTENTION

Damage to the pcb is possible by slipping off with an inappropriate adjusting tool. Ensure that the adjusting tool is firmly seated in the respective DIP switch.

6.11 To set the machine contact mode

- Bring DIP switch 7 into position 1.
- Bring DIP switch 8 into position 0.

6.12 Adjusting the output volume

- Bring DIP switch 6 into the desired position.
Position 1 = approx. 1.0 ccm/ stroke
Position 0 = approx. 0.5 ccm/ stroke

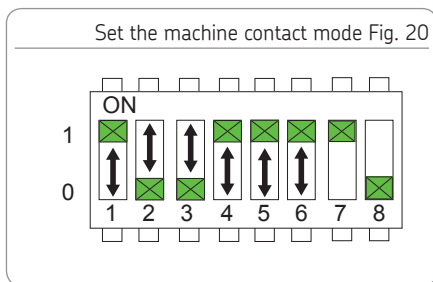
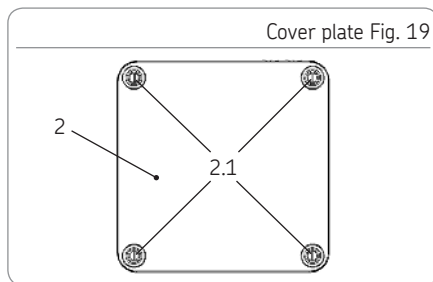
6.13 To set the pause time

Presettings

- Bring DIP switch 5 into position 0 (seconds) or 1 (hours).

Setting of definite value

- Bring DIP switches 1-4 into the desired positions.
- Reinstall the cover plate (2).



Presettings					
seconds			DIP 5	0	
hours			DIP 5	1	
Set definite time value					
DIP 1	DIP 2	DIP 3	DIP 4	seconds	hours
0	0	0	1	60	1
0	0	1	0	70	2
0	0	1	1	80	3
0	1	0	0	90	4
0	1	0	1	100	5
0	1	1	0	110	6
0	1	1	1	130	7
1	0	0	0	150	8
1	0	0	1	190	9
1	0	1	0	250	10
1	0	1	1	480	11
1	1	0	0	750	12
1	1	0	1	1000	13
1	1	1	0	1250	14
1	1	1	1	1600	15

6.14 Pulse mode

To set the mode proceed as follows:

- Unscrew the screws (2.1) and keep them for future use.
- Remove the cover plate (2).

ATTENTION

Damage to the pcb is possible by slipping off with an inappropriate adjusting tool. Ensure that the adjusting tool is firmly seated in the respective DIP switch.



The position of DIP switch 5 is not relevant for this operating mode.

6.15 To set the pulse mode

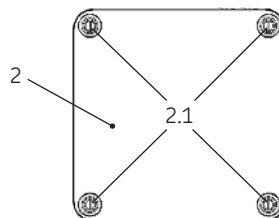
- Bring DIP switch 7 into position 1.
- Bring DIP switch 8 into position 1.

6.16 Adjusting the output volume

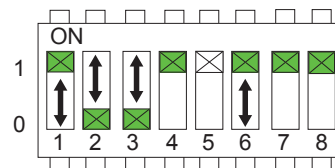
- Bring DIP switch 6 into the desired position.
- Position 1 = approx. 1.0 ccm/ stroke
Position 0 = approx. 0.5 ccm/ stroke

6.17 To set the pulses

Cover plate Fig. 21



Set the pulse mode Fig. 22



- Bring DIP switches 1-4 into the desired positions.
- Reinstall the cover plate (2).

Set definite pulse value				
DIP 1	DIP 2	DIP 3	DIP 4	Pulses
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	8
1	0	0	0	10
1	0	0	1	20
1	0	1	0	30
1	0	1	1	40
1	1	0	0	50
1	1	0	1	60
1	1	1	0	80
1	1	1	1	100

7. Initial start-up

7.1 General information

Start-up is effected:

- by external signals like the machine contact or a controller provided by the owner
- autonomously by a sensor connected to the EDL1 or independently from a signal if terminals 4 and 6 are bridged and the operating mode is correctly set to "machine contact".

7.2 Triggering an additional lubrication cycle

To trigger an additional lubrication cycle proceed as follows:

- Unscrew the screws (2.1) and keep them for future use.
- Remove the cover plate (2).

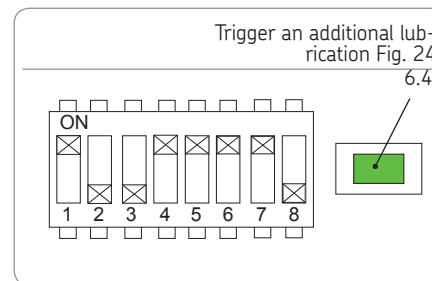
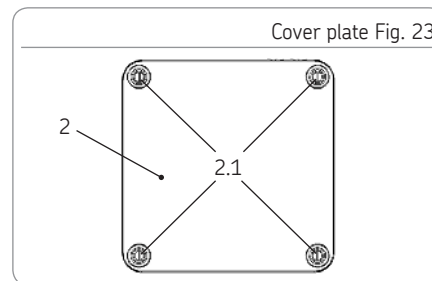


If the "additional lubrication" key is pressed > 5 seconds, a reset will be carried out instead of an additional lubrication.

- Shortly press the "additional lubrication" key (6.4), then release it again.
- Reinstall the cover plate (2).



To trigger an external additional lubrication cycle the same conditions apply as for an internal additional lubrication cycle. (i.e. a signal from the superior controller to terminal 7 for < 5 seconds).



In order to warrant safety and function, a person assigned by the operator must carry out the following inspections. Remedy detected defects before the initial start-up. Deficiencies may be remedied by an authorized and qualified specialist only.

Start-up check list

7.3 Inspections prior to initial start-up

YES IP

Electrical connection carried out correctly.	<input type="checkbox"/>	<input type="checkbox"/>
Mechanical connections carried out correctly	<input type="checkbox"/>	<input type="checkbox"/>
The performance data of the previously indicated connections correspond to the specifications stated in the Technical data.	<input type="checkbox"/>	<input type="checkbox"/>
All components, such as lubrication lines and metering devices, have been correctly installed.	<input type="checkbox"/>	<input type="checkbox"/>
Product protected with adequate pressure relief valve	<input type="checkbox"/>	<input type="checkbox"/>
No visible damage, contamination and corrosion	<input type="checkbox"/>	<input type="checkbox"/>
Any dismantled protection and monitoring equipment has been reassembled and checked for correct function	<input type="checkbox"/>	<input type="checkbox"/>
Earth strap fully present, properly connected and electrically conductive	<input type="checkbox"/>	<input type="checkbox"/>

7.4 Inspections during initial start-up

No unusual noises, vibrations, accumulation of moisture, or odours present	<input type="checkbox"/>	<input type="checkbox"/>
No unwanted escape of lubricant from connections	<input type="checkbox"/>	<input type="checkbox"/>
Lubricant is supplied free from bubbles	<input type="checkbox"/>	<input type="checkbox"/>
Bearings and friction points to be lubricated are provided with the planned amount of lubricant.	<input type="checkbox"/>	<input type="checkbox"/>



8. Operation

8.1 Operation

After its correct electrical and mechanical connection the EDL1 is ready for operation.

Operation of the EDL1 follows the preset operating mode.

9. Cleaning

	 WARNING
	Electric shock Carry out cleaning works only on depressurized products that have been disconnected from the power supply. Do not touch cables or electrical components with wet or damp hands. Use steam-jet cleaners or high-pressure cleaners only in accordance with the IP protection class of the pump. Otherwise electrical components may be damaged. Cleaning execution, required personal protective equipment, cleaning agents and devices following the valid operational regulations of the operator.

9.1 Cleaning agents

Cleaning agents compatible with the material may be used only (materials, see chapter 2.3).



Thoroughly remove residues of cleaning agents from the product and rinse off with clear water.

9.2 Exterior cleaning



Make sure to keep the reservoir closed during the cleaning procedure.

- Mark and secure wet areas.
- Keep unauthorized persons away.
- Thorough cleaning of all outer surfaces with a damp cloth.

9.3 Interior cleaning

Normally, interior cleaning is not required. Should incorrect or contaminated lubricant have been filled, inside cleaning of the product will be required.
To do so, contact the SKF Customer Service.

10. Maintenance

Regular and appropriate maintenance is a prerequisite to detect and clear faults in time.

As it is not possible for us to exactly define the operating conditions, we cannot indicate any definite deadlines. The specific timelines have to be determined, verified at regular intervals and adapted, if necessary, by the operator based on the local operating conditions. If needed, copy the table for regular maintenance activities.

Maintenance check list




Activity to be done	YES	IP
Electrical connection carried out correctly.	<input type="checkbox"/>	<input type="checkbox"/>
Mechanical connections carried out correctly	<input type="checkbox"/>	<input type="checkbox"/>
The performance data of the previously indicated connections correspond to the specifications stated in the Technical data.	<input type="checkbox"/>	<input type="checkbox"/>
All components, such as lubrication lines and metering devices, have been correctly installed.	<input type="checkbox"/>	<input type="checkbox"/>
Product protected with adequate pressure relief valve	<input type="checkbox"/>	<input type="checkbox"/>
No visible damage, contamination and corrosion	<input type="checkbox"/>	<input type="checkbox"/>
Any dismantled protection and monitoring equipment has been reassembled and checked for correct function	<input type="checkbox"/>	<input type="checkbox"/>
All warning labels on the product are available and in proper condition.	<input type="checkbox"/>	<input type="checkbox"/>
No unusual noises, vibrations, accumulation of moisture, or odours present	<input type="checkbox"/>	<input type="checkbox"/>
No unwanted escape of lubricant from connections	<input type="checkbox"/>	<input type="checkbox"/>
Lubricant is supplied free from bubbles.	<input type="checkbox"/>	<input type="checkbox"/>
Bearings and friction points to be lubricated are provided with the planned amount of lubricant.	<input type="checkbox"/>	<input type="checkbox"/>
Earthing cable fully present, properly connected and electrically conductive.	<input type="checkbox"/>	<input type="checkbox"/>

11. Troubleshooting

11.1 Display of the operating states and fault conditions

The operating states and fault conditions are displayed by different display patterns of the green, red and yellow LEDs on the control pcb.

The following displays are possible.





LED			Meaning/ possible cause	User intervention is required.
GREEN (left side)	RED (right side)	YELLOW (right side)		
				
AN			Operating voltage present	IP
AUS			No operating voltage present	possibly
AN	AUS	AN	EDL1 is ready for the next cycle no fault pending	IP
AN	AUS	AUS	EDL1 is active in lubrication cycle no fault pending	IP
AN	AN	AUS	Fault	YES

Fault table

Fault	Possible cause	Remedy
Air pockets in the lubricant or lubrication system	Loosen inlet fitting. Visual check for bubbles in the lubricant	If necessary, vent the lubrication system. To do so, observe the instructions of the upstream pump.
	Loosen outlet fitting. Visual check for bubbles in the lubricant	Vent lubrication system. To do so, trigger an additional lubrication several times, if necessary.
Defective pressure relief valve Overpressure in the centralized lubrication system	Lubricant leaking from the pressure reducing valve	Replace pressure reducing valve. Determine and remedy cause of overpressure
Lubricant volume deviates from projected values	Pause (DIP switch 1-4) set wrongly	Check and, if necessary, correct pause settings (time or pulses)
	Output volume (DIP switch 6) set wrongly	Check and, if necessary, correct output volume setting

If the fault cannot be determined and remedied, please contact our Customer Service.

12. Repairs

	WARNING
	<p>Risk of injury Before carrying out any repair work, take at least the following safety measures:</p> <ul style="list-style-type: none">○ Keep unauthorized persons away.○ Mark and secure work area.○ Depressurize the product.○ Disconnect the product from the power supply and secure it against being switched on.○ Verify that no power is being applied.○ Earth and short-circuit the product.○ Where needed, cover neighbouring units that are live.
	
	

12.1 Replacement of the housing cover

To replace the housing cover proceed as follows:

- Implement the safety measures as specified in chapter 9.3.
- Loosen the housing cover (1) by removing the two screws (1.1).

ATTENTION

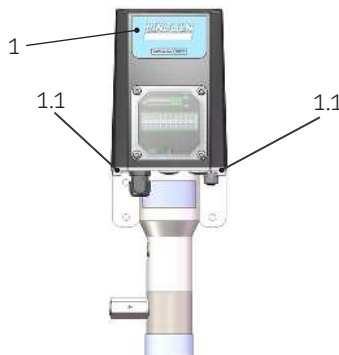
Risk of damage to the control pcb. Remove the housing cover as straight upwards as possible taking care not to knock against the control pcb.

- Remove the housing cover upwards.
- Verify that the mounting area on the carrier of the EDL1 is free from contaminations (e.g. residuals of the old moulded seal). If necessary, clean the mounting area.
- Verify that the moulded seal and the two hexagon nuts are seated correctly in the notches of the new housing cover.
- Mount new housing cover from the top. Make sure that the guide pin inside of the housing cover securely engages in the fixation (1.2).

- Reinstall the housing cover (1) by screwing in the two screws (1.1).

Tightening torque = 2 Nm \pm 0.5 Nm

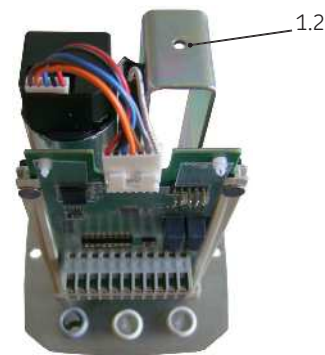
Loosen housing cover Fig. 25



Spare parts of housing cover Fig. 26



Fixation for housing cover Fig. 27



12.2 Replacement of the control pcb

To replace the control pcb proceed as follows:

- Implement the safety measures as specified in chapter 9.3.
- Loosen the housing cover (1) by removing the two screws (1.1).

ATTENTION

Risk of damage to the control pcb. Remove the housing cover as straight upwards as possible taking care not to knock against the control pcb.

- Remove the housing cover upwards.
- Verify that the moulded seal of the housing cover is not damaged. In case of visible damages the complete housing cover must be changed (see chapter 9.5).
- Keep housing cover, moulded seal and screws for future use.
- Remove all cables from the connecting terminals (6.3). Mark cables to prevent confusion.
- Remove earthing cable from connection screw (8).

- Carefully loosen the white plug (6.7) of the control pcb.
- Open the fixations of the control pcb. To do so press the two fixations (6.8) from front to back into the "OPEN" position.
- Press the control pcb (6) upwards out of the guide rails.

ATTENTION

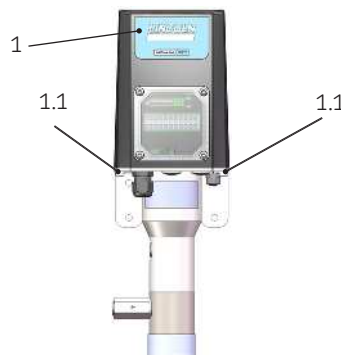
Fixations of the control pcb Fig. 29

OPEN

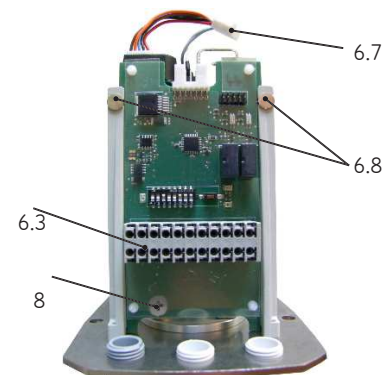
CLOSE



Loosen housing cover Fig. 28



Loosened cables and plugs Fig. 30



Risk of damage to the superior machine.
Before installing the new control pcb, check and, if necessary, correct the settings of the DIP switches so that they comply with the intended purpose.

- Insert new control pcb (6) from the top into the guide rails and carefully push it downwards without canting it.
- Close the fixations of the control pcb. To do so press the two fixations (6.8) from back to front into the "CLOSED" position.
- Remount the white plug (6.7) of the control pcb.
- Properly connect earthing cable to connection screw (8).
(Tightening torque $2 \text{ Nm} \pm 0.5 \text{ Nm}$)
- Remount all cables correctly to the connecting terminals (6.3).
- Verify that all cables are securely fixed in the connecting terminals.

12.3 Electrical safety test

For the mentioned electrical safety test use measuring equipment following DIN EN 61557.

- Testing the protective conductor system with regard to conductivity.



After the electrical safety test a functional test should be carried out by triggering an additional lubrication (see chapter 7.2).

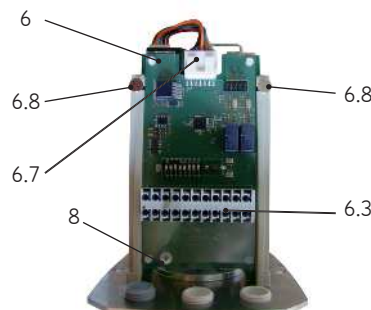
Fixations of the control pcb Fig. 32

OPEN

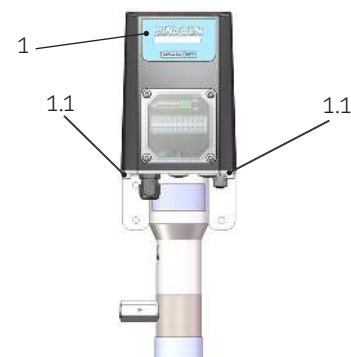
CLOSE



Control pcb is mounted Fig. 31



Mount housing cover Fig. 33



12.4 Tests after replacement of the power supply board

After replacement of the power supply board carry out an electrical test acc. to IEC 60204-1 in the following order:

12.4.1 Visual check

- Top part of housing mounted properly.
No visible damages to the pump.

12.4.2 Electrical safety test

Use measuring equipment following EN 61557 for the mentioned electrical tests.

- Testing the protective conductor system with regard to conductivity.
- Insulation test (terminals L and N bridged against PE).

12.4.3 Electrical functionality test

The electrical function test must be carried out immediately after the repair following the protection class of the electrical apparatus to be tested. The electrical function test may be carried out by a trained electrician observing the statutory provisions and pertinent regulations.

After the replacement of the power supply board the scope and findings of the test have to be recorded in writing and handed over for filing to the person responsible for machine operation.

13. Shutdown and disposal

13.1 Temporary shutdown

Temporarily shut the system down by:

- switching off the superior machine.
- Disconnecting the product from the power supply.

13.2 Final shutdown and disassembly

The final shutdown and disassembly of the product must be professionally planned and carried out by the operator in compliance with all regulations to be observed.

13.3 Disposal

Disposal should be avoided or minimized wherever possible. Disposal of products contaminated with lubricant must be effected via a licensed waste disposal contractor in accordance with environmental requirements and waste disposal regulations as well as local authority requirements.



The specific classification of the waste is in the waste producer's responsibility, as the European Waste Catalogue provides different waste disposal codes for the same type of waste but of different origin.

Dispose of or recycle electrical components following WEEE directive 2012/19/EU.



Parts made of plastic or metal can be disposed of with the commercial waste.



14. Spare parts and accessories

The spare parts assemblies may be used exclusively for replacement of identical defective parts. Modifications with spare parts on existing products are not allowed.

14.1 Housing cover assy.

Designation	Qty.	Part number
<u>Housing cover assy.</u>	1	556-60094-1
consisting of;		
1 x housing cover incl. moulded seal and label, cover disc and seal		
1 x moulded seal		
2 x hex nut M5 C		
2 x hexagonal socket head screw M5 x 12 C (8.8)		
4 x flat-head screw incl. seal		

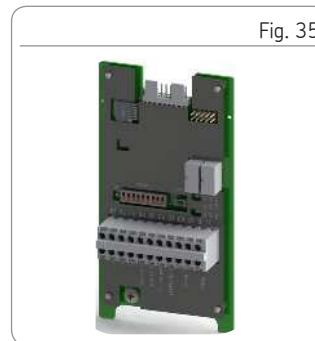
Fig. 34



14.2 Control pcb

Designation	Qty.	Part number
Control pcb 24 V DC	1	556-60095-1

Fig. 35



14.3 Hydraulic fitting

Designation	Qty.	Part number
Fitting GE 6-L G 1/4A CF (inlet/ outlet)	1	223-12477-8
Fitting GE 8-L G 1/4A CF (inlet/ outlet)	1	223-12477-6
Fitting GE 10-L G 1/4A CF (inlet/ outlet)	1	223-12272-9

Fig. 36



14.4 Check valve

Designation	Qty.	Part number
Check valve G1/4 A x G1/4	1	556-60097-1

Fig. 37



14.5 Cable fittings

Designation	Qty.	Part number
Cable gland assy. consisting of; 3 x cable gland M16 x 1.5 2 x blind plug M16 x 1.5	1	556-60096-1

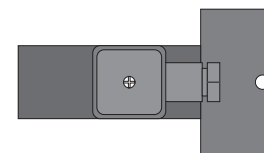
Fig. 38



14.6 Pressure switch

Designation	Qty.	Part number
Pressure switch 300 bar	1	DSB1-S30000X-1A-01
Pressure switch 100 bar	1	DSB1-S10000X-1A-01

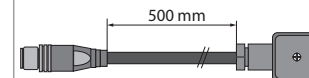
Fig. 39



14.7 Connection cable for pressure switch

Designation	Qty.	Part number
Connection cable for pressure switch	1	664-85046-3

Fig. 40



14.8 Collecting sleeve assy.

Designation	Qty.	Part number
Collecting sleeve assy.	1	556-60186-1
Consisting of:		
Collecting sleeve and O-ring as spacer		

Fig. 41



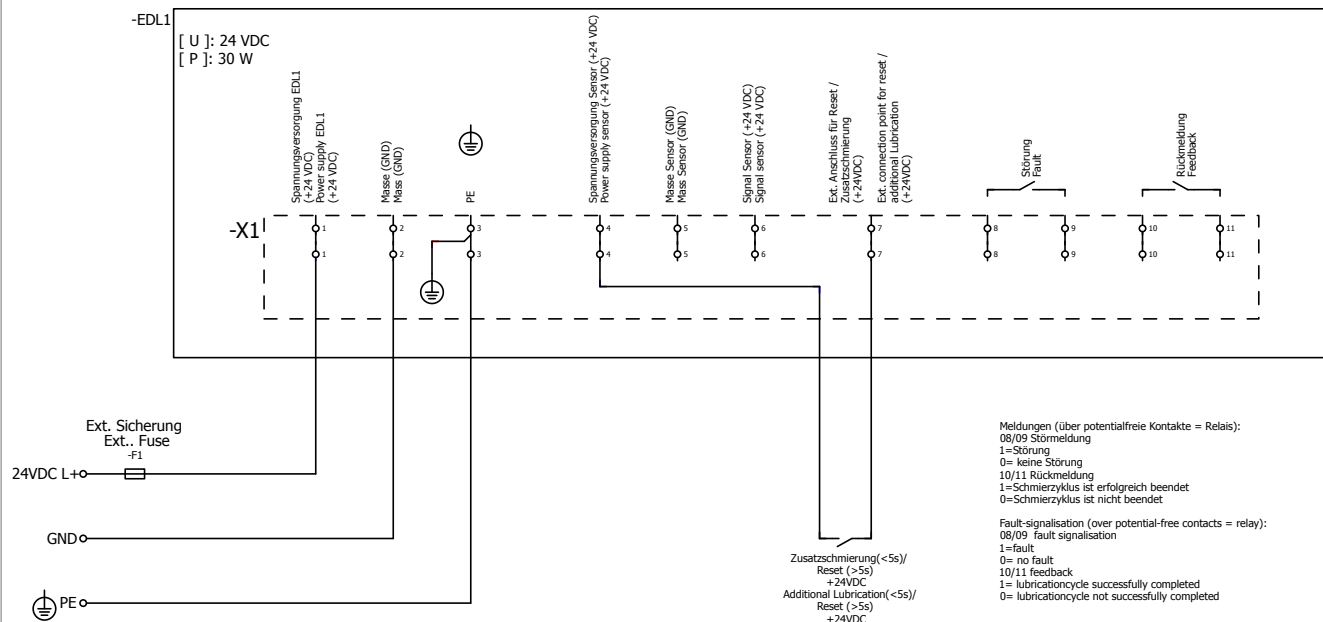
15. Connection diagrams

15.1 Legend

Cable colours following IEC60757							
Abbreviation	Colour	Abbreviation	Colour	Abbreviation	Colour	Abbreviation	Colour
BK	black	GN	green	WH	white	PK	pink
BN	brown	YE	yellow	OG	orange	TQ	turquoise
BU	blue	RD	red	VT	violet		

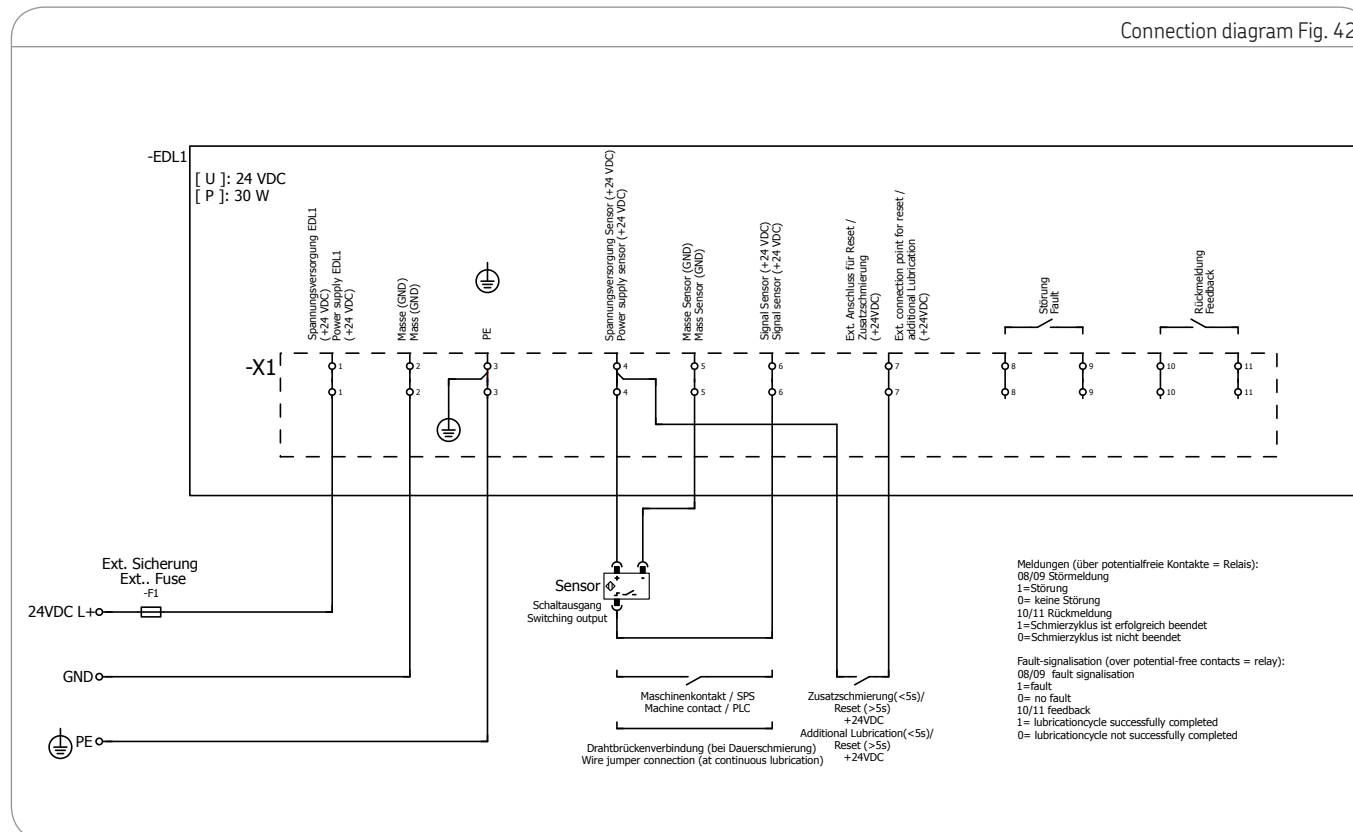
15.2 Connection diagram for the ON/OFF mode

Connection diagram Fig. 41



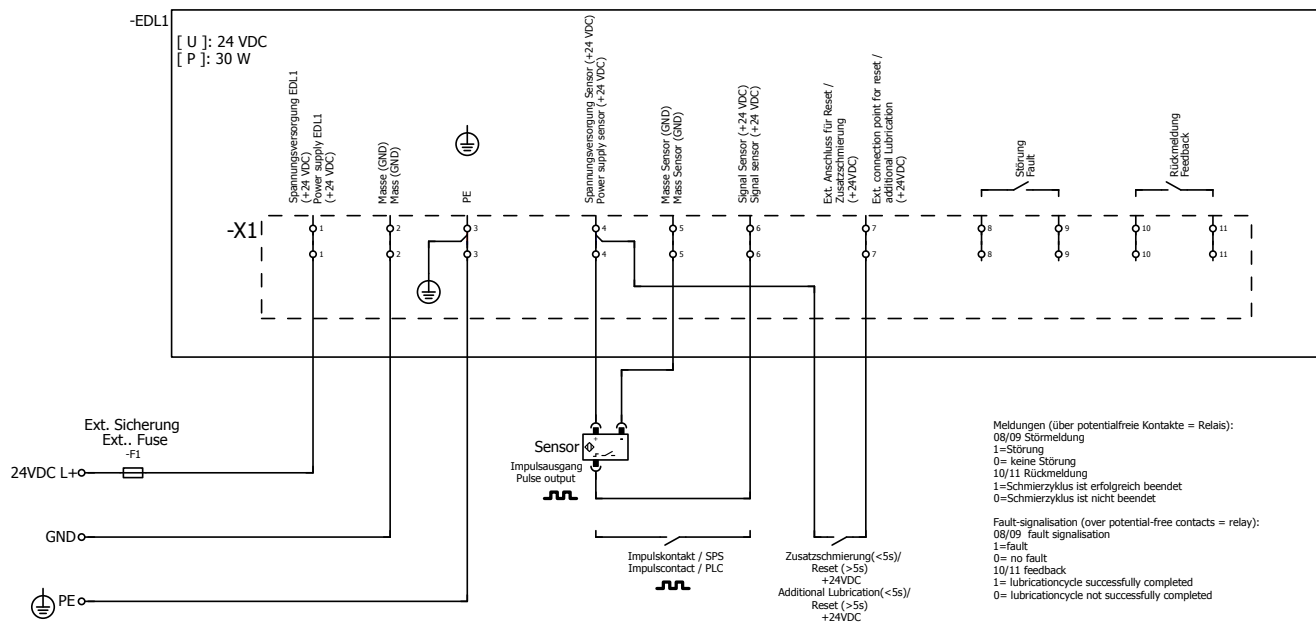
15.3 Connection diagram for machine contact mode

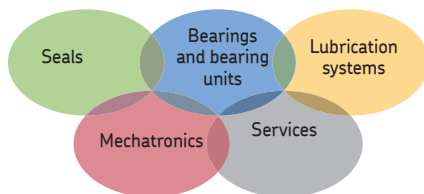
Connection diagram Fig. 42



15.4 Connection diagram for pulse mode

Connection diagram Fig. 43





The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide.

These five areas of competence include bearings and bearing units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and assessment management systems. A global presence provides SKF customers uniform quality standards and worldwide product availability.

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Version 05

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Important information on product usage

All products from SKF may be used only for their intended purpose as described in this brochure and any instructions.

Not all lubricants are suitable for use in centralized lubrication systems. SKF does offer an inspection service to test customer supplied lubricant to determine if it can be used in a centralized lubrication system.

SKF lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible temperature.

