Dosing Pump with Lubricant Cartridge

For use in centralized lubrication systems

Owner's Manual - Containing Installation, Operation and Maintenance Instructions

(Original installation instructions in accordance with EC-Machinery Directive 2006/42/EC)

Product line:

ETPx-...+924
ETPxWZ-...+924

Version 01

WARNING:
Read this owner's manual before installing, operating or maintaining the product. Failure to follow the instructions and safety precautions in this owner's manual could result in serious injury, death, or property damage. Keep for future reference.

Masthead

This owner's manual - containing installation, operation and maintenance instructions complies with EC-Machinery Directive 2006/42/EC and is an integral part of the described product. It must be kept for future use.

This owner's manual - containing installation, operation and maintenance instructions was created in accordance with the valid standards and regulations on documentation, VDI 4500 and EN 292.

Service

If you have technical queries, please contact one of the following plants:

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Owner's Manual - Containing Installation, Operation and Maintenance Instructions
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Information concerning the EC Declaration of Conformity and the EC Declaration of Incorporation

For the product(s) designated below:

Dosing Pump with Lubricant Cartridge

Product line:

ETPx-...+924
ETPxWZ-...+924

SKF herewith certifies that it conforms to the pertinent safety requirements set forth in the following Council Directive(s) for the harmonisation of the laws of the Member States...

- **Machinery Directive 2006/42/EC**
- **Electromagnetic compatibility 2004/108/EC**

Notes:

(a) This declaration certifies conformity with the aforementioned directive(s), but does not contain any assurance of properties.

(b) The safety instructions in the owner's manual must be observed.

(c) The certified product must not be started up until it is confirmed that the equipment, machinery, vehicle or the like in which the product was installed meets the provisions and requirements of the national directives to be applied. This is in particular important for the implementation of the Use of Work Directive.

(d) Operation of the products on non-standard main voltage as well as nonobservance of installation instructions can affect the EMC properties and electrical safety.

SKF further declares that the above mentioned product:

- is meant for integration into a machinery / for connection to other machinery according to the **EC-Machinery Directive 2006/42/EC, Appendix II Part B**. Starting up the product is not permissible until it is assured that the machinery, vehicle or the like in which the product was installed meets the provisions and requirements of the regulations set forth in the EC Directive 2006/42/EC.
- with reference to the **EC Directive 97/23/EC concerning apparatus subjected to pressure,** this product must only be used as intended and according to the Owner's manual. Especially observe the following:

  Products of SKF Lubrication Systems Germany AG must not be used in conjunction with fluids, group I (hazardous fluids), according to the definition of article 2 paragraph 2 of the Directive 67/548/EC dtd. 27th June, 1967; and are not approved for application with such fluids.

  None of the products manufactured by SKF Lubrication Systems Germany AG can be used with gases, liquefied gases, gases dissolved under pressure, steams or fluids that will reach a steam pressure of more than 0.5 bar above the normal atmospheric pressure (1013 mbar) in the permissible application temperature range.

When used as intended, the products supplied by SKF Lubrication Systems Germany AG do not reach the limit values listed in the Article 3 par. 1, sections 1.1 to 1.3 and par. 2 of the Directive 97/23/EC. Therefore, they do not come under the requirements set forth in annex I of that Directive. They are not labelled with the CE mark with reference to the Directive 97/23/EC. They are classified by SKF Lubrication Systems Germany AG to come under Article 3 par. 3 of the Directive.

The EC Declaration of Conformity and EC-Declaration of Incorporation is part of the product documentation. These documents are delivered with the product.

Safety information in owner's manual

Meaning of symbols and corresponding information

In this owner's manual, the symbols and words shown on this page are meant to communicate a particular risk to persons, material assets, or the environment.
Be sure all persons exposed to these risks read this manual. Keep it near the equipment for future reference.

Instructions attached directly to the equipment, such as rotational direction arrows and fluid connection labes, must be followed. Replace such signs if they become illegible.

- Rotational direction arrow
- Fluid connection label

Read this Owner's Manual before installing, operating or maintaining the product. Failure to follow the instructions and safety precautions in this owner's manual could result in serious injury, death, or property damage. Keep for future reference.

Note: Not every symbol and corresponding information described in the Safety Information is used in this owner's manual.

Hazard symbols

Symbole	Standard	Use
	DIN 4844-2 W000	General risk of injury or damage
	DIN 4844-2 W008	Voltage
	DIN 4844-2 W026	Hot surface
	DIN 4844-2 W028	Slip hazard

Keywords in safety informations and their meanings

Keyword	Use
Danger!	Indicates a danger of injury to persons
Caution!	Indicates a danger of damage to property or the environment
Notice!	Indicates additional

Information symbols

Symbol	Use
	Prompts you to take action
•	Indicates other issues, causes or circumstances
o	Used for bulleted lists
➔	Provides additional information
☞	Prompts you to take action

1. Safety information

These instructions must be read and understood by all persons who are involved with the installation, operation, maintenance, and repair of the product. These instructions must be kept close to the equipment for future reference.

Note that these installation instructions is an integral part of the product. It must be handed over to the new operator of the product if the product is sold.

The described product was manufactured in accordance with all generally acknowledged regulations pertaining to technology, occupational safety, and accident prevention. However, dangers that can cause physical injury to persons or damage to other material assets might still occur during the use of the product. This product should only be operated if it has been installed in accordance with these instructions and is safe to operate. In particular, malfunctions that might affect the safety of the product must be rectified immediately.

In addition to the information provided in the installation instructions, all generally applicable regulations on accident prevention and the environment must be observed.

1.1 Intended use

All SKF Lubrication Systems Germany AG products must only be used for their intended purpose and in accordance with the specifications of the installation instructions for the product in question.

The described product is for supplying centralized lubrication systems with lubricant and is intended for use in centralized lubrication systems. Any other use of this product constitutes improper use.

Products of SKF Lubrication Systems Germany AG must not be used in conjunction with fluids, group I (hazardous fluids), according to the definition of article 2 paragraph 2 of the Directive 67/548/EC dtd. 27th June, 1967; and are not approved for application with such fluids.

None of the products manufactured by SKF Lubrication Systems Germany AG can be used with gases, liquefied gases, gases dissolved under pressure, steams or fluids that will reach a steam pressure of more than 0.5 bar above the normal atmospheric pressure (1013 mbar) in the permissible application temperature range.

Unless otherwise noted, products of SKF Lubrication Systems Germany AG must not be used in conjunction with explosive atmospheres according to the ATEX-Directice 94/9/EC.

1.2 Authorized personnel

The products described in the installation instructions may only be installed, operated, maintained, and repaired by qualified experts. Qualified experts are persons who have been trained, instructed, and familiarized with the end product into which the described product is installed. These persons are considered capable of such tasks due to their education, training, and experience with valid standards, conditions, accident prevention regulations, and installation measures. They should be able to carry out the required tasks and to recognize - and thus avoid - any dangers that might otherwise occur.

A definition of what constitutes a qualified person and who are unqualified persons are stipulated in DIN VDE 0105 and IEC 364.

1.3 Danger relating to electric current

The electrical connection for the described product may only be established by qualified, instructed persons who have been authorized by the operator or owner to carry out this task. All local electrical operating conditions and regulations such as DIN and VDE must be observed. Improperly connected products can result in considerable damage to property and serious injury to persons.

Danger!
Working on products that have not been disconnected from the power supply can cause serious injury or death to persons. Installation, maintenance, and repair work may only be carried out by qualified experts on products that have been disconnected from the power supply. The supply voltage must be turned off before any product components are opened.

1.4 Danger relating to system pressure

Danger!
Centralized lubrication systems are under pressure when they are being operated. Such systems must therefore be depressurized before starting installation, maintenance, or repair work and before making any changes to the system.

1.5 Hazard from spring preload

Danger!
The cartridge holder of the described product is spring pre-loaded during operation. The load on the pressure spring must therefore be relieved by removing the cartridge holder before starting assembly, maintenance or repair work, or any system modifications or system repairs.

The cartridge holder of the described product is mechanically spring-loaded. The cartridge holder must therefore be opened carefully when replacing the lubricant cartridge. The pressure spring, follower plate and lubricant cartridge can be removed once the load on the pressure spring is relieved.

1.6 Warranty and liability

SKF Lubrication Systems Germany AG assumes no warranty and liability if one of the following circumstance should occur:

- Not intended use
- Improper installation/disassembly or improper operation of the product
- Use of contaminated lubricants or lubricants which are not approved
- Improper maintenance or repairing of the product
- Using of unoriginal SKF Lubrication Systems Germany AG spare parts
- Making alterations or modifications to the product, which are not approved and signed by SKF Lubrication Systems Germany AG
- Non-observance of the advices about transport and storage

2. Lubricants

2.1 General information

All SKF Lubrication Systems Germany AG products must only be used for their intended purpose and in accordance with the specifications of the installation instructions for the product in question.

The intended use of this product is for the centralized lubrication/lubrication of bearings and wear points with lubricants. All physical limitations of use stipulated in the documentation of the product such as the owner's manual, technical drawings and catalogues must be observed.

Note that hazardous substances of any kind and - in particular - the substances that are classed as hazardous in accordance with EC-Directive 67/548/EC Article 2, Paragraph 2 may only be inserted into and conveyed/distributed by centralized lubrication systems and components following consultation with SKF Lubrication Systems Germany AG and with the express written permission of the company.

Products manufactured by SKF Lubrication Systems Germany AG are not approved for use in conjunction with gases, liquefied gases, gases dissolved under pressure, vapours, and fluids with a vapour pressure of more than 0.5 bar above normal atmospheric pressure (1013 mbar) at the maximum permitted temperature.

Should there be a need to use the product to convey media other than lubricants or hazardous substances, this must be discussed with SKF Lubrication Systems Germany AG first and the company must give express written permission.

In the opinion of SKF Lubrication Systems Germany AG, lubricants constitute a design element that must be considered when selecting components and designing centralized lubrication systems. The lubrication properties of the lubricants in question must be considered.

2.2 Selection of lubricants

You must observe the machinery manufacturer's information on the lubricants to be used in the machinery.

Caution!
The manufacturer of the bearing or machinery to be lubricated will specify the lubricant requirements for each point to be lubricated. You must make sure that the required quantity of lubricant is provided to the relevant lubricating point. If a lubricating point is insufficiently lubricated, the bearing may become damaged or jammed.

While the machinery/bearing manufacturer usually specifies lubricants, it is the owner/operator (or maintenance person) who must finally select the appropriate lubricant, with the help of the lubricant supplier. When selecting a lubricant, the type of bearing/wear point, the stresses and strains to be expected during operation, and anticipated ambient conditions must be taken into account. All financial/economic aspects must also be considered.

If required, SKF Lubrication Systems Germany AG can help customers to select suitable components for the conveyance of the selected lubricant and to plan and design their centralized lubrication system.

If you have further questions, you can contact SKF Lubrication Systems Germany AG. We can test lubricants in our own laboratory to establish their suitability for conveyance (e.g. 'oil separation' behaviour) in centralized lubrication systems.
You can request an overview of lubricant tests offered by SKF Lubrication Systems Germany AG from our Service department.

2.3 Approved lubricants

Caution!
Only lubricants that have been approved by SKF for use with the product may be used. Unsuitable lubricants can cause product malfunctions and damage to property.

Caution!
Different lubricants must not be mixed together. Doing so can cause damage and require extensive cleaning of the products/centralized lubrication system. To prevent confusion, we recommend that you attach information indicating the lubricant to be used on the lubricant reservoir.

The described product can be operated with lubricants that comply with the specifications in the technical data.

Note that some lubricants may have properties that lie within the permitted limit values and yet not be suitable for use in centralized lubrication systems for other reasons. For example, some synthetic lubricants are not compatible with elastomers.

2.4 Lubricants and the environment

Caution!
Lubricants can contaminate the ground and watercourses. Lubricants must be used and disposed of properly. Country specific regulations and laws on the use and disposal of lubricants must be observed.

Note that lubricants are harmful to the environment and flammable; their transportation, storage, and processing are subject to special precautionary measures. For specifications on transportation, storage, processing, and dangers to the use and the environment for the lubricant, refer to the material safety data sheet provided by or available from the lubricant manufacturer. You can ask the manufacturer of the lubricant for the material safety data sheet.

2.5 Danger relating to lubricants

Danger!
Centralized lubrication systems must be leak-tight. Leaking centralized lubrication systems can cause a slip hazard. When performing installation, maintenance, and repairs test the centralized lubrication system for leaks. Leaky parts of the centralized lubrication system or components of the lubrication equipment have to be sealed immediately.

Leaking centralized lubrication systems or components of the lubrication equipment are a source of danger in relation to slip hazard and the risk of injury. These dangers can cause physical injury to persons or damage to other material assets.

Lubricants are hazardous substance. Refer to safety precautions in the lubricant manufacturer's material safety data sheet.

You can ask the manufacturer of the lubricant for the material safety data sheet.

3. Design and function

3.1 General information

SKF dosing pumps with lubricant cartridge are used to lubricate bearings with low and very low lubricant requirements. Typical applications include the lubrication of linear guides and rolling bearings with low or very low lubricant requirements in machines and machine systems.

SKF dosing pumps with lubricant cartridge are designed to deliver grease lubricants of NGLI Grades 000 to 2.

SKF dosing pumps with lubricant cartridge are delivered in fully assembled condition with the lubricant cartridge installed. The dosing pump and the lubricant cartridge are filled standard with an EP grease of NLGI Gr. 2. Other lubricants are available on request based on the field of application.

SKF dosing pumps with lubricant cartridge are available in model designs with or without fill level and stroke monitoring. The model designs further differ in terms of metered quantity per lubricant outlet and the number of lubricant outlets.

SKF dosing pumps with lubricant cartridge are assembled in terms of the number of lubricant outlets and the metered quantity per lubricant outlet based on the model design ordered. The number of lubricant outlets and the metered quantity cannot be changed after delivery.

3.2 Design

The dosing pump with lubricant cartridge consists of a housing containing a block of five dosing pumps. The attached cartridge holder contains a follower plate which is actuated by spring pressure and provides sufficient preload for the lubricant cartridge.

The dosing pump with lubricant cartridge has a minimum of two and a maximum of five lubricant outlets. A lubrication line is attached to each lubricant outlet.

The metered quantity per lubricant outlet can be selected based on the application. The fittings for the lubricant outlets are marked with letters identifying the metered quantity. Lubricant outlet fittings without markings have standard metering (15 mm^3/stroke). Metered quantities of 10 mm^3/stroke and 20 mm^3/stroke are marked with the letters C (10 mm^3/stroke) and A (20 mm^3/stroke), respectively. Unneeded lubricant outlets must not be closed, as this will block the unit.

The standard diameter of the lubrication lines is tube Ø 2.5 mm x wall thickness 0.5 mm. The maximum length of the lubrication lines is 1.5 m. Other lengths are available on request.

For details on the number of lubricant outlets, possible metered quantities and possible combinations, please see Figures 2 and 3 or consult the documentation.

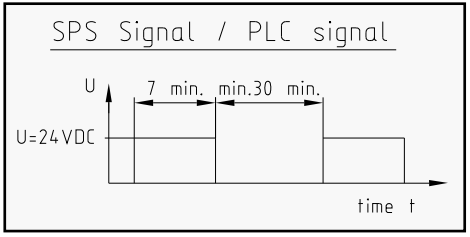
If no documentation is available, you can request the documentation directly from SKF Lubrication Systems Germany AG.

3.3 Function

SKF dosing pumps with lubricant cartridge are designed to supply a metered quantity of lubricant to a minimum of two and a maximum of five lubrication points.

The lubricant feeding operation is triggered when supply voltage of 24V DC is applied to the electrical connection. This triggers a stroke movement, which uses dosing pistons to convey the lubricant in the dosing chambers to the lubrication point through the connected lubrication lines. After supply voltage is switched off, spring tension moves the dosing pistons back to the normal position. During this process, the follower plate under spring preload helps to draw new lubricant from the lubricant cartridge into the dosing chambers. The dosing pump with lubricant cartridge is now ready for the next lubricating cycle. The time sequence for the supply voltage control is shown in Figure 1.

Fig. 1: Control of supply voltage



The dosing pump design with lubricant cartridge and monitoring system contains a fill level switch for automatic fill level control, as well as a stroke control switch for automatic control of the dosing piston strokes.

When the system is idle and the fill level in the lubricant cartridge is adequate, the contact on the fill level switch is closed and the contact on the stroke control switch is open. During operation, the fill level switch remains closed if the fill level in the lubricant cartridge is adequate. When the dosing pistons reach the correct end position, the stroke control switch is closed and an electrical signal is issued to the machine control unit through the circular electrical connector. The machine control unit evaluates the electrical signal as "OK = lubrication performed."

When the minimum fill level is reached in the lubricant cartridge, the contact on the fill level switch opens and the electrical signal is not issued, even if the stroke control switch closes due to the dosing pistons reaching the end position. The machine control unit evaluates the lack of an electrical signal as "not OK = lubrication not performed." From this point, only a small reserve of lubricant is still available for feeding, and the lubricant cartridge must be replaced immediately.

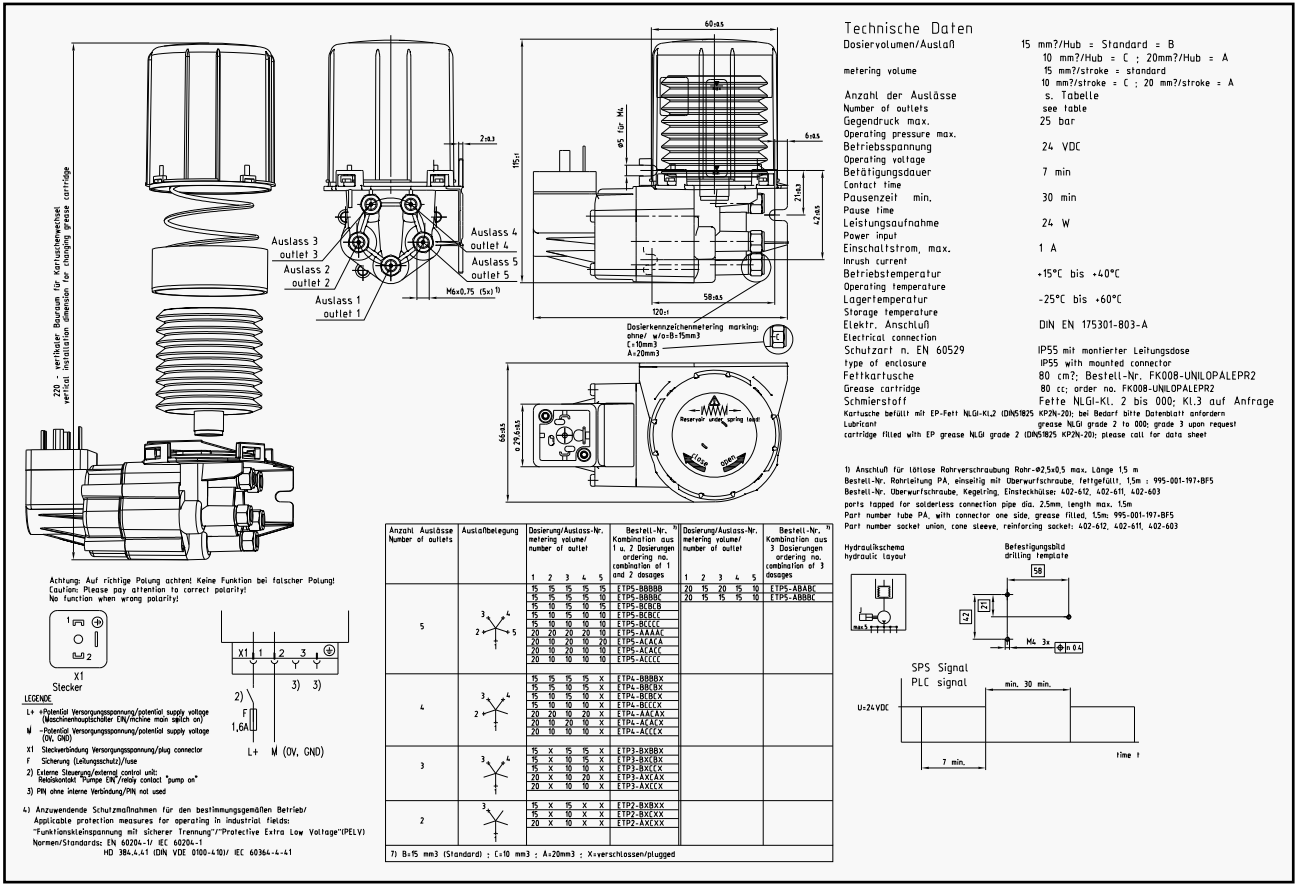
If the fill level in the lubricant cartridge is adequate (fill level switch closed) and the stroke control switch is not closed because the dosing pistons do not reach the end position, no electrical signal is issued to the machine control unit through the circular electrical connector. The machine control unit evaluates the lack of an electrical signal as "not OK = lubrication not performed."

For details on the design, technical data and function, please see Figures 2 and 3 or consult the documentation.

When programming the stroke monitoring function in the machine control unit, ensure that the dosing pistons reach the end position a maximum of 7 minutes after the 24V DC supply voltage is switched on by the machine control unit (see Figure 1). During this period of maximum 7 minutes, the stroke control switch is open and no electrical signal ("OK = lubrication performed") is sent to the machine control unit. The machine control unit should only query the control signal once a maximum of 7 minutes have passed. If the signal is present, the control unit evaluates it as "OK = lubrication performed." A malfunction must be assumed if no signal is present after 7 minutes.

The delay of 7 minutes is required due to the operating principle of the dosing pump and must be taken into consideration when programming the machine control unit.

Fig. 2: Design and technical data
ETPx-...+924



Technische Daten

Dosiervolumen/Auslaß	15 mm³/Hub = Standard = B 10 mm³/Hub = C ; 20mm³/Hub = A
metering volume	15 mm³/stroke = standard 10 mm³/stroke = C ; 20 mm³/stroke = A
Anzahl der Auslässe	s. Tabelle
Number of outlets	see table
Gegendruck max.	25 bar
Operating pressure max.	
Betriebsspannung	24 VDC
Operating voltage	
Betätigungsdauer	7 min
Contact time	
Pausenzeit min.	30 min
Pause time	
Leistungsaufnahme	24 W
Power input	
Einschaltstrom, max.	1 A
Inrush current	
Betriebstemperatur	+15°C bis +40°C
Operating temperature	
Lagertemperatur	-25°C bis +60°C
Storage temperature	
Elektr. Anschluß	DIN EN 175301-803-A
Electrical connection	
Schutzart n. EN 60529	IP55 mit montierter Leitungsdose
type of enclosure	IP55 with mounted connector
Fettkartusche	80 cm³; Bestell-Nr. FK008-UNILOPALEPR2
Grease cartridge	80 cc; order no. FK008-UNILOPALEPR2
Schmierstoff	Fette NLGI-Kl. 2 bis 000; Kl.3 auf Anfrage
Lubricant	Kartusche befüllt mit EP-Fett NLGI-Kl.2 (DIN51825 KP2N-20); bei Bedarf bitte Datenblatt anfordern grease NLGI grade 2 to 000; grade 3 upon request cartridge filled with EP grease NLGI grade 2 (DIN51825 KP2N-20); please call for data sheet

Anzahl Auslässe Number of outlets	Auslaßbelegung	Dosierung/Auslass-Nr. metering volume/ number of outlet 1 2 3 4 5	Bestell-Nr. 7) Kombination aus 1 u. 2 Dosierungen ordering no. combination of 1 and 2 dosages	Dosierung/Auslass-Nr. metering volume/ number of outlet 1 2 3 4 5	Bestell-Nr. 7) Kombination aus 3 Dosierungen ordering no. combination of 3 dosages
5		15 15 15 15 15	ETP5-BBBBB	20 15 20 15 10	ETP5-ABABC
		15 15 15 15 10	ETP5-BBBBC	20 15 15 15 10	ETP5-ABBBC
		15 10 15 10 15	ETP5-BCBCB		
		15 10 15 10 10	ETP5-BCBCC		
		15 10 10 10 10	ETP5-BCCCC		
		20 20 20 20 10	ETP5-AAAAC		
		20 10 20 10 20	ETP5-ACACA		
		20 10 20 10 10	ETP5-ACACC		
		20 10 10 10 10	ETP5-ACCCC		
4		15 15 15 15 X	ETP4-BBBBX		
		15 15 10 15 X	ETP4-BBCBX		
		15 10 15 10 X	ETP4-BCBCX		
		15 10 10 10 X	ETP4-BCCCX		
		20 20 10 20 X	ETP4-AACAX		
		20 10 20 10 X	ETP4-ACACX		
		20 10 10 10 X	ETP4-ACCCX		
3		15 X 15 15 X	ETP3-BXBBX		
		15 X 10 15 X	ETP3-BXCBX		
		15 X 10 10 X	ETP3-BXCCX		
		20 X 10 20 X	ETP3-AXCAX		
		20 X 10 10 X	ETP3-AXCCX		
2		15 X 15 X X	ETP2-BXBXX		
		15 X 10 X X	ETP2-BXCXX		
		20 X 10 X X	ETP2-AXCXX		

7) B=15 mm3 (Standard) ; C=10 mm3 ; A=20mm3 ; X=verschlossen/plugged

1) Anschluß für tötlose Rohrverschraubung Rohr-Ø2,5x0,5 max. Länge 1,5 m
Bestell-Nr. Rohrleitung PA, einseitig mit Überwurfschraube, fettgefüllt, 1,5m : 995-001-197-BF5
Bestell-Nr. Überwurfschraube, Kegelring, Einsteckhülse: 402-612, 402-611, 402-603
ports tapped for solderless connection pipe dia. 2.5mm, length max. 1.5m
Part number tube PA, with connector one side, grease filled, 1.5m: 995-001-197-BF5
Part number socket union, cone sleeve, reinforcing socket: 402-612, 402-611, 402-603

Hydraulikschema
hydraulic layout

Befestigungsbild
drilling template

SPS Signal
PLC signal

Fig. 3: Design and technical data
ETPxWZ-...+924

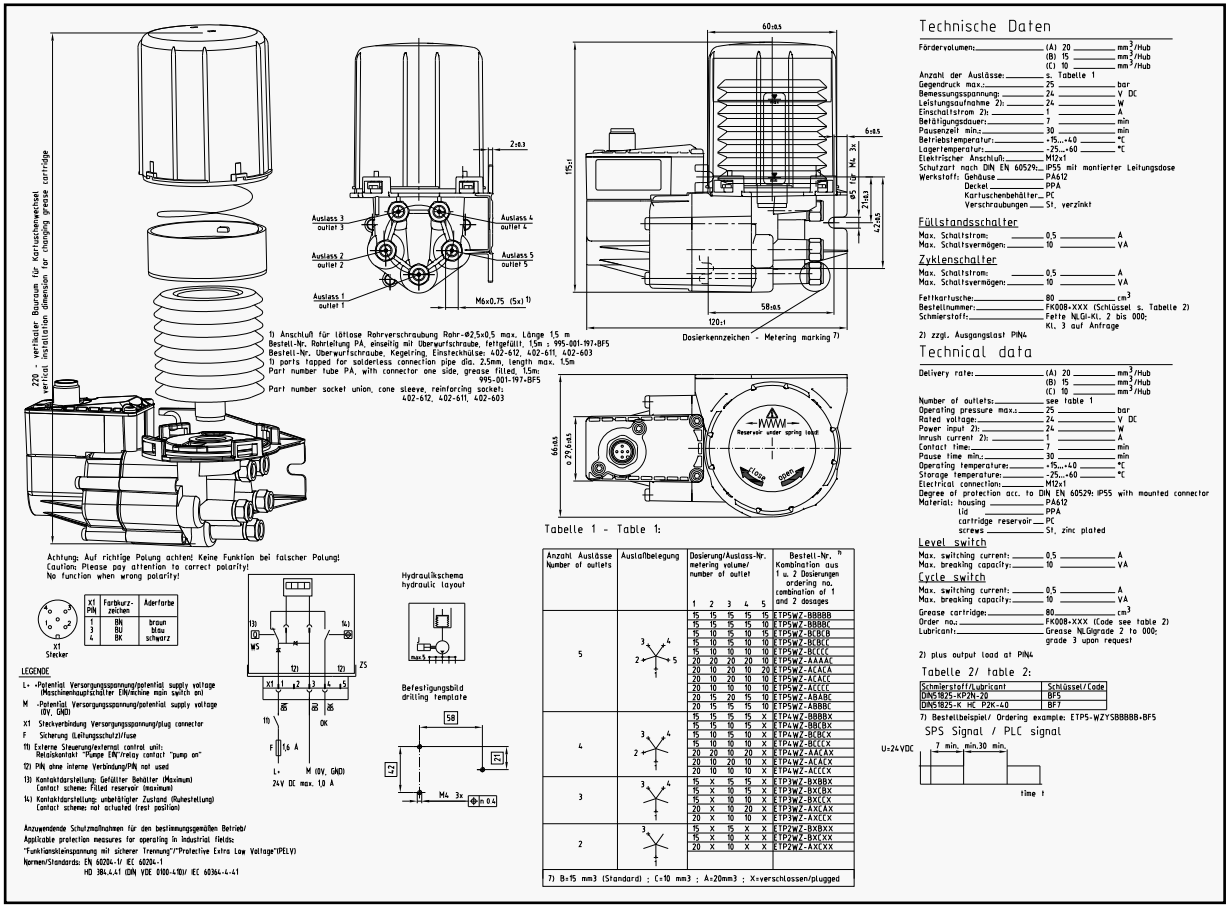


Tabelle 1 - Table 1:

Anzahl Auslässe Number of outlets	Auslaßbelegung	Dosierung/Auslass-Nr. metering volume/ number of outlet 1 2 3 4 5	Bestell-Nr. 7) Kombination aus 1 u. 2 Dosierungen ordering no. combination of 1 and 2 dosages
5		15 15 15 15 15	ETP5WZ-BBBBB
		15 15 15 15 10	ETP5WZ-BBBBC
		15 10 15 10 15	ETP5WZ-BCBCB
		15 10 15 10 10	ETP5WZ-BCBCC
		15 10 10 10 10	ETP5WZ-BCCCC
		20 20 20 20 10	ETP5WZ-AAAAC
		20 10 20 10 20	ETP5WZ-ACACA
		20 10 20 10 10	ETP5WZ-ACACC
		20 10 10 10 10	ETP5WZ-ACCCC
		20 15 20 15 10	ETP5WZ-ABABC
		20 15 15 15 10	ETP5WZ-ABBBC
4		15 15 15 15 x	ETP4WZ-BBBBX
		15 15 10 15 x	ETP4WZ-BBCBX
		15 10 15 10 x	ETP4WZ-BCBCX
		15 10 10 10 x	ETP4WZ-BCCCX
		20 20 10 20 x	ETP4WZ-AACAX
		20 10 20 10 x	ETP4WZ-ACACX
		20 10 10 10 x	ETP4WZ-ACCCX
3		15 x 15 15 x	ETP3WZ-BXBBX
		15 x 10 15 x	ETP3WZ-BXCBX
		15 x 10 10 x	ETP3WZ-BXCCX
		20 x 10 20 x	ETP3WZ-AXCAX
		20 x 10 10 x	ETP3WZ-AXCCX
2		15 x 15 x x	ETP2WZ-BXBXX
		15 x 10 x x	ETP2WZ-BXCXX
		20 x 10 x x	ETP2WZ-AXCXX

7) B=15 mm3 (Standard) ; C=10 mm3 ; A=20mm3 ; X=verschlossen/plugged

Technische Daten

Fördervolumen: (A) 20 mm³/Hub; (B) 15 mm³/Hub; (C) 10 mm³/Hub
Anzahl der Auslässe: s. Tabelle 1
Gegendruck max.: 25 bar
Bemessungsspannung: 24 V DC
Leistungsaufnahme 2): 24 W
Einschaltstrom 2): 1 A
Betätigungsdauer: 7 min
Pausenzeit min.: 30 min
Betriebstemperatur: -15...+40 °C
Lagertemperatur: -25...+60 °C
Elektrischer Anschluß: M12x1
Schutzart nach DIN EN 60529: IP55 mit montierter Leitungsdose
Werkstoff: Gehäuse PA612; Deckel PPA; Kartuschenbehälter PC; Verschraubungen St, verzinkt

Füllstandsschalter

Max. Schaltstrom: 0,5 A
Max. Schaltvermögen: 10 VA

Zyklenschalter

Max. Schaltstrom: 0,5 A
Max. Schaltvermögen: 10 VA

Fettkartusche: 80 cm³
Bestellnummer: FK008-XXX (Schlüssel s. Tabelle 2)
Schmierstoff: Fette NLGI-Kl. 2 bis 000; Kl. 3 auf Anfrage

2) zzgl. Ausgangslast PIN4

Technical data

Delivery rate: (A) 20 mm³/Hub; (B) 15 mm³/Hub; (C) 10 mm³/Hub
Number of outlets: see table 1
Operating pressure max.: 25 bar
Rated voltage: 24 V DC
Power input 2): 24 W
Inrush current 2): 1 A
Contact time: 7 min
Pause time min.: 30 min
Operating temperature: -15...+40 °C
Storage temperature: -25...+60 °C
Electrical connection: M12x1
Degree of protection acc. to DIN EN 60529: IP55 with mounted connector
Material: housing PA612; lid PPA; cartridge reservoir PC; screws St, zinc plated

Level switch

Max. switching current: 0.5 A
Max. breaking capacity: 10 VA

Cycle switch

Max. switching current: 0.5 A
Max. breaking capacity: 10 VA

Grease cartridge: 80 cm³
Order no.: FK008-XXX (Code see table 2)
Lubricant: Grease NLGIgrade 2 to 000; grade 3 upon request

2) plus output load at PIN4

Tabelle 2/ table 2:

Schmierstoff/Lubricant	Schlüssel/Code
DIN51825-KP2N-20	BF5
DIN51825-K HC P2K-40	BF7

7) Bestellbeispiel/ Ordering example: ETP5-WZYSBBBBB+BF5

SPS Signal / PLC signal

4. Installation instructions

Dosing pumps with lubricant cartridge described in the installation instructions may only be installed by qualified experts. Qualified experts are persons who have been trained, instructed, and familiarized with the end product into which the described dosing pump with lubricant cartridge is to be installed. These persons are considered capable of such tasks due to their education, training, and experience with valid standards, conditions, accident prevention regulations, and operating measures. They are entitled to carry out the required tasks and to recognize - and thus avoid - any dangers that might otherwise occur.

A definition of what constitutes a qualified person and who are unqualified persons are stipulated in DIN VDE 0105 and IEC 364.

Before installing/positioning the dosing pump with lubricant cartridge, remove the packaging material and any transportation safety devices such as sealing plugs. Keep the packaging material until you are sure that there are no delivery discrepancies that need to be clarified.

Caution!
Dosing pumps with lubricant cartridge must not be tipped up or dropped.

Country specific accident prevention regulations and the operating and maintenance instructions of the operator must be observed when carrying out all installation work on machineries.

4.1 Positioning and mounting

Dosing pumps with lubricant cartridge should be mounted in a way that protects it from humidity and vibrations. It should also be easily accessible so that all other installation work can be carried out without problems. Make sure that there is a sufficient amount of circulating air to prevent the excessive heating of the dosing pump with lubricant cartridge. For information on the maximum permitted ambient temperature, see the drawings in Figure 2 and 3 or the technical data at the end of this owner's manual.

For the product-specific technical data on a dosing pump with lubricant cartridge, see the relevant documentation. If no documentation is available, you can directly request the documentation from SKF Lubrication Systems Germany AG.

The dosing pump with lubricant cartridge can be mounted in any position.

Installation holes for the attachment of the dosing pump with lubricant cartridge to the wall must be made in accordance with the stipulations of the section 'Mounting dimensions'.

Caution!
During installation work - and particularly when drilling - the following points must be observed:

- Existing supply lines must not be damaged by the installation work.
- Other units must not be damaged by the installation work.
- The dosing pump with lubricant cartridge must not be mounted within the radius of activity of moving parts so it will not interfere with or be stuck by moving parts.
- The dosing pump with lubricant cartridge must be installed a sufficient distance away from sources of heat, so that the maximum ambient temperature of 40°C is not exceeded.
- Country specific installation and accident prevention regulations must be observed.

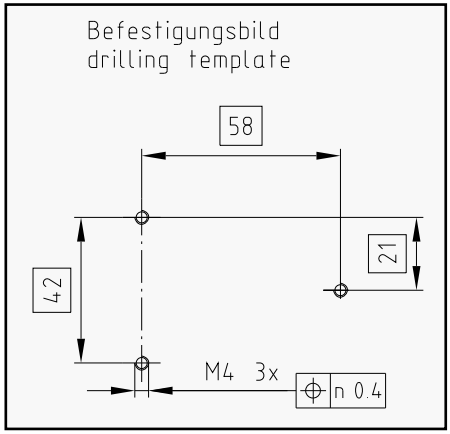
4.2 Mounting dimensions

The dosing pump with lubricant cartridge must be attached to the intended mounting location using appropriate fastening materials (e.g., bolts, washers, and nuts).

The dosing pump with lubricant cartridge is mounted using a connecting flange with three fixing points. The device is fastened to the intended mounting location using three M4 fastening screws, washers and self-locking hexagon nuts which are included in the scope of delivery. The recommended tightening torque for the fastening screws is 2 Nm. The dosing pump with lubricant cartridge must be mounted in such a way that it is not subject to tension.

For the dimensions and location of the fixing holes, see Figure 4 or consult the documentation.

Fig. 4: Fixing holes



If no documentation is available, the dimensions and location of the fixing holes for mounting the dosing pump with lubricant cartridge can be determined by taking measurements.

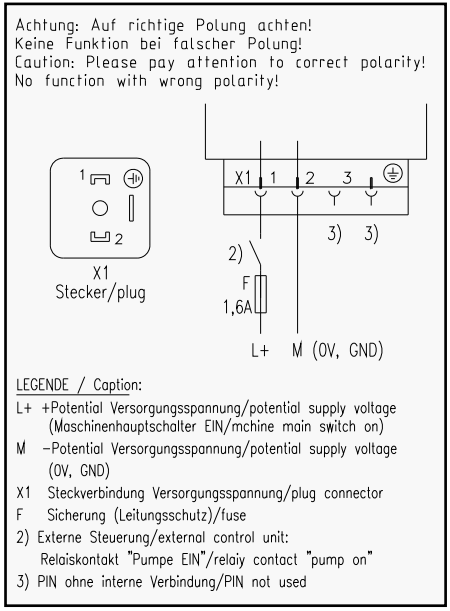
If no documentation is available, you can request the documentation directly from SKF Lubrication Systems Germany AG.

4.3 Electrical connection

Danger!
Only qualified, instructed specialists who are authorized by the operator may install the electrical connections for the dosing pump with lubricant cartridge. The local conditions for connections and local regulations (e.g., DIN, VDE) must be observed. Significant bodily injury and property damage may result from an improperly connected dosing pump with lubricant cartridge.

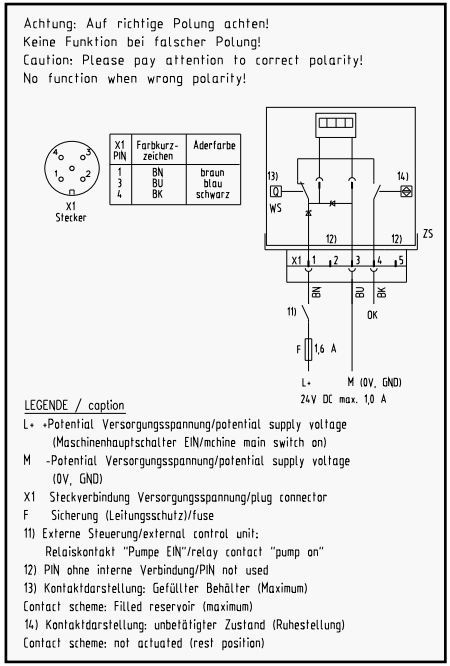
The dosing pump with lubricant cartridge is available in two different electrical model designs. The ETPx-...+924 model design does not include fill level or stroke monitoring. The electrical connection to the 24V DC supply voltage is established using a rectangular connector as per DIN EN 175301-803-A. See Figure 5 for the connector pin assignment.

Fig. 5: Connector pin assignment for ETPx-...+924



The ETPxWZ-...+924 model design is equipped with fill level and stroke monitoring. The electrical connection to the 24V DC supply voltage and the machine control unit for signal evaluation is established using a five-pin M12x1 electrical circular connector. See Figure 6 for the connector pin assignment.

Fig. 6: Connector pin assignment for ETPxWZ-...+924



The dosing pump features reverse voltage protection. Ensure that the supply voltage is connected with the correct polarity. The pump does not function if the poles are reversed. The sealed contact has no internal connection, as the housing parts are made of plastic.

4.4 Note about programming the monitoring system

When programming the stroke monitoring function in the machine control unit, ensure that the dosing pistons reach the end position a maximum of 7 minutes after the 24V DC supply voltage is switched on by the machine control unit (see Figure 1). During this period of maximum 7 minutes, the stroke control switch is open and no electrical signal ("OK = lubrication performed") is sent to the machine control unit. The machine control unit should only query the control signal once a maximum of 7 minutes have passed. If the signal is present, the control unit evaluates it as "OK = lubrication performed." A malfunction must be assumed if no signal is present after 7 minutes.

The delay of 7 minutes is required due to the operating principle of the dosing pump and must be taken into consideration when programming the machine control unit.

4.5 Lubrication line connection

The lubrication line must be connected to the lubrication unit so that no forces can be transmitted to the lubrication unit once it is mounted (strainless connection).

Caution!
The fittings used for the lubrication line should be designed for use at the maximum operating pressure of the lubrication unit. Otherwise, the lubrication system must be protected against excessively high pressure by means of a pressure relief valve.

For operating pressures up to 45 bar - as are common on single-line piston distributor systems - SKF fittings for solderless tube connection (double or single tapered sleeves) can be used.

The lubricant outlets of the dosing pump with lubricant cartridge have a M6x0.75 counterbore for connecting an SKF fitting for solderless tube unions for plastic tubing with Ø 2.5 mm x 0.5mm wall thickness. The following fittings are required to connect a plastic tube:

- **402-603 Reinforcing socket**
- **402-611 Tapered sleeve**
- **402-612 Socket union**

Firmly screw in the socket unions of the pipe union and then tighten with 1 1/2 turns.

Unneeded lubricant outlets must not be closed, as this may cause the dosing pump to function improperly.

Dosing pumps with lubricant cartridge can be ordered with different numbers of lubricant outlets. This allows the dosing pump to be optimally adjusted to the particular application. The number of lubricant outlets must be specified when ordering.

Note that the lubricant outlets meter different amounts of lubricant depending on the dosing pump design. The fittings for the lubricant outlets are marked with letters identifying the metered quantity. Lubricant outlet fittings without markings have standard metering (15 mm^3/stroke). Metered quantities of 10 mm^3/stroke and 20 mm^3/stroke are marked with the letters C (10 mm^3/stroke) and A (20 mm^3/stroke), respectively.

It is not possible to change the metered quantity of the lubricant outlets by replacing the connecting pieces. If you need to change the quantities metered at the lubricant outlets, please contact the Service department of SKF Lubrication Systems Germany AG for assistance.

The standard diameter for the lubrication lines is tube Ø 2.5 mm x wall thickness 0.5 mm. The maximum length of the lubrication lines is 1.5 m. Other lengths are available on request.

4.6 Laying of lubrication line

The following information should be observed for the laying of the main lubrication lines and lubricating point lines in order to ensure that the entire centralized lubrication system works smoothly.

The main lubrication line should be dimensioned in accordance with the maximum pressure and conveyance volume to which the lubrication unit is exposed. Where possible, the main lubrication line should climb from the lubrication unit and enable deaeration at the highest point of the lubrication line system.

The pipes, hoses, cut-off valves, control valves, fittings, and so on must be suitable for the maximum operating pressure of the lubrication unit, the permitted temperatures, and the lubricants to be conveyed. In addition, the lubrication system must be protected against excessively high pressure by means of a pressure relief valve.

All components of the lubrication line system - including pipes, hoses, cut-off valves, control valves, fittings, and so on - must be carefully cleaned before installation. No seals on lubrication line systems should protrude inwards in a way that disrupts the flow of the lubricant and could allow contaminants to enter the lubrication line system.

Lubrication lines must be laid in a way that prevents air pockets from forming anywhere on the system. Cross section changes to the lubrication line from a small to a large cross section in the direction of flow of the lubricant are to be avoided. Transitions from one cross section to another should be smooth.

The flow of the lubricant in the lubrication lines should not be impeded through the incorporation of sharp bends, corner valves, or check valves. Unavoidable cross section changes in lubrication lines must have smooth transitions. Wherever possible, sudden changes of direction are to be avoided.

Caution!
Lubrication lines must be leak-tight. Lubricants can contaminate the ground and watercourses. Lubricants must be used and disposed of properly. Country specific regulations and laws on the use and disposal of lubricants must be observed.

Danger!
Centralized lubrication systems must be leak-tight. Leaking centralized lubrication systems are a source of danger in relation to slip hazard and the risk of injury. When making installation, maintenance, and repair work test the centralized lubrication system for leaks. Leaky parts of the centralized lubrication system or components of the lubrication equipment have to be sealed immediately.

Leaking centralized lubrication systems or components of the lubrication equipment are a source of danger in relation to slip hazard and the risk of injury. These dangers can cause physical injury to persons or damage to other material assets.

Lubricants are hazardous substance. Refer to safety precautions in the lubricant manufacturer's material safety data sheet.

You can ask the manufacturer of the lubricant for the material safety data sheet.

5. Transport, delivery and storage

5.1 Transport

SKF Lubrication Systems Germany AG products are packaged in accordance with the regulations of the recipient country and in accordance with DIN ISO 9001. Our products must be transported with care. Products must be protected against mechanical influences such as impacts. Transport packaging must be labelled with the information 'Do not drop!'.

Caution!
The product must not be tipped up or dropped.

There are no restrictions relating to land, air, or sea transportation.

5.2 Delivery

Following receipt of the shipment, the product or products must be checked for damage and the shipping documents should be used to make sure that the delivery is complete. Keep the packaging material until you are sure that there are no delivery discrepancies that need to be clarified.

5.3 Storage

The following conditions apply to the storage of SKF Lubrication Systems Germany AG products.

5.3.1 Storage of lubrication units

- Ambient conditions: Dry, dust-free environment; storage in well-ventilated, dry area
- Storage time: 24 months max.
- Permitted air humidity: < 65%
- Warehouse temperature: 10 - 40°C
- Light: Direct sunlight/UV radiation must be avoided; nearby sources of heat must be screened

5.3.2 Storage of electronic and electrical devices

- Ambient conditions: Dry, dust-free environment; storage in well-ventilated, dry area
- Storage time: 24 months max.
- Permitted air humidity: < 65%
- Warehouse temperature: 10 - 40°C
- Light: Direct sunlight/UV radiation must be avoided; nearby sources of heat must be screened

5.3.3 Storage - general information

- Ensure that no dust gets into stored products by wrapping them in plastic film
- Store products on racks or pallets to protect them from damp floors
- Before placing products into storage, protect uncoated metal surfaces - and drive parts and mount surfaces in particular - from corrosion using long-term corrosion protection
- At 6-monthly intervals: Check products for corrosion. If signs of corrosion are found, remove the corrosion that has already resulted and improve the corrosion protection measures.
- Drives must be protected against mechanical damage

6. Operation

6.1 General information

The described dosing pumps with lubricant cartridge are operated automatically or manually depending on the design. The transport of lubricants through the lubrication lines should be subjected to regular visual checks.

The lubricant fill level in the lubricant cartridge should be subjected to regular visual checks. If the lubricant fill level is low, the lubricant cartridge needs to be replaced as described in the Chapter "Commissioning."

You must observe the lubricant manufacturer's instructions and precautions on the lubricant to be used.

Caution!
Use only clean lubricants. Contaminated lubricants can result in serious system malfunctions.

Caution!
Different lubricants must not be mixed together. Doing so can cause damage and require extensive cleaning of the dosing pump with lubricant cartridge /centralized lubrication system. To prevent confusion, we recommend that you fit an adhesive label on the reservoir with the information indicating the lubricant to be used on the lubricant reservoir.

Warning!
The lubricant cartridge must not be completely emptied during operation, as this creates a risk of air being introduced into the dosing pump and the centralized lubrication system. This may cause the lubrication point to receive insufficient lubrication, which can lead to damage and failure of the bearing.

If the lubricant cartridge is completely emptied during operation, the dosing pump and the entire centralized lubrication system must be completely vented.

Warning!
Air pockets in the lubricant cartridge or dosing pump adversely affect lubricant delivery. This may cause the lubrication point to receive insufficient lubrication, which can lead to damage and failure of the bearing.

6.2 Startup

Before starting up the dosing pump with lubricant cartridge, check all electrical and hydraulic connections.

The diameter and maximum length of the lubrication lines are tube Ø 2.5 mm x length 1.5 m. Other dimensions are available on request.

The lubrication lines must be filled with lubricant before they are connected to the lubricant outlets on the dosing pump with lubricant cartridge. Filled lubrication lines are available as accessories from SKF Lubrication Systems Germany AG.

The process of deaerating the centralized lubrication system is facilitated by:

- Opening the ends of the main pipe until bubble-free lubricant escapes
- Filling longer pipe sections before connecting the system to the lubricating point

6.3 Replacing the lubricant cartridge

Danger!
The cartridge holder of the described product is spring pre-loaded during operation. The load on the pressure spring must therefore be relieved by removing the cartridge holder before starting assembly, maintenance or repair work, or any system modifications or system repairs.

The dosing pump is filled with lubricant by replacing the lubricant cartridge in the cartridge holder:

- **Unlock the cartridge holder by rotating the bayonet approx. 20° counterclockwise and remove it together with the pressure spring and follower plate.**
- **Remove the empty lubricant cartridge from the housing.**
- **Remove the plug from the opening of the new lubricant cartridge and press the lubricant approx. 7 mm out of the opening.**
- **Insert the lubricant cartridge into the housing opening.**

This procedure ensures that no air is introduced to the dosing pump or the centralized lubrication system.

Warning!
Air pockets in the lubricant cartridge or dosing pump adversely affect lubricant delivery. This may cause the lubrication point to receive insufficient lubrication, which can lead to damage and failure of the bearing.

6.4 Venting the dosing pump

Danger!
The cartridge holder of the described product is spring pre-loaded during operation. The load on the pressure spring must therefore be relieved by removing the cartridge holder before starting assembly, maintenance or repair work, or any system modifications or system repairs.

Proceed as follows to vent the dosing pump:

- **Unlock the cartridge holder by rotating the bayonet approx. 20° counterclockwise and remove it together with the pressure spring and follower plate.**
- **Remove the lubricant cartridge from the housing.**
- **Remove the plug from the opening of the new lubricant cartridge and press the lubricant approx. 7 mm out of the opening.**
- **Insert the lubricant cartridge into the housing opening.**
- **Remove the lubrication lines on the lubricant outlets on the dosing pump.**
- **Run the dosing pump until bubble-free lubricant discharges at the outlets.**
- **Ensure that the lubrication lines do not contain any air pockets; if necessary, fill with lubricant without introducing bubbles.**
- **Connect lubrication lines to the dosing pump.**

7. Shutdown

7.1 Temporary shutdown

You can temporarily shut down the described product by disconnecting the electrical, pneumatic, and/or hydraulic supply connections. For more information, see the section 'General information' in this installation instructions.

If you wish to shut down the product temporarily, refer also to the instructions in the section 'Transport, delivery, and storage' of this owner's manual.

When placing the product back into operation, refer to the information in the sections 'Installation' and 'Startup' of this owner's manual.

7.2 Permanent shutdown

All country specific legal guidelines and legislation on the disposal of contaminated equipment must be observed when shutting down the product for the final time.

Caution!
Lubricants can contaminate the ground and watercourses. Lubricants must be used and disposed of properly. Country specific regulations and laws on the use and disposal of lubricants must be observed.

SKF Lubrication Systems Germany AG will take back the product and arrange for its legal disposal. Costs to the customer will be limited to SKF's incurred costs.

8. Maintenance

Danger!
To prevent chance of serious injury or death, disconnect the product from main power supply before working on it. Installation, maintenance, and repair work may only be carried out by qualified experts on a product that is not connected to a power supply.

Danger!
Centralized lubrication systems are under pressure when they are being operated. Centralized lubrication systems must therefore be depressurized before starting installation, maintenance, or repair work and before making any changes to the system.

Danger!
The described product may be under pressure when it is being operated. The product must therefore be depressurized before starting installation, maintenance, or repair work and before making any changes to the system.

Danger!
The cartridge holder of the described product is spring pre-loaded during operation. The load on the pressure spring must therefore be relieved by removing the cartridge holder before starting assembly, maintenance or repair work, or any system modifications or system repairs.

SKF Lubrication Systems Germany AG products are low-maintenance. However, to ensure that they function properly and to avoid risks right from the startup, all joints and connections should be checked to make sure that they are properly fitted.

If necessary, you can clean the product using gentle, material-appropriate cleaning agents (no alkalis, no soap). For safety reasons, the product should be disconnected from the hydraulic and/or compressed air supplies before cleaning.

During cleaning, it is important to make sure that no cleaning agent enters the inside of the product.

If the system is operated normally with intercompatible lubricants, the inside of the product does not need to be cleaned.

If you accidentally fill the product with an incorrect or contaminated lubricant, the inside of the product does have to be cleaned. If this occurs, contact SKF Lubrication Systems Germany AG Services for more information on cleaning procedures

You must not dismantle the product or parts of the product during the warranty period. Doing so invalidates all warranty claims.

Only original SKF Lubrication Systems Germany AG spare parts may be used. You must not carry out alterations to the product or use non-original spare parts or resources. Doing so invalidates the warranty.

SKF Lubrication Systems Germany AG is not liable for damage caused by improper installation, maintenance, or repair work.

9. Faults

Table 1 gives an overview of possible malfunctions and their causes. If you are unable to rectify the malfunction, please contact SKF Lubrication Systems Germany AG Service.

You must not dismantle the product or parts of the product during the warranty period. Doing so invalidates all warranty claims.

All other work relating to installation, maintenance, and repair must only be carried out by SKF Lubrication Systems Germany AG Service.

Only original SKF Lubrication Systems Germany AG spare parts may be used. It is prohibited for the operator to make alterations to the product or to use non-original spare parts and resources.

Table 1: Fault analysis and rectification

Malfunction	Possible cause	Rectification
Dosing pump does not feed lubricant, group signal absent on ETPxWZ-...+924	Lubricant cartridge empty	Replace lubricant cartridge and vent dosing pump and lubrication lines, see the Chapter "Operation"
	Connection cable broken	Replace connection cable
	Follower plate moves poorly due to contamination	Clean cartridge holder, follower plate and housing
	Seals on dosing piston worn out	Send in dosing pump for inspection or replace pump
	Actuating part of dosing pump is defective	Send in dosing pump for inspection or replace pump
Individual lubrication outlets do not feed	Seals on dosing piston worn out	Send in dosing pump for inspection or replace pump
Constant lubricant leakage from one or more lubricant outlets	Outlet valve contaminated or defective	Send in dosing pump for inspection or replace pump

Danger!
Working on products that have not been disconnected from the power supply can cause serious injury or death to persons. Installation, maintenance, and repair work may only be carried out by qualified experts on products that have been disconnected from the power supply. The supply voltage must be turned off before any product components are opened.

Danger!
Centralized lubrication systems are under pressure when they are being operated. Centralized lubrication systems must therefore be depressurized before starting installation, maintenance, or repair work and before making any changes to the system.

10. Technical data

Dosing pump with lubricant cartridge	Unit	ETPx-...+924	ETPxWZ-...+924
Delivery rate	mm^3/stroke	10, 15 (standard), 20	10, 15 (standard), 20
Number of lubricant outlets		2-5	2-5
Back pressure, max.	bar	25	25
Ambient temperature	°C	+15 to +40	+15 to +40
Actuation duration	min	7	7
Interval time, min.	min	30	30
Protection class according to DIN EN 60529		IP55	IP55
Lubricant cartridge capacity	cm^3	80	80
Lubricant NLGI Grade		000, 00, 0, 1, 2	000, 00, 0, 1, 2
Lubrication tubing Ø	mm	2.5 x 0.5	2.5 x 0.5
Line length, max.	m	1,5	1,5
Electrical connection		DIN EN 175301-803A	M12x1, 5-pin
Pump housing material		PA612	PA612
Pump lid material		PPA	PPA
Cartridge holder material		PC	PC
Fittings material		Steel, galvanized	Steel, galvanized
Stroke element			
Rated voltage	V DC	24	24
Input power	W	24	24 [1.)]
Starting current	A	1	1 [1.)]
			1.) plus PIN4 external load
Fill level switch			
Rated voltage	V DC	-	24
Switched current, max.	A	-	0,5
Switching capacity, max.	VA	-	10
Stroke control switch			
Rated voltage	V DC	-	24
Switched current, max.	A	-	0,5
Switching capacity, max.	VA	-	10

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Order No. 951-170-003

SKF reserves the right to make content and technical changes!

Important product usage Information

All SKF Lubrication Systems Germany AG products may only be used as intended and as described in the installation instructions. If the installation instructions are delivered with your product, read them carefully and follow them.

Not all lubricants can be conveyed with centralized lubrication systems. If required, SKF Lubrication Systems Germany AG can check the lubricant selected by the user to make sure that it is suitable for conveyance in centralized lubrication systems. All lubrication systems and components that are manufactured by SKF Lubrication Systems Germany AG are not approved for use in conjunction with gases, liquefied gases, gases dissolved under pressure, vapours, and fluids with a vapour pressure of more than 0.5 bar above normal atmospheric pressure (1013 mbar) at the maximum permitted temperature.

Note that hazardous substances of any kind and - in particular - the substances that are classed as hazardous in accordance with EC Directive 67/548/EC Article 2, Paragraph 2 may only be inserted into and conveyed/distributed by centralized lubrication systems and components following consultation with SKF Lubrication Systems Germany AG and with the express written permission of the company.

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