



Products: Lubrication

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Grease		Characteristic applications	Operating temperature		Continuous limit temperature °C	Thickener
			°C from	°C to		
Multi-purpose greases	MULTITOP	<ul style="list-style-type: none"> Ball and roller bearings in rolling mills Construction machinery Spinning and grinding spindles Automotive engineering 	-50 ¹⁾	+140	+80	Lithium soap
	MULTI2	<ul style="list-style-type: none"> Ball bearings up to an outside diameter of 62 mm in large electric motors Agricultural and construction machinery Household appliances 	-30	+120	+75	Lithium soap
	MULTI3	<ul style="list-style-type: none"> Ball bearings with an outside diameter of or more than 62 mm in large electric motors Agricultural and construction machinery Fans 	-30	+120	+75	Lithium soap
High loads	LOAD150	<ul style="list-style-type: none"> Ball, roller and needle roller bearings Linear guidance systems in machine tools 	-20	+140	+95	Lithium complex soap
	LOAD220	<ul style="list-style-type: none"> Ball and roller bearings in rolling mill plant Paper machinery Rail vehicles 	-20	+140	+80	Lithium/calcium soap
	LOAD400	<ul style="list-style-type: none"> Ball and roller bearings in mining machinery Construction machinery Wind turbine main bearings 	-40	+130	+80	Lithium/calcium soap
	LOAD460	<ul style="list-style-type: none"> Ball and roller bearings Wind turbines Bearings with pin cage 	-40 ¹⁾	+130	+80	Lithium/calcium soap
	LOAD1000	<ul style="list-style-type: none"> Ball and roller bearings in mining machinery Construction machinery Cement plant 	-30 ¹⁾	+130	+80	Lithium/calcium soap
High temperatures	TEMP90	<ul style="list-style-type: none"> Ball and roller bearings in couplings Electric motors Automotive engineering 	-40	+160	+90	Polycarbamide
	TEMP110	<ul style="list-style-type: none"> Ball and roller bearings in electric motors Automotive engineering 	-35	+160	+110	Lithium complex soap
	TEMP120	<ul style="list-style-type: none"> Ball and roller bearings in continuous casting plant Paper machinery 	-30	+180	+120	Polycarbamide
	TEMP200	<ul style="list-style-type: none"> Ball and roller bearings in guide rollers for baking machinery Kiln trucks and chemical plant Piston pins in compressors 	-30	+260	+200	PTFE
Special requirements	SPEED2,6	<ul style="list-style-type: none"> Ball bearings in machine tools Spindle bearings Rotary table bearings Instrument bearings 	-40	+120	+80	Lithium complex soap
	VIB3	<ul style="list-style-type: none"> Ball and roller bearings in rotors for wind turbines (blade adjustment) Packaging machinery Rail vehicles 	-30	+150	+90	Lithium complex soap
	FOOD2	<ul style="list-style-type: none"> Ball and roller bearings in applications with food contact (NSF-H1 registration, kosher and halal certification) 	-30	+120	+70	Aluminium complex soap
	CLEAN-M	<ul style="list-style-type: none"> Ball, roller and needle roller bearings as well as linear guidance systems in clean room applications 	-30	+180	+90	Polycarbamide
	MOTION2	<ul style="list-style-type: none"> Ball and roller bearings in oscillating operation Slewing rings in wind turbines 	-40	+130	+75	Lithium soap

+++ Extremely suitable ++ Highly suitable + Suitable – Less suitable – – Not suitable

¹⁾ Measurement values according to Schaeffler FE8 low temperature test.

Base oil	Consistency NLGI	Base oil viscosity at +40 °C mm ² /s	Temperatures		Low friction, high speed	High load, low speed	Vibrations	Support for seals	Relubri- cation facility
			Low	High					
Partially synthetic oil	2	82	+++	++	++	+++	++	+	+++
Mineral oil	2	110	++	+	+	+	+	+	+++
Mineral oil	3	80	++	+	+	+	++	++	++
Mineral oil	2	160	+	++	–	+++	++	++	++
Mineral oil	2	245	+	+	–	+++	++	++	++
Mineral oil	2	400	+	+	–	+++	++	++	++
Mineral oil	1	400	++	+	–	+++	++	–	++
Mineral oil	2	1 000	+	+	--	+++	++	++	++
Partially synthetic oil	3	148	+++	++	+	+	+	++	++
Partially synthetic oil	2	130	+++	+++	++	+	+	+	+
Synthetic oil	2	400	++	+++	–	+++	+	++	+
Alkoxyfluoro oil	2	550	++	+++	--	++	+	+	+
Synthetic oil	2 – 3	25	+++	+	+++	--	–	+	+
Mineral oil	3	170	++	++	–	++	+++	++	–
Synthetic oil	2	150	++	–	+	+	+	+	+++
Ether oil	2	103	+++	+++	+	+	+	+	++
Synthetic oil	2	50	+++	+	–	++	+++	++	+



Lubricants

Features

A significant factor for the performance capability and life of a rolling bearing or linear unit is the selection of a suitable lubricant.

Rolling bearing greases Arcanol

Schaeffler has been investigating for decades which grease is the most suitable solution for which application. The Arcanol rolling bearing greases offer very good preconditions for favourable running behaviour of bearings and a long operating life and high operational security of the bearing arrangement. The lubricant range is graduated such that almost all areas of application are covered.

The areas of application of Arcanol greases were determined under widely differing operating conditions and with rolling bearings of all types by means of modern testing methods and testing systems.

In 2015 alone, Schaeffler used its own FE8 and FE9 test rigs to carry out more than 50 000 hours of testing, *Figure 1* and *Figure 2*, page 73. Arcanol rolling bearing greases have superior characteristics in all areas compared to normal greases.

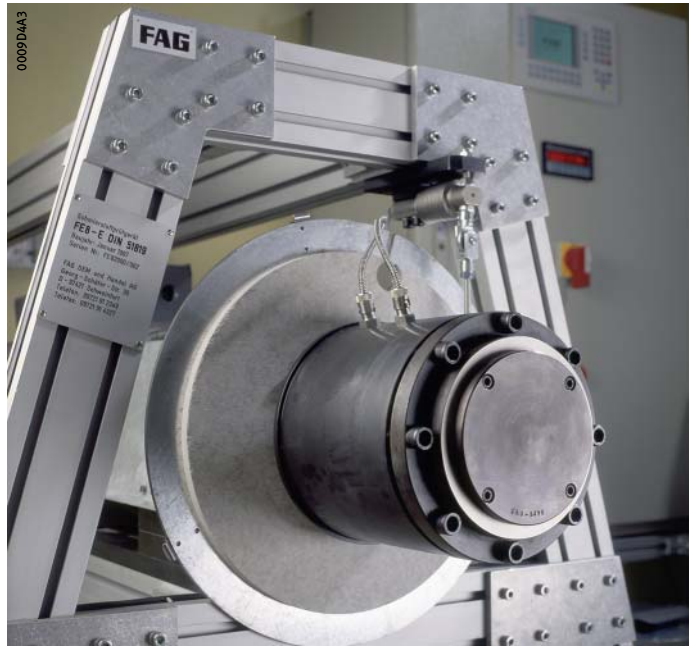


Figure 1
Test rig FE8

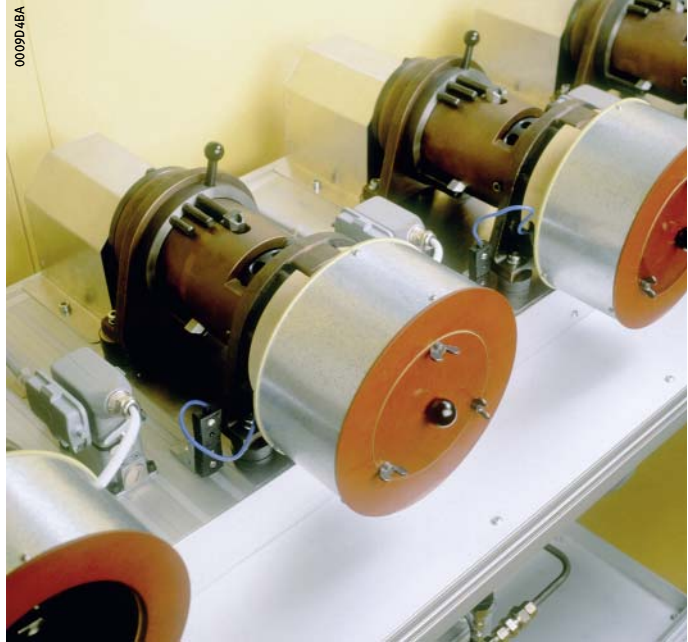


Figure 2
Test rig FE9

Based on the findings of the test rig runs, a range of greases has been developed that is subdivided into four groups:

- Multi-purpose greases:
greases with a wide range of applications
- Heavy duty greases:
greases suitable for high demands on load carrying capacity
- High temperature greases:
greases that must withstand high application temperatures
- Special greases:
greases that have been specially selected for a particular area of application.

**Consistent product quality
as a result of
comprehensive quality inspection**

Each delivery of Arcanol greases is subjected to comprehensive quality inspection. The quality of each batch can be clearly demonstrated and identified. In the in-house analysis laboratory, the chemical and physical characteristics of Arcanol greases are tested in accordance with strict test guidelines, thus ensuring the highest level of product quality.

Lubricants

Grease container sizes

Arcanol grease ¹⁾	Tube		Cartridge	Can
	70 g	250 g	400 g	1 kg
MULTITOP	—	●	●	●
MULTI2	—	●	●	●
MULTI3	—	●	●	●
LOAD150	—	—	●	●
LOAD220	—	—	●	●
LOAD400	—	—	●	●
LOAD460	—	—	●	●
LOAD1000	—	—	—	—
TEMP90	—	—	●	●
TEMP110	—	—	●	●
TEMP120	—	—	●	●
TEMP200	●	—	—	●
SPEED2,6	—	●	●	●
VIB3	—	—	●	●
FOOD2	—	—	●	●
CLEAN-M	—	●	●	●
MOTION2	—	●	●	●
MOUNTINGPASTE	●	●	●	●

¹⁾ Other containers are available by agreement.

Grease container sizes (continued)

Arcanol grease ¹⁾	Bucket		Hobcock		Drum
	5 kg	12,5 kg	25 kg	50 kg	180 kg
MULTITOP	●	●	●	—	●
MULTI2	●	●	●	—	●
MULTI3	●	●	●	—	●
LOAD150	—	●	—	●	—
LOAD220	—	●	●	—	●
LOAD400	●	●	●	●	●
LOAD460	●	●	●	●	●
LOAD1000	●	—	●	●	●
TEMP90	●	—	●	—	●
TEMP110	—	—	—	●	—
TEMP120	●	—	●	—	—
SPEED2,6	—	—	●	—	—
VIB3	●	—	●	●	—
FOOD2	—	●	●	—	—
CLEAN-M	—	●	●	—	—
MOTION2	●	●	●	●	—

¹⁾ Other containers are available by agreement.

Further information

- TPI 168, Rolling Bearing Greases Arcanol
- Enquiries:
industrial-services@schaeffler.com, +49 2407 9149-66.



Product overview Lubrication devices

Automatic relubrication devices

Lubricators
Lubrication systems

CONCEPT2



0008A91C

CONCEPT8



0008AB02

Lubrication system
for spindle bearings

CONCEPT-PRECISION-GREASE



000A04CC

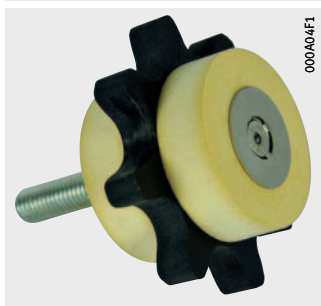
CONCEPT-PRECISION-OIL



000A04DE

Chain lubrication pinion
Lubrication gear

ARCALUB-X.CHAIN-PINION



000A04F1

ARCALUB-X.PINION



000A050C

Pistol grease guns

ARCA-PUMP-BARREL.GUN-METER



00017AC3

Grease pumps

Drum pumps

Bearing-specific greasing tool

ARCA-PUMP-BARREL



00019331

TOOL-RAILWAY-GREASER



000433E7

Lever grease guns

ARCA-GREASE-GUN



000179B4



Lubrication devices

Features Rolling bearings are automatically provided with the correct quantity of lubricant by lubricators and lubrication systems. This prevents the most frequent cause of rolling bearing failure: inadequate or incorrect lubrication. Approximately 90% of bearings are lubricated with grease. Relubrication with the correct quantity of grease at the appropriate intervals gives a significant increase in the life of rolling bearings. For manual relubrication, grease guns are suitable.

Automatic relubrication devices Automatic relubrication devices convey fresh lubricant in the defined quantity at the correct time to the contact points of the rolling bearing. The devices adhere to the lubrication and maintenance intervals and prevent undersupply or oversupply of grease. Plant downtime and maintenance costs are reduced as a result.

The relubrication devices are matched to the bearing positions. They have a wide range of applications, for example on electric motors, pumps, compressors and fans, in linear systems, conveying equipment or machine tools.

Lubricator CONCEPT2 This lubricator of protection class IP54 has a very compact design. It has one or two pump bodies that can be individually controlled, depending on the design. This means it can supply one or two lubrication points with lubricant. LC units are available in the size 250 cm³. The lubricator is supplied with voltage either from a battery or via a mains power pack, see table, page 79. It can work independently or can be optionally controlled by an external control system.

- Advantages

The advantages of the lubricator are as follows:

 - easy operation and good overview
 - supply of up to two lubrication points
 - facility for setting different lubrication intervals for each lubrication point
 - supply of set lubricant quantity independent of temperature
 - counterpressure measurement up to the lubrication point
 - reliable piston pump as delivery pump
 - low ongoing maintenance costs
 - favourable price/performance ratio
 - operating temperature from –20 °C to +70 °C
 - battery or mains operation (DC 24 V) possible
 - pressure build-up to 50 bar (mains operation) or 30 bar (battery operation)
 - differentiated alarm messages
 - simple coupling with machine operation possible
 - suitable for control via an external control system.



Available lubricators

CONCEPT2

Designation	Design
CONCEPT2-1P	Battery version with one outlet
CONCEPT2-2P	Battery version with two outlets
CONCEPT2-1P-24VDC	24-V version with one outlet
CONCEPT2-2P-24VDC	24-V version with two outlets

Available LC units

Designation	
ARCALUB-C2.LC250-MULTITOP	ARCALUB-C2.LC250-TEMP90
ARCALUB-C2.LC250-MULTI2	ARCALUB-C2.LC250-TEMP110
ARCALUB-C2.LC250-LOAD150	ARCALUB-C2.LC250-TEMP120
ARCALUB-C2.LC250-LOAD220	ARCALUB-C2.LC250-TEMP200
ARCALUB-C2.LC250-LOAD400	ARCALUB-C2.LC250-SPEED2,6
ARCALUB-C2.LC250-LOAD460	ARCALUB-C2.LC250-MOTION2
ARCALUB-C2.LC250-LOAD1000	ARCALUB-C2.LC250-FOOD2
–	ARCALUB-C2.LC250-CLEAN-M

Further information

LC units are also available by agreement with other greases.

Lubrication devices

Lubrication system CONCEPT8

This single-point and multi-point lubrication system offers high flexibility. It has one, two, three or four pump bodies that can be individually controlled, depending on the design. Each pump body has two outlets and, as a result, up to eight lubrication points can be flexibly provided with the required quantity of lubricant in the correct lubrication interval using just one lubrication system.

The lubrication system CONCEPT8 is designed for a wide variety of operating conditions. Designs for linear systems, the use of oils as lubricant or with an internal heating facility are also available, see table Available lubrication systems, page 81. Lubricant cartridges (LC units) provide the device with lubricant, see table Available LC units, page 81. LC units are available in the size 800 cm³.

The lubrication system is supplied with voltage from a mains power pack. Coupling with machine operation is possible if the voltage supply to machine and lubrication system is coupled, then the relubrication interval will always be dependent on the number of operating hours.

Advantages

The advantages of the lubrication system are as follows:

- easy operation and good overview
- suitable for oil and grease up to NLGI 3
- supply of up to eight lubrication points
- supply of set lubricant quantity independent of temperature
- counterpressure measurement up to the lubrication point
- reliable piston pump as delivery pump
- favourable price/performance ratio
- operating temperature from –20 °C to +70 °C
- facility for setting different lubrication intervals and lubricant quantities for each pump body
- low operating voltage of DC 24 V
- pressure build-up to 70 bar
- differentiated alarm messages
- simple coupling with machine operation possible
- suitable for control via an external control system.

**Available lubrication systems
CONCEPT8**

Designation	
CONCEPT8-1P	CONCEPT8-1P-CC
CONCEPT8-2P	CONCEPT8-2P-CC
CONCEPT8-3P	CONCEPT8-3P-CC
CONCEPT8-4P	CONCEPT8-4P-CC
CONCEPT8-1P-LIN	CONCEPT8-1P-OIL
CONCEPT8-2P-LIN	CONCEPT8-2P-OIL
CONCEPT8-3P-LIN	CONCEPT8-3P-OIL
CONCEPT8-4P-LIN	CONCEPT8-4P-OIL

LIN = for linear applications
CC = with internal heating facility
OIL = oil version

Available LC units

Designation	
ARCALUB-C8.LC800-MULTITOP	ARCALUB-C8.LC800-TEMP90
ARCALUB-C8.LC800-MULTI2	ARCALUB-C8.LC800-TEMP110
ARCALUB-C8.LC800-MULTI3	ARCALUB-C8.LC800-TEMP120
ARCALUB-C8.LC800-LOAD150	ARCALUB-C8.LC800-TEMP200
ARCALUB-C8.LC800-LOAD220	ARCALUB-C8.LC800-SPEED2,6
ARCALUB-C8.LC800-LOAD400	ARCALUB-C8.LC800-VIB3
ARCALUB-C8.LC800-LOAD460	ARCALUB-C8.LC800-MOTION2
ARCALUB-C8.LC800-LOAD1000	ARCALUB-C8.LC800-FOOD2
—	ARCALUB-C8.LC800-CLEAN-M

Further information

- LC units are also available by agreement with other greases or with oils
- Other accessories available by agreement
- Enquiries:
industrial-services@schaeffler.com, +49 2407 9149-66.



Lubrication devices

**Minimal quantity
lubrication devices**

The compact lubrication systems allows very precise and efficient supply of lubricant to spindle bearings.

**Grease lubrication system
for spindle bearings**

The grease lubrication system for spindle bearings is specially designed in terms of the delivery volume per stroke for the greasing of main spindles, see table.

Hoses filled with grease are connected to the outlets. These constitute the lubricant reservoir for relubrication. The cartridge only contains a pressure agent that is pumped into the hoses during delivery. The lubricant and pressure agent are separated from each other by a ball in the hose.

The lubricant is only subjected to pressure during the relubrication process in order to prevent separation of the grease.

Advantages

- The advantages of the lubrication system are:
- optimum relubrication of the main spindles by means of very small quantities
 - prevention of impermissible temperature increases
 - suitable for bearings with different lubrication requirements
 - simple coupling with machine operation possible
 - favourable price/performance ratio.

**Available grease lubrication system
for spindle bearings**

Designation	Outlet ducts	Delivery quantity per outlet duct cm ³ /stroke
	Quantity	
CONCEPT-PRECISION-GREASE	2	0,023

Oil lubrication system for spindle bearings	<p>Spindle bearings run at high speeds. For this reason, pneumatic oil lubrication has previously been used for speed parameters above 1 600 000 mm/min. This requires extremely clean, dry compressed air. The high costs of this compressed air are not incurred with direct oil lubrication. The compressed air is replaced by a damper throttle element. This element gives an almost continuous delivery rate. Two systems are available, see table. One version has an internal oil tank, while the other is supplied via a connection adapter for an external oil tank.</p>						
Advantages	<p>The advantages of the lubrication system are:</p> <ul style="list-style-type: none"> ■ optimum relubrication of main spindles by means of very small quantities at a constant delivery rate ■ suitable for bearings with different lubrication requirements ■ simple coupling with machine operation possible ■ no compressed air costs for bearing lubrication ■ no risk of spindle failure due to inadequate air cleanliness ■ favourable price/performance ratio. 						
Available oil lubrication system for spindle bearings	<table> <tr> <th>Designation</th><th>Oil tank cm³</th></tr> <tr> <td>CONCEPT-PRECISION-OIL-250</td><td>250</td></tr> <tr> <td>CONCEPT-PRECISION-OIL</td><td>–</td></tr> </table>	Designation	Oil tank cm ³	CONCEPT-PRECISION-OIL-250	250	CONCEPT-PRECISION-OIL	–
Designation	Oil tank cm ³						
CONCEPT-PRECISION-OIL-250	250						
CONCEPT-PRECISION-OIL	–						



Lubrication devices

Chain lubrication pinion

A chain lubrication pinion is used to supply chains with chain oil according to requirements and fully automatically. The rollers are made from open cell PU foam and transfer very small quantities of oil to the highest points on the chain links. From there, the oil passes between the inner and outer links and between the pins and rollers. There is no coating of other surfaces of the chain with oil, which is unnecessary and in many case undesirable.

The chain pinion segments are made from special plastic and convert the linear (translation) movement of the chain into rotary motion (rotation) of the chain lubrication pinion. Despite the non-uniform surface of the chain links, the co-rotation of the plastic pinion ensures very quiet running of the lubrication pinion even at very high speeds.

Chain lubrication pinions are available for standard chains, simplex, duplex, triplex and also special chains.

Lubrication gear

A lubrication system comprises a lubrication gear and drive pinion or a lubrication gear and toothed rack. The lubrication gear gives automatic, continuous relubrication of the open tooth sets of the drive pinion or toothed rack.

A lubrication gear is connected to the drive pinion or toothed rack. The lubrication gear, made from open cell PU foam, stores the lubricant and transfers it in very small metering quantities to the tooth set in contact. This facilitates optimum supply to the tooth sets over very long periods and prevents both overlubrication as well as wear due to lubricant starvation.

A lubrication gear does not transmit either force or torque.

The following tooth sets are available:

- straight teeth
- helical teeth, helix angle up to 45°
- modulus: 2 to 30
- width: up to 700 mm.

Pistol grease gun

The pistol grease gun has a 4 digit digital counter that displays the lubricant quantity in grams. The specific mass of the lubricant can be set.

Ordering designation

ARCA-PUMP-BARREL.GUN-METER

The features of the pistol grease gun are as follows:

- measurement range: 0,1 g to 1000 g
- display of gram counter: 4 digits
- display of total counter (kg): 4 digits
- maximum operating pressure: 600 bar
- burst pressure: 1000 bar
- maximum operating temperature: +60 °C
- tolerance: $\pm 3\%$ of displayed value
- battery life: 24 months
- inlet: z type swivel joint G¹/₄
- outlet: nozzle tube with 4 jaw nozzle
- mass: 1,7 kg.



Lubrication devices

Grease pumps

Grease pumps are driven by pneumatic or manual means.

Drum pumps

Drum pumps ARCA-PUMP-BARREL, see table, are pneumatically driven and suitable for delivering large quantities of grease under high pressure over long distances. Drum pumps can be used either as delivery pumps for individual greasing stations or as a supply pump for central lubrication systems.

Available drum pumps

Designation	Pump ratio	Delivery rate at 6 bar g/min	Air consumption l/min	Suitable for container sizes kg
ARCA-PUMP-BARREL-25-S	70:1	1 100	150	25
ARCA-PUMP-BARREL-50-S	70:1	1 100	150	50
ARCA-PUMP-BARREL-180-S	70:1	1 100	150	180

The following accessories are available for the drum pumps: drum cover (dust cover), follower plate, high pressure delivery hoses and pistol grease guns.

Bearing-specific greasing tools

In the reconditioning of wheel bearing sets for rail vehicles (TAROL units), rapid and uniform greasing can be achieved by means of bearing-specific greasing tools. The tool is connected to a drum pump that supplies the appropriate grease quantity.

Ordering example
Ordering designation

Greasing tool for bearing F-561775
TOOL-RAILWAY-GREASER-F-561775

Further information

- TPI 156, Tapered Roller Bearing Units TAROL – Mounting, Maintenance, Repair
- Enquiries:
industrial-services@schaeffler.com, +49 2407 9149-66.

Lever grease gun and reinforced hose

The lever grease gun, see table, can be used to manually relubricate rolling bearings via lubrication nipples.

The container on the lever grease gun can be filled with 500 g loose grease or with a 400-g cartridge. The cartridge must conform to DIN 1284 (diameter 53,5 mm, length 235 mm).

The lever grease gun is connected to the lubrication nipple via a reinforced hose. The reinforced hose must be ordered separately, see table. The connector thread is G¹/₈. The reinforced hose has a hydraulic grip coupling for connection to the taper type lubrication nipple in accordance with DIN 71412.

Alternatively, the reinforced hose can be fitted with a connector for cylindrical lubrication nipples in accordance with DIN 3404.

In place of the hydraulic grip coupling, slide couplings for button head lubrication nipples in accordance with DIN 3404 or other nozzles can be connected. These connectors are available from normal trade outlets.

Available lever grease guns

Designation	Maximum delivery pressure bar	Delivery quantity per stroke cm ³
ARCA-GREASE-GUN	800	2



Available reinforced hoses

Designation	Length mm	Connector
ARCA-GREASE-GUN.HOOK-ON-HOSE	300	Cylindrical lubrication nipples with head 16 mm in accordance with DIN 3404
ARCA-GREASE-GUN.HOSE	300	Taper type lubrication nipples in accordance with DIN 71412