



FAG Lubrication Systems CONCEPT8 + CONCEPT2

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- ▶ Why Lubricators
- ▶ Concept 8 (Product and Auxiliary)
- ▶ Concept 2 (Product and Auxiliary → E-Motor-Kit)
- ▶ How to make the right configuration (which product, which auxiliary)
- ▶ How to choose the grease and calculate the lubrication intervals/amount
- ▶ How to set the device (C2 and C8)
- ▶ How to sell the device (comparison and references)



Keeping machines up and running provides a measurable benefit to customers. Reduction in these associated categories means uninterrupted production – higher throughput which means more product available for sale, reduced maintenance costs, reduced shutdown costs, all of which put more cash in the bottom line or maintenance budget.

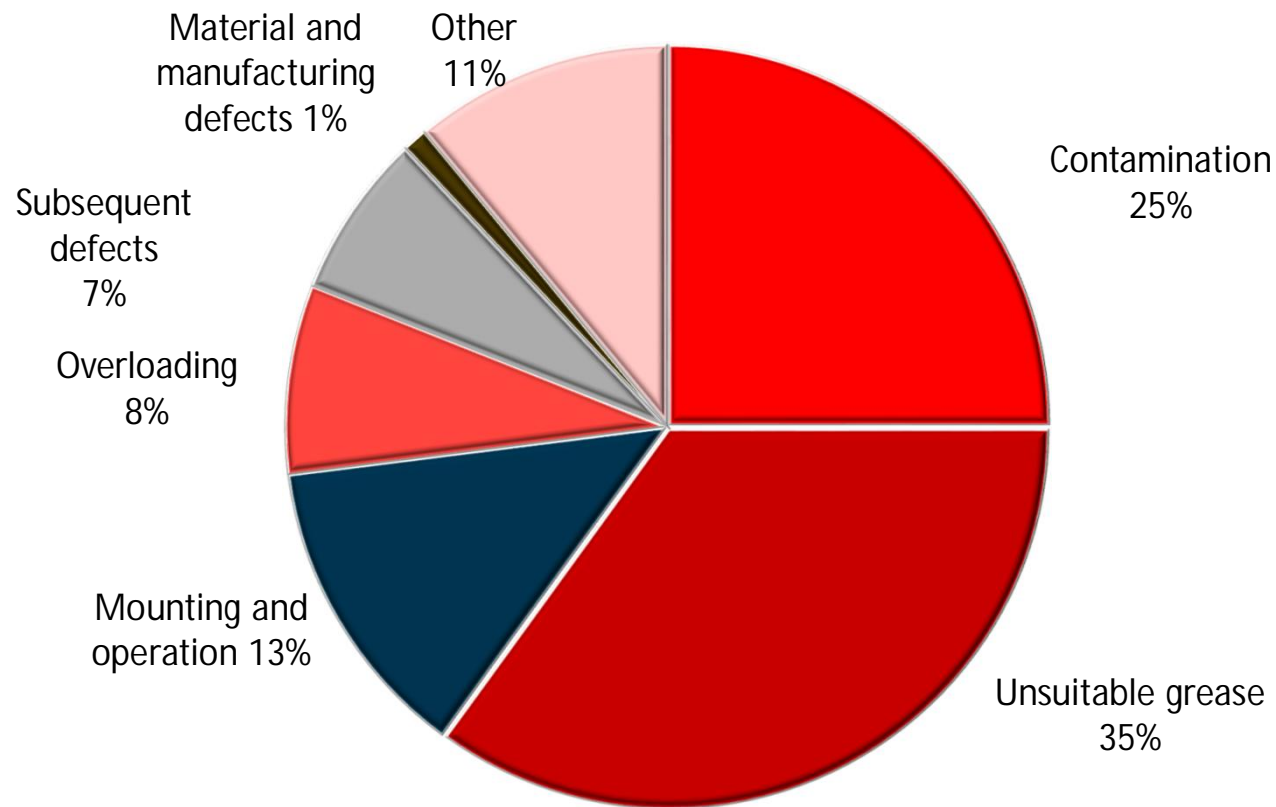
- Professional lubrication reduces bearing failures
- Reduced downtime for maintenance increases production output
- Automated lubrication of bearings reduces maintenance costs
- Use of lubricators simplifies to reach safety guidelines
- Reliability for customers – quality product supported by best in class hardware

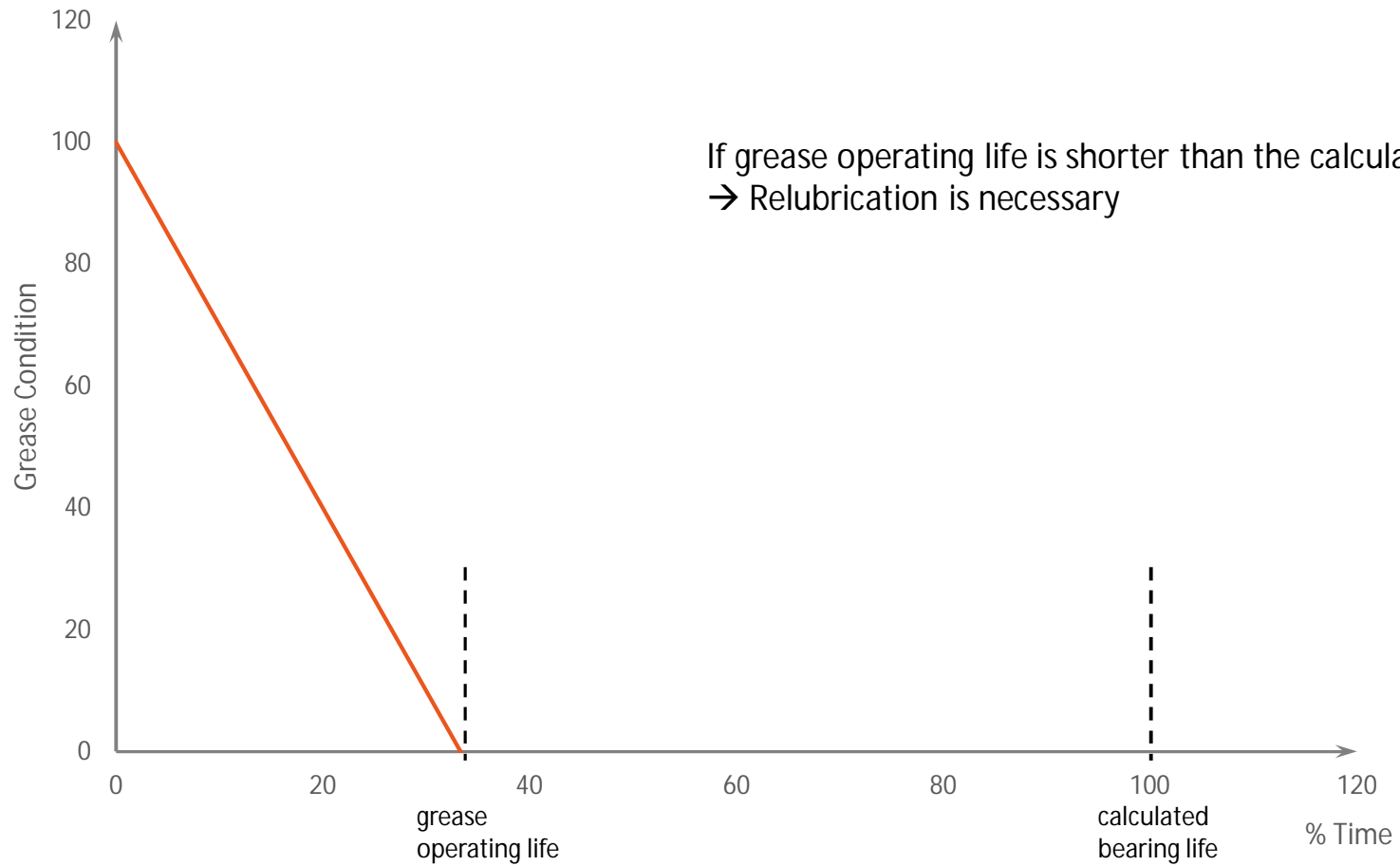
Hardware installed on machine tools sold to customers provides maximum operational life from moving elements

- Less warranty claims
- Less hours spent on service calls
- Less repair hardware kept in stock

Why is proper lubrication important?

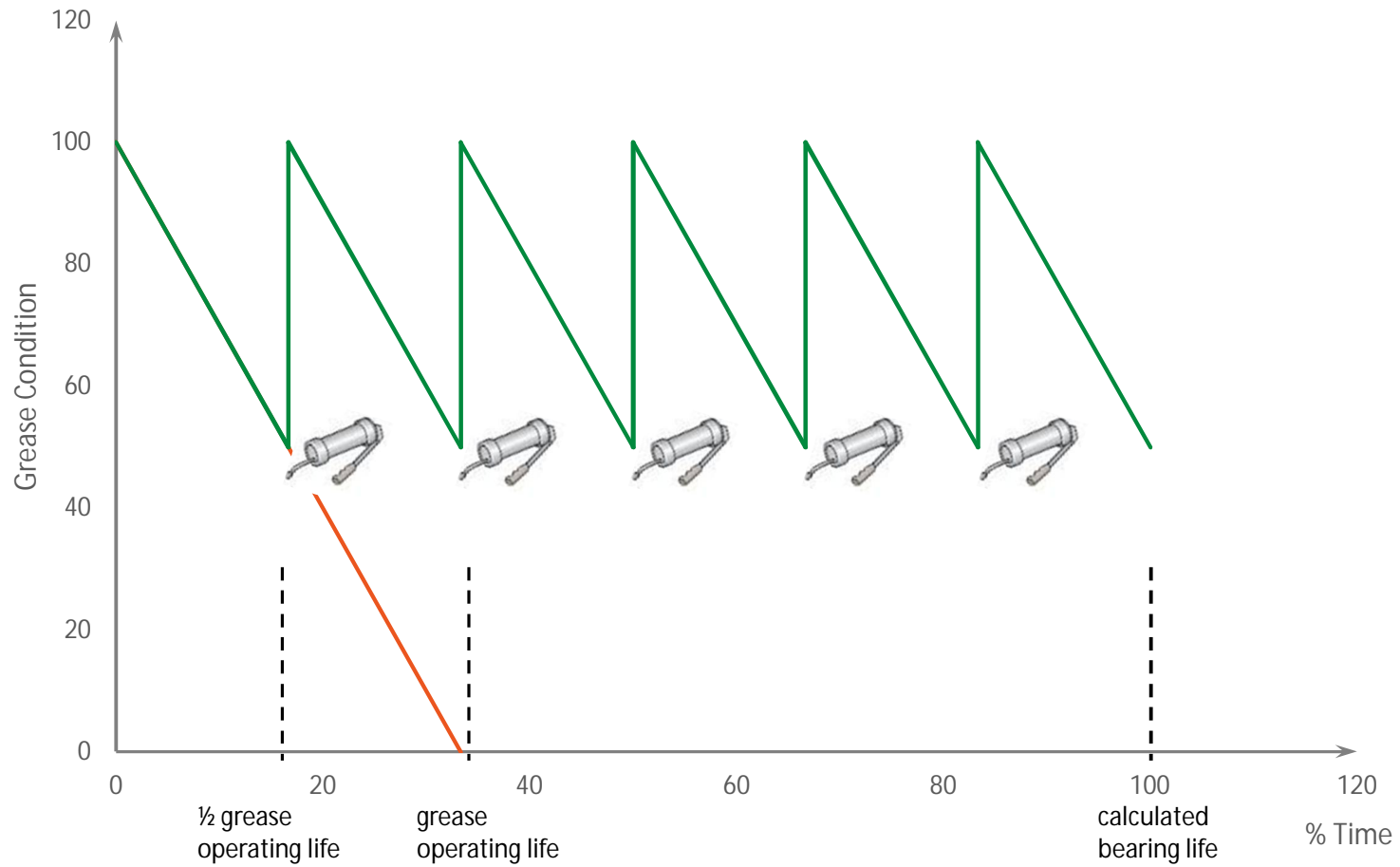
Because approximately 60% of all bearing failures are lubricant related.

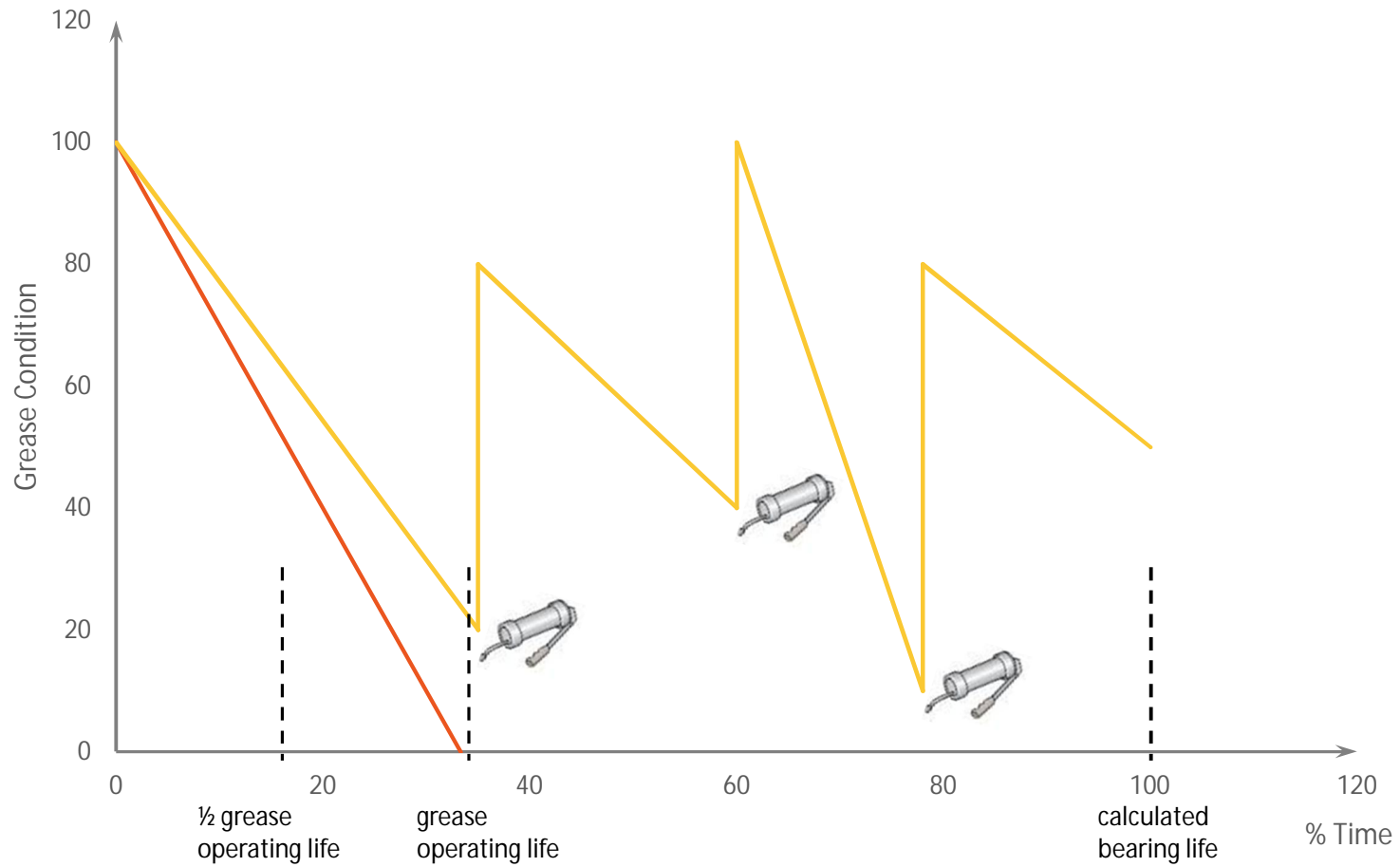


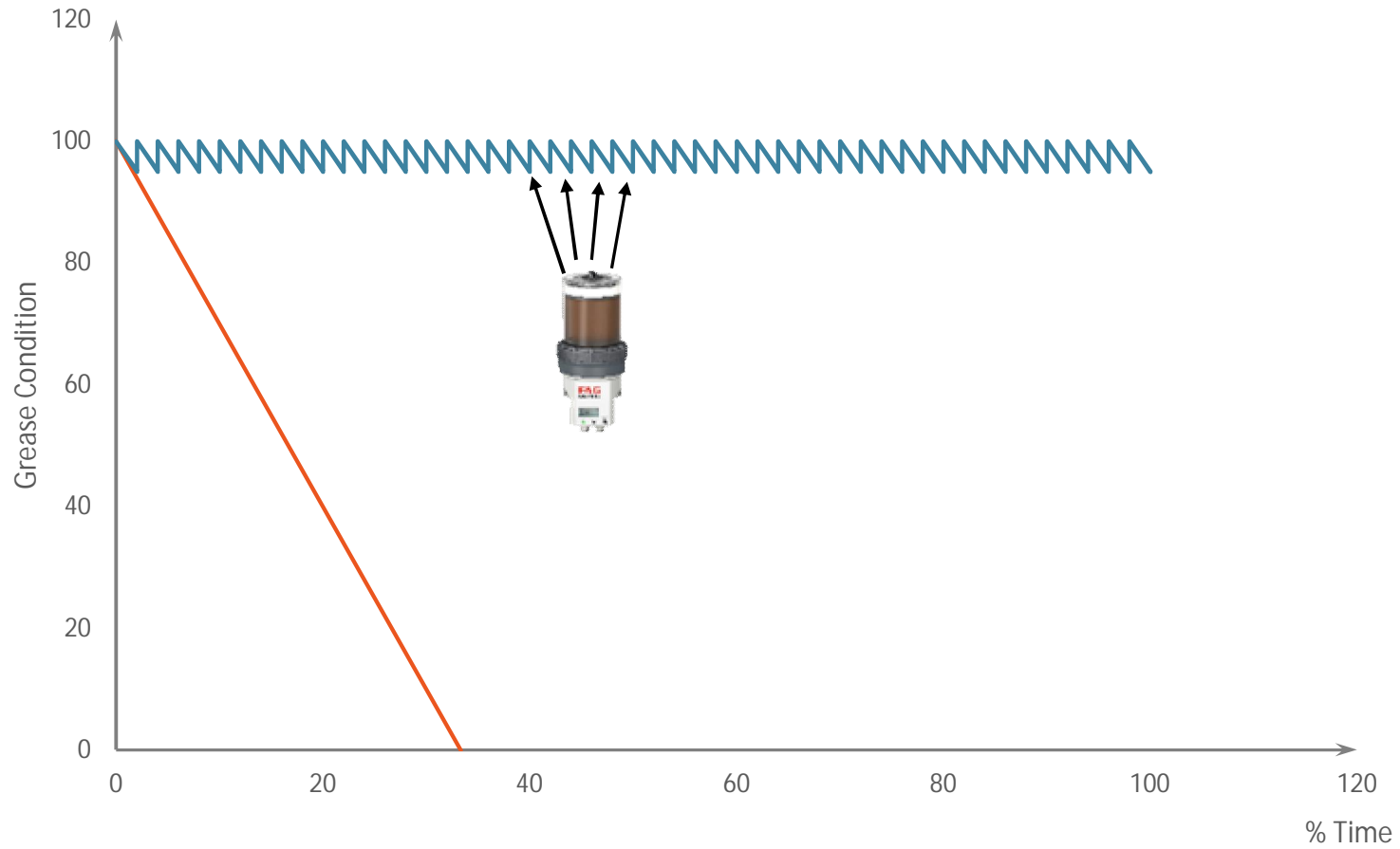


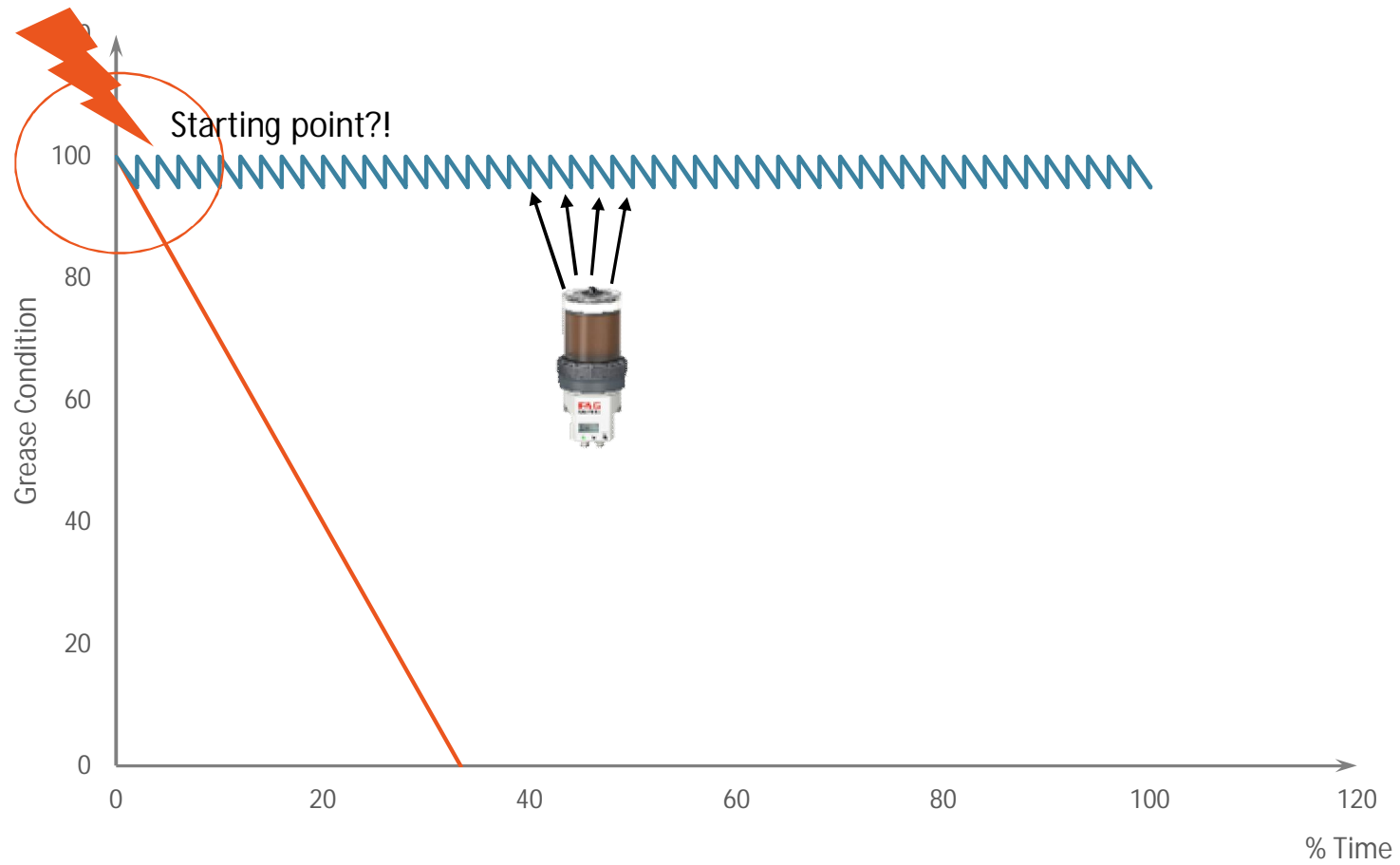
Introduction to Automatic Lubricators
Grease relubrication - theory

SCHAEFFLER





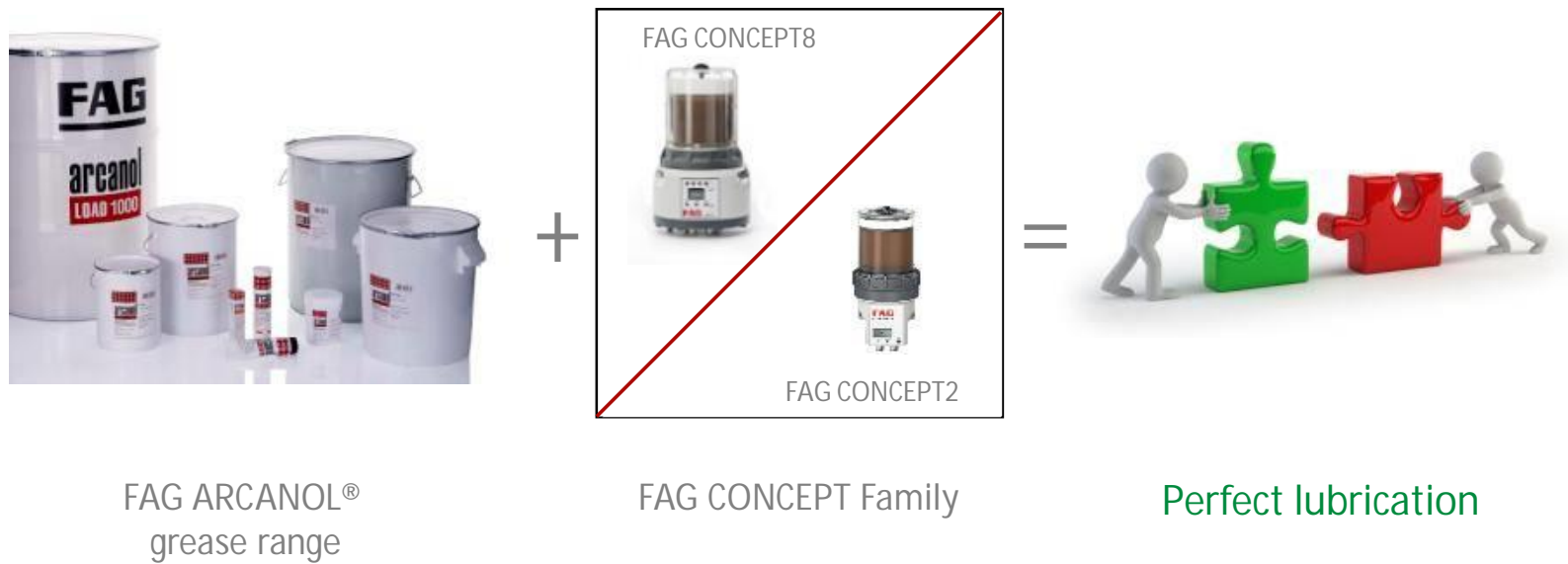






- Right supply of grease to every bearing position
- Only small amount of lubricant: Only small influence on the bearing (ΔT)
- Fully automatic, maintenance reduced operation
- Risk of accident for personnel is prevented
- Personnel has more time for more important work

Automatic lubricators provide fresh grease to the contact points of the rolling bearing in **the desired quantity and at the right time.**



Schaeffler Automatic Lubricators allow grease to be supplied in a requirement-based way instead of a time-controlled way

- Optimized grease quantities and lubrication intervals
- Reduced friction
- Reduced temperature development
- Permanent monitoring during operation
- Documentation of bearing monitoring is possible



- ▶ Individual, precise supply of grease to every bearing position
- ▶ Fully automatic, maintenance-free operation
- ▶ Risk of accident for personnel is prevented
- ▶ Savings on personnel costs compared to manual re-lubrication
- ▶ Danger of lubricants being mixed up is largely eliminated
- ▶ Larger bearing service lifetime, always fresh grease and no temperature changes

- ▶ Why Lubricators
- ▶ Concept 8 (Product and Accessories)
- ▶ Concept 2 (Product and Accessories → E-Motor-Kit)
- ▶ How to make the right configuration (which product, which accessory)
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- ▶ How to set the device
- ▶ How to sell the device (comparison and references)



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- ① Multi-function interface for voltage supply and I/O interface
- ② Outlets of piston pumps P1 to P4



Figure 1
CONCEPT8
with multi-function interface

- automatic, pulse-controlled lubricator for:
 - grease (Arcanol range up to NLGI 3, other greases by agreement)
 - oil (oil viscosity > 68 cSt)
- independently operating piston pumps each with two outlets:
 - 2 or 4 piston pumps
 - variable metering quantity:
 - min. 0,15 cm³ per outlet, with 1 lubrication cycle,
 - max. 7,2 cm³ per outlet, with 96 lubrication cycles;
 - freely selectable number of lubrication cycles per control operation; both outlets operated once in each of 2 lubrication cycles
- programmable pause times per piston pump:
 - 1 hour – 240 hours (internal time control)
 - ≥ 1 hour (external time control via PLC)

- ① Minimum distances necessary for the mounting and dismantling of the cartridge and hose connectors

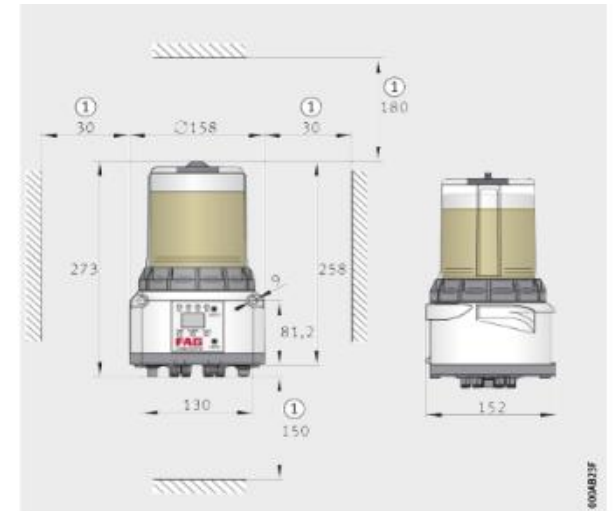


Figure 2
Dimensions and
minimum distances

- voltage supply:
 - external, DC 24 V
- delivery pressure at room temperature:
 - ≤ 70 bar
- storage volume:
 - 800 cm³, grease cartridge replaceable
 - 1000 cm³, oil container non-replaceable
- output of error messages via display, status LED and multi-function interface:
 - empty level display
 - back pressure too high
 - advance warning at 20% residual fill level (only via multi-function interface)
 - feedback function for completed lubrication cycle (only via multi-function interface).

FAG CONCEPT8 Product Characteristics

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Sufficient lubrication is decisive when it comes to achieving a long operating life for rolling bearings. This is precisely where FAG CONCEPT8 comes in. This lubricator can supply precisely the right quantity of grease to nearly all industrial machines.

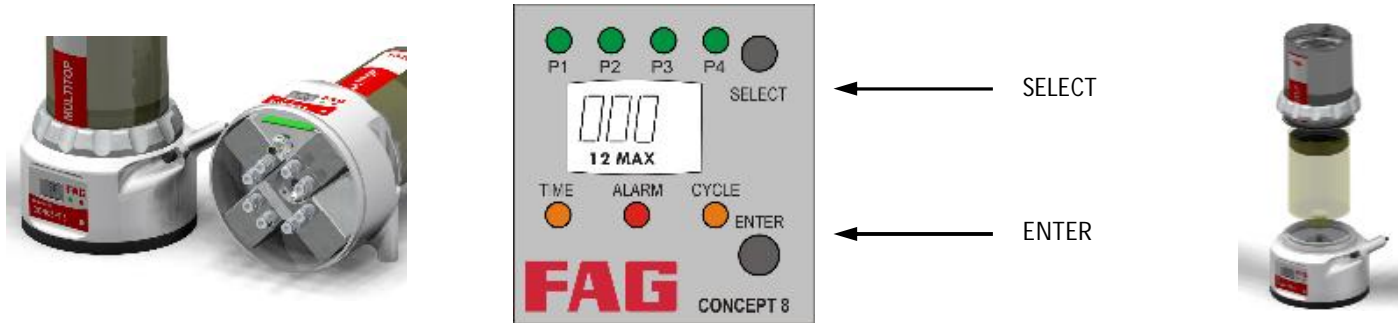
Product characteristics:

- 4 pump bodies with 2 outlets each for optimal greasing of your machine
- Pressure up to 70 bar
- Easy installation and use
- Increase in machine availability
- Reduced service costs



FAG CONCEPT8 Features

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Important new features:

- Easier to use: 2 switches for communication (SELECT and ENTER)
- Switches are operated using reed contacts with magnets
- Grease sensor can be integrated using the FAG GreaseCheck sensor input
- Reserve message possible: e.g. if lubricator is 100 % empty (irrespective of empty status message)
- Operates with original cartridges (not refillable) only
- Oil supply: lubricant reservoir in the cartridge or direct filling without cartridge (approx. 1 l)

FAG CONCEPT8 More Product Features

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Advantages in Detail:

- ▶ Fill with grease or oil (grease up to NLGI 3*)
- ▶ Industrial housing IP65 for maximum protection
- ▶ Up to eight outlets from four individual pump units that can be controlled separately
- ▶ Pump units can be programmed individually by individually setting the quantity for the pump units
- ▶ Easy to operate and monitor thanks to a simple LCD menu
- ▶ Programming options for lubrication intervals and quantities plus time or impulse mode
- ▶ Timely alarm for empty cartridge, electrical spikes, in case of cable breakage or malfunction
- ▶ Transparent cartridge for visual confirmation of remaining lubricant



FAG CONCEPT8 Design and functions

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- Action Pen + Display
 - disguised as bleed screw
 - magnetic pen on using the keyboard SELECT and ENTER
 - Reed contacts
 - Protection against unauthorized access
 - aware only 2 buttons:
Simplify intuitive operation



- Cartridge

- 800 cm³ contents (grease cartridge replaceable)
- 1000 cm³ (oil container non replaceable)
- transparent: Optical level indicator
Vacancy sensor
- Original welded: proof of originality filling
- not refillable except oil version

Avoid operational disturbances due to improperly filled cartridges.

- Detection original cartridge
- Follower Plate
- Positioning
- Retaining tabs (Function: next slide)



FAG CONCEPT8 Design and functions

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- cartridge cover
- function retaining tabs
- Integrated Action Pen
- biasing spring (0.2 bar)

Note: Self-priming pumps spring ensures tracking the follower piston

- bayonet lock



- Functioning pump body

→ A pump body has two pistons K1 and K2, and thus two outlets A1 and A2

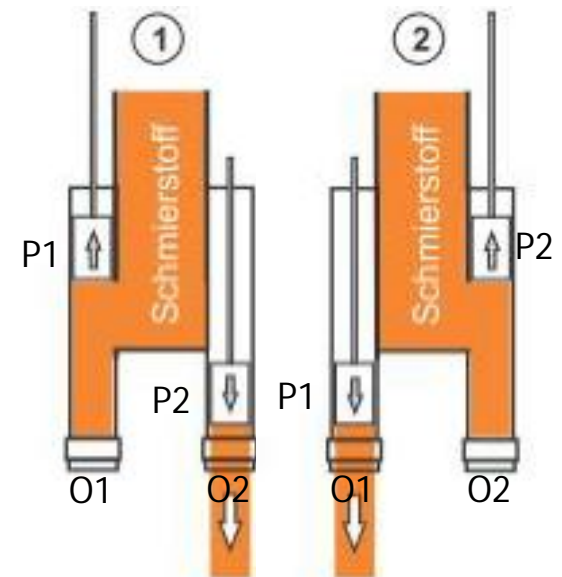
→ The two pistons are connected by a transmission

→ E-motor drives Gearbox

→ Picture 1: During a delivery piston K2 makes (outlet A2 is operated), aspirated piston K1 simultaneously new lubricant from the cartridge into the reservoir.

→ screen 2: During a delivery piston K1 makes (outlet A1 is operated), aspirated piston K2 simultaneously new lubricant from the cartridge in the pantry.

→ outlets are operated reciprocally.



FAG CONCEPT8 Design and functions

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- Outlets + hose connection parts
 - A CONCEPT 8 can be fitted with 1, 2, 3 or 4 pump bodies, that is, with 2, 4, 6 or 8 outlets
 - Both outlets must be open
 - It must be no closed outlet
 - The CONCEPT8 is through hoses to connect to the lubrication points.
- Depending on the thread on the lubrication points input, various service hydrants parts needed:



CONCEPT8 with 4 pump bodies (= 8 Outlets)

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Voltage supply



Grease cartridges



Splitters, progressive distributors



Device holders



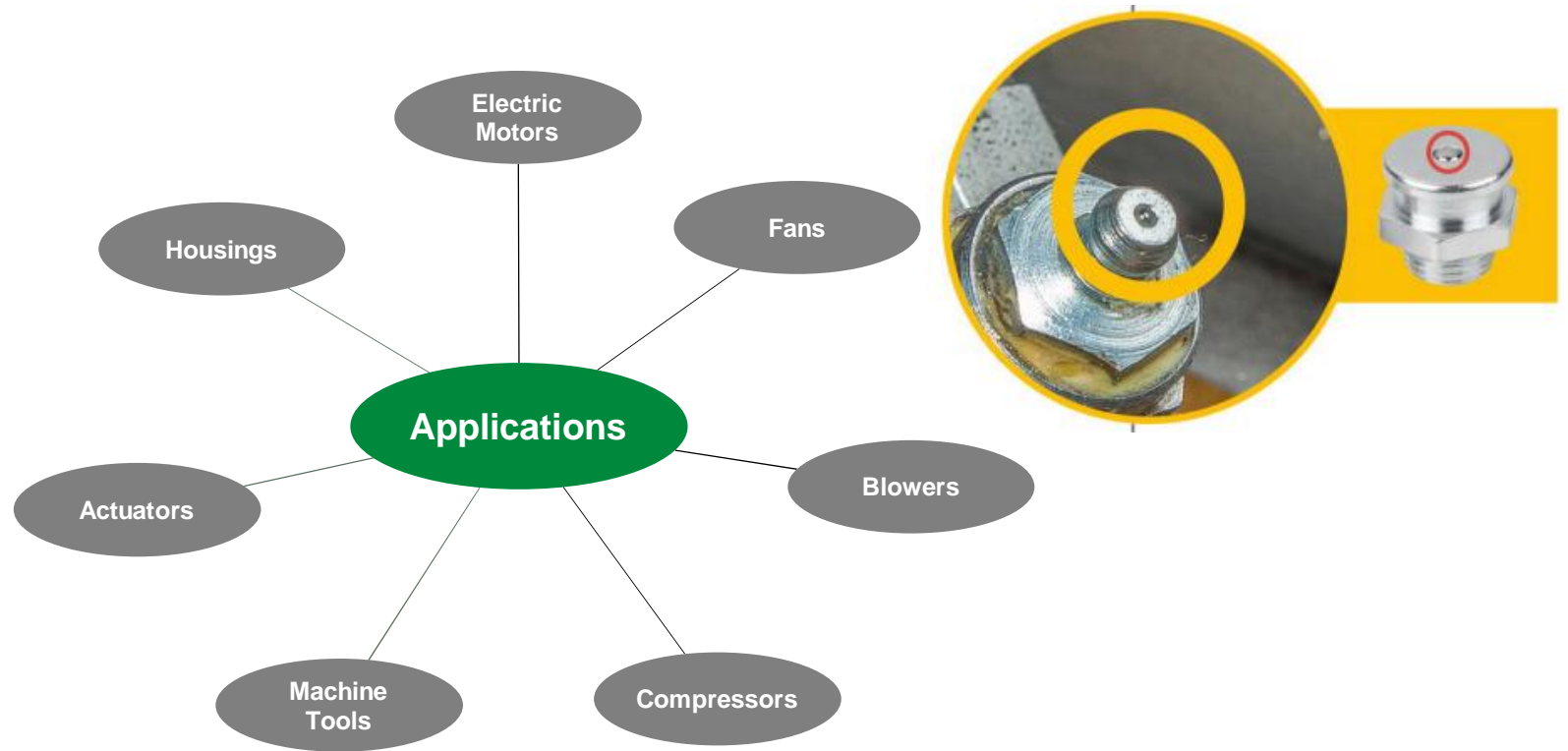
Fittings, Y pieces, check valves

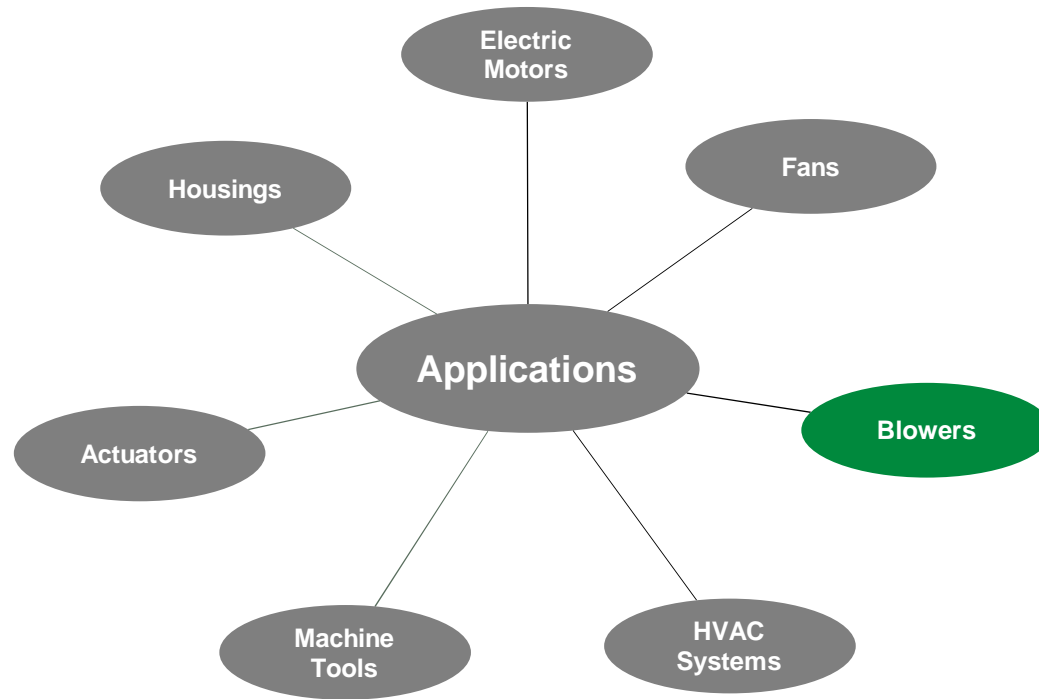


Hoses, hose cutters



Lubrication gears, chain lubrication pinions,
lubrication rollers





Target Applications Blowers

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The Challenge

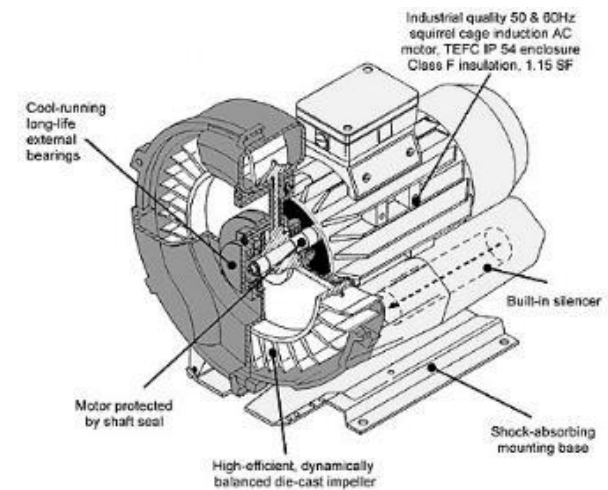
- ▶ Fans run continuously and are critical to plant operation
- ▶ Lubrication points are hard to access
- ▶ Requires shutdown to perform manual lubrication
- ▶ Expensive to replace

Cooling Tower Fans / Gearboxes are a perfect match for a multi-point lubricator

- ▶ Concept 8 800cc lubricators per Cooling Fan
- ▶ Two installation points per gearbox
- ▶ Two installation points per electric motor

How to win business

- ▶ Target fan manufacturers – built in cost savings for their target customers (OEM)
- ▶ **Aftermarket**; steel mills, production plants, power plants, warehousing, technology companies, hospitals, food and beverage etc.
- ▶ Focus on less maintenance time for critical operating parts
- ▶ Safer working environment for lubrication specialists



Blowers
\$1M+ / yr



Target Applications

Industrial Blower – Market Analysis

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An *Industrial Blower* or *Centrifugal Blower* typically has one of seven types of wheels that draws the air into the inlet of the blower housing while an *Axial Flow Fan* or *Industrial Axial Fan* uses a propeller to draw the air into it. The air in an industrial or centrifugal blower is drawn through the wheel, and discharged at 90 degrees out through the discharge of the housing. An axial flow fan discharges it in the same axial direction. Fans are air moving devices with propellers while blowers are those with a wheel.

Applications

While a list of all the applications our Industrial Blowers are used for would be extremely long, the most common include:

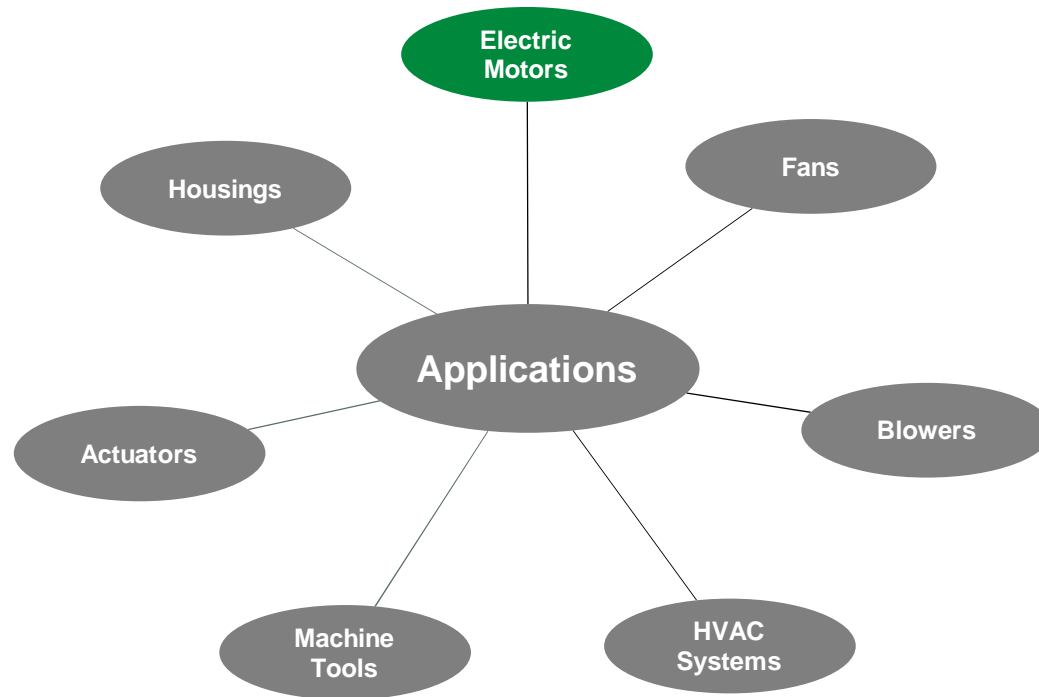
- Conveying material in dust collector systems or loading to silos, trucks and railroad cars.
- Combustion air for burners and industrial water heaters.
- Cooling electrical equipment or parts from heat curing ovens and kilns.
- Pressurizing cabinets, vaults or rooms.
- Blow-off systems to remove moisture from parts prior to painting, coating or packing.
- General ventilation of rooms or factories.
- Providing suction or pressure for industrial process air flotation tables.
- Drying ink on cans and bottles, silk screen and printing processes.
- Food processing.
- Circulating air in ovens and dryers to eliminate cold spots.
- Forced ventilation of AC and DC motors, traction motors and electrical cabinets.

Market

Primary Global Producers

- ▶ Nidec Motor Corporation (U.S.)
- ▶ Emerson Electric Co. (U.S.)
- ▶ ABB Ltd. (Switzerland)
- ▶ Siemens AG (Germany)
- ▶ WEG Electric Corp. (Brazil)





Target Applications

Electric Motors – Market Analysis

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Induction motors are simple and rugged in construction. They are used in most of the industries. The advantages of induction motors include their robustness and ability to operate in any environmental condition. DC motors which were earlier used for industrial applications have now been replaced by induction motors.

Induction motors, based on their construction, are of two types: single phase induction motors and three phase induction motors.

Three Phase Induction Motors (electric motors)

Three phase induction motors are widely used in motor and drive applications. The three phase induction motors are estimated to grow at a double-digit CAGR (Compound Annual Growth Rate) from 2014 to 2019.

Applications

They are used in lathes, drilling machines, agricultural and industrial pumps, lifts, cranes, and so on. The three phase induction motors are further divided into squirrel cage induction motors and slip ring induction motors.

Market

The global induction motor market is expected to register a CAGR of 12.4% from 2014 to 2019. The Asia-Pacific region is expected to dominate the market, growing at a CAGR of 12.9% during the forecast period.

Factors driving the induction motor market include economical cost and low maintenance of the induction motors. Induction motors are economical and maintenance free due to the absence of brushes, commutators, and slip rings.

Primary Global Producers

- ▶ Nidec Motor Corporation (U.S.)
- ▶ Emerson Electric Co. (U.S.)
- ▶ ABB Ltd. (Switzerland)
- ▶ Siemens AG (Germany)
- ▶ WEG Electric Corp. (Brazil)



Target Applications

Electric Motors – Industrial Example

SCHAEFFLER

Primary Application!

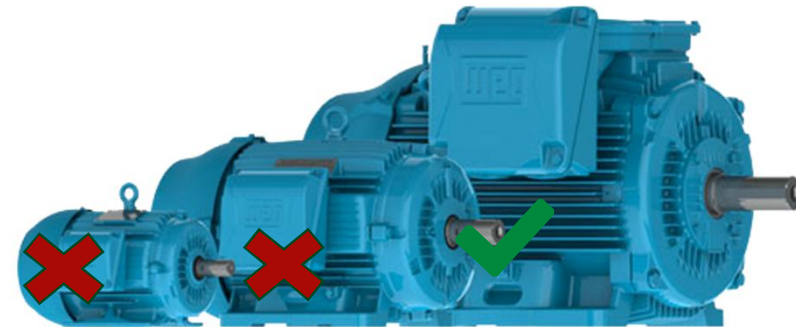
- ▶ Large only – small and medium size e-motors are considered "throw away" items.
- ▶ Focus on large, expensive e-motors, huge market
- ▶ Expensive to replace and critical to operations
- ▶ End users commonly have hundreds of e-motors in operation
 - ▶ Dozens of large e-motors

Application examples

- ▶ Use to turn fans, compressors, lathes, drilling machines, agricultural and industrial pumps, lifts, cranes etc.
- ▶ Two installation points per motor
- ▶ Lubricate difficult to access areas, several motors at once

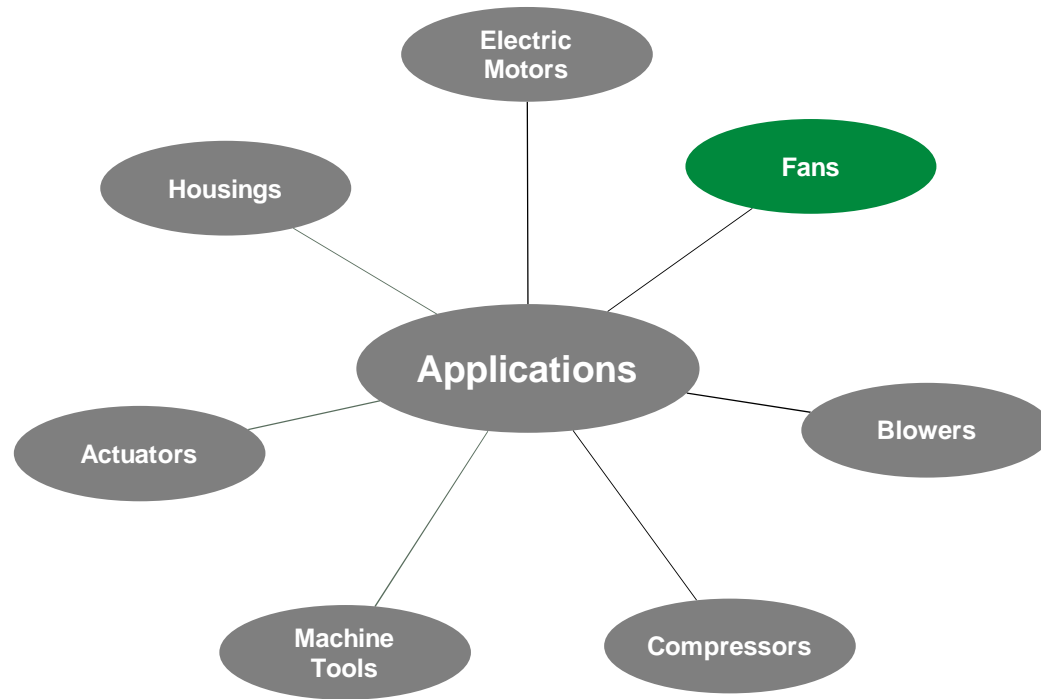
How to win business

- ▶ **Target End Users** – steel mills, production plants, power plants, warehousing, technology companies, hospitals, food and beverage etc.
- ▶ Focus on less maintenance time for critical operating parts
- ▶ Safer working environment for lubrication specialists



Electric Motors
\$1M+ / yr





Target Applications

Cooling Tower Fan – Gearboxes and E-motors

SCHAEFFLER

The Challenge

- ▶ Fans run continuously and are critical to plant operation
- ▶ Lubrication points are hard to access
- ▶ Requires shutdown to perform manual lubrication
- ▶ Expensive to replace

Cooling Tower Fans / Gearboxes are a perfect match for a multi-point lubricator

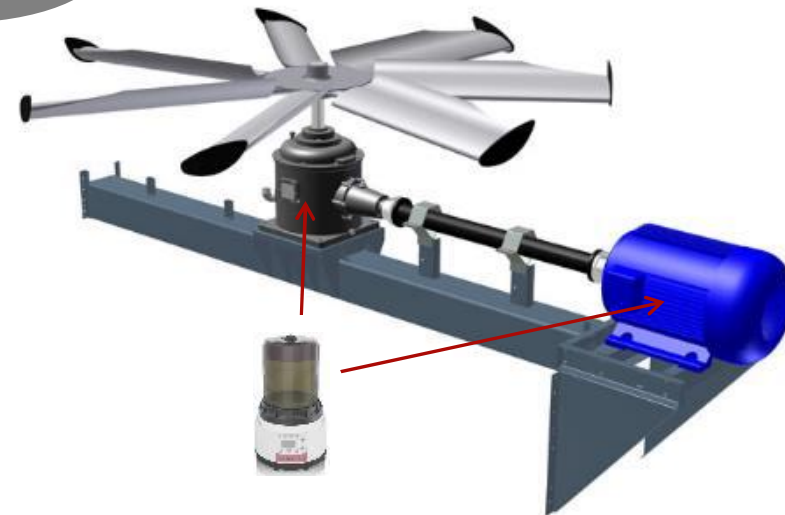
- ▶ Concept 8 800cc lubricators per Cooling Fan
- ▶ Two installation points per gearbox
- ▶ Two installation points per electric motor

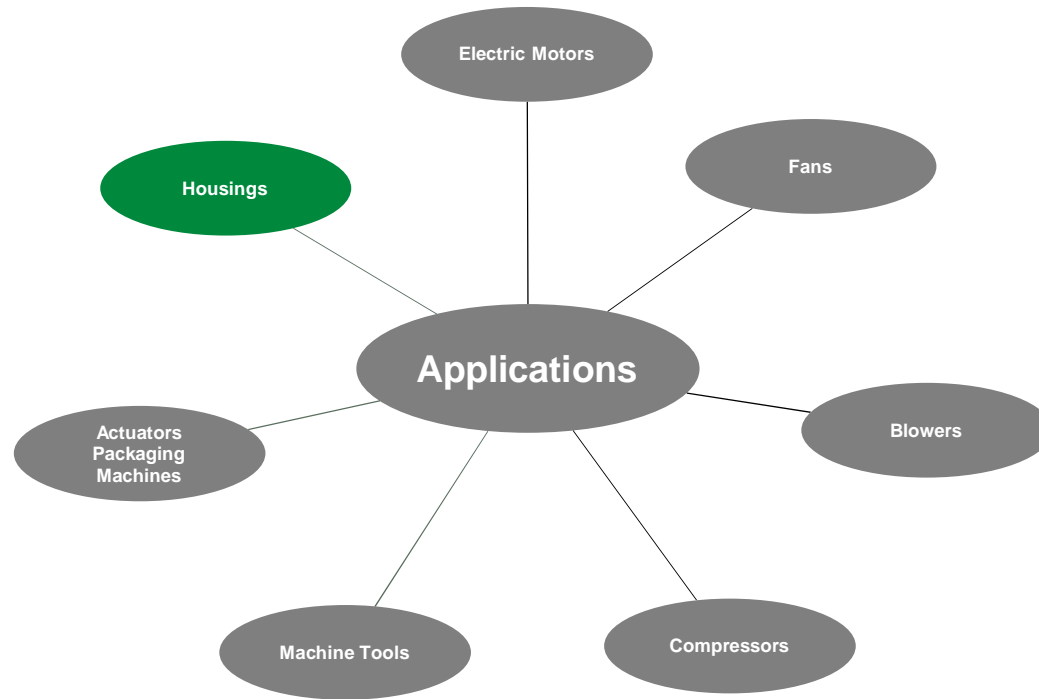
How to win business

- ▶ Target fan manufacturers – built in cost savings for their target customers (OEM)
- ▶ **Aftermarket**: steel mills, production plants, power plants, warehousing, technology companies, hospitals, food and beverage etc.
- ▶ Focus on less maintenance time for critical operating parts
- ▶ Safer working environment for lubrication specialists



Cooling Fans
\$50k - \$70k / yr





Target Applications
Applications – SAF / SAE /SNV / SNS Housings

SCHAEFFLER



IDEAL FOR SIZES >250MM



Plummer Block Target Sizes

- > 200 mm
- Series xxx

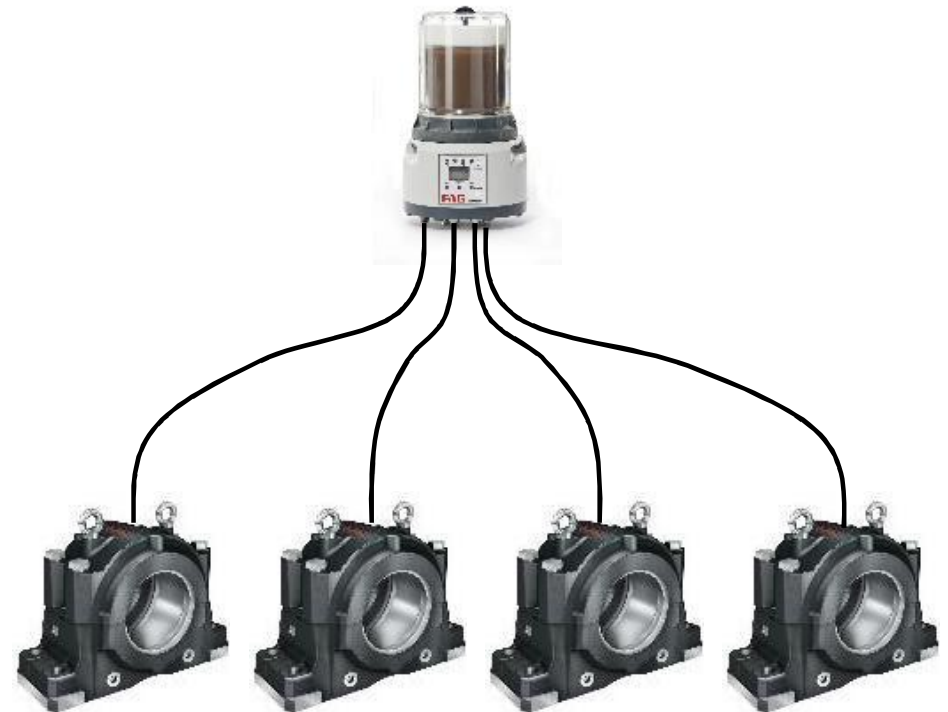
Deliver precise lubrication quantities
Re-lubricate with Arcanol to achieve
maximum running life

Target Applications SNF / SAF Housings

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- ▶ Suitable for Various Schaeffler Housing Styles
- ▶ Lubricate multiple housings at the same time

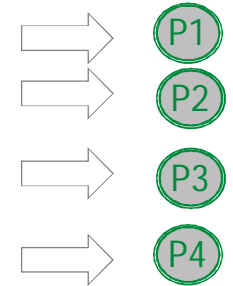


Example
BMW Group, Germany

SCHAEFFLER



Machine Part:	Bearing:	Re-lubrication Interval:	Quantity:
Motor	NU320-E	5400 h	160 g
Motor	6218	8760 h	60 g
Fan Main Shaft	22226-E1	3900 h	200 g
Fan Main Shaft	22228-E1	3900 h	200 g
Seal	-	4000 h	100 g



Lubricant: FAG ARCANOL LOAD220.
 Threat of Lubrication points: M8, angled.
 Length of hoses: Shorter than 5m.
 Environment temperature: 30°C ± 5°C

What kind of device?
 How many pumps?
 What kind of cartridge?
 What kind of connectors?
 How many connectors?
 Is Y-connector needed?
 How many Y-connectors?
 What kind of cable?
 What kind of hoses?
 How many hoses?

CONCEPT8 Standard.
 4 pumps bodies.
 800cc filled with ARCANOL LOAD220
 M8, angled.
 5.
 Yes.
 3.
 5m, angled.
 8 x 5 mm. 5m long.
 5.





- Pump bodies can be individually controlled
 - Individual adjustment of the quantity delivered by each pump body
- Easy to use and good overview
 - Simple menu navigation using an LCD display with only two switches
- Safe supply of grease to the lubrication point
 - Grease is subjected to reduced compressive loads due to the direct supply to the lubrication point

- Versatile programmability
 - Adjustment of lubricant quantities and time intervals directly in the device or control in pulsed operation using a higher-level machine control system
- Differentiated alarm of faults and major defects
 - In the case of empty status, excessive back pressure or cable breakage



- ▶ Why Lubricators
- ▶ Concept 8 (Product and Accessories)
- ▶ Concept 2 (Product and Accessories → E-Motor-Kit)
- ▶ How to make the right configuration (which product, which accessory)
- ▶ How to choose the grease and calculate the lubrication intervals/amount
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- ▶ How to sell the device (comparison and references)



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- ① Multi-function interface for voltage supply and I/O communication
- ② Outlets of piston pumps P1 and P2



Figure 1
CONCEPT2...-24VDC
with multi-function interface

- automatic, pulse-controlled lubricator for:
 - grease (Arcanol range up to NLGI 2, other greases by agreement)
 - oil (oil viscosity > 68 cSt)
- two independently operating piston pumps:
 - metering quantity per lubrication cycle = 0,15 cm³
- programmable pause times per piston pump:
 - 25 minutes – 925 minutes (internal time control)
 - ≧ 1 minute (external time control via PLC)
- voltage supply options:
 - internal, 3-V lithium-metal battery, non-rechargeable (grease version only, no multi-function interface for I/O communication with PLC)
 - external, DC 24 V

- ① Minimum distances necessary for the mounting and dismounting of the cartridge and hose connectors

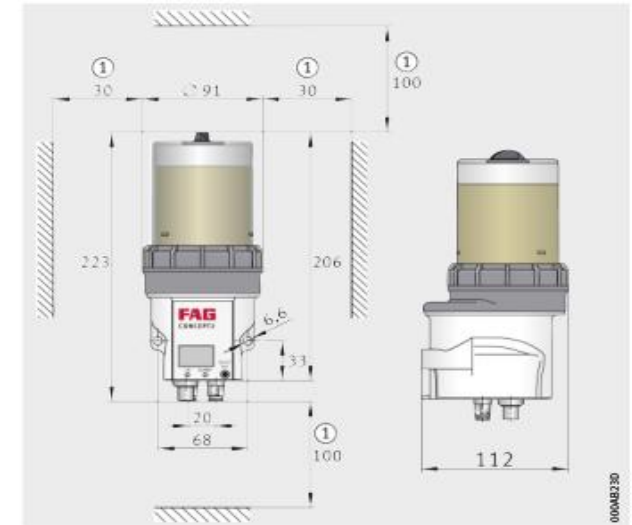


Figure 2
Dimensions and
minimum distances

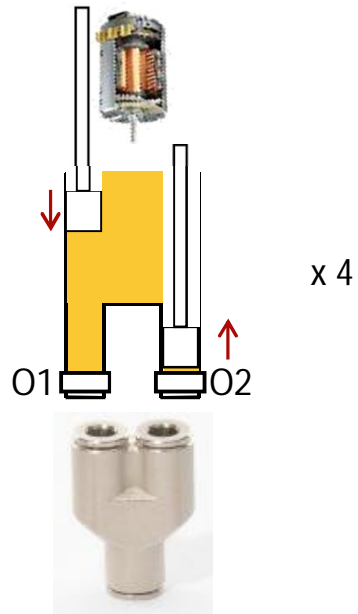
- delivery pressure at room temperature:
 - ≦ 30 bar (internal voltage supply)
 - ≦ 50 bar (external voltage supply)
- storage volume:
 - 250 cm³, grease cartridge replaceable
 - 300 cm³, oil container non-replaceable
- output of error messages via display, status LED and multi-function interface:
 - empty level display
 - back pressure too high
 - advance warning at 20% residual fill level (only via multi-function interface)
 - feedback function for completed lubrication cycle (only via multi-function interface).

FAG CONCEPT8 & CONCEPT2 Piston pump principle

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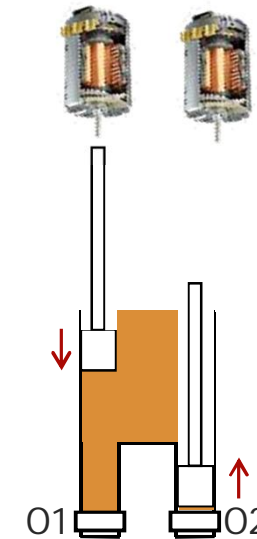
CONCEPT8

► Up to eight outlets from four individual pump units that can be controlled separately



CONCEPT2

► Up to two outlets that can be controlled separately



Independent outlets!
Each piston has its own electric motor

(not in operation at the same time)



FAG CONCEPT2 Product features

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Sufficient lubrication is decisive when it comes to achieving a long operating life for rolling bearings.

This is precisely where the **FAG CONCEPT2** comes in.

This lubricator **can precisely supply** a wide range of industrial machines **with the correct quantity of grease**.

Product characteristics:

- Up to two outlets with independently adjustable lubrication intervals
- Power supply: Battery / 24 V DC
- Lubricating media: Oil and grease up to NLGI 2
- Lubricant reservoir: 250 cm³ cartridge
- Delivery pressure: Up to 50 bar (24 V DC) / 30 bar (battery operation)
- Operating temperature: -20 °C to +70 °C
- Piston pump principle





Voltage supply

TPI
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Grease cartridges



Device holders



Fittings, Y pieces, check valves



Hoses, hose cutters

Ideal for applications with two lubrication points

- Ideal for original equipment and retrofitting
- Electric motors
- Fans
- Compressors



- Supply of up to two lubrication points
 - Only one lubricating device is needed instead of two single point lubricators
- Different lubrication intervals can be set for each outlet
 - Two bearings with different lubrication requirements can be supplied
- Can easily be integrated into machine operation
 - Relubrication intervals dependent on the number of operating hours



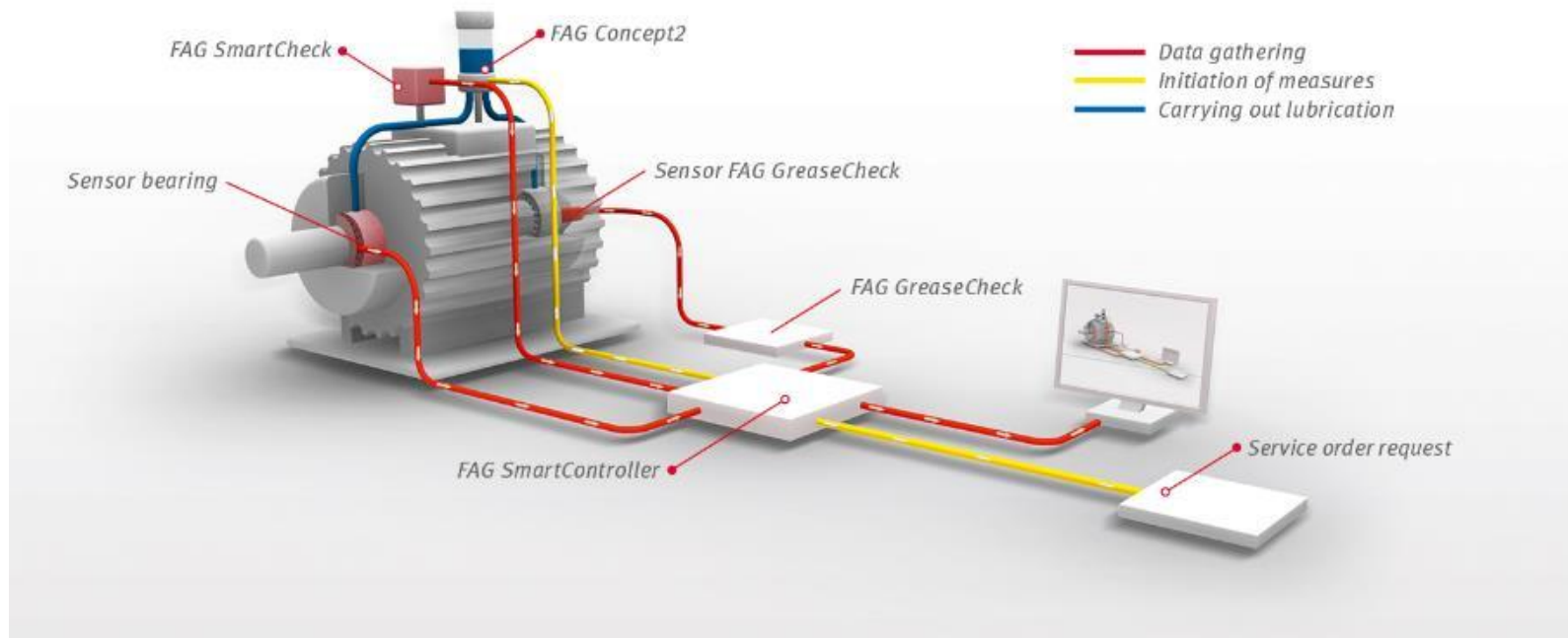
FAG CONCEPT2 Customer benefits

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- Reduction in ongoing maintenance costs
 - The maintenance process is simplified
- Low purchase cost
 - Good price/performance ratio
- Easy to put into operation
 - Virtually self-explanatory system



The intelligent interconnection of FAG products like the **FAG CONCEPT2**, **FAG SmartController**, and **FAG SmartCheck** allows autonomous machine monitoring to be achieved.



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The Concept 8 consists of 5 major components:

- ① Concept 8 base unit (available in 2 and 4 pump Models)
- ② Arcanol Lubricant Cartridge
- ③ Power Cable
- ④ Grease Line
- ⑤ Fittings and Adapters

Each component needs to be ordered to create a full unit. The base C8 unit will not include cartridge, cable, grease line or fittings.

The base unit is available in two styles:

- ▶ The **Standard** model
- ▶ The **Oil capable** model

Build a complete kit

Step 1: Select your C8 model

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Standard

- ▶ The Standard model
- ▶ Suitable for all grease applications
- ▶ Tubing needed: PA66 - 8 x 5 mm
- ▶ PA12 - 6 x 4 mm tubing can be used with ARCALUB-X.CONNECT-8-6

SAP-Nr	designation	outlets	pumping elements
082249156-0000-10	ARCALUB-C8-2P	4	P1, P2
082266646-0000-10	ARCALUB-C8-4P	8	P1, P2, P3, P4



Oil capable

- ▶ Designed for customer to fill with oil
- ▶ *No cartridge required (skip step 2)*
- ▶ Tubing needed: PA12-CLEAR - 6 x 3 mm

SAP-Nr	designation	outlets	pumping elements
083786910-0000-10	ARCALUB-C8-2P-OIL	4	P1, P2
083787062-0000-10	ARCALUB-C8-4P-OIL	8	P1, P2, P3, P4

Build a complete kit
Step 2: Select your lubricant

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FAG CONCEPT8 operates on Schaeffler's ARCANOL range of lubricants. This range includes 17 different greases, each one developed by Schaeffler application engineers and produced by leading international lubricant manufacturers. These greases therefore provide specific lubrication properties for almost every type of industrial application.

SAP-Nr.	designation	grease type
	MULTI PURPOSE GREASES	
082631492-0000-10	ARCALUB-C8.LC800-MULTITOP	Arcanol MULTITOP
083532412-0000-10	ARCALUB-C8.LC800-MULTI2	Arcanol MULTI2
083548289-0000-10	ARCALUB-C8.LC800-MULTI3	Arcanol MULTI3
	HEAVY LOAD GREASES	
083532439-0000-10	ARCALUB-C8.LC800-LOAD150	Arcanol LOAD150
083533583-0000-10	ARCALUB-C8.LC800-LOAD220	Arcanol LOAD220
083533761-0000-10	ARCALUB-C8.LC800-LOAD400	Arcanol LOAD400
083533818-0000-10	ARCALUB-C8.LC800-LOAD460	Arcanol LOAD460
083548343-0000-10	ARCALUB-C8.LC800-LOAD1000	Arcanol LOAD1000
	HIGH TEMPERATURE GREASES	
083533630-0000-10	ARCALUB-C8.LC800-TEMP90	Arcanol TEMP90
083548580-0000-10	ARCALUB-C8.LC800-TEMP110	Arcanol TEMP110
083548599-0000-10	ARCALUB-C8.LC800-TEMP120	Arcanol TEMP120
083548602-0000-10	ARCALUB-C8.LC800-TEMP200	Arcanol TEMP200
	SPECIAL PURPOSE GREASES	
083548629-0000-10	ARCALUB-C8.LC800-SPEED2,6	Arcanol SPEED2,6
083549099-0000-10	ARCALUB-C8.LC800-VIB3	Arcanol VIB3
089922832-0000-10	ARCALUB-C8.LC800-MOTION2	Arcanol MOTION2
083549064-0000-10	ARCALUB-C8.LC800-FOOD2	Arcanol FOOD2
083549129-0000-10	ARCALUB-C8.LC800-CLEAN-M	Arcanol CLEAN-M

Build a complete kit
Step 3: Select Power Cable

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Right Angle or Straight
connector at
5 or 10 meter length

Connection cable

SAP-Nr.	designation	connector type	cable lenght
075592240-0000-10	ARCALUB-X.CABLE-M12-5M-LED	M12x1, angulate 90° with LED index	5 meter
077879805-0000-10	ARCALUB-X.CABLE-M12-10M-LED	M12x1, angulate 90° with LED index	10 meter
083788964-0000-10	ARCALUB-X.CABLE-M12-5M-LED-S	M12x1, straight with LED index	5 meter
083788980-0000-10	ARCALUB-X.CABLE-M12-10M-LED-S	M12x1, straight with LED index	10 meter
Power supply 24 VDC (optional)			
083872507-0000-10	ARCALUB-X.POWER-SUPPLY-UNIT	Power supply 230 VAC / 24 VDC	

Calculation of lubrication line length for grease lubrication

TPI
PAGE 8

In design of the lubrication system, the maximum lubrication line length must be observed.

The maximum lubrication line length L_{max} is dependent in the case of grease lubrication on:

- the delivery pressure of the lubricator
- the grease temperature
- the grease
- the inside diameter of the lubrication line
- the pause times between the pump strokes.

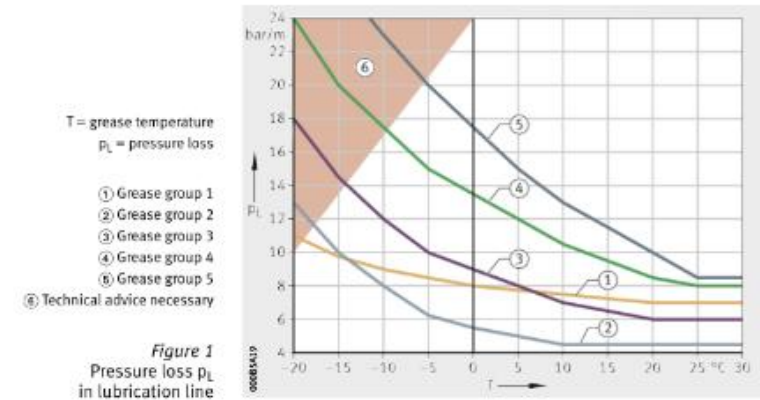
L_{max} is calculated as follows:

$$L_{max} = \frac{p_{max}}{p_L} \cdot K_S \cdot K_P$$

- L_{max} m
Maximum lubrication line length
- p_{max} bar
Delivery pressure of lubricator, see table
- p_L bar/m
Pressure loss in lubrication line, *Figure 1*, page 9
- K_S -
Correction factor for inside diameter of lubrication line, see table, page 10
- K_P -
Correction factor for pause time between pump strokes, see table, page 10.

Delivery pressure p_{max}

Lubricator	p_{max} bar
CONCEPT2 (battery)	30
CONCEPT2 (DC 24 V)	50
CONCEPT8 (DC 24 V)	70



Grease groups of Arcanol greases

Grease group	Grease
1	Arcanol FOOD2
	Arcanol MOION2
	Arcanol SPEED2,6
2	Arcanol LOAD460
	Arcanol TEMP120
3	Arcanol LOAD150
	Arcanol LOAD220
	Arcanol LOAD400
	Arcanol MULTI2
	Arcanol MULTIFOP
	Arcanol TEMP110
	Arcanol TEMP200
4	Arcanol CLEAN-M
	Arcanol LOAD1000
	Arcanol MULTI3
	Arcanol TEMP90
5	Arcanol VIB3

The allocation of the grease Arcanol Bio2 to the grease groups was not yet complete at the time of publication. If necessary, please contact Schaeffler.

Correction factor K_S

Inside diameter of lubrication line mm	K_S
5	1
4	0,65

Correction factor K_p

Pause time between 2 pump strokes h	K_p
≥ 3	1
< 3	0,65



The procedure described here for calculating the maximum lubrication line length is only valid for a simple lubrication line without additional components such as splitters, progressive distributors or angled hose connectors.

Lubrication line length for oil lubrication

In oil lubrication, the maximum lubrication line length L_{max} is:
 $L_{max} = 100 \text{ m}$

Design example

Initial data:

- lubricator CONCEPT8 (DC 24 V)
- grease temperature = +20 °C
- Arcanol MULTITOP
- inside diameter of hose = 5 mm
- pause time between 2 pump strokes = 5 h.

Calculation of the maximum lubrication line length L_{max} :

- delivery pressure $p_{max} = 70 \text{ bar}$
- pressure loss $p_L = 6 \text{ bar/m}$
- correction factor $K_S = 1$
- correction factor $K_p = 1$
- maximum lubrication line length $L_{max} \approx 11,6 \text{ m}$.

Double Check together

Build a complete kit
Step 4: Select tube

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Black
 8 x 5mm
 or
 6 x 4 mm



Transparent
 6 x 3 mm

Grease – Standard:

SAP-Nr.	designation	type
083788573-0000-10	ARCALUB-X.HOSE-PA66-5M	hose PA66, unfilled, black 8x5 mm (OD x ID), length 5 m
083788581-0000-10	ARCALUB-X.HOSE-PA66-10M	hose PA66, unfilled, black 8x5 mm (OD x ID), length 10 m
083788603-0000-10	ARCALUB-X.HOSE-PA66-50M	hose PA66, unfilled, black 8x5 mm (OD x ID), length 50 m,

Grease – Linear applications:

SAP-Nr.	designation	type
076691217-0000-10	ARCALUB-X.HOSE-PA12-5M	hose PA12, unfilled, black 6x4 mm (OD x ID), length 5 m
076691497-0000-10	ARCALUB-X.HOSE-PA12-10M	hose PA12, unfilled, black 6x4 mm (OD x ID), length 10 m
085842109-0000-10	ARCALUB-X.HOSE-PA12-50M	hose PA12, unfilled, black 6x4 mm (OD x ID), length 50 m

Oil:

SAP-Nr.	designation	type
075526336-0000-10	ARCALUB-X.HOSE-PA12-CLEAR-5M	hose PA12, unfilled, transparent 6x3 mm (OD x ID), length 5 m
083788441-0000-10	ARCALUB-X.HOSE-PA12-CLEAR-10M	hose PA12, unfilled, transparent 6x3 mm (OD x ID), length 10 m

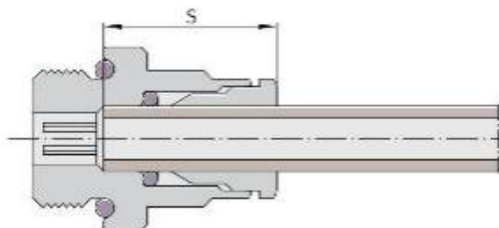
Build a complete kit

Step 5: Select your tube connectors (8mm OD) only for *Standard*

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Standard



Standard dimensions: (Code G=straight; W=angulate, rotatable)

SAP-Nr.	designation	thread, type
083654216-0000-10	ARCALUB-X.TUBEFIT-M8X1-SAT088G	M8x1, straight
083654275-0000-10	ARCALUB-X.TUBEFIT-M8X1-SAT088W	M8x1, angulate, rotatable
083654356-0000-10	ARCALUB-X.TUBEFIT-M10X1-SAT108G	M10x1, straight
083654402-0000-10	ARCALUB-X.TUBEFIT-M10X1-SAT108W	M10x1, angulate, rotatable
083654534-0000-10	ARCALUB-X.TUBEFIT-G1/8-SAT188G	G1/8", straight
083654577-0000-10	ARCALUB-X.TUBEFIT-G1/8-SAT188W	G1/8", angulate, rotatable
083654607-0000-10	ARCALUB-X.TUBEFIT-G1/4-SAT148G	G1/4", straight
083654623-0000-10	ARCALUB-X.TUBEFIT-G1/4-SAT148W	G1/4", angulate, rotatable

If it is necessary to connect both outlets of one pump to one inlet, it is recommended to use a Y-connector. Please do not use a T-connector!

SAP-Nr.	designation	thread, type
083654640-0000-10	ARCALUB-X.TUBEFIT-Y-D8	Y-connector, 3 x 8mm

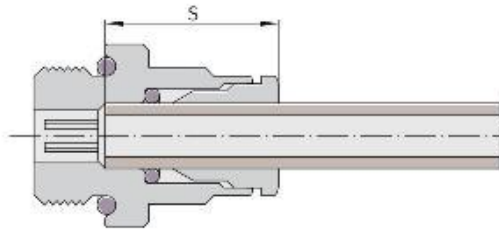
If it is necessary to extend the length of the hoses or to reduce the diameter, please use specific connectors.

SAP-Nr.	designation	thread, type
083867309-0000-10	ARCALUB-X.CONNECT-8-8	OD 8mm to OD 8mm
083867279-0000-10	ARCALUB-X.CONNECT-8-6	OD 8mm to OD 6mm

Build a complete kit
Step 5: Select your tube connectors (6 mm OD)



Standard



Standard dimensions: (Code G=straight; W=angulate, rotatable)

SAP-Nr.	designation	thread, type
077937490-0000-10	ARCALUB-X.TUBEFIT-M5-SAT056G	M5, straight
079567401-0000-10	ARCALUB-X.TUBEFIT-M5-SAT056W	M5, angulate, rotatable
075527472-0000-10	ARCALUB-X.TUBEFIT-M6-SAT066G	M6, straight
075676621-0000-10	ARCALUB-X.TUBEFIT-M6-SAT066W	M6, angulate, rotatable
079567428-0000-10	ARCALUB-X.TUBEFIT-M8X1-SAT086G	M8x1, straight
079567584-0000-10	ARCALUB-X.TUBEFIT-M8X1-SAT086W	M8x1, angulate, rotatable
075527626-0000-10	ARCALUB-X.TUBEFIT-M10X1-SAT106G	M10x1, straight
076968553-0000-10	ARCALUB-X.TUBEFIT-M10X1-SAT106W	M10x1, angulate, rotatable
084465905-0000-10	ARCALUB-X.TUBEFIT-G1/8-SAT186G	G1/8", straight
084465964-0000-10	ARCALUB-X.TUBEFIT-G1/8-SAT186W	G1/8", angulate, rotatable
079567606-0000-10	ARCALUB-X.TUBEFIT-G1/4-SAT146G	G1/4", straight
079567622-0000-10	ARCALUB-X.TUBEFIT-G1/4-SAT146W	G1/4", angulate, rotatable

If it is necessary to connect both outlets of one pump to one inlet, it is recommended to use a Y-connector. Please do not use a T-connector!

SAP-Nr.	designation	thread, type
076693180-0000-10	ARCALUB-X.TUBEFIT-Y-D6	Y-connector, 3 x 6mm

If it is necessary to extend the length of the hoses, please use specific connectors.

SAP-Nr.	designation	thread, type
083867112-0000-10	ARCALUB-X.CONNECT-6-6	OD 6mm to OD 6mm

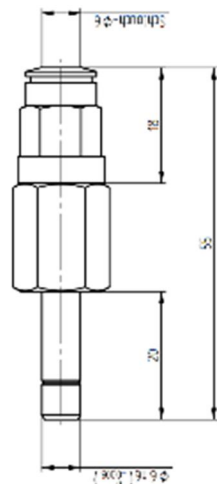
Build a complete kit

Step 5: Select your tube connectors (6 mm OD) only for *Oil*

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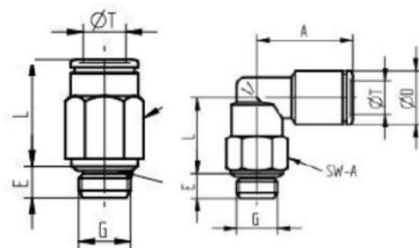


Oil capable



For C8-OIL version it is always needed to use a check valve to avoid empty hoses.

Check valve has 6mm hoses piece which should be inserted in any kind of 6mm connector.



SAP-Nr.	designation	thread, type
092927122-0000-10	ARCALUB-X.OIL-VALVE-SAT106G	back pressure valve, for 6mm connector

Standard dimensions: (Code G=straight; W=angulate, rotatable)

SAP-Nr.	designation	thread, type
077937490-0000-10	ARCALUB-X.TUBEFIT-M5-SAT056G	M5, straight
079567401-0000-10	ARCALUB-X.TUBEFIT-M5-SAT056W	M5, angulate, rotatable
075527472-0000-10	ARCALUB-X.TUBEFIT-M6-SAT066G	M6, straight
075676621-0000-10	ARCALUB-X.TUBEFIT-M6-SAT066W	M6, angulate, rotatable
079567428-0000-10	ARCALUB-X.TUBEFIT-M8X1-SAT086G	M8x1, straight
079567584-0000-10	ARCALUB-X.TUBEFIT-M8X1-SAT086W	M8x1, angulate, rotatable
075527626-0000-10	ARCALUB-X.TUBEFIT-M10X1-SAT106G	M10x1, straight
076968553-0000-10	ARCALUB-X.TUBEFIT-M10X1-SAT106W	M10x1, angulate, rotatable
084465905-0000-10	ARCALUB-X.TUBEFIT-G1/8-SAT186G	G1/8", straight
084465964-0000-10	ARCALUB-X.TUBEFIT-G1/8-SAT186W	G1/8", angulate, rotatable
079567606-0000-10	ARCALUB-X.TUBEFIT-G1/4-SAT146G	G1/4", straight
079567622-0000-10	ARCALUB-X.TUBEFIT-G1/4-SAT146W	G1/4", angulate, rotatable

Build a complete kit

Step 6: Filling lines

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Note:

For initial operation, following additional parts should be available:

- Screws 2x M8x80 (or longer) with internal hexagon and corresponding screw nuts or thread cutter for mechanical mounting of CONCEPT8
- Liquid screw locking for fixation of the screws
- Hose fixing parts for fixing the hose on the machine
- Hose cut tool, for rectangular and burr-free cutting of the hoses *
- Grease gun for prefilling the hoses **
- Grease cartridges for use with the grease gun (same grease as in the CONCEPT8 cartridge) ***
- Hose connector for connecting the grease gun with the hoses ****

SAP-Nr.	designation	Product description
083788620-0000-10	ARCALUB-X.HOSE-CUTTOOL	hose cut tool *
039064115-0000-10	ARCA-GREASE-GUN	grease gun **
083654607-0000-10	ARCALUB-X.TUBEFIT-G1/4-SAT148G	G1/4", straight

SAP-Nr.	designation	Product description
080266258-0000-10	ARCANOL-MOTION2-400G	400g cartridge with FAG Arcanol grease MOTION2
069429111-0000-10	ARCANOL-CLEAN-M-400G	400g cartridge with FAG Arcanol grease CLEAN-M
019143648-0000-10	ARCANOL-FOOD2-400G	400g cartridge with FAG Arcanol grease FOOD2
055358152-0000-10	ARCANOL-LOAD150-400G	400g cartridge with FAG Arcanol grease LOAD150
064741028-0000-10	ARCANOL-LOAD220-400G	400g cartridge with FAG Arcanol grease LOAD220
019143818-0000-11	ARCANOL-LOAD400-400G	400g cartridge with FAG Arcanol grease LOAD400
065825144-0000-10	ARCANOL-LOAD460-400G	400g cartridge with FAG Arcanol grease LOAD460
019003463-0000-10	ARCANOL-LOAD1000-5KG	5kg bucket with FAG Arcanol grease LOAD1000
019143893-0000-11	ARCANOL-MULTI2-400G	400g cartridge with FAG Arcanol grease MULTI2
016727355-0000-11	ARCANOL-MULTI3-400G	400g cartridge with FAG Arcanol grease MULTI3
019144016-0000-11	ARCANOL-MULTITOP-400G	400g cartridge with FAG Arcanol grease MULTITOP
062447610-0000-10	ARCANOL-SPEED2,6-400G	400g cartridge with FAG Arcanol grease SPEED2,6
019144075-0000-10	ARCANOL-TEMP110-400G	400g cartridge with FAG Arcanol grease TEMP110
038652200-0000-10	ARCANOL-TEMP120-1KG	1kg can with FAG Arcanol grease TEMP120
019144121-0000-10	ARCANOL-TEMP200-1KG	1kg can with FAG Arcanol grease TEMP200
019144172-0000-10	ARCANOL-TEMP90-400G	400g cartridge with FAG Arcanol grease TEMP90
055289568-0000-10	ARCANOL-VIB3-400G	400g cartridge with FAG Arcanol grease VIB3





The **CONCEPT2** consists of 5 major components:

- ① Concept2 base unit
- ② Arcanol Lubricant Cartridge
- ③ Power Cable (24VDC Version) or Battery (Battery Version)
- ④ Grease Line
- ⑤ Fittings and Adapters

Each component needs to be ordered to create a full unit. The base C2 unit will not include cartridge, cable, grease line or fittings.

The base unit is available 2 versions:

- ▶ 24 VDC Version
- ▶ Battery Version
- ▶ OIL Version

Build a complete kit
Step 1: Select your C2 model



① CONCEPT2 24 VDC Version

SAP-Nr.	Bezeichnung	Beschreibung
086873105-0000-10	ARCALUB-C2-2P-24VDC	CONCEPT2 with 2 outlets



① CONCEPT2 Batterie Version

SAP-part-no.	SAP-designation	Product description
086872931-0000-10	ARCALUB-C2-2P	CONCEPT2 with 2 outlets



① CONCEPT2 24 VDC Version

SAP-Nr.	Bezeichnung	Beschreibung
092246265-0000-10	ARCALUB-C2-2P-OIL	CONCEPT2 Oil with 2 outlets

Build a complete kit
Step 2: Select your lubricant

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FAG CONCEPT2 operates on Schaeffler's ARCANOL range of lubricants. This range includes 16 different greases, each one developed by Schaeffler application engineers and produced by leading international lubricant manufacturers. These greases therefore provide specific lubrication properties for almost every type of industrial application.

SAP-Nr.	designation	grease type
	MULTI PURPOSE GREASES	
087328810-0000-10	ARCALUB-C2.LC250-MULTITOP	Arcanol MULTITOP
087328038-0000-10	ARCALUB-C2.LC250-MULTI2	Arcanol MULTI2
	HEAVY LOAD GREASES	
087329077-0000-10	ARCALUB-C2.LC250-LOAD150	Arcanol LOAD150
087329115-0000-10	ARCALUB-C2.LC250-LOAD220	Arcanol LOAD220
087329131-0000-10	ARCALUB-C2.LC250-LOAD400	Arcanol LOAD400
087329140-0000-10	ARCALUB-C2.LC250-LOAD460	Arcanol LOAD460
087329280-0000-10	ARCALUB-C2.LC250-LOAD1000	Arcanol LOAD1000
	HIGH TEMPERATURE GREASES	
087329816-0000-10	ARCALUB-C2.LC250-TEMP90	Arcanol TEMP90
087329840-0000-10	ARCALUB-C2.LC250-TEMP110	Arcanol TEMP110
087329980-0000-10	ARCALUB-C2.LC250-TEMP120	Arcanol TEMP120
087329999-0000-10	ARCALUB-C2.LC250-TEMP200	Arcanol TEMP200
	SPECIAL PURPOSE GREASES	
087334046-0000-10	ARCALUB-C2.LC250-SPEED2,6	Arcanol SPEED2,6
087334216-0000-10	ARCALUB-C2.LC250-MOTION2	Arcanol MOTION2
087334020-0000-10	ARCALUB-C2.LC250-FOOD2	Arcanol FOOD2
087334194-0000-10	ARCALUB-C2.LC250-CLEAN-M	Arcanol CLEAN-M

Build a complete kit

Step 3: Select your power supply

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if you selected CONCEPT2 24 VDC Version

③ Power Cable



Connection cable

SAP-Nr.	designation	connector type	cable length
075592240-0000-10	ARCALUB-X.CABLE-M12-5M-LED	M12x1, angulate 90° with LED index	5 meter
077879805-0000-10	ARCALUB-X.CABLE-M12-10M-LED	M12x1, angulate 90° with LED index	10 meter
083788964-0000-10	ARCALUB-X.CABLE-M12-5M-LED-S	M12x1, straight with LED index	5 meter
083788980-0000-10	ARCALUB-X.CABLE-M12-10M-LED-S	M12x1, straight with LED index	10 meter

Power supply 24 VDC (optional)

083872507-0000-10	ARCALUB-X.POWER-SUPPLY-UNIT	Power supply 230 VAC / 24 VDC	
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Anglulated or Straight connector
at 5 or 10 meter length

if you selected CONCEPT2 Battery Version

③ Battery



Battery pack

SAP-Nr.	designation	number
087314762-0000-10	ARCALUB-C2.BATTERY	1 piece

Calculation of lubrication line length for grease lubrication

In design of the lubrication system, the maximum lubrication line length must be observed.

The maximum lubrication line length L_{max} is dependent in the case of grease lubrication on:

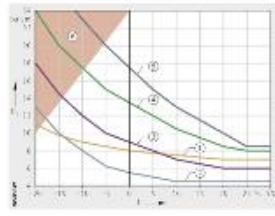
- ① the delivery pressure of the lubricator
- ② the grease temperature
- ③ the grease
- ④ the inside diameter of the lubrication line
- ⑤ the pause times between the pump strokes.

L_{max} to G2:



- ①
- ②
- ③
- ④
- ⑤

T = 25°C
 P = 1000 kPa
 Grease group: 2
 Grease temperature: 25°C
 Grease group: 2
 Grease temperature: 25°C
 Grease group: 2
 Grease temperature: 25°C



Grease groups of Atlas Copco greases

Grease group	Grease
1	Grease Plus 1
	Grease Multi 1
	Grease Super 1
2	Grease Multi 2
	Grease Plus 2
	Grease Super 2
3	Grease Multi 3
	Grease Plus 3
	Grease Super 3
4	Grease Multi 4
	Grease Plus 4
	Grease Super 4
5	Grease Multi 5
	Grease Plus 5
	Grease Super 5

Correction factor K_S	Inside diameter of lubrication line (mm)	K_S
	3	1
	4	0,85

Correction factor K_P	Pause time between 2 pump strokes (h)	K_P
	<= 2	1
	> 2	0,65

! The procedure described here for calculating the maximum lubrication line length is only valid for a simple lubrication line without additional components such as splitters, progressive distributors or angled hose connectors.

Exercise:

E-Motor: (2 Bearing positions DGBB) no power connection possible

Grease temperature: +25°C

Temperature in application: +80 °C

Grease: Standard E-Motor application

Tube diameter: Standard Grease diameter (???)

Pause time: 10hrs

What is the L_{max} for this application???

Build a complete kit
Step 4: Select tube

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Grease – 24 VDC or Battery:

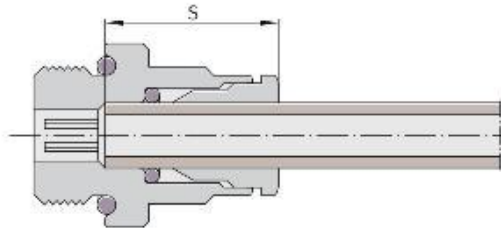
SAP-Nr.	designation	type
076691217-0000-10	ARCALUB-X.HOSE-PA12-5M	hose PA12, unfilled, black 6x4 mm (OD x ID), length 5 m
076691497-0000-10	ARCALUB-X.HOSE-PA12-10M	hose PA12, unfilled, black 6x4 mm (OD x ID), length 10 m
085842109-0000-10	ARCALUB-X.HOSE-PA12-50M	hose PA12, unfilled, black 6x4 mm (OD x ID), length 50 m

Oil:

SAP-Nr.	designation	type
075526336-0000-10	ARCALUB-X.HOSE-PA12-CLEAR-5M	hose PA12, unfilled, transparent 6x3 mm (OD x ID), length 5 m
083788441-0000-10	ARCALUB-X.HOSE-PA12-CLEAR-10M	hose PA12, unfilled, transparent 6x3 mm (OD x ID), length 10 m

Build a complete kit
Step 5: Select your tube connectors

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Standard dimensions: (Code G=straight; W=angulate, rotatable)

SAP-Nr.	designation	thread, type
077937490-0000-10	ARCALUB-X.TUBEFIT-M5-SAT056G	M5, straight
079567401-0000-10	ARCALUB-X.TUBEFIT-M5-SAT056W	M5, angulate, rotatable
075527472-0000-10	ARCALUB-X.TUBEFIT-M6-SAT066G	M6, straight
075676621-0000-10	ARCALUB-X.TUBEFIT-M6-SAT066W	M6, angulate, rotatable
079567428-0000-10	ARCALUB-X.TUBEFIT-M8X1-SAT086G	M8x1, straight
079567584-0000-10	ARCALUB-X.TUBEFIT-M8X1-SAT086W	M8x1, angulate, rotatable
075527626-0000-10	ARCALUB-X.TUBEFIT-M10X1-SAT106G	M10x1, straight
076968553-0000-10	ARCALUB-X.TUBEFIT-M10X1-SAT106W	M10x1, angulate, rotatable
084465905-0000-10	ARCALUB-X.TUBEFIT-G1/8-SAT186G	G1/8", straight
084465964-0000-10	ARCALUB-X.TUBEFIT-G1/8-SAT186W	G1/8", angulate, rotatable
079567606-0000-10	ARCALUB-X.TUBEFIT-G1/4-SAT146G	G1/4", straight
079567622-0000-10	ARCALUB-X.TUBEFIT-G1/4-SAT146W	G1/4", angulate, rotatable

If it is necessary to extend the length of the hoses, please use specific connectors.

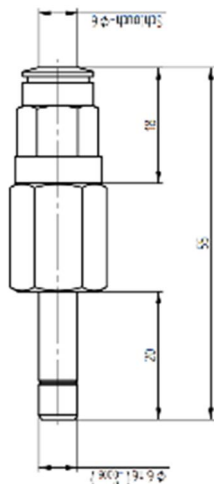
SAP-Nr.	designation	thread, type
083867112-0000-10	ARCALUB-X.CONNECT-6-6	OD 6mm to OD 6mm



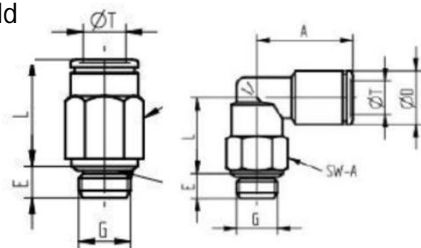
Build a complete kit

Step 5: Select your tube connectors (6 mm OD) only for *Oil*

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For C8-OIL version it is always needed to use a check valve to avoid empty hoses. Check valve has 6mm hoses piece which should be inserted in any kind of 6mm connector.



SAP-Nr.	designation	thread, type
092927122-0000-10	ARCALUB-X.OIL-VALVE-SAT106G	back pressure valve, for 6mm connector

Standard dimensions: (Code G=straight; W=angulate, rotatable)

SAP-Nr.	designation	thread, type
077937490-0000-10	ARCALUB-X.TUBEFIT-M5-SAT056G	M5, straight
079567401-0000-10	ARCALUB-X.TUBEFIT-M5-SAT056W	M5, angulate, rotatable
075527472-0000-10	ARCALUB-X.TUBEFIT-M6-SAT066G	M6, straight
075676621-0000-10	ARCALUB-X.TUBEFIT-M6-SAT066W	M6, angulate, rotatable
079567428-0000-10	ARCALUB-X.TUBEFIT-M8X1-SAT086G	M8x1, straight
079567584-0000-10	ARCALUB-X.TUBEFIT-M8X1-SAT086W	M8x1, angulate, rotatable
075527626-0000-10	ARCALUB-X.TUBEFIT-M10X1-SAT106G	M10x1, straight
076968553-0000-10	ARCALUB-X.TUBEFIT-M10X1-SAT106W	M10x1, angulate, rotatable
084465905-0000-10	ARCALUB-X.TUBEFIT-G1/8-SAT186G	G1/8", straight
084465964-0000-10	ARCALUB-X.TUBEFIT-G1/8-SAT186W	G1/8", angulate, rotatable
079567606-0000-10	ARCALUB-X.TUBEFIT-G1/4-SAT146G	G1/4", straight
079567622-0000-10	ARCALUB-X.TUBEFIT-G1/4-SAT146W	G1/4", angulate, rotatable

Build a complete kit

Step 6: Filling lines

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Note:

For initial operation, following additional parts should be available:

- Screws 2x M8x80 (or longer) with internal hexagon and corresponding screw nuts or thread cutter for mechanical mounting of CONCEPT8
- Liquid screw locking for fixation of the screws
- Hose fixing parts for fixing the hose on the machine
- Hose cut tool, for rectangular and burr-free cutting of the hoses *
- Grease gun for prefilling the hoses **
- Grease cartridges for use with the grease gun (same grease as in the CONCEPT8 cartridge) ***
- Hose connector for connecting the grease gun with the hoses ****

SAP-Nr.	designation	Product description
083788620-0000-10	ARCALUB-X.HOSE-CUTTOOL	hose cut tool *
039064115-0000-10	ARCA-GREASE-GUN	grease gun **
083654607-0000-10	ARCALUB-X.TUBEFIT-G1/4-SAT148G	G1/4", straight

SAP-Nr.	designation	Product description
080266258-0000-10	ARCANOL-MOTION2-400G	400g cartridge with FAG Arcanol grease MOTION2
069429111-0000-10	ARCANOL-CLEAN-M-400G	400g cartridge with FAG Arcanol grease CLEAN-M
019143648-0000-10	ARCANOL-FOOD2-400G	400g cartridge with FAG Arcanol grease FOOD2
055358152-0000-10	ARCANOL-LOAD150-400G	400g cartridge with FAG Arcanol grease LOAD150
064741028-0000-10	ARCANOL-LOAD220-400G	400g cartridge with FAG Arcanol grease LOAD220
019143818-0000-11	ARCANOL-LOAD400-400G	400g cartridge with FAG Arcanol grease LOAD400
065825144-0000-10	ARCANOL-LOAD460-400G	400g cartridge with FAG Arcanol grease LOAD460
019003463-0000-10	ARCANOL-LOAD1000-5KG	5kg bucket with FAG Arcanol grease LOAD1000
019143893-0000-11	ARCANOL-MULTI2-400G	400g cartridge with FAG Arcanol grease MULTI2
016727355-0000-11	ARCANOL-MULTI3-400G	400g cartridge with FAG Arcanol grease MULTI3
019144016-0000-11	ARCANOL-MULTITOP-400G	400g cartridge with FAG Arcanol grease MULTITOP
062447610-0000-10	ARCANOL-SPEED2,6-400G	400g cartridge with FAG Arcanol grease SPEED2,6
019144075-0000-10	ARCANOL-TEMP110-400G	400g cartridge with FAG Arcanol grease TEMP110
038652200-0000-10	ARCANOL-TEMP120-1KG	1kg can with FAG Arcanol grease TEMP120
019144121-0000-10	ARCANOL-TEMP200-1KG	1kg can with FAG Arcanol grease TEMP200
019144172-0000-10	ARCANOL-TEMP90-400G	400g cartridge with FAG Arcanol grease TEMP90
055289568-0000-10	ARCANOL-VIB3-400G	400g cartridge with FAG Arcanol grease VIB3



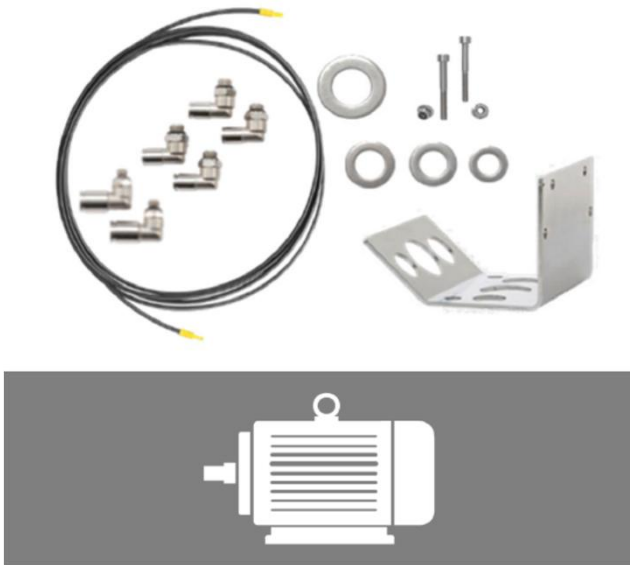
Easier Solution

CONCEPT2 E-Motor Kit

SCHAEFFLER

- ARCALUB-C2-2P oder ARCALUB-C2-2P-24VDC, depending on the Version
- Battery or Cable 10 m, depending on the Version
- Holder Kit
- 3 m Hoses 6 x 4 mm
- Connectors M8, angled 2 pieces.
- Connectors M10, angled 2 pieces.
- Connectors G1/8", angled 2 pieces.

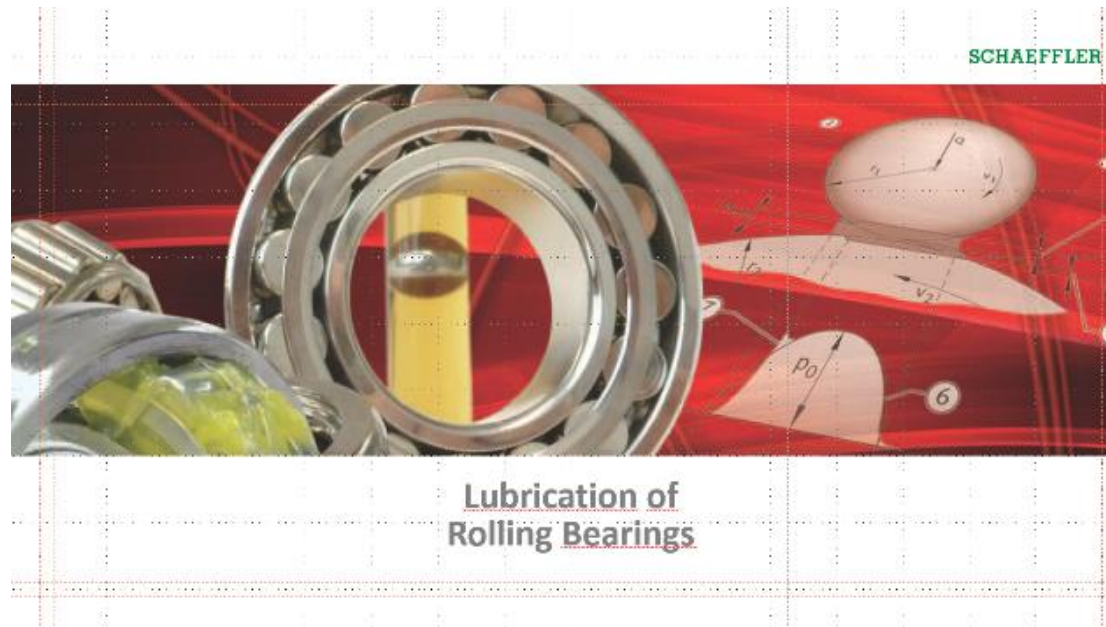
SAP-Nr.	Designation	Description
092662269-0000-10	ARCALUB-C2-2P-EKIT	Battery Version, 2 Outlets
086873105-0000-10	ARCALUB-C2-2P-24VDC-EKIT	24 VDC Version, with 2 Outlets



- ▶ Why Lubricators
- ▶ Concept 8 (Product and Accessories)
- ▶ Concept 2 (Product and Accessories → E-Motor-Kit)
- ▶ How to make the right configuration (which product, which accessory)
- ▶ How to choose the grease and calculate the lubrication intervals/amount
- ▶ How to set the device
- ▶ How to sell the device (comparison and references)



Do you remember the section of Lubrication???



Further exercise needed let's do it together with a application of you customer???

- ▶ Why Lubricators
- ▶ Concept 8 (Product and Accessories)
- ▶ Concept 2 (Product and Accessories → E-Motor-Kit)
- ▶ How to make the right configuration (which product, which accessory)
- ▶ How to choose the grease and calculate the lubrication intervals/amount
- ▶ How to set the device
- ▶ How to sell the device (comparison and references)



Example Setting C8 Concept8 how to set

Pre calculation and knowledge via Excel Sheets

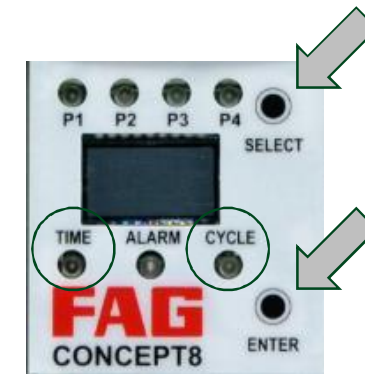
CORPORATE MATERIALS / LUBRICATION TECHNOLOGY		LUK	INA	FAG
Calculation Of Grease Service Life And Relubrication Interval				
Customer:	XYZ			
Bearing:	6313			
Bearing type:	Deep groove ball bearing single-row / Housing unit			
Grease selection:	TEMP90			
Bore diameter [mm]	65	: data input cells		
Outer diameter [mm]	140			
Bearing width [mm]	33			
Speed / Frequency [min-1]	1000			
Initial grease quantity [g]	23,8			
Oscillating angle φ (rotating=180°)	360			
Upper long time temperature [°C]	90			
Bearing Temperature [°C]	80			
Co / P	3			
Correction factors	Over-all correction: 0,17760		kf* n^* *dm= 102.500	
Oscillation K_{α}	1,00000	calculated		
High Temperature K_T	1,00000	calculated		
High load K_D	0,22200	calculated		
Environmental factor K_U	0,8	1: low	0,8: normal	0,5: high manuel input!
Vertical Shaft K_S	1	1: no	0,7 - 0,5 (depending on se; manuel input!)	
Guidance values !!	min	max		
Grease service life [h]	5.800	8.800		
Relubrication recommended [h] for functional reliability	2.900	4.400		
	50%	80%		
Relubrication quantity [g]	11,9	19,04		

Pump settings				
Relubrication interval [h]	2000	Rotating bearing	Discussed values are given whole per mil (Disc value for CONCEPT)	0.15 perf
Relubrication amount [g]	10	per	Discussed values are given whole per mil (Disc value for CONCEPT)	70 g
V connector	1.00	per		
Please choose a combination TIME / CYCLE with following criterias:				
Do not choose red marked combinations				
CYCLE values should be not rounded, if possible (e.g. 1.0, 2.0, 3.0, etc.)				
TIME values should be small for most applications (small lubrication intervals)				
Assumption: CONCEPT8 is linked with machine operation, that means that CONCEPT8 is off when machine is not in operation.				
Combination	TIME	CYCLE		
1	1	1,0		
2	2	2,0		
3	3	3,0		
4	4	4,0		
5	5	5,0		
6	6	6,0		
7	7	7,0		
8	8	8,0		
9	9	9,0		
10	10	10,0		
11	11	11,0		
12	12	12,0		
13	13	13,0		
14	14	14,0		
15	15	15,0		
16	16	16,0		
17	17	17,0		
18	18	18,0		
19	19	19,0		
20	20	20,0		
21	21	21,0		
22	22	22,0		
23	23	23,0		
24	24	24,0		
25	25	25,0		
26	26	26,0		
27	27	27,0		
28	28	28,0		
29	29	29,0		
30	30	30,0		
31	31	31,0		
32	32	32,0		
33	33	33,0		
34	34	34,0		

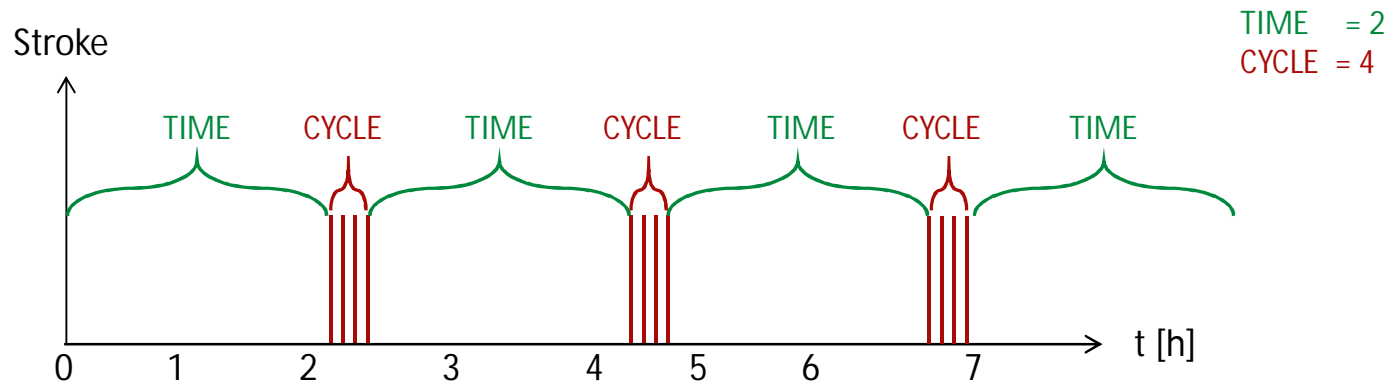
Legend:
 Red marked
 Usual value
 Number of CYCLE bigger than 90 or smaller than 1

Setting the re-lubrication quantity and interval of the unit. Each pump body can be programmed independently.

Key	Description	Value	Unit
TIME	Set the pause time for each pump body = time between lubrication operations in h	1 - 240	h
CYCLE	Set the delivery strokes for each pump body = number of delivery strokes per operation 1 delivery stroke = 0,15 cm ³	1 - 96	-



The pump body can be turned off by setting CYCLE = 0



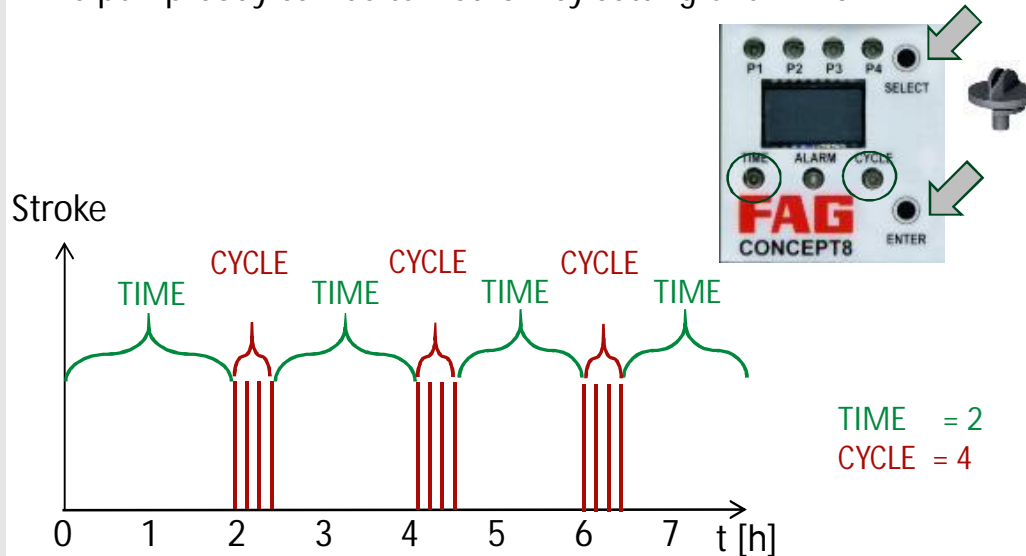
FAG CONCEPT8 & CONCPET2 Timing (internal microprocessor)

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Setting the re-lubrication quantity and interval of the unit. Each pump body can be programmed independently.

Key	Description	Value	Unit
TIME	Set the pause time for each pump body = time between lubrication operations in h	1 – 240	h
CYCLE	Set the delivery strokes for each pump body = number of delivery strokes per operation 1 delivery stroke = 0,15 cm ³	1 – 96	-

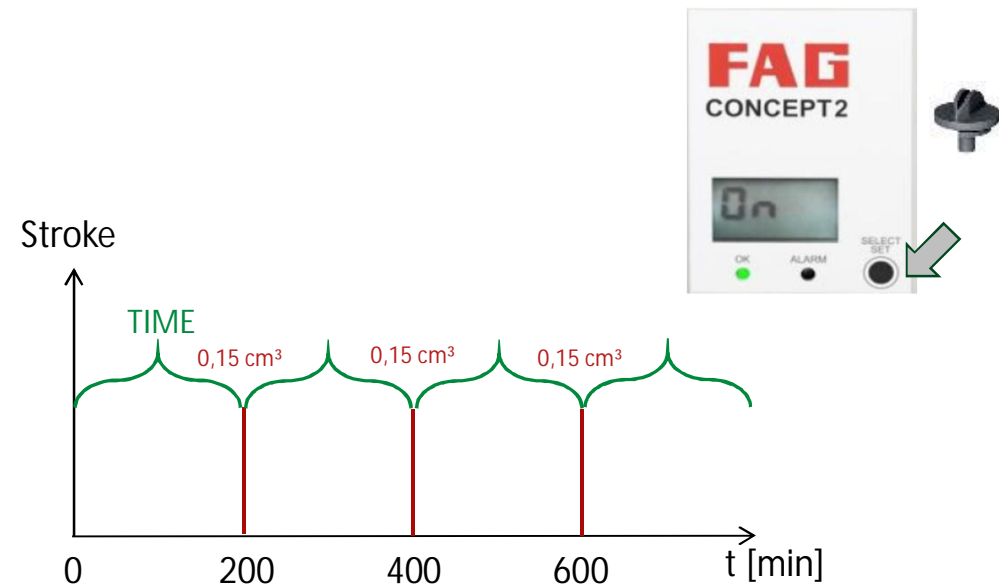
The pump body can be turned off by setting CYCLE = 0



Setting the re-lubrication interval of the unit. Each outlet can be programmed independently.

You can set the relubrication interval for each outlet from 25 – 925 Minutes.

→ 0,15 cm³ per relubrication interval



BA36
PAGE 27

Operation

Operating modes

The lubrication system FAG CONCEPT8 can run in two different operating modes, *Figure 15*:

- time control (time mode) by means of the integrated microcontroller (default setting), *Figure 16*
- pulse control by means of connection to an external controller, *Figure 17*, page 28.

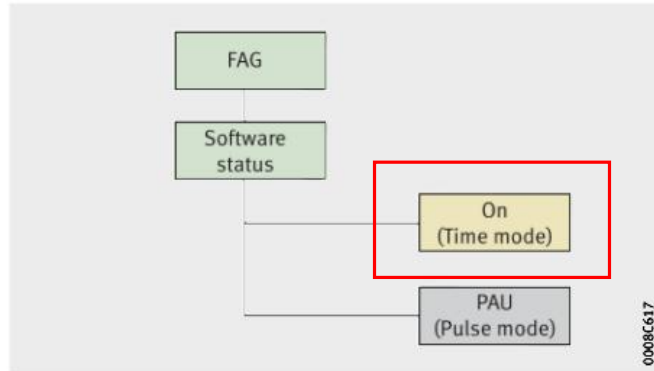


Figure 15
Operating modes of lubrication system FAG CONCEPT8

0008C617

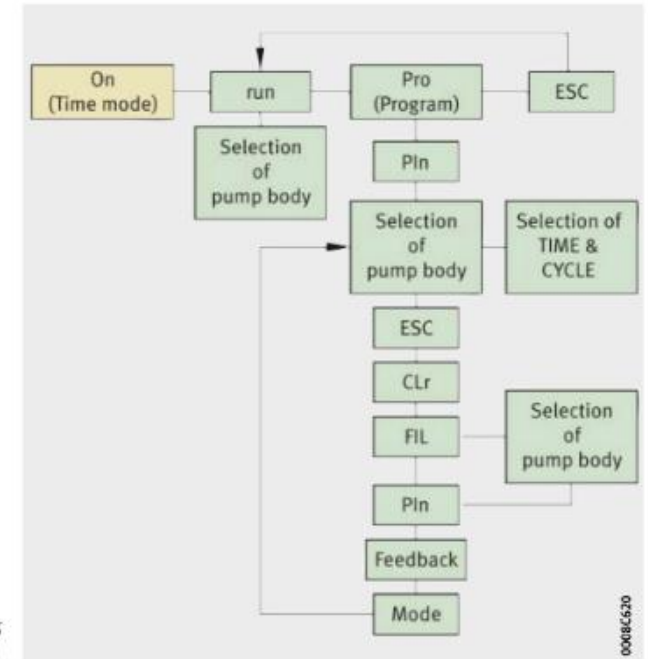
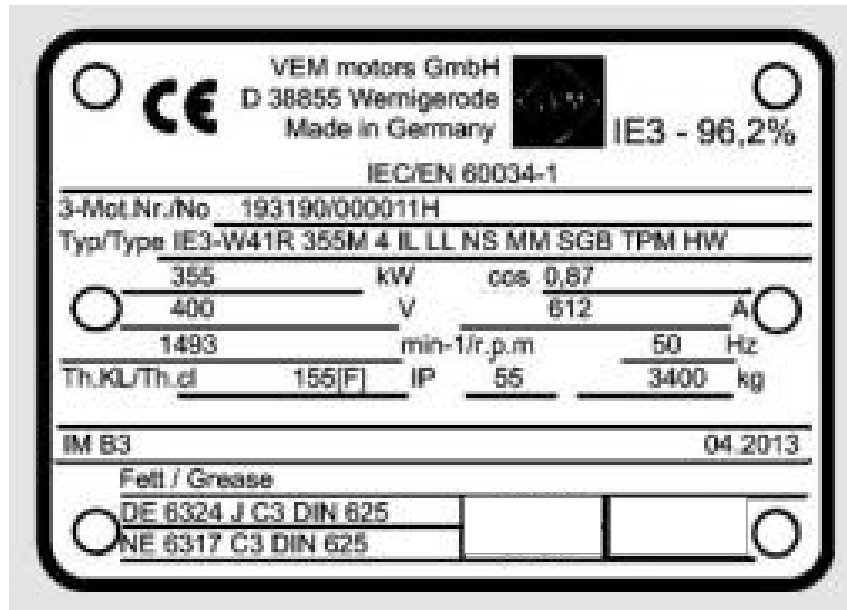


Figure 16
Time control

0008C620

Concept2 what and how to set?



Grease quantity and relubrication interval???

- Please check what relubrication amount and interval is necessary-

Excercise Setting C2

Concept2 what and how to set?

SCHAEFFLER

Calculating Grease Quantity, Frequency

Grease Calculator Helps You Determine How Much Grease is Enough

Noria Corporation
Tags: greases, bearing lubrication, electric motor lubrication



Use this handy tool as a general guideline for establishing grease frequency and volume in bearings. If you need help creating precision calculations for your equipment, consider Noria's Lubrication Program Development services.

Grease Volume and Frequency Calculator

Units of Measurement
 Imperial Metric

Sizing Source: [Make Selection]

Bearing Type: [Make Selection]

Width: in

Outer Diameter: in

Shaft Diameter: in

Shaft RPM:

Operating Temperature: [Make Selection]

Particle Contamination: [Make Selection]

Moisture: [Make Selection]

Vibration: [Make Selection]

Position: [Make Selection]

The values calculated are based on the data that is input and may not reflect actual in-service environments. To increase the accuracy of regrease volumes and frequencies we recommend the use of condition-based tools such as grease analysis and ultrasound.

Webbrowser searchstring "noria grease calculator"

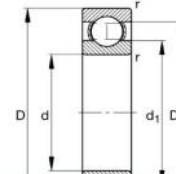
<https://www.machinerylubrication.com/Read/29620/grease-quantity-frequency>



6324

Deep groove ball bearings

main dimensions to DIN 625-1



d	120 mm
D	260 mm
B	55 mm
d ₁	215 mm
D ₁	120 mm
D _a max	246 mm

Grease Volume and Frequency Calculator

Units of Measurement
 Imperial Metric

Sizing Source: [Make Selection]

Bearing Type: [Make Selection]

Width: mm

Outer Diameter: mm

Shaft Diameter: mm

Shaft RPM:

Operating Temperature: 150°F (65.4°C) - 175°F (79.4°C)

Particle Contamination: Light, non-Abrasive

Moisture: [Make Selection]

Vibration: 0.2-0.4 g

Position: Horizontal

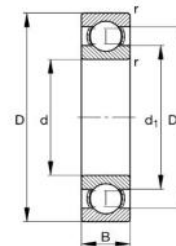
The values calculated are based on the data that is input and may not reflect actual in-service environments. To increase the accuracy of regrease volumes and frequencies we recommend the use of condition-based tools such as grease analysis and ultrasound.

Regrease Volume: 71.50 gr
 Frequency: 2 Month(s)

6317

Deep groove ball bearings

main dimensions to DIN 625-1



d	85 mm
D	180 mm
B	41 mm
d ₁	151,6 mm
D ₁	85 mm
D _a max	166 mm
d _i	114,4 mm
d _a min	99 mm
r _a max	2,5 mm

Grease Volume and Frequency Calculator

Units of Measurement
 Imperial Metric

Sizing Source: [Make Selection]

Bearing Type: [Make Selection]

Width: mm

Outer Diameter: mm

Shaft Diameter: mm

Shaft RPM:

Operating Temperature: 150°F (65.6°C) - 175°F (79.4°C)

Particle Contamination: Light, non-Abrasive

Moisture: [Make Selection]

Vibration: 0.2-0.4 g

Position: Horizontal

The values calculated are based on the data that is input and may not reflect actual in-service environments. To increase the accuracy of regrease volumes and frequencies we recommend the use of condition-based tools such as grease analysis and ultrasound.

Regrease Volume: 37.78 gr
 Frequency: 4 Month(s)

2 single pumps
 • separately controllable



CONCEPT2
 possible timer interval
 25 - 925 minutes

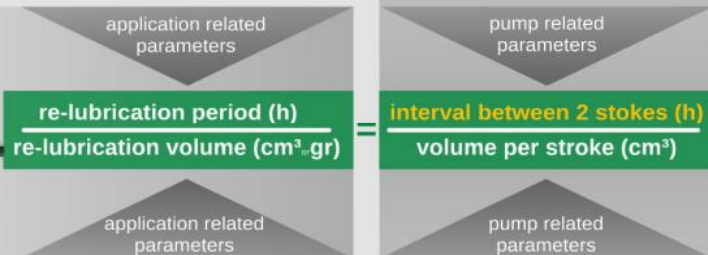
DE Interval = 3,33h or 200min (rule of three) 👍

NE Interval = 5,26h or 316min (rule of three) 👍

DE $\frac{2000 \text{ (h)}}{90 \text{ (cm}^3\text{-gr)}} = \frac{? \text{ (h)}}{0,15 \text{ (cm}^3\text{)}}$

NE $\frac{2000 \text{ (h)}}{57 \text{ (cm}^3\text{-gr)}} = \frac{? \text{ (h)}}{0,15 \text{ (cm}^3\text{)}}$

VEM motors GmbH D 38855 Wernigerode Made in Germany		IE3 - 96,2%	
IEC/EN 60034-1			
3-Mot.Nr./No 193190/000011H			
Typ/Type IE3-W41R 355M 4 IL LL NS MM SGB TPM HW			
355	kW	cos 0,87	
400	V	612	A
1493	min-1/r.p.m	50	Hz
Th.KL/Th.cl	155[F]	IP 55	3400 kg
IM B3		04.2013	
Fett / Grease			
DE 6324 J C3 DIN 625	90 cm ³	2.000 h	
NE 6317 C3 DIN 625	57 cm ³		



2 double pump bodies
 • both outlets of a double pump body have to be merged with a Y-Connector
 • therefore both "new" outlets are now separately controllable



CONCEPT8
 possible timer interval
 1 - 240 hours

DE Interval = 3,33h (rule of three)

NE Interval = 5,26h (rule of three)

4h undersupply - 17%
 3h oversupply + 11%

6h undersupply - 12%
 5h oversupply + 5%

Cycles
 multiple strokes
 ...
 try to get integer multiples of calculated interval

3 x 3,33h = 10h; 3 cycles (3 times equal to 3 cycles) 👍

4 x 5,26h = 21h; 4 cycles (4 times equal to 4 cycles) 👍

AGENDA

- ▶ Why Lubricators
- ▶ Concept 8 (Product and Accessories)
- ▶ Concept 2 (Product and Accessories → E-Motor-Kit)
- ▶ How to make the right configuration (which product, which accessory)
- ▶ How to choose the grease and calculate the lubrication intervals/amount
- ▶ How to set the device
- ▶ How to sell the device (comparison and references)



Comparing the Concept Lubricators with other competitor devices is not the right way.
In the following you will get an idea why it is not the right approach to compare
different technologies.

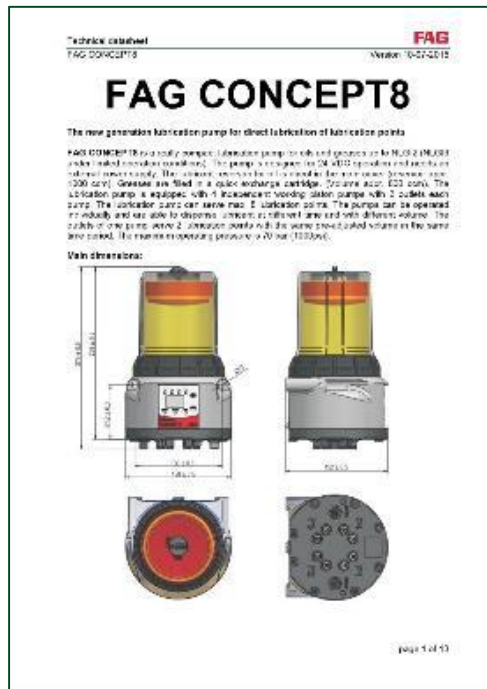


Benchmark

Schaeffler CONCEPT 8 / SKF TMLP 1008

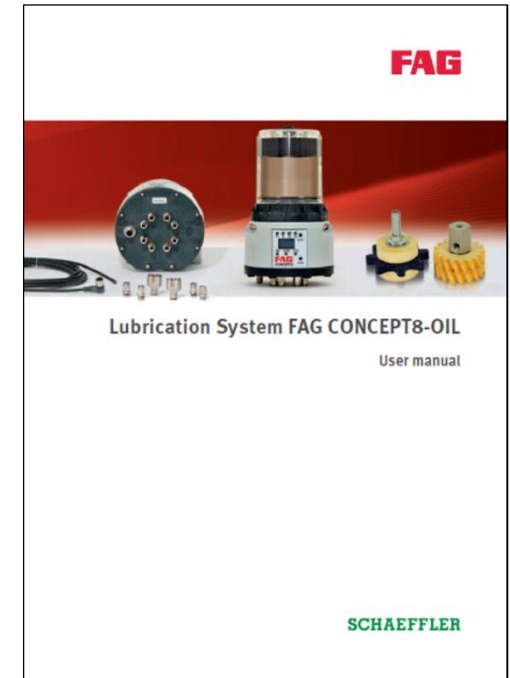
Technical Datasheet:

13 pages with all technical information, accessories, SAP-part numbers, Schaeffler Store designation, description, etc.

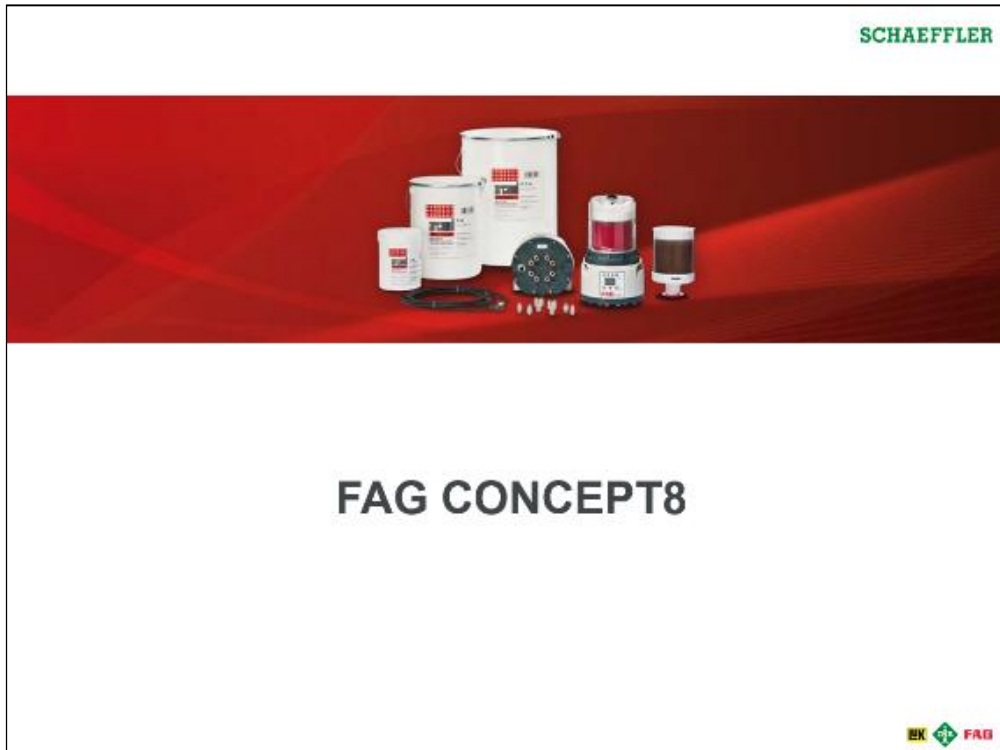


User Manual:

Lubrication System FAG CONCEPT8.
User Manual Grease and Oil Version.



Presentation CONCEPT8



Flyer CONCEPT8



FAG CONCEPT8 DEMO CASE 084224878-0000-10 DEMO-ARCALUB-C8-SET



Presentation CONCEPT2



Flyer CONCEPT2



FAG CONCEPT8 DEMO CASE 089395433-0000-10 DEMO-ARCALUB-C2-CASE





Thanks