Your perma partner:

Catalogue

The Expert in Lubrication Solutions

perma

Legend

Applications:


Conveyors


Electric motors


Pumps


Blowers / Fans

Machine elements:


Roller bearings


Sliding bearings /
Sliding guides


Linear guides


Open gears /
Gear racks


Spindles


Shaft seals


Chains

Ex-proof certification:

Testing and certification of equipment intended for use in potentially explosive atmospheres. It certifies that the device was tested and is in compliance with ex-proof requirements and safety standards.

Ex
→ Europe

TIIS
→ Japan

IECEx
→ Global

FM APPROVED
→ Canada and USA

ANZEx
→ Australia and New Zealand

UL (Underwriters Laboratories)
→ Canada and USA

perma VIDEOS:


Video available
online

3 steps to the optimal lubrication solution

References

Strong brands around the world rely on perma automatic lubrication systems

perma-tec manufactures and sells single- and multi-point lubrication systems for many different applications. perma products, with their numerous patents, are used millions of times worldwide in all branches of industry, reliably performing their services.

For years, renowned companies have profited from the performance and benefits of perma lubrication systems. perma, the expert in lubrication solutions, convinces with performance, reliability and customer satisfaction.

Company introduction – perma-tec

For more than 50 years, the perma name has stood for innovative and creative lubrication solutions. perma single- and multi-point lubrication systems are used in almost all types of industries and applications around the world.

perma's leadership in the single-point lubrication market is based on numerously patented and specifically certified products. All perma products are developed, tested and manufactured in the company's headquarters in Germany and meet the quality standard "Made in Germany".

With many years of sales experience and a global network of own subsidiaries and competent partners around the world, perma can offer customers many solutions that meet the highest technical requirements.

1934
Foundation of metal goods factory for household and kitchen appliances in Bad Kissingen

1964
Invention and patenting of **perma CLASSIC** single-point lubrication system

1989
Sale/**acquisition by private investment group**

1991
New management and extensive reorganisation

1995
Foundation of subsidiaries **H-T-L perma**

2000
Change of company name to **perma-tec GmbH & Co. KG**

2005
New **production and warehouse building** as well as **office building extension**

2011
Completion of additional **warehouse/office building**

→ perma-tec in figures

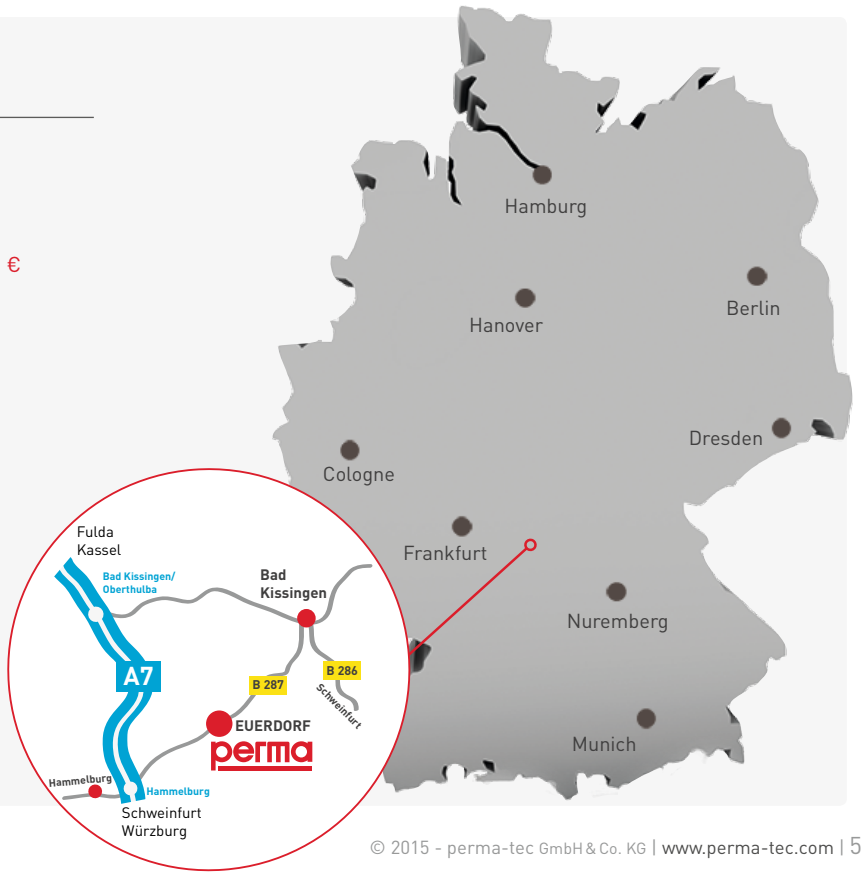
Employees worldwide	219
Employees in Germany	151
Turnover 2014 (unconsolidated)	70 Mio. €
Share of sales earned abroad	78%

Subsidiaries

H-T-L perma USA	1995
H-T-L perma France	1995
H-T-L perma Ibérica (Spain)	1996
H-T-L perma Italia	1997
H-T-L perma UK	1998
H-T-L perma Australia	2004
H-T-L perma India	2008
H-T-L perma Sudamérica	2014

Distributor network in more than 60 countries

As of: 03/2015



perma lubrication systems

Advantages at a glance

Every 11 seconds, a perma lubrication system is installed or exchanged, worldwide. Manual lubrication is a thing of the past! Today, anyone looking for safe, effective and long-term economical lubrication of equipment takes advantage of automatic lubrication. perma offers a technically and economically optimal solution for any lubrication point.

Technology

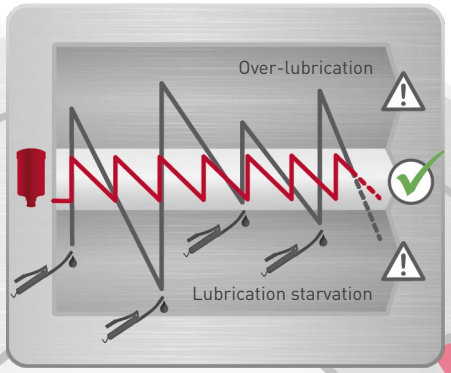
perma helps to prevent up to 55% of roller bearing failures

- Constant renewal of the lubricating film during application **ensures equipment availability**
- Reliable, clean and precise lubrication **around the clock**
- Discharge periods from **1 day to 24 months**
- Lubricant volume **60 cm³ to 7,000 cm³**
- Operating temperature from **-20 °C to +60 °C**

Since 1964 perma-tec has been manufacturing exclusively in Germany.

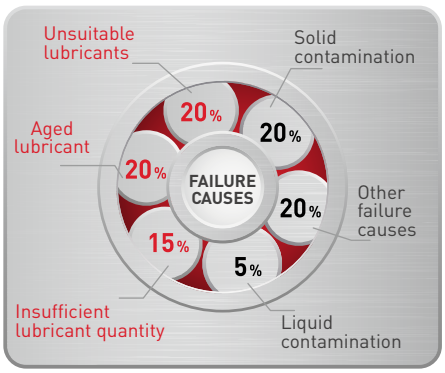
Made in Germany

Lubricant output comparison: Manual lubrication vs. perma lubrication



Bearing damage caused by lubrication starvation

55% of roller bearing failures could be prevented with perma lubrication systems!

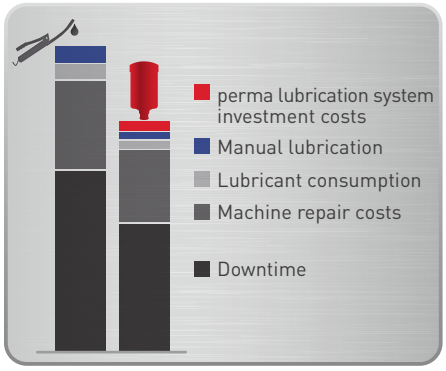


*Sources:
Internal calculations: Material, time and servicing expenditure/ figures from the roller bearing industry and insurance companies

Cost effectiveness

perma reduces costs by up to 25%

- Continuous production processes and **predictable servicing intervals**
- Continuous, low maintenance, **long-term lubrication**
- Permanent supply of lubrication points with **fresh lubricant**
- Consistently high lubricant quality guarantees **high equipment availability**
- **Reduction of energy cost**



The perma-tec quality management system is certified according to DIN EN ISO 9001 and DIN EN ISO/IEC 80079-34.

Workplace safety

perma reduces the risk of accidents by up to 90%

- **Long replacement intervals**
- **Reduction** of **maintenance runs**
- **Reduction** of time spent in **dangerous areas**
- Significantly **less** workplace hazards

perma-tec is member of the Association of German Safety Engineers (Verband Deutscher Sicherheitsingenieure – VDSI).

VDSI Verband für Sicherheit, Gesundheit und Umweltschutz bei der Arbeit

Environmental protection

perma – certified environmental management system

- **Reduction of lubricant demand** due to optimal lubricant quantity for each lubrication point
- **Closed systems** – lubricant cannot escape into the environment
- **Reusable** components help minimise energy and material costs
- **Environmentally friendly materials** for simple, unproblematic and clean disposal

The perma-tec environmental management system is certified according to DIN EN ISO 14001.

Applications

STEP 1

1.1 **Industries** 8–17

- Gypsum, lime & cement plants
- Quarrying industry
- Sewage treatment plants
- Recycling industry
- Pulp & paper industry
- Mining & heavy industry

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- Electric motors
- Pumps
- Blowers & fans

1.3 **Machine elements** 28–37

- Roller & sliding bearings
- Chains
- Linear guides
- Spindles & open gears

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- Functioning of automatic lubrication
- Comparison: Independent lubrication systems/ lubrication systems with external power supply
- Single-point lubrication systems
- Multi-point lubrication systems

3.2 **perma lubricants** 64–65

- Oils
- Greases up to NLGI 2

Lubrication systems for your industry

perma-tec has the right lubrication system for every industry. Depending on requirements, single- or multi-point lubrication systems are used, which have now been proven in practice for more than 50 years.
Continuous product developments, designed to meet the needs of the individual, local production processes, have contributed to this success. Since 1964 more than 55 million perma lubrication systems have been sold globally in all industries.

Further industries can be found on our website: www.perma-tec.com

perma lubrication systems for

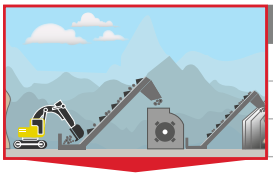
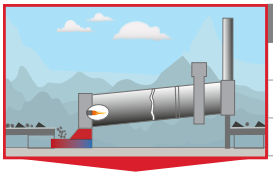
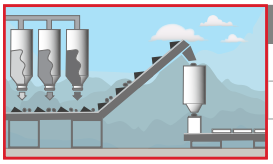
Gypsum, lime & cement plants

There are hundreds of rotating machine elements in gypsum, lime and cement plants. Equipment must function reliably under the most difficult operating conditions. 80% of machine failures are due to mechanical wear caused by dirt contamination. perma automatic lubrication systems prevent ingress of dirt and ensure optimum lubrication of the equipment.

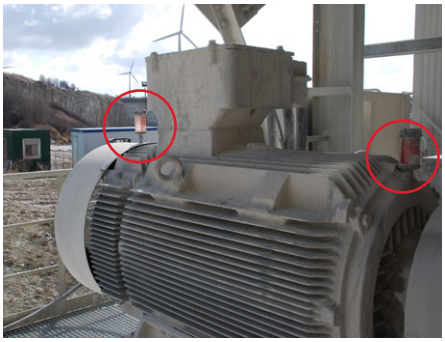
References

OPTERRA
A CRH COMPANY

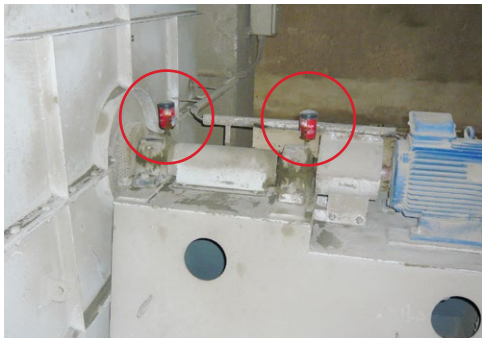
Lubrication points

			1 Roller bearings	2 Sliding bearings	3 Chains
	**Raw material processing**				
	→ **Crushing**	Crusher	✓	✓	-
	→ **Transport**	Conveyors	✓	-	-
	→ **Drying and grinding**	Raw mill	✓	✓	-
	**Processing to final product**				
	→ **Heating**	Rotary kiln	✓	-	-
	→ **Fine grinding**	Cement mill, fine screen	✓	✓	-
	→ **Cleaning**	Dust removal equipment	✓	-	-
	**Storage and packing**				
	→ **Storage**	Conveyors	✓	-	✓
	→ **Packing**	Palletiser	-	-	✓

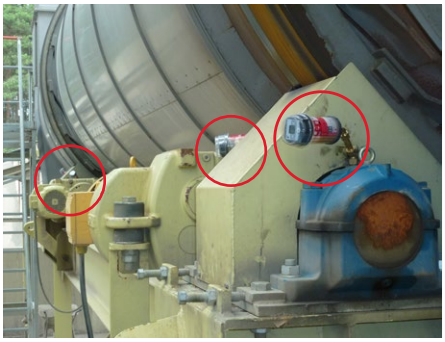
Application examples



Lubrication of motor on a vibrating screen



Lubrication of pillow block bearing on fan drive shaft



Lubrication of pillow block bearing on rotary dryer

perma lubrication systems for

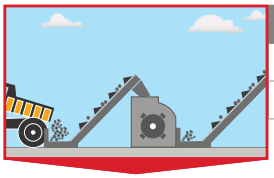
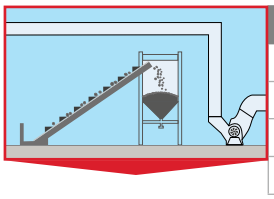
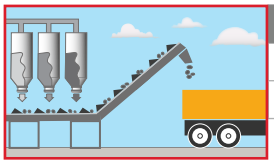
Quarrying industry

The quarrying industry is very demanding for both workers and machines. Spread-out equipment, insufficient staff, rough operating conditions and cost pressure continuously challenge quarry operators and employees. Automatic lubrication with perma lubrication systems can tremendously increase equipment safety and availability.

References

NSN

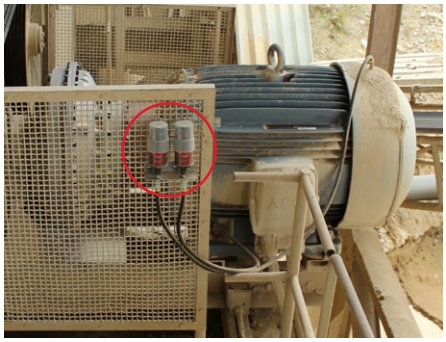
Lubrication points

		1 Roller bearings	2 Sliding bearings
	**Raw material processing**		
	→ **Crushing**	Jaw, cone and roll crushers	✓	✓
	→ **Transport**	Conveyors	✓	-
	**Processing to final product**		
	→ **Screening**	Grit and sand screens	✓	-
	→ **Sorting & cleaning**	Conveyors	✓	-
	→ **Dust removal**	Dedusting equipment, fans	✓	-
	→ **Transport**	Conveyors	✓	-
	**Storage & packing**		
	→ **Packing**	Conveyors	✓	-
	→ **Filling**	Silo discharge	✓	-

Application examples

Lubrication of pillow block bearing on conveyor

Lubrication of pillow block bearing on belt weigher



Remote lubrication of electric motor

perma lubrication systems for

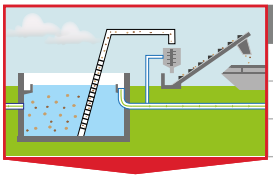
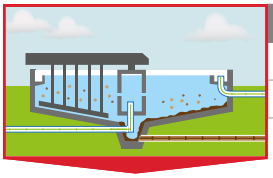
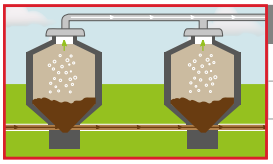
Sewage treatment plants

Trouble-free operation during the entire cleaning process is imperative for treatment of waste water. Important equipment parts like roller and sliding bearings, chains and spindles are directly exposed to dirt, water, phosphates and other chemicals. Continuous relubrication is necessary to prevent premature wear.

References

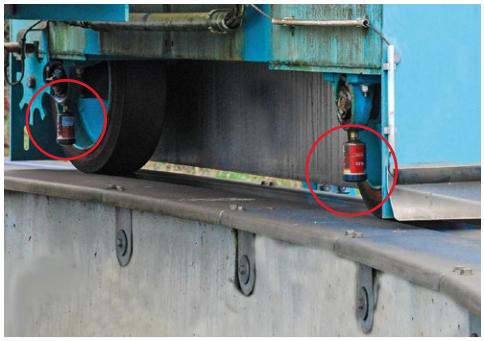
SEF STADTENTWÄSSERUNG FRANKFURT AM MAIN

Lubrication points

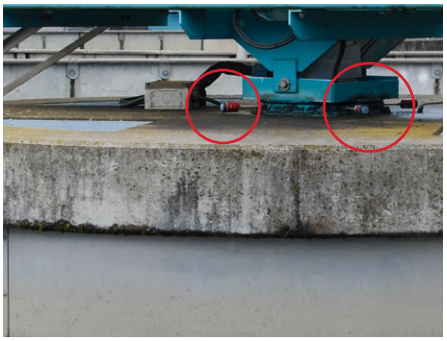
		1 Roller bearings	2 Sliding bearings	3 Chains
	**Physical treatment**			
	→ **Screening**	Chain guide roller	✓	-	✓
	→ **Grit & grease removal**	Scraper	-	✓	-
	→ **Sedimentation tank**	Impeller wheel	✓	✓	-
	**Biological treatment**			
	→ **Aerated tank**	Surface aerator	✓	-	-
	→ **Clarification tank**	Wheel bearing, pivot bearing	-	✓	-
	**Sludge treatment**			
	→ **Sludge thickening**	Sludge belt conveyor	✓	-	-
	→ **Sludge dewatering**	Screw press	✓	-	-

Application examples

Lubrication of bearing
at surface aerator



Wheel bearing lubrication
at circular scraper bridge



Pivot bearing lubrication
at circular scraper bridge

perma lubrication systems for

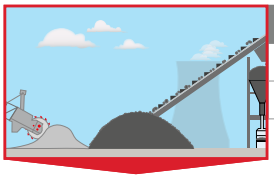
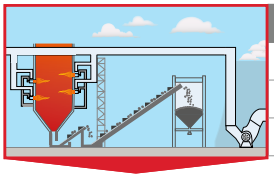
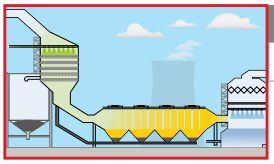
Power plants

The energy turnaround demands more flexibility from conventional power plants. Power plant operators, in particular maintenance departments, are faced with new challenges. Frequent load changes and longer downtimes require reliable lubrication of equipment and machine elements.

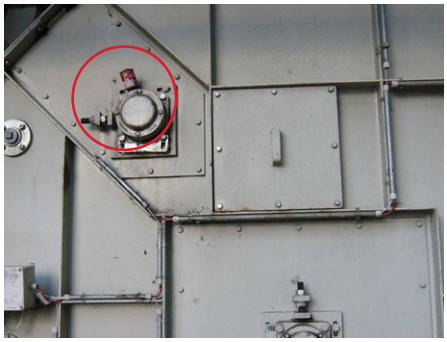
References

VATTENFALL

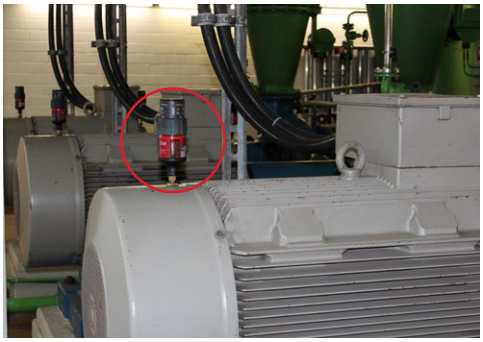
Lubrication points

			① Roller bearings
	**Material transport**		
	→ **Transport**	Portal scraper, conveyors	✓
	→ **Loading**	Ship unloader, crane	✓
	**Processing**		
	→ **Crushing**	Impact hammer, coal mill	✓
	→ **Dust removal**	Blowers & fans, electric motors	✓
	→ **Transport**	Conveyors	✓
	**Post processing**		
	→ **Dust extracting**	Flue gas scrubbing, blowers & fans, electric motors	✓

Application examples



Lubrication of flange bearing on bucket conveyor



Electric motor bearing lubrication

Lubrication of electric motor and shaft on secondary fan

perma lubrication systems for

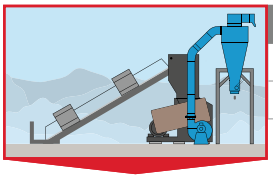
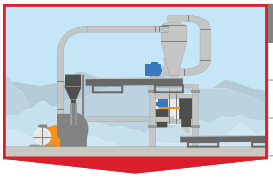
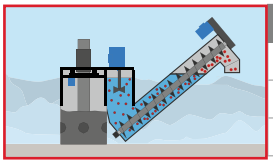
Recycling industry

Recycling companies are constantly under pressure. Large price fluctuations, significantly changing market demands and short contract periods with buyers of recycling materials are some of the enormous challenges faced by the operators. In order to operate profitably, operators must have efficient technologies and avoid recycling process failures. This makes machine and plant maintenance and lubrication particularly important for these operations.

References

KORN RECYCLING

Lubrication points

		① Roller bearings	② Sliding bearings
	**Preparation**		
	→ Crushing	Hammer/impact mills	✓
	→ Grinding	Granulators	✓
	**Processing**		
	→ Screening	Vibrating screen	✓
	→ Screening	Air separator	✓
	→ Dust removal	Electric motors	✓
	**Final processing**		
	→ Cleaning	Scrubbers	✓
	→ Drying	Blowers/fans	✓
	→ Transport	Conveyors	✓

Application examples

Lubrication of flange earing on conveyor

Lubrication of pillow block bearing on conveyor

Lubrication of drive shaft on pump

perma lubrication systems for

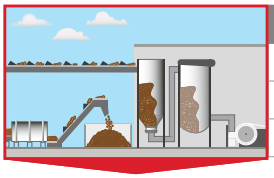
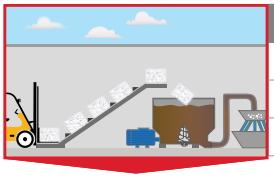
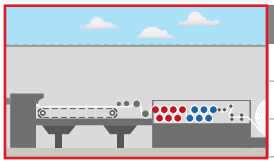
Pulp & paper industry

The paper industry is currently facing many new challenges:
An increase in international competition, falling demand for a variety of paper types as a result of digital media, rising energy costs, stricter health, safety and environmental constraints. In order to meet these challenges, operators must increase plant productivity and profitability and simultaneously reduce operating costs. perma lubrication systems can help to provide a solution to these problems.

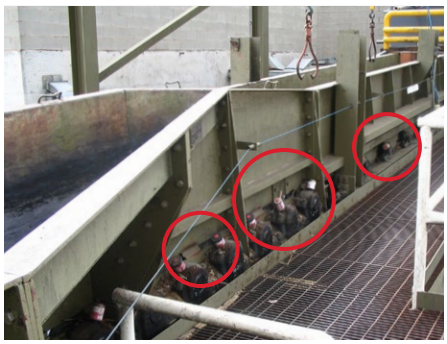
References

sappi
Inspired by life

Lubrication points

		① Roller bearings	② Shaft seals	③ Chains
	**Pulp production**			
	→ **Chipping, storing**	Conveyors, tumblers	✓	-	✓
	→ **Cooking, washing**	Pumps, wash presses	✓	✓	-
	→ **Bleaching, drying**	Electric motors, dryers	✓	-	-
	**Pulp treatment**			
	→ **Defibering**	Pulpers, electric motors	✓	-	-
	→ **Grinding**	Refiners, electric motors	✓	-	-
	→ **Conveying, dewatering/thickening**	Pumps, electric motors	✓	-	-
	**Paper production**			
	→ **Dewatering, screening**	Vacuum systems	✓	-	-
	→ **Pressing, drying**	Press pulpers, dryers	✓	-	-
	→ **Spreading, rolling**	Dryers, roller conveyors	✓	-	✓

Application examples



Bearing lubrication at the tree sorting system

Lubrication of pillow block bearing on a ventilation system

Pump bearing lubrication

perma lubrication systems for

Mining & heavy industry

In order to maintain their competitiveness, mining and heavy industry companies (e.g. steel mills) must increase productivity and simultaneously minimise long-term operating costs. One important component in this context is preventive maintenance, which extends equipment service life and minimises the down-times required for maintenance, repairs and overhauls. This reduces operating costs and enhances company performance.

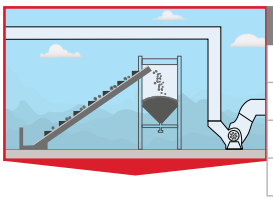
HINT

Order the free perma catalogue for Heavy industry & mining
Art. No. 110197

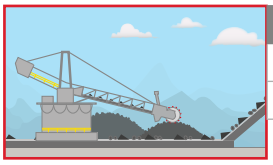
Lubrication points

1 Roller bearings 2 Sliding bearings 3 Shaft seals

Mining and transport of raw materials		1	2	3
→ Mining	Conveyor excavators, conveyor shovels	✓	✓	-
→ Crushing	Jaw, cone & roll crushers	✓	✓	-
→ Transport	Conveyors, pumps	✓	-	✓

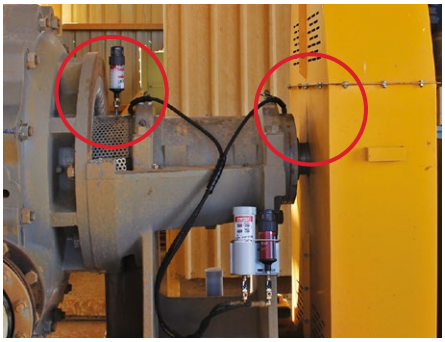


Processing to final product		1	2	3
→ Screening	Raw material screens	✓	✓	-
→ Sorting & cleaning	Conveyors, pumps, mixer gears	✓	-	✓
→ Dust removal	Dedusting equipment, fans	✓	-	✓
→ Transport	Conveyors	✓	-	✓

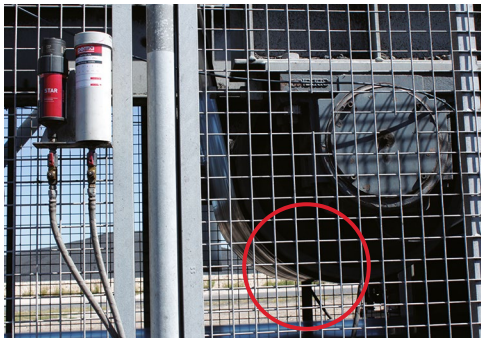


Storage & transport		1	2	3
→ Storage	Conveyors	✓	-	✓
→ Transport	Conveyors, loading stations	✓	-	-

Application examples

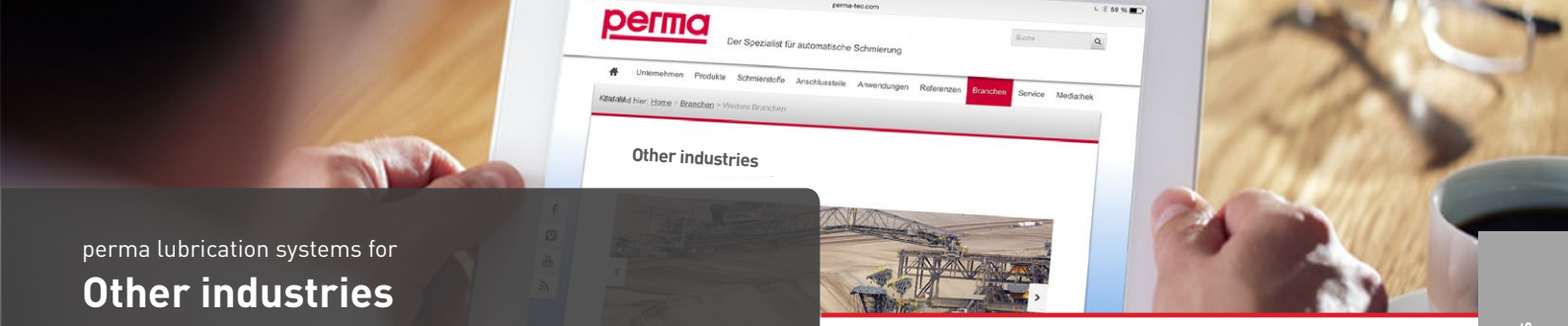


Lubrication of flange bearings and seals on pump



Lubrication of pillow block bearing on conveyor

Pump bearing lubrication



perma lubrication systems for

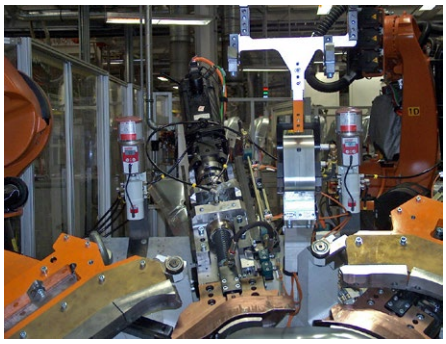
Other industries

Information on other industries, such as elevators, biogas plants, escalators, timber industry, building services engineering, hospitals, hotels, cranes, railway transport, locks, cable cars and mountain railways, textiles industry, wind turbines, etc., can be found on our website:

→ **www.perma-tec.com/en/industry-sectors**

Automotive industry

Lubrication points:
- Electric motors
- Blowers/fans
- Lifting stations
- Lifting devices
- Linear guides

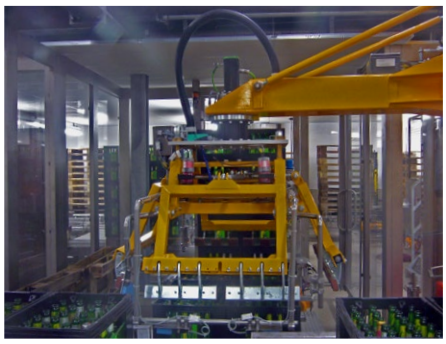


Chemicals & pharmaceuticals industry

Lubrication points:
- Blowers/fans
- Electric motors
- Pumps
- Fan drives

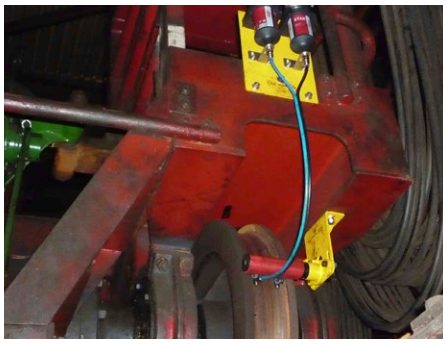
Food industry

Lubrication points:
- Pumps
- Mixers
- Filling facilities
- Compressors
- Surface aerators



Steel industry

Lubrication points:
- Pumps
- Cooling section
- Vibrating screen
- Crane systems
  → CWL PLUS SET, Art. No. 101564
- Coking plant
- Rolling mill



Applications

STEP 1

1.1 **Industries** 8–17

- Gypsum, lime & cement plants
- Quarrying industry
- Sewage treatment plants
- Recycling industry
- Pulp & paper industry
- Mining & heavy industry

1.2 **Applications** 18–27

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- Electric motors
- Pumps
- Blowers & fans

1.3 **Machine elements** 28–37

- Roller & sliding bearings
- Chains
- Linear guides
- Spindles & open gears

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- Remote mounting

3.1 **perma lubrication systems** 42–63

- Functioning of automatic lubrication
- Comparison: Independent lubrication systems/ lubrication systems with external power supply
- Single-point lubrication systems
- Multi-point lubrication systems

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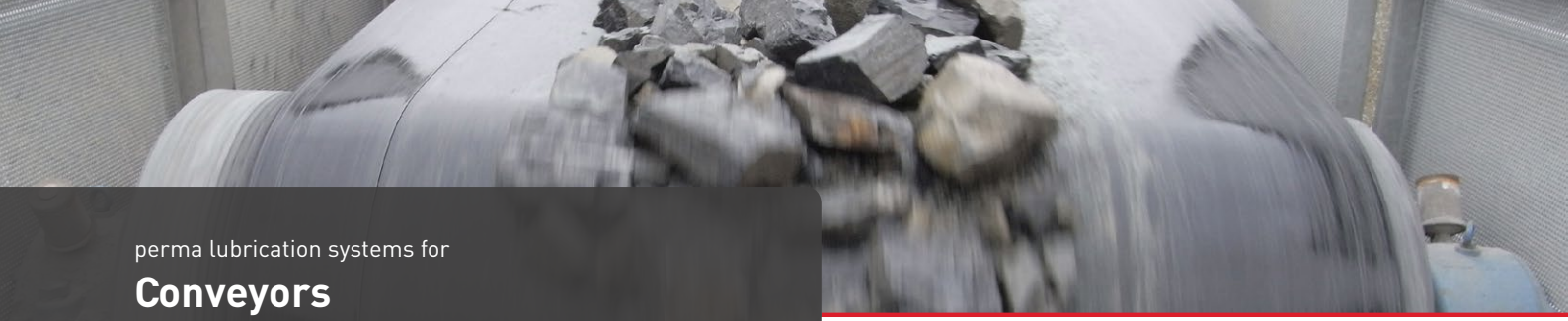
- Oils
- Greases up to NLGI 2

Our product recommendation for your application

For years, perma-tec has been offering perfect solutions for single-point lubrication in application areas including conveyors, electric motors, pumps and fans and blowers. This chapter explains the lubrication challenges of these applications in more detail and presents suitable solutions.

o Limited suitability + Suitable ++ Recommended					
		Conveyors → Page 20/21	**Electric motors** → Page 22/23	**Pumps** → Page 24/25	**Blowers & fans** → Page 26/27
Single-point lubrication systems					
	**CLASSIC FUTURA**	+	o	+	o
	**FLEX**	+	+	++	++
	**NOVA**	+	++	+	++
	**STAR VARIO***	++	++	++	++

* also available as perma STAR CONTROL with external power supply



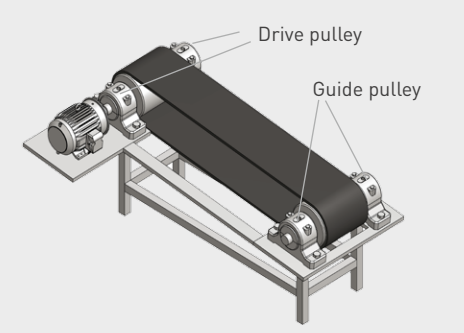
perma lubrication systems for

Conveyors

Functioning conveyors are essential for smooth process flows. Despite dirt, dust or strong vibration, optimal lubrication is necessary to prevent equipment failures. Equipment downtimes, costly repairs and service calls make up a significant proportion of the operating costs.

- → Mining & heavy industry
- → Power plants
- → Food industry
- → Recycling industry
- → Quarrying industry
- → Cement plants

Lubrication points



Pillow block housings with spherical roller bearings are mainly used for **drive/guide pulleys**.

Bearings and **bearing housing seals** must be permanently supplied with lubricant.

Challenges

Large conveyors often extend over large distances and several levels and are **difficult to access**. Relubrication should ideally take place while the equipment is running. The lubrication points at the transfer points above the storage containers or treatment facilities can often only be reached with the help of ladders or other aids and are therefore often **neglected**. Restricted access as a result of hazardous ambient conditions **endangers workplace safety**.

Lubrication starvation results in wear, which leads to **failure of equipment components** and reduces productivity and cost effectiveness.

- → **Dirt** and **water** must not enter the lubrication points
- → Optimal and regular **lubrication with fresh lubricant** during equipment operation
- → **No unnecessary equipment downtimes** due to relubrication
- → **Workplace safety** must be ensured

HINT Conveyor lubrication manual available on request.

Advantages of automatic lubrication

- Lubricant seals lubrication points and **prevents** ingress of **contamination**
- **Lubrication takes place while the equipment is running** without interrupting the work process
- perma lubrication systems are installed outside of dangerous areas (remote mounting) and **actively contribute to accident prevention**
- Precise lubricant discharge **lowers** lubricant consumption and thus the **environmental impact**

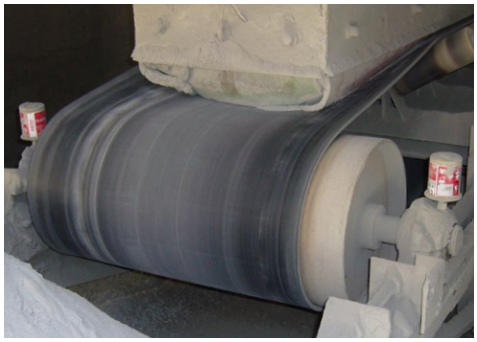
References

K+S

Solutions

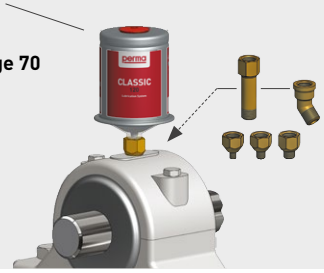
Direct mounting on the lubrication point: e.g. with perma CLASSIC

→ Easy, quick mounting
→ For lubrication points with little vibration/shocks
→ For easy-to-reach, safe lubrication points



perma CLASSIC

Art. No. go to page 70



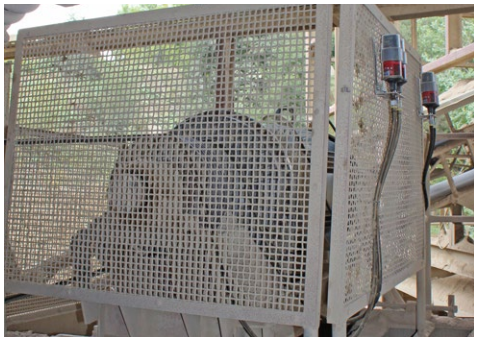
INSTALLATION KIT CLASSIC Direct Mounting
Use extensions, angles & reducers depending on the installation situation

Art. No. 101476

→ Go to page 40 for details

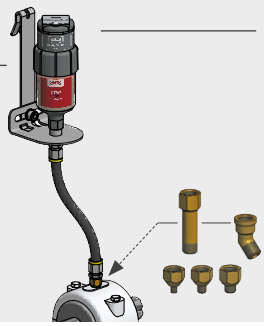
Remote mounting at lubrication point: e.g. with perma STAR VARIO

→ For lubrication points with strong vibration/shocks (isolation of lubrication system)
→ When workers' safety is at risk: Mounting in safe areas
→ For hard-to-reach lubrication points



Cage hanger arm

Art. No. 109959



perma STAR VARIO with LC 120

Art. No. go to page 71

INSTALLATION KIT STAR with 3.0 m hose
Use extensions, angles & reducers depending on the installation situation

Art. No. 101482

→ Go to page 41 for details

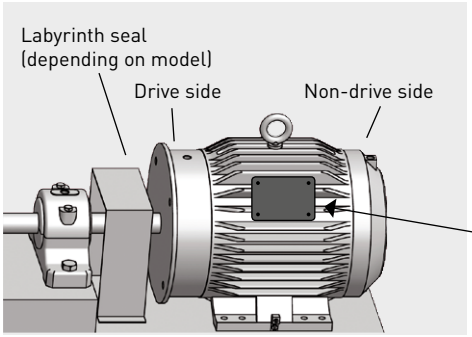
perma lubrication systems for

Electric motors

Electric motors are used for a variety of applications. An electric motor is designed to convert electrical into mechanical energy. Efficient lubrication and maintenance are essential for reliable operation of electric motors. Many motors are located in poorly accessible locations or in dangerous areas. They are therefore often only lubricated irregularly. Failure to adhere to manufacturer specifications frequently leads to damage and failures due to over-lubrication or lubrication starvation.

- → Mining
- → Power plants
- → Food industry
- → Recycling industry
- → Quarrying industry
- → Cement plants

Lubrication points



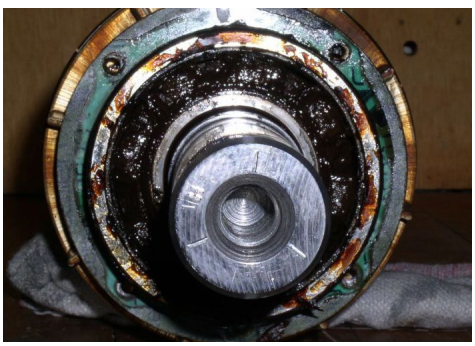
Lubrication points are located on the **drive** and **non-drive end of electric motors**. **Grease escape** (grease drain hole, grease relief ports or grease trap) also has to be taken into consideration. Bearings will overheat if grease cannot escape and/or if grease traps are filled up with used grease.

The correct lubricant
Motors with relubrication fittings come with information plates specifying grease amounts and relubrication intervals.

Speed high	Base oil thinner
Speed low	Base oil thicker

→ NLGI 0-2

Challenges



During manual lubrication, the grease is **applied in uneven amounts**. A large quantity of lubricant is introduced at one time. This leads to temporary **over-lubrication of the bearings**. Non-adherence to relubrication intervals leads to **lubrication starvation**.

- → **Overheating** of bearings and **fire hazard**, since distribution of excess grease takes hours; **shut-off** by temperature monitoring
- → Bearing damage due to lubrication starvation results in unscheduled **machine downtimes** and higher production costs
- → **Increasing maintenance costs** caused by premature wear

Relubrication during running operation (manufacturer recommendation) jeopardises maintenance workers. Increased accident risk due to time spent in **dangerous** or **difficult-to-access** areas.

- → **High accident risk**
- → **Motor shut-down** when entering secured areas

HINT Electric motor lubrication manual available on request.

Advantages of automatic lubrication

- **Relubrication during running operation** minimises overheating of bearings
- **Predictable exchange intervals** with reduced material and personnel expenditure
- **Increased workplace safety** due to automatic lubrication of hard-to-reach lubrication points
- Precise lubricant discharge **lowers** lubricant consumption and thereby **environmental impact**

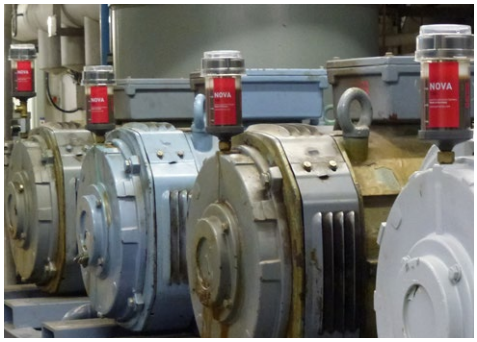
References

SALZGITTER FLACHSTAHL
Ein Unternehmen der Salzgitter Gruppe

Solutions

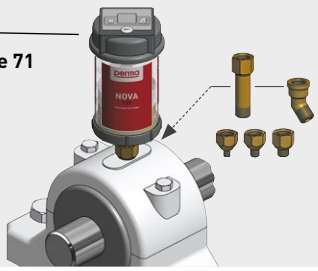
Direct mounting on the lubrication point: e.g. with perma NOVA

→ Easy, quick mounting
→ For lubrication points with little vibration/shocks
→ For easy-to-reach, safe lubrication points



perma NOVA with LC 125

Art. No. go to page 71



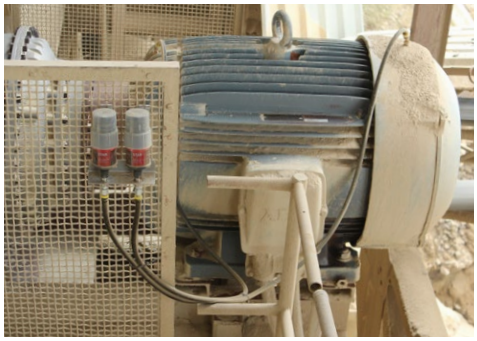
INSTALLATION KIT NOVA Direct Mounting
Use extensions, angles & reducers depending on the installation situation

Art. No. 101476

→ Go to page 40 for details

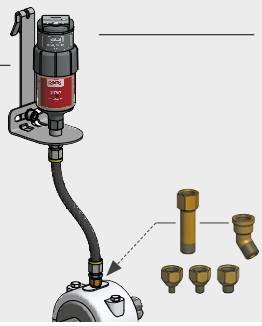
Remote mounting at lubrication point: e.g. with perma STAR VARIO

→ For lubrication points with strong vibration/shocks (isolation of lubrication system)
→ When workers' safety is at risk: Mounting in safe areas
→ For hard-to-reach lubrication points



Cage hanger arm

Art. No. 109959



perma STAR VARIO with LC 120

Art. No. go to page 71

INSTALLATION KIT STAR with 3.0 m hose
Use extensions, angles & reducers depending on the installation situation

Art. No. 101482

→ Go to page 41 for details

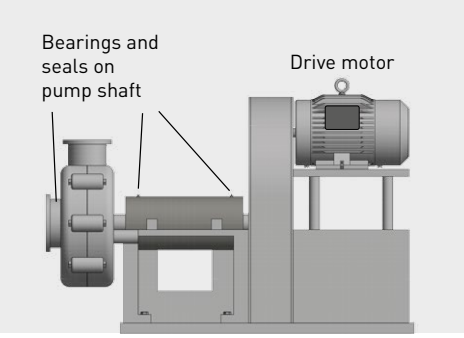
perma lubrication systems for

Pumps

Pumps are the core of many industrial applications. A failing pump can often interrupt the entire work or production process. All sorts of pumps are used in many fields and applications. Appropriate lubrication safeguarding the work and production process of the pump is a decisive factor of smooth operation.

- → Mining & heavy industry
- → Chemical industry
- → Power generation
- → Food industry
- → Oil and gas production
- → Paper industry
- → Pharma industry
- → Environmental technology
- → Water and wastewater

Lubrication points

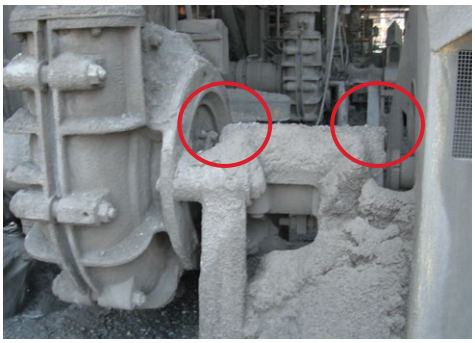


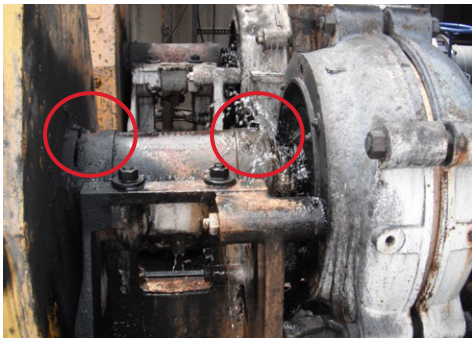
Lubrication points (roller bearings) are located on the **drive shaft** between drive motor and pump body or in the pump housing.

Lubrication of **packing gland** and **labyrinth seals** prevents the ingress of dirt and/or pumped media. **Bearings** and **bearing housing seals** must be permanently supplied with the specified amount of the right lubricant.

Information about drive motor lubrication can be found on pages 22/23, "Electric motors".

Challenges





Pumps are often operated under extreme conditions, subjecting individual components to special wear. These can include **heavy contamination** from slurry or dust, as well as **hazardous materials** such as bases and weak acids.

→ **Dirt, water or other contaminants** must not enter the bearing points

Lubrication points can often only be accessed using **extreme protective measures** (safety gloves and mask). This frequently leads to neglect of or non-compliance with the prescribed lubrication.

Lubrication starvation results in wear, which leads to **failure of equipment components** or pump **leakages**.

- → Optimal and regular **lubrication with fresh lubricant** during equipment operation
- → Operation in **potentially explosive areas**
- → **Workplace safety** must be ensured

HINT Pump lubrication manual available on request.

Advantages of automatic lubrication

- **Increased workplace safety** due to automatic lubrication of hard-to-reach lubrication points
- Precise lubricant discharge **lowers** lubricant consumption and thereby **environmental impact**
- **Fewer maintenance runs** minimise the time workers spend in dangerous areas
- Depending on the selected lubrication system, use may be possible **underground** or in **potentially explosive areas**

References

VATTENFALL

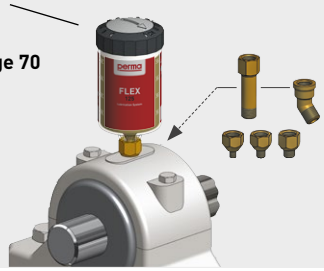
Solutions

Direct mounting on the lubrication point: e.g. with perma FLEX

→ Easy, quick mounting
→ For lubrication points with little vibration/shocks
→ For easy-to-reach, safe lubrication points

perma FLEX 125

Art. No. go to page 70



INSTALLATION KIT FLEX Direct Mounting
Use extensions, angles & reducers depending on the installation situation

Art. No. 101476

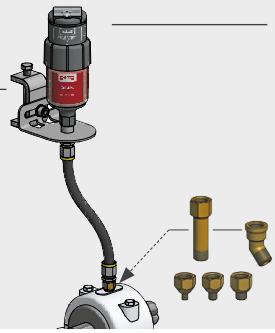
→ Go to page 41 for details

Remote mounting at lubrication point: e.g. with perma STAR VARIO

→ For lubrication points with strong vibration/shocks (isolation of lubrication system)
→ When workers' safety is at risk: Mounting in safe areas
→ For hard-to-reach lubrication points

Beam clamp 65 mm

Art. No. 109958



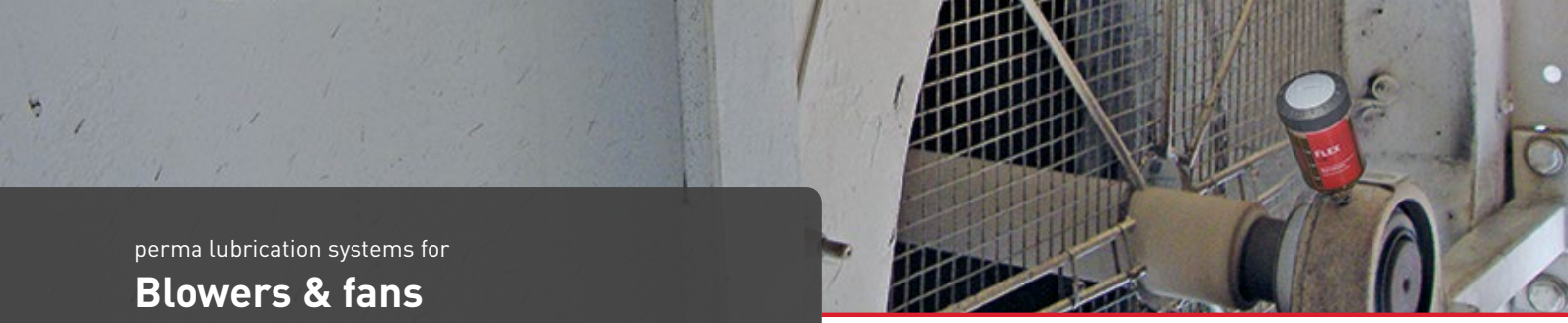
perma STAR VARIO with LC 120

Art. No. go to page 71

INSTALLATION KIT STAR with 3.0 m hose
Use extensions, angles & reducers depending on the installation situation

Art. No. 101482

→ Go to page 41 for details



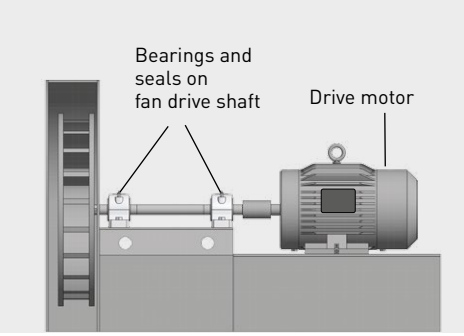
perma lubrication systems for

Blowers & fans

Blowers and fans are used in almost all key industries. They provide adequate amounts of primary and secondary air. Flue gas fans remove air containing dust, gases and harmful substances. In primary air zones, induced draft fans are used such as in scrubbers, dust collectors, heat exchangers and desulfurisation plants.

- → Mining & heavy industry
- → Chemical industry
- → Glass industry
- → Wood-working
- → Power plants (power generation)
- → Food industry
- → Refineries

Lubrication points

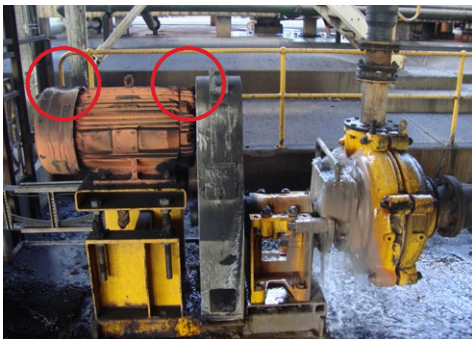


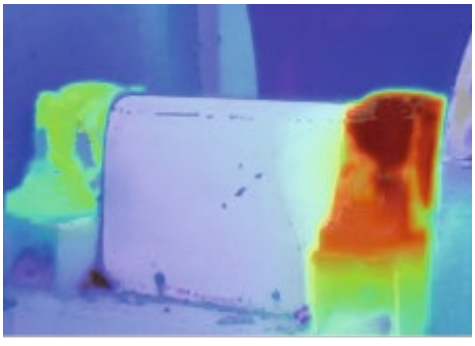
The lubrication points (roller bearings) are located at the **drive shaft** between drive motor and fan impeller.

Bearing and **sealing of fan drive shaft** is normally done by means of a pillow block housing or a bearing unit. These must be permanently supplied with the specified amount of the right lubricant.

Information about drive motor lubrication can be found on pages 22/23, “Electric motors”.

Challenges





Fans and blowers are normally operated under **exceptional conditions**. **Contaminants** such as dust or pumped media are dispersed by operation of the ventilator. These can enter the bearing system, which leads to increased wear of individual components and a shorter service life.

- → Contaminants (e.g. **dust**) raised in the air must not enter the lubrication points

Regular lubrication of bearings and seals is imperative. Lubrication points are often extremely dirty and hard to reach, which makes maintenance even more difficult. Specified lubrication intervals are neglected or not observed for this reason. The resulting **lubrication starvation** leads to increased wear and in extreme cases to failure of the blowers and fans.

- → **Excessive overheating of bearing points** due to lubrication starvation
- → Lubricants must cope with the **demands** made of it, e.g. in terms of vibrations or high speeds
- → **Observation of relubrication intervals** depending on bearing type, bearing size and ambient conditions

HINT Blower/fan lubrication manual available on request.

Advantages of automatic lubrication

- perma lubrication systems seal lubrication points and **protect against contamination**
- **Precise metering** of lubricant amount reduces lubricant consumption
- Safe and reliable lubrication, also in areas with **potentially explosive atmospheres**
- Different lubricant volumes for **exact adjustment to lubrication point**

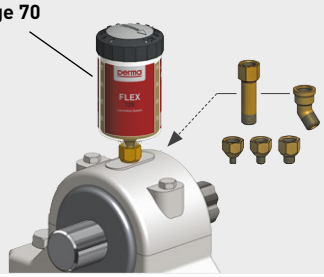
References

Solutions

Direct mounting on the lubrication point: e.g. with perma FLEX

→ Easy, quick mounting
→ For lubrication points with little vibration/shocks
→ For easy-to-reach, safe lubrication points

perma FLEX 125
Art. No. go to page 70



INSTALLATION KIT FLEX Direct Mounting
Use extensions, angles & reducers depending on the installation situation

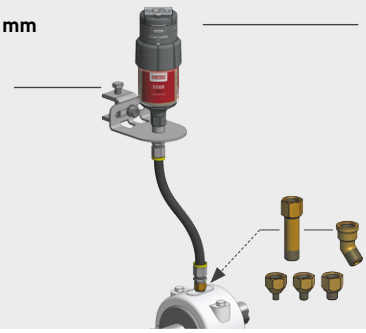
Art. No. 101476

→ Go to page 40 for details

Remote mounting at lubrication point: e.g. with perma STAR VARIO

→ For lubrication points with strong vibration/shocks (isolation of lubrication system)
→ When workers' safety is at risk: Mounting in safe areas
→ For hard-to-reach lubrication points

Beam clamp 30 mm
Art. No. 109957



perma STAR VARIO with LC 120

Art. No. go to page 71

INSTALLATION KIT STAR with 3.0 m hose
Use extensions, angles & reducers depending on the installation situation

Art. No. 101482

→ Go to page 41 for details

Applications

STEP 1

1.1

Industries 8–17

- Gypsum, lime & cement plants
- Quarrying industry
- Sewage treatment plants
- Recycling industry
- Pulp & paper industry
- Mining & heavy industry

1.2

Applications 18–27

- Conveyors
- Electric motors
- Pumps
- Blowers & fans

1.3

Machine elements 28–37

- Roller & sliding bearings
- Chains
- Linear guides
- Spindles & open gears

2.

Determination of mounting type 38–41

- Direct mounting
- Remote mounting

3.1

perma lubrication systems 42–63

- Functioning of automatic lubrication
- Comparison: Independent lubrication systems/ lubrication systems with external power supply
- Single-point lubrication systems
- Multi-point lubrication systems

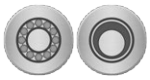
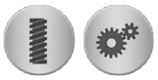
3.2

perma lubricants 64–65

- Oils
- Greases up to NLGI 2

Our product recommendation for your machine elements

perma-tec not only offers perfect application solutions, but also constantly works on finding reliable and safe lubrication solutions for lubrication points with special demands.

- Unsuitable o Limited suitability + Suitable ++ Recommended	 **Roller & sliding bearings** → Page 30/31	 **Chains** → Page 32/33	 **Linear guides** → Page 34/35	 **Spindles & open gears** → Page 36/37
Single- & multi-point lubrication systems				
 **CLASSIC / FUTURA**	+	+	-	+
 **FLEX / NOVA**	+	++	o Depending on lubricant	+
 **STAR VARIO / STAR CONTROL**	++	++	o Depending on lubricant	++
 **PRO MP-6 / PRO C MP-6**	++	-	++ perma PRO LINE / perma PRO C LINE	+
 **ECOSY**	-	++	-	+

perma lubrication systems for

Roller & sliding bearings

Roller and sliding bearings are used in all industry sectors. Only regular and efficient lubrication ensures that these components function correctly. Bearing damage, resulting from insufficient lubrication or contamination in the bearing, can result in consequential damage.

- → Automotive industry
- → Conveying and warehouse technology
- → Food industry
- → Packaging industry
- → Machine tools

Lubrication points

In **roller bearings**, loads and movements are transferred by means of rollers, arranged between an outer and inner race. If these metallic components make contact, undesirable friction, wear and damage is the result, which may lead to bearing failure.

In **sliding bearings,** the moving parts are in direct, sliding, linear contact. They can accept greater forces than roller bearings, but are more heavily impacted by wear due to the greater friction.

Challenges

Service life and reliability of seals, roller and sliding bearings are to a large extent governed by the ambient conditions. Exceptional operating conditions and the ingress of contaminants in the bearing system lead to increased wear and thus to a reduction in the service life.

The ambient and influencing factors can be divided into three groups:

- → **Dust and liquids in the bearing**
- → **Oscillations and vibrations**
- → **High bearing temperatures**

These factors influence the service life and must be taken into consideration when calculating lubricant quantities. The higher the load or the influence of ambient conditions, the greater the quantity of lubricant required to guarantee **optimal lubrication**.

Advantages of automatic lubrication

- **Protection** against contaminant and liquid ingress reduces wear and **increases the bearing service life**
- **Permanent supply** of lubrication points with correct quantity of fresh lubricant
- **Machine / PLC controlled lubrication** with lubrication system monitoring (e.g. with perma STAR CONTROL)
- **Maintenance and servicing works** can be planned in advance

Solutions

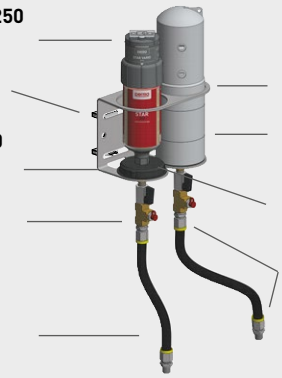
Automatic lubrication with perma lubrication systems

→ Continuous, low-maintenance, long-term lubrication ensures uninterrupted production processes
→ Maintenance runs can be reduced and planned long-term
→ Reusable components minimise energy and material costs

Angle 45° G1/4 male x G1/4 female
Art. No. 104823

Extension 75 mm G1/4 male x G1/4 female
Art. No. 104856

perma NOVA with LC 125
Art. No. go to page 71



perma STAR VARIO with LC 250
Art. No. go to page 71

Beam clamp 30 mm
Art. No. 109957

Support flange STAR Gen 2.0 G1/4 male x G1/4 female
Art. No. 109420

Purge connection with manual valve G1/4 female
Art. No. 109684

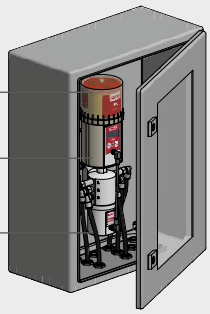
Heavy Duty hose with NBR lining and fabric insert
Art. No. 101555

Mounting bracket STAR Heavy Duty C-section 2-point G1/4 female
Art. No. 108648

Protection cap STAR VARIO Heavy Duty 250
Art. No. 109999

Cover clip for protection cap STAR VARIO Heavy Duty
Art. No. 108606

Hose connector G1/4 male for hose iØ 9.5 mm - push-lock
Art. No. 101554

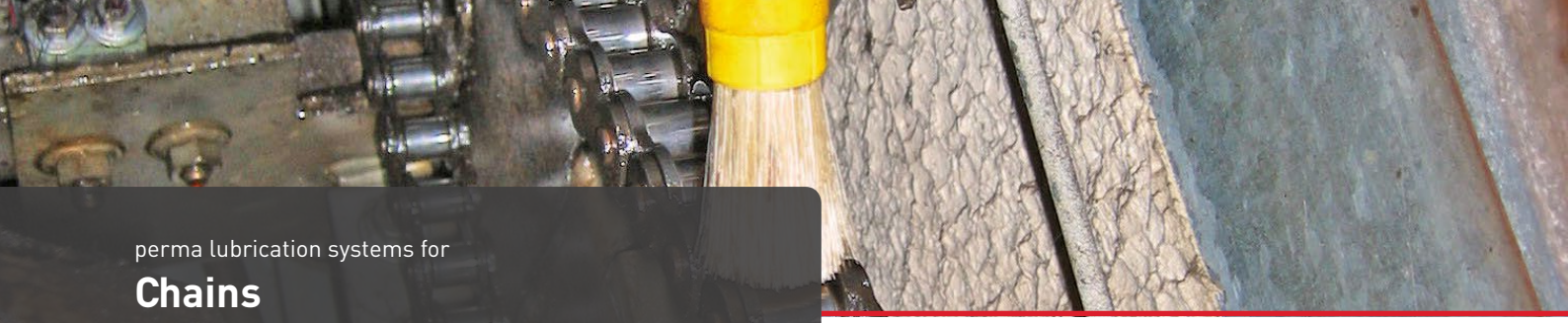


PRO LC 250
Art. No. go to page 71

PRO MP-6 Basic system (with Battery PRO B)
Art. No. 106919

Accessory kit PRO
Art. No. 106937

Protection box double
Art. No. 111153



perma lubrication systems for

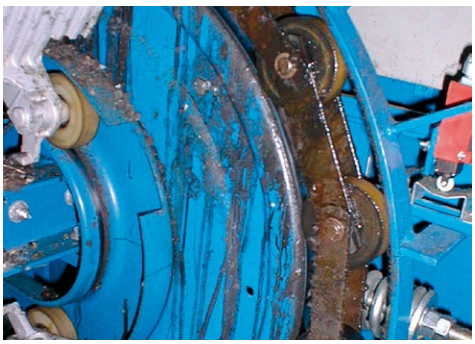
Chains

The primary aims of operators are equipment safety and availability. Plant servicing bears many challenges.

Integration of "intelligent" perma lubrication systems permits exact and individual lubrication of chains.

- → Elevators
- → Moving walkways
- → Escalators
- → Conveyors
- → Lifting stations

Lubrication points



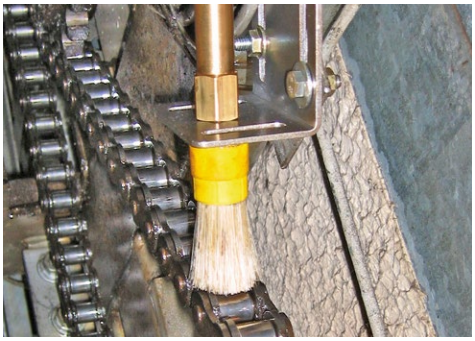
In oil lubrication it is extremely important to apply just the right amount of lubricant, because lubrication starvation can be just as bad as over-lubrication.

The following aspects must be considered:
Over-lubrication of chains can lead to **safety hazards**
- → **Slipping hazard** for persons in the direct vicinity of the lubrication point
- → **Contamination** of the environment

Lubrication starvation can lead to **severe attrition**
- → **Premature wear** of chain pins and rollers
- → Unpleasant **noise development**
- → **Uneven chain movement (jerking)**
- → Possible **equipment failure**

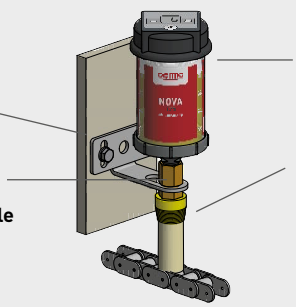
Access for equipment lubrication or cleaning is **not always** possible and/or desired
- → Additional night-time work and thus **increased costs**
- → **Emergency shutdown** of equipment required

The following single-point lubrication systems are suitable: perma CLASSIC / FUTURA / FLEX / NOVA / STAR



Bracket
Art. No. 104864

Insert for bracket G1/4 male x G1/4 female
Art. No. 104820



perma NOVA with LC 125
Art. No. go to page 71

Oil brush Ø20 mm G1/4 female
Art. No. 101396

When mounting perma CLASSIC or perma STAR, additionally use an oil retaining valve (go to page 82).

Advantages of automatic lubrication

- **Protection** against corrosion and contamination reduces wear and **increases chain service life**
- **Maintenance costs are minimised** as oil consumption is reduced by up to 75%
- perma lubrication systems are mounted in an easily accessible place and remote from moving parts, and **actively contribute to accident prevention**
- **Contamination** caused by over-lubrication is **avoided** hence **environmental impact is reduced**

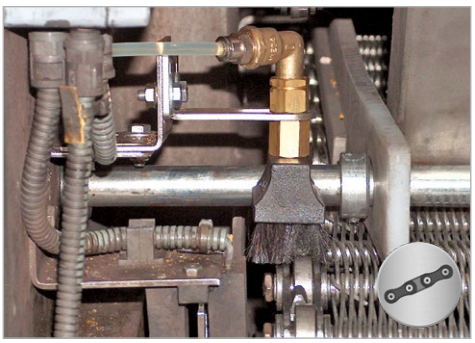
References

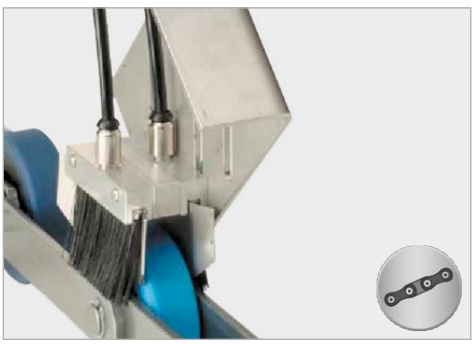
OTIS

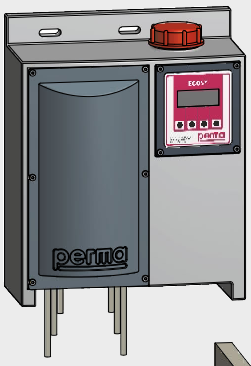
Solutions

Multi-point lubrication for up to 6 lubrication points

→ Up to 6 lubrication points can be supplied with an individual amount of oil independently of each other
→ Large tank volume allows long maintenance intervals and helps to reduce maintenance costs
→ For hard-to-reach lubrication points: Remote mounting <10 m grease line possible per lubrication point





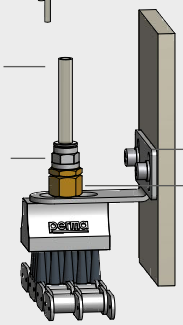


perma ECOSY
Art. No. 101700

Tube up to +100 °C oØ 6 x iØ 4 mm
Art. No. 101494

Tube connector G1/8 male for tube oØ 6 mm straight
Art. No. 101446

Oil brush 60 x 30 mm G1/4 female
Art. No. 101398

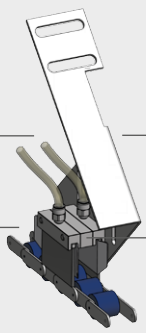


Bracket
Art. No. 104864

Oil retaining valve G1/4 male x G1/4 female
Art. No. 104862

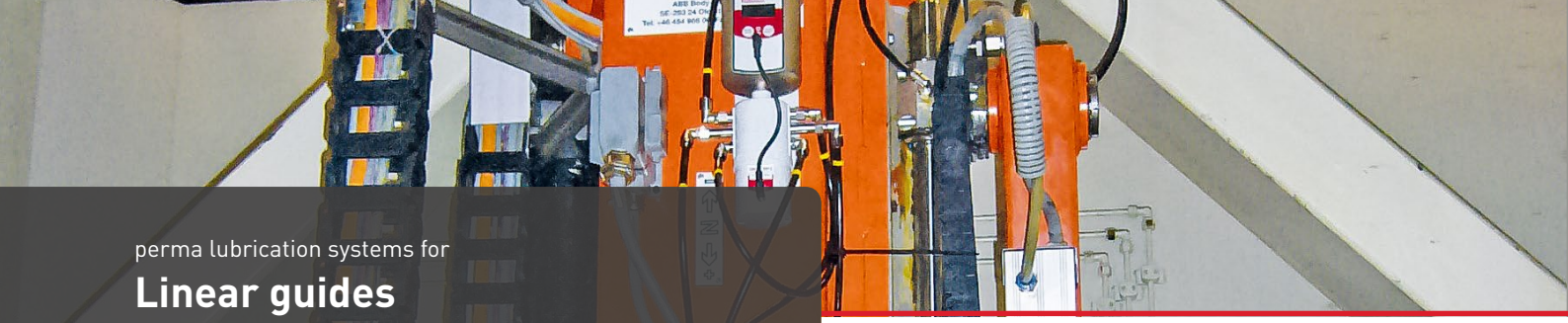
Tube oØ 6 mm x iØ 4 mm (PA)
Art. No. 101494

Special brush for large chains up to +80 °C with tapped bore M6
Art. No. 101524 + 101525



Mounting bracket left for special brush
Art. No. 101533

Spacer for special brush, width: 13 mm
Art. No. 101535



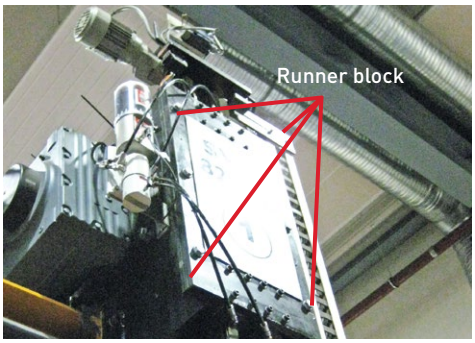
perma lubrication systems for

Linear guides

Linear guides are machine elements that enable the movement of machines or components in linear direction. These are available in the form of roller bearing guides (e.g. linear bearings, linear roller bearings or profile rails) or as sliding guides (e.g. dovetail guides or linear sliding guides). Linear guide drives are mainly screw drives, lifting gears or a combination of both.

- → Automotive industry
- → Conveying and warehouse technology
- → Food industry
- → Packaging industry
- → Machine tools

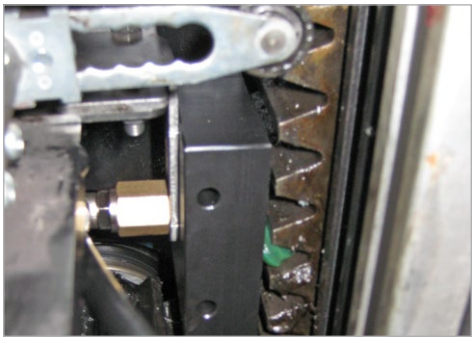
Lubrication points



Lubrication points are located on the **runner block** or on the **drive** (spindle and/or gear rack or belt).

A **continuous supply** of components with fresh lubricant is a basic requirement for achieving maximum service life.

Challenges



On account of the **special design** and diverse use of linear guide systems, lubrication points on these systems present a challenge for efficient and preventive maintenance.
Lubrication points can often only be accessed with assistive equipment. The consequences are neglected or insufficient lubrication of the components.

- → **Prevent equipment downtimes** through relubrication
- → **Workplace safety** must be ensured

Several lubrication points must be lubricated exactly according to **manufacturer specifications** while the equipment is running. Different lubrication points require different lubricant amounts. Improper lubrication can cause **equipment component failures** and reduce productivity and cost effectiveness.

- → Recirculating ball/roller guides: the internal distribution to the four raceways on the runner block requires **a specific minimum volume flow**
- → The **drive** (spindle and/or gear rack) often requires **more lubricant** than the runner blocks

Advantages of automatic lubrication

- The lubricant amount can be set differently for **each of the 6 outlets** according to the different manufacturers' specifications
- **Long exchange intervals** significantly **reduce maintenance expenditure** compared to manual lubrication
- perma lubrication systems can be mounted outside of dangerous areas and **actively contribute to accident prevention** and/or **risk minimisation**
- **Precise lubricant discharge prevents over-lubrication** and contributes to environmental protection

References

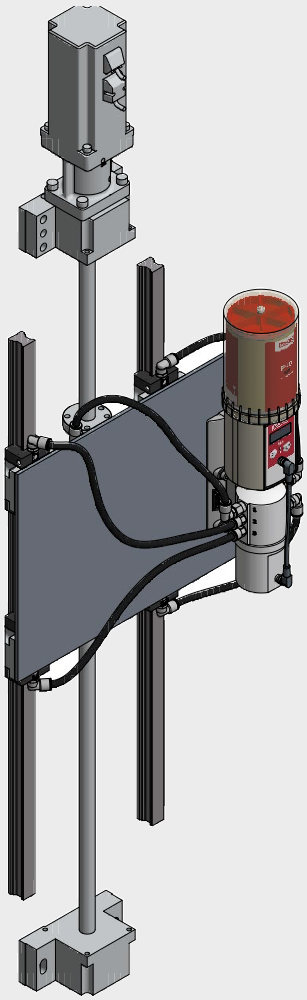
Rexroth
Bosch Group

Use of lubricants approved by the manufacturer.

Solutions

Special system for linear guides: perma PRO LINE / PRO C LINE

- → Different discharge amount can be set for each outlet: Number of pump strokes per discharge
- → Number of activated outlets can be selected freely: 1–6
- → Flexible setting of time between discharges: Setting of pauses in days (24 h) possible



Linear guide outlet assignment, e.g.:

Outlet 1: Spindle/gear rack
(= larger discharge quantity)
Outlet 2: Closed
Outlet 3: Runner 1
Outlet 4: Runner 2
Outlet 5: Runner 3
Outlet 6: Runner 4

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perma PRO LINE Basic system
battery operated
or
perma PRO C LINE Basic system
with external power supply

→ For product description, go to page 60/61

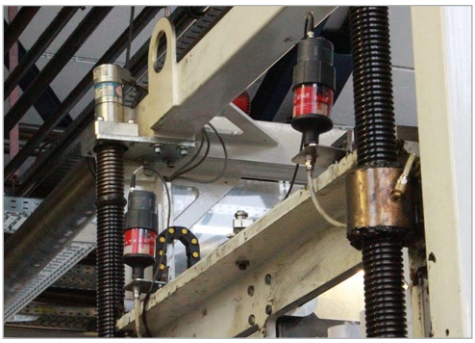
perma lubrication systems for

Spindles & open gears

The demand for ever higher transferable power and torques with simultaneous reduction in size and weight can often only be implemented with difficulty in practice. This makes it all the more important to implement effective lubrication, contributing to optimisation of a rack and pinion drive.

- → Automotive industry
- → Conveying and warehouse technology
- → Food industry
- → Packaging industry
- → Machine tools

Lubrication points



Relubrication is especially important for enhancing the service life and availability of gear ring drives. Right at the beginning of the bedding-in phase, care must be taken that the tooth flank surfaces are smooth.

During running operations, **graphite-containing adhesive lubricants** are generally employed, which withstand the **high loads** (mixed friction, loads, corrosion, aggressive impacts).

Challenges

In order to ensure relubrication occurs, a lubrication system with matching accessories for transferring the lubricant to the gear surface can be used. Permanent renewal of the lubricant film with subsequent lubricant transfer to additional gear wheel pairs helps to reduce wear in the long-term and increases gear wheel service life.

Large gear ring drives are used where heavy loads need to be moved, e.g. in rotary kilns and ball mills. Because of their occasionally considerable dimensions, the gear teeth on gear rings often cannot be effectively protected against environmental impacts.

Open gear ring and spindle drives are often used in contact with dirt, abrasive cement and coal dust, which accelerates wear and corrosion.

- → **Dust, liquids and contamination**
- → **Environmental impacts**
- → **Oscillations and vibrations**
- → **High temperatures**

Advantages of automatic lubrication

- Permanent operational lubrication **extends the service life of gear ring drives**
- Lubrication of tooth flanks **reduces friction and protects against wear**
- Easy transfer of lubricant to tooth surfaces with **extensive accessories**
- **Contamination** caused by over-lubrication is **prevented** and **environmental impact is reduced**

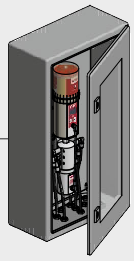
Solutions

Automatic lubrication with perma lubrication systems

→ Lubrication systems available in varying sizes
→ Simple mounting directly at the lubrication point
→ The right lubricant can be selected for every lubrication point

Protection box single
Art. No. 101527

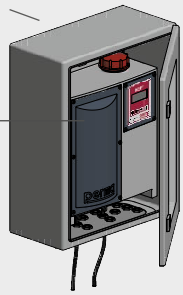
perma PRO MP-6/ perma PRO LINE
Go to page 72 et seq.



Protection box double
Art. No. 111153

perma ECOSY
Art. No. 101700

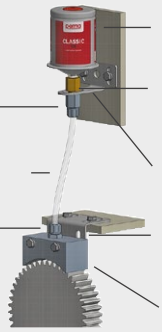
Accessories
Go to page 73 et seq.



Tube connector for perma G1/4 female
Art. No. 101390

Tube oØ 8 mm x iØ 6 mm (PA)
Art. No. 101393

Tube connector G1/4 male
Art. No. 101391



perma CLASSIC
Art. No. go to page 70

Insert for bracket G1/4 male x G1/4 female
Art. No. 104820

Bracket
Art. No. 104864

Mounting angle 50 x 70 x 70 x 2.5 mm
Art. No. 101430

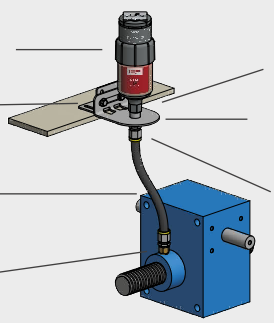
Lubrication pocket for gear lubrication
Art. No. on request

perma STAR VARIO with LC 120
Art. No. go to page 72

Mounting angle 50 x 70 x 70 x 2.5 mm
Art. No. 101430

Heavy Duty hose with NBR lining and fabric insert
Art. No. 101555

Reducer
Art. No. go to page 79



Support flange STAR Gen 2.0
Art. No. 109420

Mounting bracket STAR Standard Duty 1-point G1/4 female
Art. No. 109663

Hose connector G1/4 male
Art. No. 101554

Determination of mounting type

1.1 **Industries** 8–17

- Gypsum, lime & cement plants
- Quarrying industry
- Sewage treatment plants
- Recycling industry
- Pulp & paper industry
- Mining & heavy industry

1.2 **Applications** 18–27

- Conveyors
- Electric motors
- Pumps
- Blowers & fans

1.3 **Machine elements** 28–37

- Roller & sliding bearings
- Chains
- Linear guides
- Spindles & open gears

STEP 2

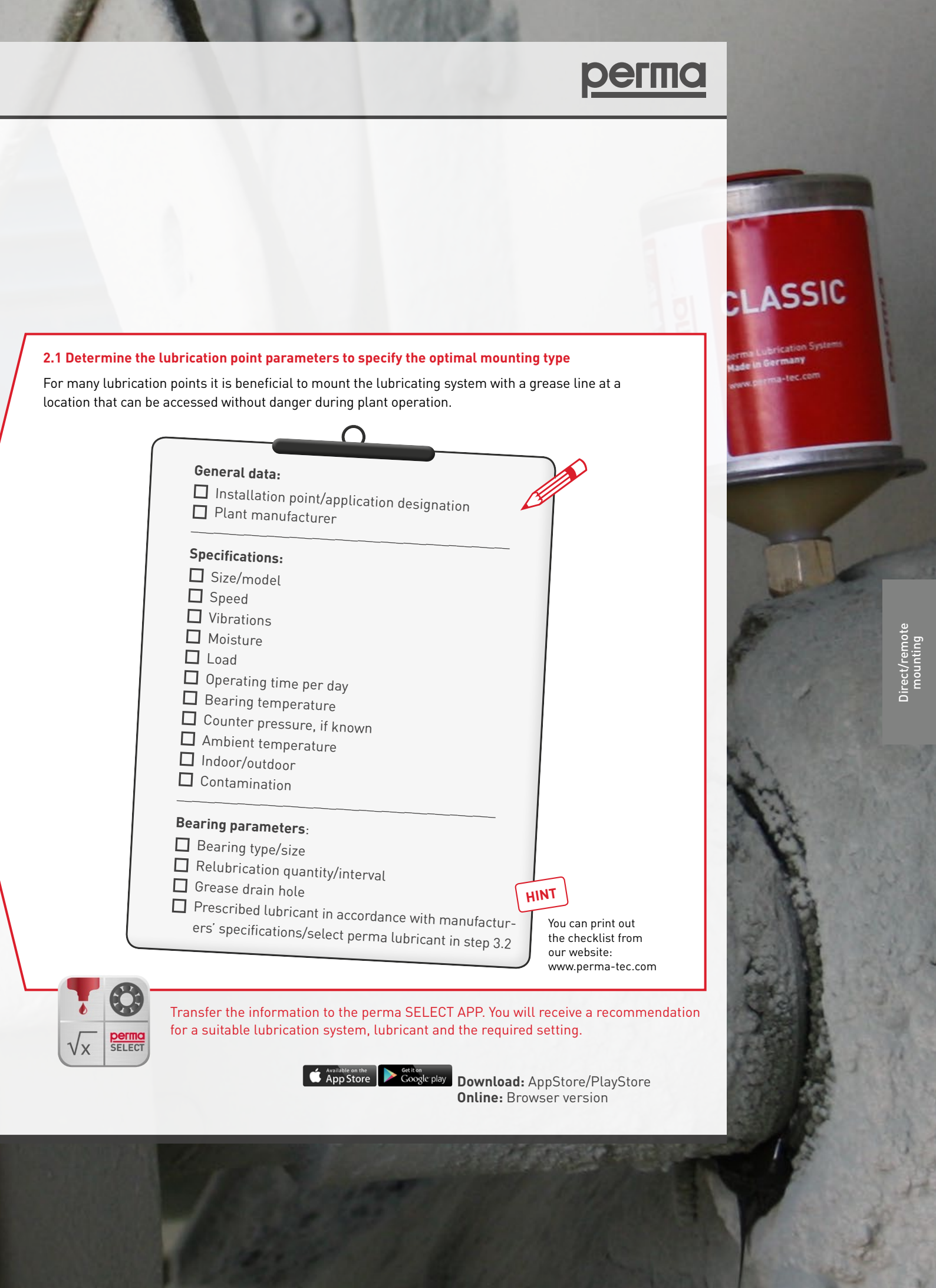
Determination of mounting type

3.1 **perma lubrication systems** 42–63

- Functioning of automatic lubrication
- Comparison: Independent lubrication systems/ lubrication systems with external power supply
- Single-point lubrication systems
- Multi-point lubrication systems

3.2 **perma lubricants** 64–65

- Oils
- Greases up to NLGI 2



2.1 Determine the lubrication point parameters to specify the optimal mounting type

For many lubrication points it is beneficial to mount the lubricating system with a grease line at a location that can be accessed without danger during plant operation.

General data:

- ☐ Installation point/application designation
- ☐ Plant manufacturer

Specifications:

- ☐ Size/model
- ☐ Speed
- ☐ Vibrations
- ☐ Moisture
- ☐ Load
- ☐ Operating time per day
- ☐ Bearing temperature
- ☐ Counter pressure, if known
- ☐ Ambient temperature
- ☐ Indoor/outdoor
- ☐ Contamination

Bearing parameters:

- ☐ Bearing type/size
- ☐ Relubrication quantity/interval
- ☐ Grease drain hole
- ☐ Prescribed lubricant in accordance with manufacturers' specifications/select perma lubricant in step 3.2

HINT

You can print out the checklist from our website: www.perma-tec.com

Transfer the information to the perma SELECT APP. You will receive a recommendation for a suitable lubrication system, lubricant and the required setting.

Available on the App Store · Get it on Google play

Download: AppStore/PlayStore
Online: Browser version

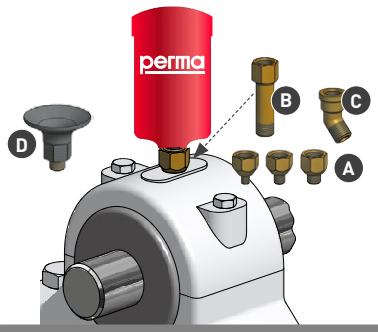
Determination of mounting type

2.2 Decide which mounting type is suitable

If you answer any of the questions with YES, we recommend remote mounting:

NO

INSTALLATION KITS Direct mounting



Contents for all INSTALLATION KITS	
A	1 x Reducer G1/8 male x G1/4 female 1 x Reducer M6 male x G1/4 female 1 x Reducer M8x1 male x G1/4 female 1 x Reducer M10x1 male x G1/4 female
B	1 x Extension G1/4 male x G1/4 female – 45 mm
C	1 x Angle 45° G1/4 male x G1/4 female
D	1 x Support flange STAR Gen 2.0 G1/4 male x G1/4 female (only with Art. No. 101477)

INSTALLATION KIT CLASSIC, FUTURA, FLEX, NOVA
Direct Mounting
Art. No. 101476

INSTALLATION KIT STAR
Direct Mounting
Art. No. 101477

Order lubrication system separately!
Use extensions, angles & reducers depending on the installation situation

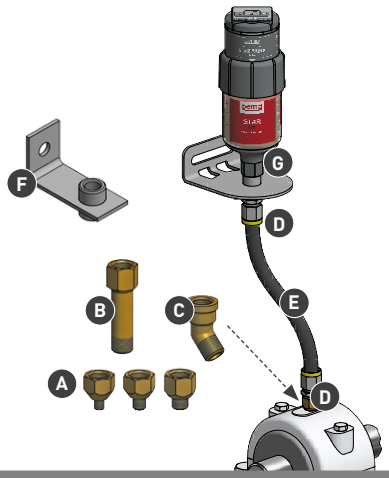
For varying installation situations you can find additional accessories such as angles, reducers, etc. starting on page 78.

Determine the thread size at the lubrication point
perma Fitting thread tester, Art. No. 110374

- → Is it difficult or dangerous to reach the lubrication point **during plant operation**?
- → Is the lubrication point subject to **strong vibrations** or **high temperatures** which may impair or damage the lubrication system?
- → Is **access permission** required to reach lubrication points in secured areas or at great heights?
- → Is the lubrication point exposed to the following:
  Large amounts of water, pumped media, production process media or impact by solid substances?

YES

INSTALLATION KITS remote mounting with grease line



Contents for all INSTALLATION KITS	
A	1 x Reducer G1/8 male x G1/4 female 1 x Reducer M6 male x G1/4 female 1 x Reducer M8x1 male x G1/4 female 1 x Reducer M10x1 male x G1/4 female
B	1 x Extension G1/4 male x G1/4 female – 45 mm
C	1 x Angle 45° G1/4 male x G1/4 female
D	2 x Hose connector G1/4 male for tube iØ9.5 mm (zinc-plated steel)
E	Heavy Duty hose up to +100 °C oØ 16 mm x iØ 9.5 mm
F	1 x Mounting bracket G1/4 female single
G	1 x Support flange STAR Gen 2.0 G1/4 male x G1/4 female (only with Art. No. 101482)

INSTALLATION KIT CLASSIC, FUTURA, FLEX, NOVA
incl. 1.5 m hose
Art. No. 101481

INSTALLATION KIT STAR
incl. 3.0 m hose
Art. No. 101482

Order lubrication system separately!
Use extensions, angles & reducers depending on the installation situation

The following lubrication systems are always installed with grease line:

perma PRO/PRO C
perma PRO LINE/PRO C LINE
→ Accessory KIT PRO go to page 72

perma ECOSY
→ Accessories go to page 73

Selecting the lubrication system

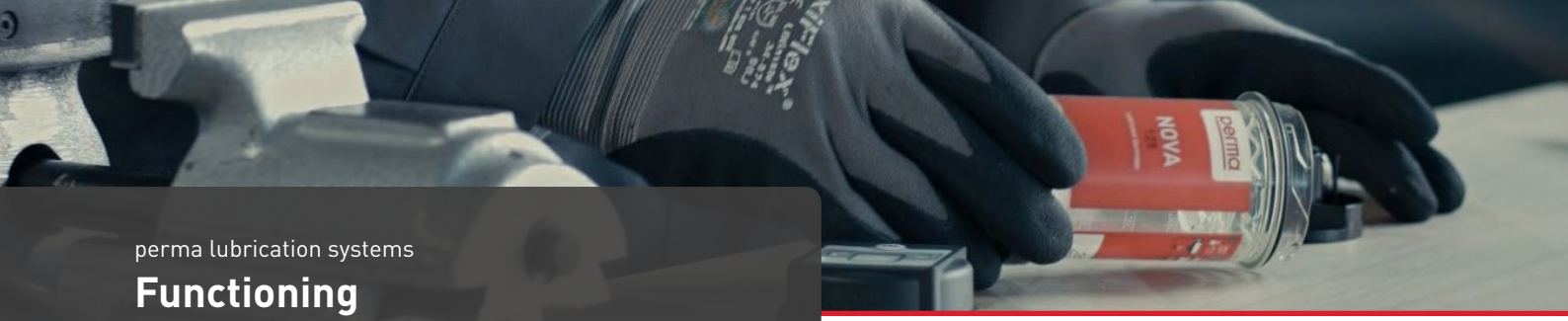
Overview of all perma lubrication systems & standard lubricants

Manual relubrication is work- and time-intensive and is often impractical in practice. This quickly leads to the lubricant in the bearings ageing rapidly or the lubricant falling to an excessively low level. The bearings are then subject to greater wear or fail completely.

By using automatic lubrication systems the necessary lubricant is discharged at the lubrication point in sufficient quantity and optimal quality. This ensures that no mixing of lubricants occurs, because only the lubricant in the lubrication system is introduced into the lubrication point.

Single-point lubrication systems

Multi-point lubrication systems



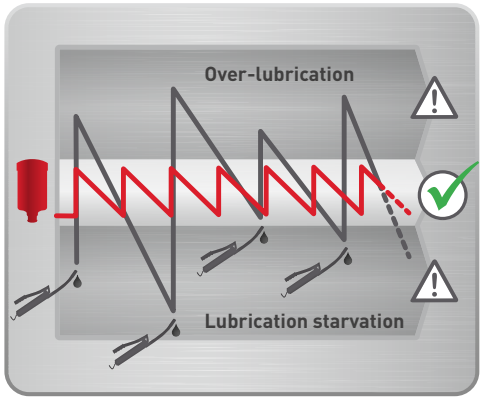
perma lubrication systems

Functioning

Today, anyone looking for safe, effective and long-term economical lubrication of equipment takes advantage of automatic lubrication. perma offers an optimal solution for any lubrication point in terms of technology, economy, and workplace safety aspects.

HINT

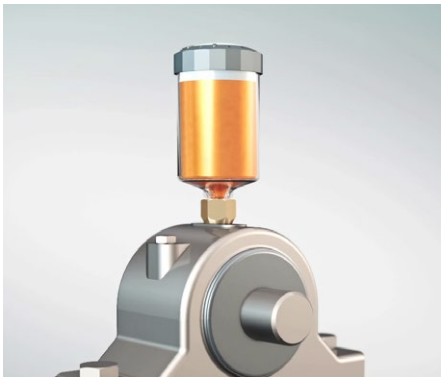
Continuous relubrication



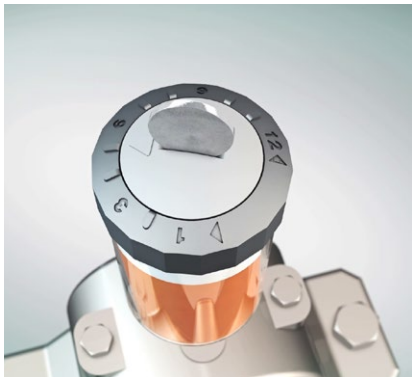
The service life of roller and sliding bearings can be considerably extended by applying a selected lubricant to the lubrication point at short intervals and in the correct quantity. In manual lubrication using a grease gun, lubrication intervals generally cannot be adhered to due to the lack of capacity, which often leads to premature wear or bearing failure.

Automatic lubrication systems continuously discharge small quantities of lubricant into the lubrication point over a predefined discharge period. This ensures that the correct amount of lubricant is replaced in the bearing.

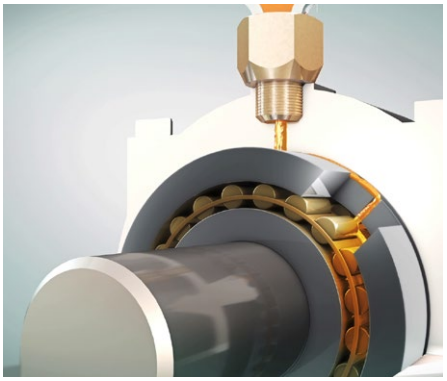
Mode of functioning of automatic lubrication systems



perma lubrication systems can be easily attached to any lubrication point.



The quantity is regulated in the discharge time settings.



Once the system is activated fresh lubricant is discharged uniformly into the lubrication point.

Independent lubrication systems

Self-sufficient systems can be used at any location and are **immediately ready for use**. The systems are driven by an electro-chemical reaction or an electromechanical drive with battery. These systems can be installed quickly and easily.

perma CLASSIC / perma FUTURA

perma FLEX

perma NOVA

perma STAR VARIO

perma PRO MP-6 / perma PRO LINE

Precise lubrication systems with external power supply

Automatic lubrication systems with **external power supply** allow time- or distance-based lubrication. By coupling with a higher-level machine controller, signals from the lubrication system's operating status can be analysed.

perma STAR CONTROL

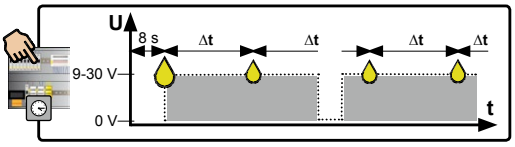
perma PRO C MP-6 / perma PRO C LINE

perma ECOSY

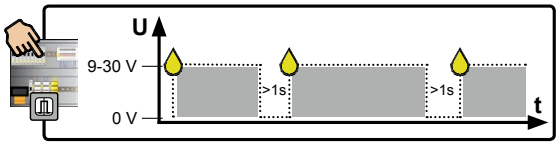
Signalling
- → Operating status
- → Errors
- → Lubricant empty/ refill/replace LC (= lubricant cartridge)

In addition for impulse control:
- → Time of impulses
- → Number of impulses

Time control – In case of external power supply, the lubrication system discharges the predefined amount per operating hour (0h) independently. The required discharge amount setting is made via the lubrication system.



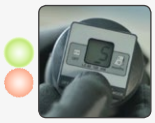
Impulse control – In case of external power supply, the lubrication system carries out a single lubrication impulse. The time at which discharge occurs can be programmed via the PLC. The discharge amount per impulse is either pre-set (PRO C/ECOSY) or can be selected (STAR CONTROL/ PRO C LINE).



Lubrication systems with remote servicing

perma NET is a network, which is monitored and configurable online, consisting of up to 100 multi-point lubrication systems. The discharge behaviour can be defined individually for each lubrication point and be modified if required.
Your perma contact will support you in project planning and configuration.
We are happy to advise you.

Overview of single-point lubrication systems

	perma CLASSIC / perma FUTURA → Page 48/49	perma FLEX → Page 50/51	perma NOVA → Page 52/53	perma STAR VARIO → Page 54/55	perma STAR CONTROL → Page 56/57
					
Specifications					
SET	**Activator** 	**Rotary switch**  Complete system	**Push button + LCD display**  Reusable NOVA Control unit	**Push button + LCD display + LED signals red/green**  Reusable STAR VARIO Drive	**Push button + LCD display + LED signals red/green**  Reusable STAR CONTROL Drive
°C	**0 to +40 °C**	**-20 to +60 °C**		**-10 to +60 °C**	**-20 to +60 °C**
	max. 4 bar	**max. 5 bar**	**max. 6 bar**	**6 bar**	
cm³	**120 cm³**	**60, 125 cm³**	**65, 125 cm³**	**60, 120, 250 cm³**	
	Electrochemical			**Electromechanical Battery pack STAR VARIO**	**Electromechanical 9–30 V DC**
	Tamper-proof	**Discharge period can be altered at any time/system can be shut down**			
	1, 3, 6, 12 months at +20 °C/ perma Multipurpose grease SF01	**1, 2, 3 ... 12 months** at +20 °C/ perma Multipurpose grease SF01	**1, 2, 3 ... 12 months** independent of operating temperature	**1, 2, 3 ... 12 months** independent of operating temperature and counter pressure	-
	-				**1, 2, 3 ... 12 months** independent of operating temperature and counter pressure
	-				**0.1–9.5 cm³ per impulse** independent of operating temperature and counter pressure
		IP 68	**IP 65**	**IP 65**	
	CE Ex	CE Ex IECEx FM APPROVED TIIS	CE Ex IECEx ANZEx	CE cULus LISTED	CE
Special operating conditions					
	Minor vibration at the lubrication point	**Minor to moderate vibration**		**Minor to heavy vibration**	
		Remote mounting of lubrication system with grease line allows connection to lubrication points with minor to heavy vibrations.			
	<1 meter grease line → Go to page 76	**<2 meters grease line** → Go to page 76		**<5 meters grease line** → Go to page 76	

Overview of multi-point lubrication systems

	perma PRO MP-6 → Page 58/59	perma PRO C MP-6 → Page 58/59	perma PRO LINE → Page 60/61	perma PRO C LINE → Page 60/61	perma ECOSY → Page 62/63
					
Specifications					
SET	**Push button + LCD display + LED signals red/green**  PRO Drive & Distributor MP-6 Reusable				**Push button + LCD display**  perma ECOSY Refillable
°C	**-20 to +60 °C**				
	max. 25 bar				**max. 10 bar**
cm³	**250, 500 cm³ (greases up to NLGI 2)**				**7 litres (oils)**
	Electromechanical				**Electromechanical 24 V DC/85–240 V AC**
	Battery PRO B	**15–30 V DC**	**Battery PRO B**	**15–30 V DC**	
	Discharge period can be altered at any time / system can be shut down				
	1 day to 24 months Number of outlets selectable		**Individual discharge quantity Number of outlets selectable**		-
	1 day to 24 months (LC 250) 1 day to 12 months (LC 500)	**1 day to 24 months** (Depending on operating hours)	**1 to 99 days pause period 1 to 9 discharge strokes** (Depending on operating hours)		0 to 9.999 ml per **1,000 operating hours**
	Discharge quantity 1.0 cm³ per impulse/outlet Same discharge quantity per outlet → Max. 6 lubrication points		**Discharge quantity 0.5 to 4.5 cm³ per impulse/outlet** Individual discharge quantity per outlet → Max. 6 lubrication points		**Discharge quantity 0.5 cm³ per impulse/outlet Individual discharge quantity per outlet** → Max. 6 lubrication points
	IP 54		**IP 54**		
	cULus CE	CE	CE	CE	CE
Special operating conditions					
	Minor to heavy vibration Remote lubrication system mounting with grease line allows deployment at lubrication points with minor to heavy vibrations				
	<5 meters grease line → Go to page 76				**<10 meters grease line** → Go to page 76

perma CLASSIC / perma FUTURA

The classical lubrication system

I M2 c X
II 2G c IIC T6 X
II 2D c T80°C X
0 °C ≤ Ta ≤ +40 °C

Made in Germany

Simple, robust, reliable

perma CLASSIC and perma FUTURA can be used in all types of applications with ambient temperatures from 0 to +40 °C. Depending on operating conditions, a lubricant volume of 120 cm³ is dispensed in 1, 3, 6 or 12 months. Reliable function is based on an electro-chemical reaction. The activator is screwed in the lubrication system and the eyelet torn off. The contained gas generator generates a pressure of max. 4 bar, which moves the piston forward and transports lubricant into the lubrication point.

Applications / machine elements

perma CLASSIC and perma FUTURA are used for single-point lubrication of roller and sliding bearings, sliding guides, open gears, gear racks, spindles, shaft seals, chains, etc. Main application areas of perma CLASSIC include the mining, steel, automotive and mechanical engineering industries. perma FUTURA has a corrosion-proof plastic housing, which makes it ideal for hygienically clean environments such as the food and chemical industries.

Product characteristics — Benefits

Simple activation through activator

One-time activation:
1, 3, 6 or 12 months

- → Tamper-proof, easy to use
- → Economical, permanent lubrication
- → Quick and easy exchange without special tools

perma CLASSIC
Metal housing

perma FUTURA
Transparent plastic housing with integrated support flange

- → Robust housing for use in harsh environments
- → Easy fill level check via permanently visible position of piston in lubrication system
- → Corrosion-proof

Ex-proof certification
Mining approval

- → Safe and reliable lubrication in explosive areas
- → Better workplace safety, since dangerous areas have to be visited for maintenance less often
- → Suitable for underground use

Technical data

→ Refer to page 70 for part numbers

Drive
Electrochemical reaction via gas generator

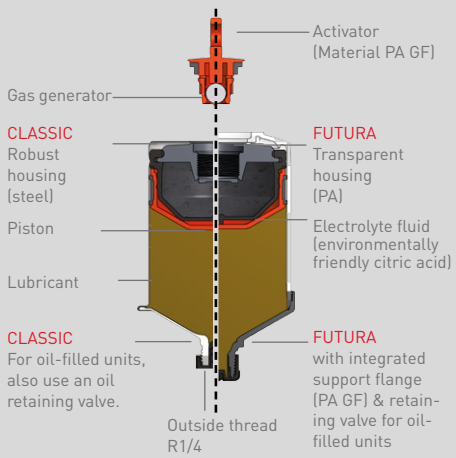
Discharge period at +20 °C/ perma Multipurpose grease SF01
1, 3, 6 or 12 months

Lubricant volume
120 cm³

Operating temperature
0 °C to +40 °C

Pressure build-up
Max. 4 bar

Standard & special lubricants
Greases up to NLGI 2/oils



Dimensions
Ø 70 x 99 mm

Dimensions
Ø 67 x 111 mm

Discharge period in months:

120 cm³	101331	101332	101333	101335
at 0 °C	4	8	15	>18
at +10 °C	2	5	8	18
at +20 °C	1	3	6	12
at +30 °C	0.8	2	3	6
at +40 °C	0.6	1	2	3

Go to page 69 to select a suitable activator.

perma FLEX

The flexible lubrication system in two compact sizes

II 1G Ex ia IIC T6
II 1D Ex iaD 20 T85°C
I M1 Ex ia I

TIIS

Made in Germany

Flexible use – even on lubrication points with challenging requirements

perma FLEX is a compact, ready-to-use lubrication system supplied as a complete unit. It can be used in various types of applications at temperatures ranging from -20 °C to +60 °C. Discharge period setting is freely adjustable from 1 to 12 months.The required pressure is developed via an electronically controlled chemical reaction. The lubrication point is continuously supplied with fresh lubricant throughout the selected discharge period. perma FLEX is available in sizes 60 cm^3 and 125 cm^3.

Applications / machine elements

perma FLEX is suitable for single-point lubrication in all types of applications. It fulfils the requirements of IP 68 (ingress of water/contamination) and functions reliably in extremely dusty and moist environments. It can furthermore be used at various temperatures, also outdoors. Discharge can be suspended if required. The discharge period can also be adjusted after activation.

Product characteristics

Benefits

All-in-one system with rotary switch for discharge period setting:
1, 2, 3 ... 12 months

- → System is supplied fully mounted and is ready to use immediately
- → Easy setting and activation using rotary switch
- → Discharge period can be regulated from 1–12 months in monthly steps

System operates reliably from -20 °C to +60 °C

- → Flexible use in various temperature ranges
- → Year-round outdoor use possible

Ex-proof certification
FM approval
IP 68

- → Safe and reliable lubrication in explosive areas
- → Can be used in very moist and dusty environments
- → Increased workplace safety

Technical data

→ Refer to page 70 for part numbers

Drive
Electrochemical reaction via gas generating unit

Discharge period at +20 °C/ perma Multipurpose grease SF01
1, 2, 3 ... 12 months

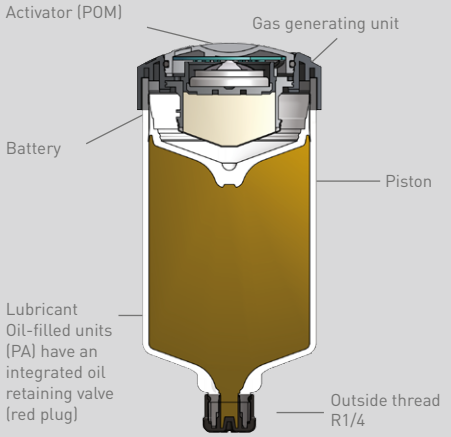
Lubricant volume
60 cm³ or 125 cm³

Operating temperature
-20 °C to +60 °C

Pressure build-up
Max. 5 bar

Protection class
IP 68

Standard & special lubricants
Greases up to NLGI 2/oils



Dimensions
FLEX 60: Ø 58 x 86.5 mm
FLEX 125: Ø 58 x 117 mm

Discharge period setting in months:

Reference values for emptying without counter pressure using NLGI 2 lubricant.

Grease residues possible at temperatures >+40 °C and discharge periods >6 months.

		1	3	6	9	12
at	-20 °C	2	5	10	13	15
at	0 °C	1.3	3.8	7.2	11	13
at	**+20 °C**	**1**	**3**	**6**	**9**	**12**
at	+40 °C	0.8	2.5	5.2	7.5	10
at	+60 °C	0.6	2	4	-	-

perma NOVA

The first temperature-independent, electrochemical lubrication system

I M1 Ex ia I Ma
II 2G Ex ia IIC T4 Gb
II 2D Ex ia IIIC T135°C Db
ZELM 09 ATEX 0420 X
-20 °C ≤ Ta ≤ +60 °C

ANZEx

Made in Germany

For application areas with high temperature fluctuations

perma NOVA can be used in all application areas between -20 °C and +60 °C. A discharge period from 1 to 12 months can be entered via the setting button on the NOVA Control unit. Taking into account the ambient temperature, the control unit then calculates the required quantity of gas for constant and reliable discharge. perma NOVA consists of a reusable control unit, a NOVA LC filled with grease or oil and a protective cover. NOVA LC is available in sizes of 65 cm^3 and 125 cm^3.

Applications / machine elements

perma NOVA was specifically developed for single-point lubrication of roller and sliding bearings, sliding guides, open gears, gear racks, shaft seals and chains located in areas with considerable temperature variations (e.g. outside installations).
The lubrication system is protected against dust and water jets, subject to correct assembly of the individual parts (IP 65).
perma NOVA with LC 65 cm³ is ideal for the lubrication of electric motors.



Product characteristics — Benefits

Electronic control unit with temperature compensation shows discharge period/operating status

LCD display and push button setting: 1, 2, 3 ... 12 months

- → Discharge period setting independent of ambient temperature
- → Accelerated pressure build-up for first discharge within one day
- → Simple and safe handling
- → Reusable NOVA Control unit

System operates reliably from -20 °C to +60 °C

- → Universal use both in cold areas and at higher temperatures
- → Temperature compensation permits use with heavily fluctuating ambient temperatures
- → Stable threaded connection through integrated support flange

Ex-proof certification IP 65

- → Safe and reliable lubrication in explosive areas
- → Dust-tight and protected against water jets
- → Increased workplace safety

Technical data

→ Refer to page 71 for part numbers

Drive – reusable
Electrochemical reaction via gas generating cells with electronic temperature compensation

Discharge period
1, 2, 3 ... 12 months

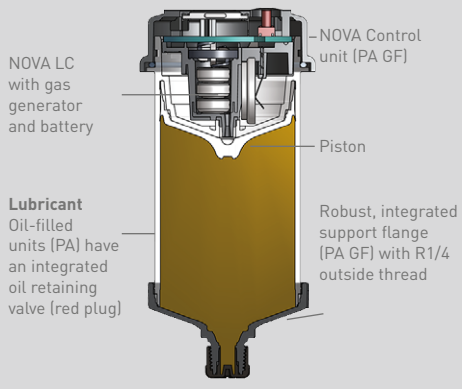
Lubricant volume
65 cm³ or 125 cm³

Operating temperature
-20 °C to +60 °C

Pressure build-up
Max. 6 bar

Protection class
IP 65

Standard & special lubricants
Greases up to NLGI 2/oils



Dimensions
LC 65: Ø 65 x 101 mm
LC 125: Ø 65 x 132 mm

perma STAR VARIO

High-precision and easy-to-use lubrication system –
independent of temperature and counter pressure

CE cULus LISTED Made in Germany

Three different sizes for individual lubricant metering

perma STAR VARIO operates fully automatically, independent of temperature and pressure as well as offering a very precise discharge. The system consists of an electromechanical drive, an LC with 60, 120 or 250 cm³ of lubricant and a battery pack. The desired discharge period and LC size can easily be selected with the setting button and are immediately visible in the LCD. The current operating status is indicated on the LCD and via LED signal lights (red/green) visible all round. The LED signals are also recognisable from a distance.

perma

Applications / machine elements

perma STAR VARIO is used for single-point lubrication of roller and sliding bearings, sliding guides, open gears, gear racks, spindles, shaft seals and chains. Thanks to precise lubricant metering, perma STAR VARIO is ideal for lubrication of electric motors with specified lubricant quantities.perma STAR VARIO is protected against dust and water jets, subject to correct assembly of the individual parts (IP 65).



Product characteristics — Benefits

LCD display with setting button
displays discharge period, LC size and operating status

Setting:
1, 2, 3 ... 12 months and LC size

- → Simple and self-explanatory operation
- → Precise settings according to requirements prevent lubrication starvation and over-lubrication
- → Settings can be changed at any time
- → Can be turned off for extended equipment shut downs

Electromechanical, reusable drive with battery pack

LED (red/green) visible all round
signals functioning and any errors

- → Reliable, precise lubricant discharge independent of temperature and counter pressure
- → One-time acquisition costs for STAR VARIO Drive
- → Quick function control via LED signals saves time and relieves maintenance workers

Pressure build-up to 6 bar allows remote mounting up to 5 m

Counter pressure testing and manual additional discharge at the press of a button (purge)

- → Installation outside of dangerous areas or at easy-to-reach places increases workplace safety and saves time
- → Higher equipment availability, since exchange during running operation possible
- → Lubrication point can be purged to clear blockages

Technical data

→ Refer to page 71 for part numbers

Drive – reusable
Electromechanical function using Battery pack STAR VARIO

Discharge period
1, 2, 3 ... 12 months

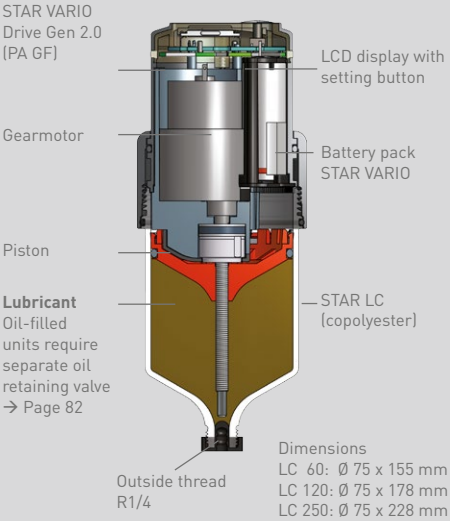
Lubricant volume
60 cm³, 120 cm³ or 250 cm³

Operating temperature
-10 °C to +60 °C

Pressure build-up
6 bar

Protection class
IP 65

Standard & special lubricants
Greases up to NLGI 2/oils



perma STAR CONTROL

TIME and IMPULSE mode combined in a single system

CE Made in Germany

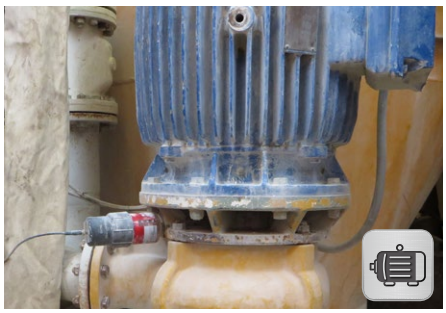
Lubricant optimally metered as a function of operating hours or by impulses

In contrast to the perma STAR VARIO (with battery pack), the perma STAR CONTROL is supplied with external power via cable. In addition, the operating status can be transmitted to a PLC via this connection. The two integrated operating modes TIME and IMPULSE allow flexible use. In the TIME mode, lubricant dispensing is dependent on operating hours. In the IMPULSE mode, a precisely defined quantity is dispensed as soon as a voltage is applied. The perma STAR CONTROL consists of an electromechanical drive and an LC with 60, 120 or 250 cm³ of lubricant. The required mode is set on the drive. Lubrication is precise, temperature-independent and with up to 6 bar counter pressure.

perma

Applications / machine elements

The perma STAR CONTROL is used to lubricate roller and sliding bearings, sliding guides, open gears, gear racks, spindles, shaft seals and chains. Thanks to precise lubricant metering, perma STAR CONTROL is ideally suited for lubrication of electric motors with specified lubricant quantities. The system is protected against dust and water jets, subject to correct assembly of the individual parts (IP 65).



Product characteristics | Benefits

LCD display with setting button shows discharge settings, LC size and operating status

Setting:
Mode, LC size, discharge quantity and PIN

- → Flexible handling thanks to simple TIME or IMPULSE mode setting; can be changed at any time
- → Fast, simple control of settings, the remaining impulses or operating hours until exchange
- → PIN request protects against possible tampering

Electromechanical drive with external power supply

LED (red/green) visible all round signals functioning and any errors

- → Reliable, precise lubricant discharge independent of temperature and counter pressure
- → Quick function control thanks to optical or electronic signals on the lubrication system and plant error reporting system saves time and relieves maintenance workers

6 bar pressure build-up allows remote mounting

Counter pressure testing and manual additional discharge at the press of a button (purge)

- → Mounting up to 5 m outside of dangerous areas or at easily accessible locations increases workplace safety
- → Higher equipment availability, because exchange can take place during running operations
- → Lubrication point can be purged to clear blockages

Technical data

→ Refer to page 71 for part numbers

Drive – reusable
Electromechanical function using external voltage: 9–30 V DC, Imax 0.5 A

Discharge period
Time-controlled (TIME)
Impulse-controlled (IMPULSE)

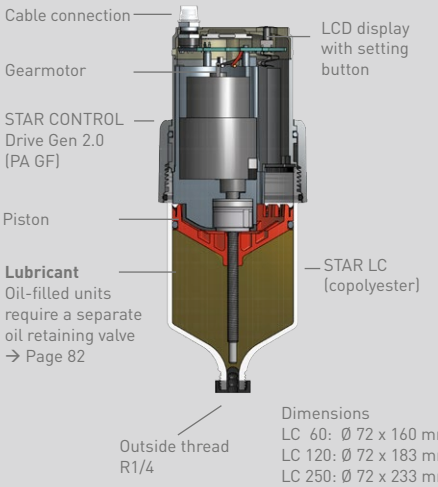
Lubricant volume
60 cm³, 120 cm³ or 250 cm³

Operating temperature
-20 °C to +60 °C

Pressure build-up
6 bar

Protection class
IP 65

Standard & special lubricants
Greases up to NLGI 2/oils



perma PRO MP-6 / PRO C MP-6

The precise multi-point lubrication system for up to 6 lubrication points

c UL us LISTED

CE Made in Germany

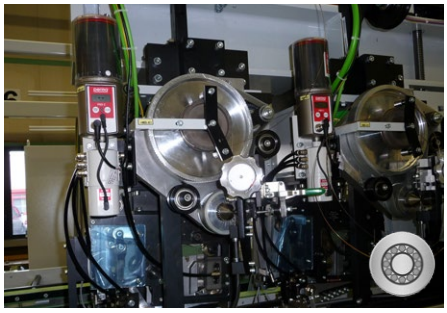
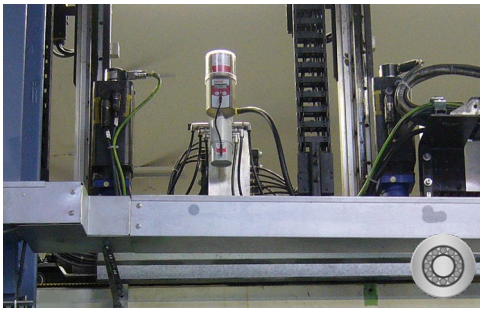
Precise lubricant supply even under extreme conditions

The perma PRO MP-6 is available as a self-sufficient, battery operated multi-point lubrication system or as perma PRO C MP-6 with external power supply (PLC or machine controlled). Depending on the discharge period, from 1 day to 24 months, 250 or 500 cm³ of lubricant are dispensed from a maximum of six outlets into the lubrication points. Thanks to the maximum pressure build-up of 25 bar in the MP-6 distributor, the lubricant is uniformly and precisely distributed using up to 5 m of grease line per outlet.

perma

Applications / machine elements

perma PRO MP-6 and perma PRO C MP-6 multi-point lubrication system applications include roller and sliding bearings, linear guides, open gears, spindles as well as shaft seals on motors, generators, pumps and fans. The types of applications range from the automotive industry and combined heat and power stations, through the paper industry and mining, and on to various steel industry sectors.


Product characteristics — Benefits

Setting via push button with display and LED

Outlet display
LED red/green = function

- → Easy configuration of discharge period and outlets
- → Display of remaining volume and active outlets
- → Status control on display
- → Easy to set and change at any time

Pressure build-up to 25 bar allows remote mounting up to 5 m per outlet

Additional discharge (purge)

- → Installation outside of dangerous areas or at easy-to-reach places increases workplace safety and saves time
- → Higher equipment availability, since exchange during running operation possible
- → Lubrication point can be purged to clear blockages

MP-6 distributor with 6 outlets – Number of active outlets can be user-defined

- → Supply of 1 to 6 lubrication points with same lubricant amount
- → Precise supply of lubrication points
- → Monitoring of lubrication point status

Technical data

→ Refer to page 72 for part numbers

Drive – reusable
PRO MP-6: Battery operation
PRO C MP-6: External power supply 15–30 V | 120 mA

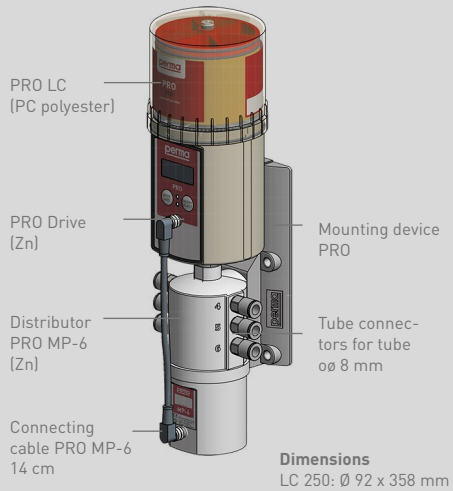
Discharge periods
1 day to 24 months

Lubricant volume
250 cm³ or 500 cm³

Operating temperature
-20 °C to +60 °C

Pressure build-up
Max. 25 bar
Mounting with <5 m grease line per outlet

Standard & special lubricants
Greases up to NLGI 2



Dimensions
LC 250: Ø 92 x 358 mm
LC 500: Ø 92 x 408 mm

Create your perma PRO system in 3 steps:

1. **perma PRO Basic system**
   battery operated

   or

   perma PRO C Basic system
   with external power supply
2. **Accessory kit PRO**
3. **PRO LC and Cover**

The grease used to prefill the grease lines has to match the grease used for PRO LC. 400 g cartridges for prefilling can be found on page 68.

perma PRO LINE / PRO C LINE

Precise lubrication system for linear guides

References

Rexroth
Bosch Group

Use of lubricants approved by the manufacturer.

CE Made in Germany

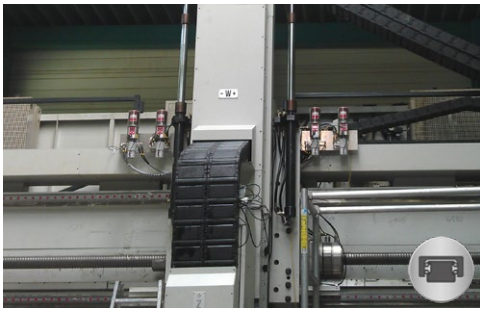
The flexible multi-point lubrication systems for 1 to 6 lubrication points

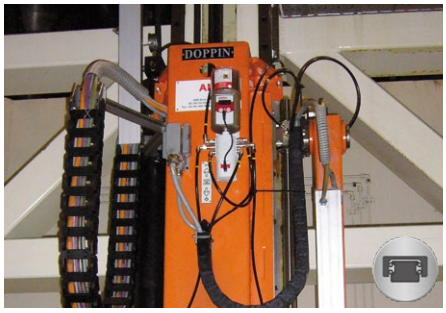
perma PRO LINE and perma PRO C LINE are flexible multi-point lubrication systems for linear guides. The discharge can be adapted precisely to the manufacturer's specifications. The lubricant quantity and relubrication interval can be set flexibly for each of the six outlets. The PRO LC is filled with 250 or 500 cm^3 of grease. The high pressure build-up enables remote mounting using grease lines of up to 5 meters per outlet. This increases workplace safety, while at the same time allowing reliable lubrication of the running system.

perma

Applications / machine elements

Main applications for the multi-point lubrication systems perma PRO LINE and perma PRO C LINE are linear guides. The types of applications range from linear components, modules and units, through screw drives and gear racks in machine tools, handling systems, and traversing axes on industrial robots. Other application areas are roller and sliding bearings, open gears and spindles.





Product characteristics — Benefits

Flexible setting options for every outlet
Pause time between discharges

- → Lubricant quantity individually configurable for each outlet
- → Individual setting of pause times per outlet
- → Lubricant discharge is optimally adapted to respective lubrication point

Setting via push button with display and LED
Display of remaining discharge time
Display of distributor outlets
LED red/green = function

- → Simple operation of lubrication system
- → Lubrication system function and error immediately visible
- → Quick check of discharge time saves time and simplifies planning of PRO LC exchange

Dual operation
Mixture of time and impulse operation

- → Time mode (flexible discharge per interval) and impulse mode (flexible discharge per impulse), as well as dual operation
- → Additional discharges can be triggered for all outlets during pause times
- → Lubrication point can be purged in order to e.g. supply fresh lubricant after longer downtimes

Technical data

→ Refer to page 72 for part numbers

Drive – reusable
PRO LINE: Battery operation
PRO C LINE: External power supply
15–30 V | 120 mA

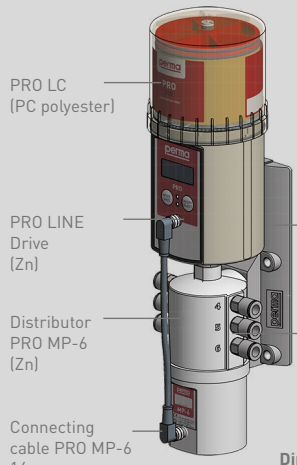
Discharge periods
Pause times in days (24 h)
Discharge quantity per outlet
Impulse mode

Lubricant volume
250 cm³ or 500 cm³

Operating temperature
-20 °C to +60 °C

Pressure build-up
Max. 25 bar
Mounting with <5 m grease line per outlet

Standard & special lubricants
Greases up to NLGI 2



Dimensions
LC 250: Ø 92 x 358 mm
LC 500: Ø 92 x 408 mm

Create your perma PRO system in 3 steps:

1. **perma PRO LINE Basic system**
   battery operated

   or

   perma PRO C LINE Basic system
   with external power supply
2. **Accessory kit PRO**
3. **PRO LC and Cover**

The grease used to prefill the grease lines has to match the grease used for PRO LC. 400 g cartridges for prefilling can be found on page 68.

perma ECOSY

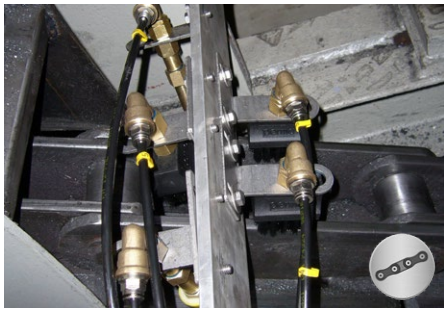
Ideal oil lubrication for demanding applications

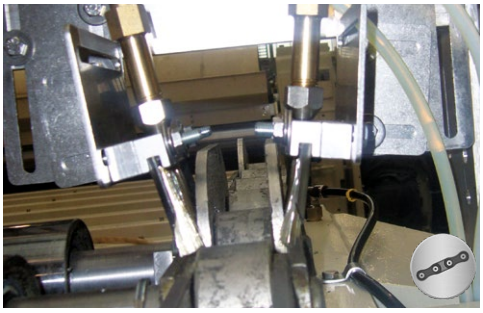
Exact oil metering for every application

perma ECOSY is a multi-point lubrication system and supplies up to 6 lubrication points with a predefined quantity of oil. The machine dependent control of perma ECOSY allows time, sensor or impulse mode and can therefore be adapted to varying demands.
The lubrication pump and control unit are integrated in a 7 litre plastic tank, which is filled with oil by the user. The high perma ECOSY pump pressure allows lubrication points up to 10 m away to be supplied with lubricant, e.g. in poorly accessible and soiled areas.

Applications / machine elements

perma ECOSY can be used to lubricate guideways as well as drive and transport chains. The system supplies the lubrication points with the defined lubricant quantity via special brushes and prevents friction and wear at the contact points. This results in a longer service life cycle and lower maintenance costs. Typical application areas include escalators, moving walkways and conveyors.





Product characteristics — Benefits

Multifunction display in several languages

- → Simple operation with no special programming knowledge
- → Lubricant quantity per outlet can be individually defined
- → Display with error and reserve notification

High-quality plastic housing with 7-litre tank volume

- → Compact and lubricant resistant plastic housing with integrated lubrication pump and control unit
- → Reduction in maintenance costs due to long servicing intervals
- → Refilling only necessary every 2 years (dependent on operating hours)

Flexible pump control of 6 outlets

- → Time, sensor or impulse dependent control possible
- → Lubricating oils with viscosities of 65–2000 mm²/s (at +40 °C) can be pumped
- → High pumping pressure allows supply of remote and hard-to-reach lubrication points

Technical data

→ Refer to page 73 for part numbers

Fill volume
7 litres

Number of outlets
1–6, individual, electronically activatable

Discharge periods
Machine controlled/time controlled

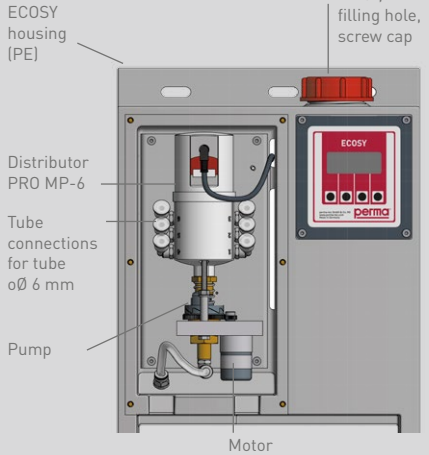
Feed rate
0–9,999 ml/1,000 h per outlet

Operating temperature
-20 °C to +60 °C

Pressure build-up
Max. 10 bar

Supply voltage
85–240 V AC | 50–60 Hz
24 V DC | 25 W

Standard & special lubricants
Oils



Dimensions
310 x 380 x 170 mm

perma ECOSY – electrical connections

Plug A
85–240 V AC
power supply
4-pin

Plug B
Control &
24 V DC supply
8-pin

perma lubrication systems

perma lubricants

perma-tec offers a wide range of high-quality lubricants meeting a great variety of requirements. Consistently high quality has established the product in diverse industrial sectors.

Renowned manufacturers develop and produce lubricants specifically for perma lubrication systems. All lubricants are tested under laboratory conditions and in real applications to ensure optimal function in perma lubrication systems.

NSF H1 Food, drinks, tobacco and pharma industry

Bio-degradable for all applications

Oils

Name → Lubricant properties	Base oil	Operating temperature (°C)	Viscosity at +40 °C [mm²/s]	Sliding bearings Sliding guides	Open gears Gear racks	Spindles	Chains
perma High performance oil SO14 → Lubricates effectively even at high operating temperatures → Good viscosity/temperature behaviour → Special creep properties ensure rapid film formation	Ester oil + synth. hydrocarbon oil	-20 to +250	320	-	-	-	✓
perma Multipurpose oil SO32 → High performance transmission & multipurpose oil → Ageing- & oxidation-resistant → Good wear protection for gear teeth & roller bearings	Mineral oil	-5 to +100	100	✓	✓	✓	✓
perma Bio oil, low viscosity SO64 → Multipurpose oil → Rapidly biodegradable → Good viscosity/temperature behaviour	Ester oil	-30 to +110	100	✓	✓	✓	✓
perma Bio oil, high viscosity SO69 → Multipurpose oil → Rapidly biodegradable → Good wear protection	Ester oil	-20 to +110	460	✓	✓	✓	✓
perma Food grade oil NSF H1 SO70 → Broad operating temperature range → Very good ageing & oxidation resistance → Good wear protection	PAO + ester oil	-30 to +120	220	✓	✓	✓	✓

Additives
Tribological properties of the lubricant are enhanced with additives. The additives, e.g. anti-wear (AW) additives or extreme pressure (EP) additives, are mixed with the base oil.

Depending on the application, additives are selected to provide the required characteristics. In the case of gear oil, additives are imperative for specific purposes, such as increasing pressure resistance and shear strength.

Speed index = dk
The speed index indicates the maximum speed for various bearing types for which a specific lubricant is suitable. perma overviews specify the speed indexes for grease lubrication of deep groove ball bearings.
Calculation: n x dm = speed factor dk **dm = (D + d) ÷ 2**
n = Operating speed (1/min); D = Outside bearing diameter;
d = Inside (bore) bearing diameter; dm = Bearing size

Operating temperature
The operating temperature is the temperature range in which reliable function of components is guaranteed. Using the lubricant outside this range can lead to damage.

HINT

→ Special lubricants are available upon request
→ The perma SELECT APP helps you choose the right lubricant

Greases

Name → Lubricant properties	NLGI grade	Thickener	Base oil	Operating temperature [°C]	Basic viscosity at +40 °C [mm²/s]	Speed index	Roller bearings	Sliding bearings Sliding guides	Linear guides	Open gears Gear racks	Spindles
perma Multipurpose grease SF01 → Powerful multipurpose grease → Wear reducing thanks to EP additives → Free of heavy metals & silicone	2	Li/Ca	Mineral oil	-30 to +130	220	300,000	✓	✓	✓	-	✓
perma Extreme pressure grease SF02 → High-pressure grease with MoS2 → Ageing- & oxidation-resistant → Good dry-running properties	2	Li + MoS2	Mineral oil	-30 to +120	100	350,000	-	✓	-	✓	-
perma High temp. grease SF03 → Good oil retention → High thermal stability → Good corrosion protection	2	PHS + PTFE	Ester + PFPE	-20 to +220	420	300,000	✓	✓	-	-	-
perma High performance grease SF04 → Multipurpose lubricant for extreme requirements → Powerful at high temperatures & vibrations → Resistant to aggressive media	0/1	PHS	Mineral oil + PAO	-20 to +160	500	200,000	✓	✓	✓	✓	✓
perma High temp. / Extreme pressure grease SF05 → Multipurpose grease for extreme requirements → High load-carrying capacity → Good dry-running properties thanks to solid lubricants	0/1	PHS + MoS2	Mineral oil + PAO	-20 to +160	500	200,000	✓	✓	-	✓	-
perma Liquid grease SF06 → Good water resistance → High wear protection → Easily pumped	0	Al com.	Mineral oil	-20 to +130	220	300,000	✓	✓	✓	-	✓
perma High speed grease SF08 → High speed index → Low friction coefficient due to synthetic base oil → Broad operating temperature range	2	Ca com.	PAO	-40 to +140	100	600,000	✓	✓	-	-	-
perma Multipurpose bio grease SF09 → Rapidly biodegradable → Water hazard class WGK 1 → Fully synthetic	2	PHS	Ester	-40 to +140	120	300,000	✓	✓	-	✓	-
perma Food grade grease NSF H1 SF10 → Synthetic → Good wear protection & low temperature resistance → Good water resistance	1	Al com.	PAO	-45 to +120	150	500,000	✓	✓	✓	✓	✓

Base oil
The base oil determines the properties and performance of the lubricant. Base oils are mineral oils, hydrocracked oils, polyalphaolefin (PAO) oils or synthetic ester oils.

Basic viscosity
The viscosity indicates the flowability of the base oil. Low viscosity base oils are used for very high speeds. High viscosity base oils are used for high load applications. The viscosity of a typical roller bearing grease at +40 °C is between 15 and 500 mm²/s.

NLGI grade
The NLGI grade (consistency number) denotes the consistency of a lubrication grease. Grades range from 000 (very fluid) to 6 (very hard). Greases up to NLGI grade 2 can be used in perma lubrication systems.

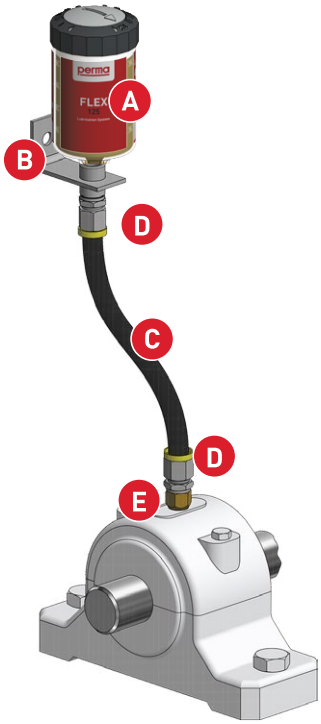
Thickener
The thickener acts like a sponge. It holds the individual components of the grease together and ensures that the oil stays at the contact point.

Lubrication system mounting – from preparation to solution

It has never been so easy to integrate automatic lubrication systems in existing production processes. Thanks to many years of global experience perma-tec can pass on its expertise to customers in all industries, and offer service and support.

On the following pages we explain step by step, using installation examples, how the lubrication point is prepared and the materials required. In addition, the activation and installation of the lubrication systems is shown.

Guide to optimal installation of single-point lubrication systems



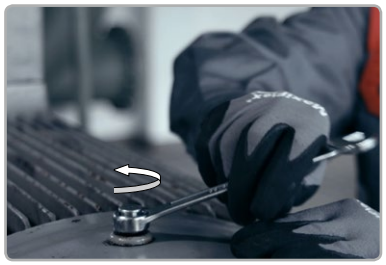
Installation example roller bearing lubrication

INDEX – single-point lubrication systems:

HINT **FAQs about all perma single-point lubrication systems can be found on our website: www.perma-tec.com**

1. Prepare lubrication point

HINT



Clean the lubrication point, remove grease fitting

Apply thread sealant (e.g. Loctite® 243™) to all connecting parts, screw in reducer

Prelubricate lubrication point and connecting parts, prefill grease lines if applicable (use the same lubricant as in lubrication system)

perma VIDEOS: Mounting of lubrication systems
See perma-tec website:
→ www.perma-tec.com/en/media/videos/

Z Prepare lubrication point

Greases	Cartridge 400 g for grease gun	Pail 1 kg	Pail 5 kg
perma Multipurpose grease SF01	101585	107494	107508
perma Extreme pressure grease SF02	101588	107495	107509
perma High temp. grease SF03	101589	107496	107510
perma High performance grease SF04	101590	107497	107511
perma High temp. / Extreme pressure grease SF05	101591	107498	107512
perma Liquid grease SF06	101592	107499	107513
perma High speed grease SF08	101593	107500	107514
perma Multipurpose bio grease SF09	101594	107501	107515
perma Food grade grease NSF H1 SF10	101595	107502	107516
Oils		**Bottle 1 litre**	**Canister 5 litres**
perma High performance oil SO14		107463	107520
perma Multipurpose oil SO32		107465	107521
perma Bio oil, low viscosity SO64		107469	107523
perma Bio oil, high viscosity SO69		107472	107525
perma Food grade oil NSF H1 SO70		107473	107526

Accessories for preparing the lubrication point	Pic.	Art. No.
Grease gun (operating pressure 400 bar/1.9 cm³ stroke)	1	101455
Hose with rotary joint, slide and hydraulic coupling for grease gun	1a	110199
Oil gun (operating pressure 400 bar/1.9 cm³ stroke)	2	109009
Accessory set for pressure test (order lubrication system separately)	-	101480
Purge connection with manual valve G1/4 female	3	109684
Prefill adapter G1/4 male	4	109003
Hose prefill adapter for Heavy Duty hose	5	107633
Tube prefill adapter for VA-flex tubes	6	107634
Tube prefill adapter for tube oØ 8 mm	7	101526
Tube prefill adapter for tube oØ 6 mm	8	101532
50 ml Bottle Loctite® 243™ thread sealant (medium strength)	9	110278


1


1a


2


3


4


5


6


7


8

9

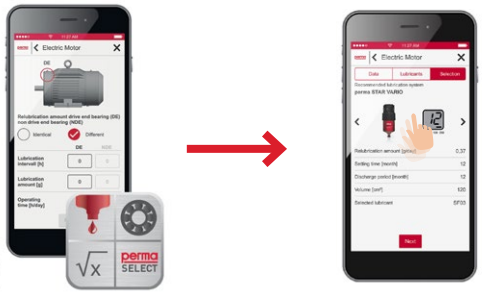
Conversion tables

Download the free perma SELECT APP to your smartphone/tablet

perma SELECT APP

Download: AppStore/PlayStore
Online: Browser version

Get it on Google play
Available on the App Store



NEW
As of Q1/2016

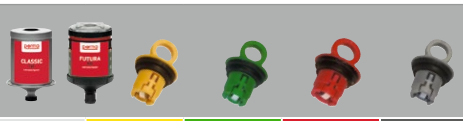
Alternatively, determine the setting based on the stipulated discharge quantity

Conversion: 1 stroke grease gun = approx. 1.5 cm³ = 1.2 g lubricant

HINT

Note activation and exchange date on label

120 cm³ lubricant



Activator/ months at +20 °C with SF01	1	3	6	12
Lubricant/day [cm³]	4.0	1.3	0.7	0.3
Lubricant/week [cm³]	28.0	9.3	4.7	2.3
Strokes with grease gun/day	2–3	1	0.5	0.25
Strokes with grease gun/week	16–20	5–7	3–4	1–2

60–65 cm³ lubricant

Setting/months	1	2	3	4	5	6	7	8	9...	...12
Lubricant/day [cm³]	2.0	1.0	0.7	0.5	0.4	0.3	0.3	0.3	0.2	0.2
Lubricant/100 h [cm³]	8.3	4.2	2.8	2.1	1.7	1.4	1.2	1.0	0.9	0.7
Lubricant/week [cm³]	14.0	7.0	4.7	3.5	2.8	2.3	2.0	1.8	1.6	1.6
Strokes with grease gun/day	1–2	<1	0.5	-	-	0.25	-	-	-	0.13
Strokes with grease gun/100 h	5–7	3	2	1.5	<1.5	1	<1	<1	<1	0.5
Strokes with grease gun/week	9–11	5	3	2–3	2	1–2	<1.5	<1.5	1	<1

120–125 cm³ lubricant

Setting/months	1	2	3	4	5	6	7	8	9...	...12
Lubricant/day [cm³]	4.2	2.1	1.4	1.0	0.8	0.7	0.6	0.5	0.5	0.4
Lubricant/100 h [cm³]	17.4	8.7	5.8	4.3	3.5	2.9	2.5	2.2	1.9	1.6
Lubricant/week [cm³]	29.2	14.6	9.7	7.3	5.8	4.9	4.2	3.6	3.2	2.6
Strokes with grease gun/day	3	1–2	1	<1	<1	0.5	-	-	-	0.25
Strokes with grease gun/100 h	11–13	5–7	4	3	2–3	2	<2	1.5	<1.5	1
Strokes with grease gun/week	18–22	9–11	6–7	5	4	3–4	3	2–3	2	1–2

250 cm³ lubricant

Setting/months	1	2	3	4	5	6	7	8	9...	...12
Lubricant/day [cm³]	8.3	4.2	2.8	2.1	1.7	1.4	1.2	1.0	0.9	0.7
Lubricant/100 h [cm³]	34.7	17.4	11.6	8.7	6.9	5.8	5.0	4.3	3.9	3.1
Lubricant/week [cm³]	58.3	29.2	19.4	14.6	11.7	9.7	8.3	7.3	6.5	5.2
Strokes with grease gun/day	5–6	3–4	2	1.5	<1.5	1	<1	<1	<1	0.5
Strokes with grease gun/100 h	22–24	9–13	7–9	5–7	4–6	3–5	2–4	1–3	2	1–2
Strokes with grease gun/week	36–40	18–21	12–14	9–11	7–9	6–7	5–6	5	4–5	3–4

Activation & installation of lubrication system

HINT

perma CLASSIC/
perma FUTURA

perma FLEX

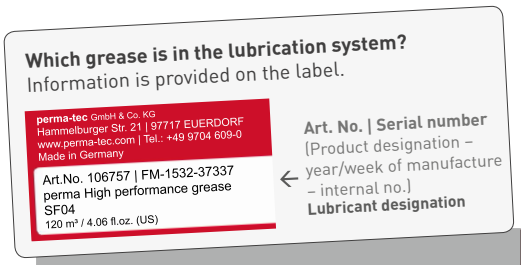
perma NOVA /
perma STAR VARIO

Remove plug

Screw lubrication system into lubrication point

Art. No. lubrication systems

A perma lubrication systems



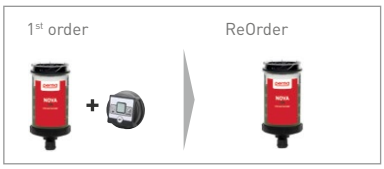
1st order/ReOrder:

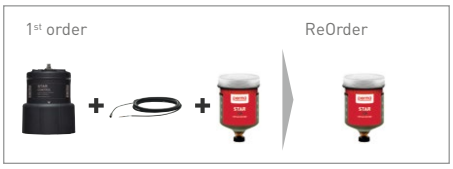
1st order/ReOrder:

	perma CLASSIC / perma FUTURA	perma FLEX
Drive / Activator	 Activator, **yellow** 1 month, 101331  Activator, **green** 3 months, 101332  Activator, **red** 6 months, 101333  Activator, **grey** 12 months, 101335	 For harsh environments: Protection cap incl. support flange FLEX G1/4 male x G1/4 female (steel / alu) 101428

Lubrication systems/ LC (= Lubricant Cartridge)	 perma CLASSIC 120 cm³	 perma FUTURA 120 cm³	 perma FLEX 60 cm³	 perma FLEX 125 cm³
Greases				
perma Multipurpose grease SF01	100020	106997	107224	107155
perma Extreme pressure grease SF02	100034	107008	107226	107161
perma High temp. grease SF03	100045	107012	107227	107163
perma High performance grease SF04	100052	107016	107228	107164
perma High temp. / Extreme pressure grease SF05	100063	107020	107229	107167
perma Liquid grease SF06	100074	107024	107230	107168
perma High speed grease SF08	100083	107029	107232	107170
perma Multipurpose bio grease SF09	100089	107032	107233	107172
perma Food grade grease NSF H1 SF10	100096	107037	107234	107173
Oils	**Order oil retaining valve separately**	**Including oil retaining valve**	**Including oil retaining valve**	
perma High performance oil SO14	100427	107083	107246	107199
perma Multipurpose oil SO32	100449	107090	107247	107200
perma Bio oil, low viscosity SO64	100473	107099	107248	107202
perma Bio oil, high viscosity SO69	100483	107103	107249	107204
perma Food grade oil NSF H1 SO70	100489	107107	107251	107205

Support flange	Support flange not required	Support flange integrated	 Support flange FLEX Gen 2.0 G1/4 male x G1/4 female (brass / plastic) 101427





perma NOVA	perma STAR VARIO	perma STAR CONTROL
	 **Protection cap STAR Standard Duty (plastic)** **for LC 60/120** 109520 **for LC 250** 109519	 **Protection cap STAR Standard Duty (plastic)** **for LC 60/120** 109520 **for LC 250** 109519
	 **Protection cap STAR VARIO Heavy Duty 250 (plastic)** 109999 **> use with Art. No. 109420** **Cover clip for protection cap STAR VARIO Heavy Duty** 108606	 **Adapter cable STAR CONTROL 30 cm angled** 109521
 **perma NOVA** Control unit 1, 2, 3 ... 12 months 107271	 **perma STAR VARIO Drive Gen 2.0** 1, 2, 3 ... 12 months 107529	 **perma STAR CONTROL Drive Gen 2.0** TIME or IMPULSE mode 108985
	 **Battery pack STAR VARIO** 101351	 **Cable STAR CONTROL Gen 2.0** 5 m 108432 10 m 108431





NOVA LC 65 cm³	NOVA LC 125 cm³	STAR LC 60 cm³	STAR LC 120 cm³	STAR LC 250 cm³
107415	110281	104044	100724	104473
107416	110282	104048	100733	104480
107417	110283	104051	100739	104485
107418	110284	104054	100744	104488
107419	110285	104057	100750	104492
107420	110286	104061	100755	104497
107421	110287	104063	100762	104500
107422	110288	104065	100766	104502
107423	110289	104069	100770	104506
Including oil retaining valve		Order oil retaining valve separately		
107425	110290	104180	101096	104685
107426	110291	104188	101117	104696
107427	110292	104198	101137	104711
107428	110293	104202	101145	104716
107429	110294	104204	101148	104719

Support flange integrated		Support flange STAR Gen 2.0 G1/4 male x G1/4 female (brass / plastic) 109420

1 **PRO Basic system**
Battery or external power supply?
How many lubrication points?
Application: Linear guide?

2 **Accessory kit PRO:** Art. No. 106937

3 **PRO LC and Cover:** Which grease? 250 or 500 cm³?

ReOrder: PRO

ReOrder: PRO C

1st order: PRO / PRO C Complete system in 3 steps

1

Select a basic system

Every basic system contains the following:
1 x Mounting device PRO (for wall mounting) – pre-assembled
1 x Distributor PRO MP-6 including PRO MP-6 Accessories box (16 pieces)
1 x Connecting cable PRO MP-6 (14 cm)

PRO MP-6 Basic system
(with Battery PRO B)

106919

PRO C MP-6 Basic system
(with Cable PRO C M12)

5 m 106922
10 m 106938

PRO LINE Basic system
(with Battery PRO B)

106934

PRO C LINE Basic system
(with Cable PRO C M12)

5 m 106935
10 m 106936

2

Mounting example

Accessory kit PRO — 106937

30 m Tube up to +100 °C oØ 8 mm x iØ 5 mm (PA) - for PRO – per outlet <5 m mounting possible	101569
1 x Tube prefill adapter for tube oØ 8 mm	101526
6 x Tube connector G1/4 male for tube oØ 8 mm straight (brass nickel-plated)	101496
6 x Reducer G1/8 male x G1/4 female (brass)	104833
6 x Reducer M6 male x G1/4 female (brass)	104837
6 x Reducer M8x1 male x G1/4 female (brass)	104838
6 x Reducer M10x1 male x G1/4 female (brass)	104840
2 x Extension 16 mm G1/8 male x G1/8 female (brass nickel-plated)	101576
2 x Extension 36 mm G1/8 male x G1/8 female (brass nickel-plated)	101577

3

perma PRO LC (=Lubricant Cartridge) / Cover for PRO LC

	PRO LC 250 cm³	PRO LC 500 cm³
perma Multipurpose grease SF01	106639	106753
perma Extreme pressure grease SF02	106641	106754
perma High temp. grease SF03	106642	106755
perma High performance grease SF04	106644	106757
perma High temp. / Extreme pressure grease SF05	106645	106758
perma Liquid grease SF06	106646	106759
perma High speed grease SF08	106647	106760
perma Multipurpose bio grease SF09	106648	106761
perma Food grade grease NSF H1 SF10	106649	106762
Cover for PRO LC	106959	106960

PRO Accessories

1

2

Steel:
perma PRO are attached to the mounting plate inside the protection box. They are wall-mounted using four screws (not supplied).

3

Plastic:
The protection box is attached using the PRO wall-mounting bracket, Art. No. 101568.

Protection box single (steel) including mounting plate & mounting set (cable bushings, blanking plugs and locking nuts)
→ Bores for outlets are made
External dimensions (H x W x D): 470 x 240 x 210 mm/IP 66
Fig. 1, 101527

Protection box double (steel) including mounting plate & mounting set (cable bushings, blanking plugs and locking nuts)
→ Bores for outlets are made
External dimensions (H x W x D): 500 x 400 x 210 mm/IP 66
Fig. 2, 111153

Protection box single (plastic) including drilling template & mounting set (cable bushings, blanking plugs and locking nuts)
→ Without outlet bores, without cable gland
External dimensions (H x W x D): 640 x 310 x 215 mm
Fig. 3, 101548

PRO Components / Accessories	Pic.	Art. No.
perma PRO Drive perma PRO LINE Drive (operational only with Art. No. 106939) including 1x Reducer coupling G3/8 female to G1/8 female, nickel-plated (Art. No. 101545) Mounting material for Mounting device PRO	1	106896 106931
Battery PRO B	2	106953
perma PRO C Drive perma PRO C LINE Drive (operational only with Art. No. 106939) including 1x Reducer coupling G3/8 female to G1/8 female, nickel-plated (Art. No. 101545) Mounting material for Mounting device PRO	3	106903 106932
Cable PRO C M12 (5 m)	4	106942
Cable PRO C M12 (10 m)	5	106943
Distributor PRO MP-6 including MP-6 Accessories box: 6 x Tube connector G1/8 male for tube oØ 8 mm 90° – rotary type 6 x Tube connector G1/8 male for tube oØ 8 mm straight 4 x Plugs for MP-6  (each illustrated 1x)	6	106939
Connecting cable PRO MP-6 (14 cm)	7	106940
Connecting cable PRO MP-6 (2 m)	8	106941
Mounting device PRO (for wall mounting)	9	101568

1

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perma ECOSY

1

Suitable connecting parts, tubes and additional accessories can be found on the following pages.

2

perma ECOSY including connecting plug perma ECOSY has a volume of 7 litres and can be manually refilled.	1	101700
Control sensor perma ECOSY	2	109401

perma accessories

B Brackets

Beam clamp
30 mm
(stainless steel)
Art. No. 109957

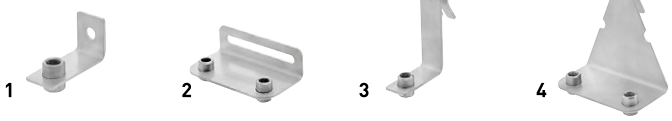
or

Beam clamp
65 mm
(stainless steel)
Art. No. 109958

or

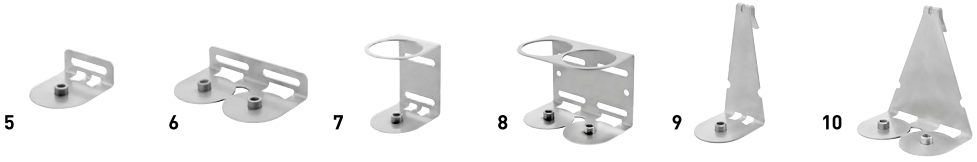
Cage hanger arm
(stainless steel)
Art. No. 109959

Mounting brackets for perma CLASSIC, FUTURA, FLEX, NOVA	Pic.	Material	Art. No.
Mounting bracket CLASSIC, FUTURA, FLEX, NOVA 1-point G1/4 female	1	Stainless steel	109685
Mounting bracket CLASSIC, FUTURA, FLEX, NOVA 2-point G1/4 female	2	Stainless steel	109686
Mounting bracket CLASSIC, FUTURA, FLEX, NOVA cage hanger 1-point G1/4 female	3	Stainless steel	109689
Mounting bracket CLASSIC, FUTURA, FLEX, NOVA cage hanger 2-point G1/4 female	4	Stainless steel	109690



for

Mounting brackets for perma STAR VARIO, STAR CONTROL	Pic.	Material	Art. No.
Mounting bracket STAR Standard Duty 1-point G1/4 female	5	Stainless steel	109663
Mounting bracket STAR Standard Duty 2-point G1/4 female	6	Stainless steel	109667
Mounting bracket STAR Heavy Duty C-section 1-point G1/4 female	7	Stainless steel	109664
Mounting bracket STAR Heavy Duty C-section 2-point G1/4 female	8	Stainless steel	108648
Mounting bracket STAR Standard Duty cage hanger 1-point G1/4 female	9	Stainless steel	109665
Mounting bracket STAR Standard Duty cage hanger 2-point G1/4 female	10	Stainless steel	109668

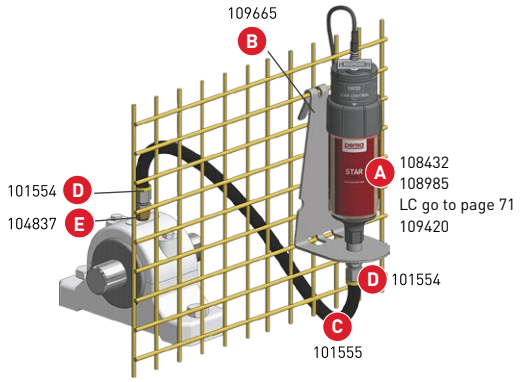


for

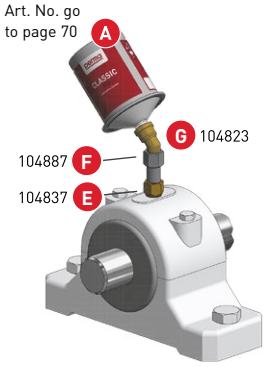
HINT

Additional mounting brackets and complete INSTALLATION KITS can be found in our catalogue "Lubrication Solutions Mining and Heavy Industry".

Installation example roller bearing lubrication



Remote mounting with grease line

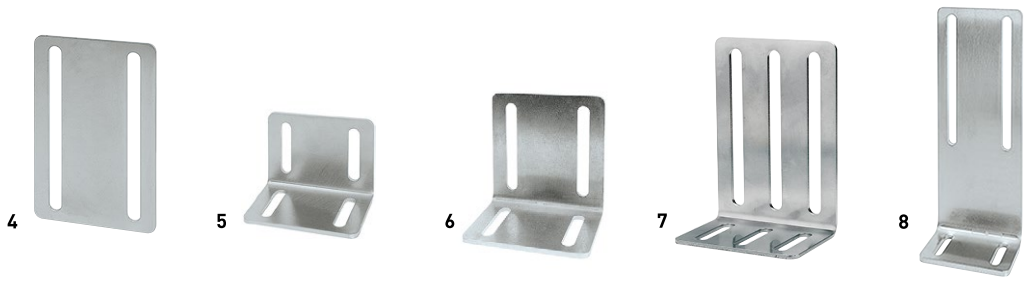


Direct mounting

Thread designations:
iØ = inner diameter
oØ = outer diameter
G1/4 female = inside thread G1/4
G1/4 male = outside thread G 1/4

Additional brackets	Pic.	Material	Art. No.
Clamp CLASSIC for earthing in explosion-risk area	1	Steel, zinc-plated	101384
Multipurpose clip CLASSIC, FUTURA, FLEX, NOVA, STAR	2	Plastic	101388
Bracket	3	Stainless steel	104864
Insert for bracket G1/4 male x G1/4 female	3a	Brass	104820
	3b	Stainless steel	104865

Mounting plate / Mounting angle		Pic.	Material	Art. No.
Mounting plate 110 x 70 x 2.5 mm	Holespacing 45 mm	4	Stainless steel	101432
Mounting angle 50 x 50 x 70 x 2.5 mm	Holespacing 45 mm	5	Stainless steel	101429
Mounting angle 50 x 70 x 70 x 2.5 mm	Holespacing 45 mm	6	Stainless steel	101430
Mounting angle 50 x 100 x 70 x 2.5 mm	Holespacing 45 mm / 22.5 mm	7	Stainless steel	101431
Mounting angle 50 x 180 x 70 x 5 mm	Holespacing 45 mm	8	Stainless steel	101433



C Hose / Tubes

Name Material → Properties	Art. No. (meter goods)	iØ/oØ [mm]	Operating temperature range [°C]	Minimum bending radius [mm]	Max. operating pressure [bar]	Silicone-free/halogen-free	Max. grease line* [m]				
							CLASSIC / FUTURA	FLEX / NOVA	STAR	PRO	ECOSY
Heavy Duty hose with NBR lining and fabric insert → Synthetic rubber with fabric insert → Oil and weather resistant outer layer	**101555** 	9.5/16	-40 to +100	75	25	-	1	2	5		
VA-Flex tube PTFE / stainless steel → High resistance to fractures and impacts → High temperature resistance	**101549 (1000 mm)** **101550 (1500 mm)** 	8/11	-150 to +260	70	220	✓	1	2	5	5	
Tube PA → UV-resistant → Resistant to water → Translucent	**101393**	6/8	-40 to +80	40	19	✓	1	2	3		
Tube PTFE → Good temperature resistance → Noncombustible (flammability class V-0) → Suitable for food and beverages → Translucent	**101394**	6/8	-70 to +260	50	9	-	1	2	3		
Tube PA → Highly resistant to stress cracking, pressure and impact → High mechanical strength	**101569** 	5/8	-35 to +100	45	31	✓				5	
Tube PA → Highly resistant to stress cracking, pressure and impact → High mechanical strength → Translucent	**101494**	4/6	-35 to +100	35	27	-/ ✓					10
Hose spiral guard 25 mm Plastic	**109695** 										

*** The maximum length of the grease line depends on the lubrication system, lubricant and operating temperature. Information applies at +20 °C using perma Multipurpose grease SF01 or perma High performance oil SO14.**

Thread designations:
iØ = inner diameter
oØ = outer diameter
G1/4 female = inside thread G1/4
G1/4 male = outside thread G 1/4

D Hose / Tube connectors

Hose connector Heavy Duty suitable for hose iØ 9.5 /oØ 16 mm 101555		Pic.	Material	Art. No.
Hose connector G1/4 male – push-lock	max. +100 °C	1	Steel, zinc-plated	101554


1

Tube connector VA-Flex suitable for tubes iØ 8 /oØ 11 mm 101549 & 101550		Pic.	Material	Art. No.
Cutting ring coupling R1/4 male straight	max. +260 °C	2	Stainless steel	104868
Cutting ring coupling R1/8 male 90° adjustable	max. +260 °C	3		104869
Cutting ring coupling R1/8 male straight	max. +260 °C	4		104870
Cutting ring coupling straight – connector for oØ 8 mm	max. +260 °C	5		104871


2 3 4 5

Tube connector up to 6 bar suitable for tube iØ 6 mm/oØ 8 mm 101393 & 101394		Pic.	Material	Art. No.
Tube connector for perma G1/4 female	max. +80 °C	6	POM/Alu	101390
Tube connector G1/4 male	max. +80 °C	7		101391
Tube connector G1/8 male	max. +80 °C	8		101392
Tube connector for perma G1/4 female	max. +100 °C	9	Brass, nickel-plated	104821
Tube connector G1/4 male	max. +100 °C	10	Brass	104822
Tube connector for perma G1/4 female	max. +250 °C	11	Stainless steel	104866
Tube connector G1/4 male	max. +250 °C	12		104867


6 7 8 9 10 11 12

Tube connector push-lock up to 25 bar suitable for tube oØ 8 mm 101393, 101394 & 101569	Pic.	Material	Art. No.
Tube connector G1/8 male straight	13	Brass nickel-plated	101570
Tube connector G1/8 male 90° – rotary type	14		101571
Tube connector G1/4 male straight	15		101496
Tube connector G1/4 female straight	16		101502
Tube connector G1/4 male 90° – rotary type	17		101497
Tube connector G3/8 male straight	18		101498


13 14 15 16 17 18

Y-connector			101513

Pictures are not original size & may vary.

D Tube connectors

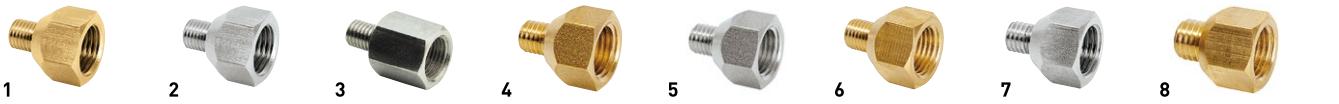
Tube connector push-lock suitable for tube oØ 6 mm up to 25 bar 101494	Pic.	Material	Art. No.
Tube connector G1/8 male straight	1	Brass nickel-plated	101446
Tube connector G1/8 male 90° – rotary type	2		101449
Tube connector G1/4 male straight	3		101447
Tube connector G1/4 female straight	4		101511
Tube connector G1/4 male 90° – rotary type	5		101551
 1 2 3 4 5			
Tube connector M5 male straight	6	Brass nickel-plated	101448
Tube connector M6 male straight	7		101509
Tube connector M6 male – swivel type	8		101515
Tube connector M6x0.75 male 90° – swivel type	9		101516
Tube connector M8x1 male straight	10		101517
Tube connector M8x1 male 90° – rotary type	11		101507
Tube connector M10x1 male straight	12		101510
Tube connector M10x1 male 90° – rotary type	13		101508
Extension for tube oØ 6 mm to 8 mm	14		101512
 6 7 8 9 10 11 12 13 14			
Y-connector 		Brass nickel-plated	101514

E Reducers / Reducer coupling

Reducers / Reducer coupling	Pic.	Material	Art. No.
Reducer G1/4 male x G1/8 female	14	Brass	104834
Reducer G1/8 male x G1/4 female	15	Brass	104833
	16	Stainless steel	104875
Reducer coupling G3/8 female to G1/8 female	17	Nickel-plated	101545
 14 15 16 17			
Reducer R1/2 male x G1/4 female	18	Brass	104832
Reducer R1/4 male x G1/4 female	19		109954
Reducer R1/8 male x G1/4 female	20		109953
Reducer R3/4 male x G1/4 female	21		104835
Reducer R3/8 male x G1/4 female	22		104836
 18 19 20 21 22			

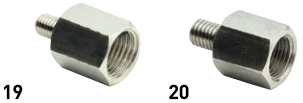
E Reducers

Reducers	Pic.	Material	Art. No.
Reducer M6 male x G1/4 female	1	Brass	104837
	2	Stainless steel	104876
Reducer M6 male x G1/8 female	3	Stainless steel	109847
Reducer M8 male x G1/4 female	4	Brass	104839
	5	Stainless steel	104878
Reducer M8x1 male x G1/4 female	6	Brass	104838
	7	Stainless steel	104877
Reducer M10 male x G1/4 female	8	Brass	104841
Reducer M10x1 male x G1/4 female	9	Brass	104840
	10	Stainless steel	104879
Reducer M12 male x G1/4 female	11	Brass	104842
Reducer M12x1 male x G1/4 female	13		104843
Reducer M12x1.5 male x G1/4 female	12		104844
Reducer M14 male x G1/4 female	14		104846
Reducer M14x1.5 male x G1/4 female	15		104845
Reducer M16 male x G1/4 female	16		104847
Reducer M16x1.5 male x G1/4 female	17		104848



Reducer Whitworth 1/4" male x G1/4 female	18	Brass	104849

Reducer 1/4 UNF male x G1/4 female	19	Stainless steel	109845
Reducer 1/4 UNF male x G1/8 female	20	Stainless steel	109846



Thread designations:
iØ = inner diameter
oØ = outer diameter
G1/4 female = inside thread G1/4
G1/4 male = outside thread G 1/4

Determine the thread size
at the lubrication point:
perma Fitting thread tester, Art. No. 110374

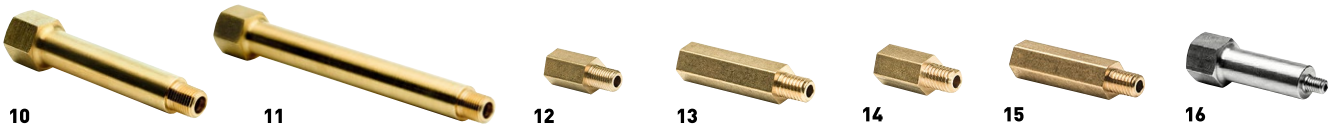
Pictures are not original size & may vary.

F Extensions

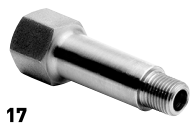
Extensions	Pic.	Material	Art. No.
Extension 30 mm G1/4 male x G1/4 female	1	Brass	104854
Extension 45 mm G1/4 male x G1/4 female	2	Brass	104855
	3	Stainless steel	104887
Extension 75 mm G1/4 male x G1/4 female	4	Brass	104856
	5	Stainless steel	104888
Extension 115 mm G1/4 male x G1/4 female	6	Brass	104857
Extension 16 mm G1/8 male x G1/8 female	7	Brass, nickel-plated	101576
Extension 36 mm G1/8 male x G1/8 female	8		101577

Extension 50 mm R1/8 male x G1/4 female	9	Brass	109848

Extension 75 mm M10x1 male x G1/4 female	10	Brass	108923
Extension 115 mm M10x1 male x G1/4 female	11		108924
Extension 14 mm M6x0.75 male x M6 female	12		104858
Extension 30 mm M6x0.75 male x M6 female	13		104859
Extension 14 mm M6 male x M6 female	14		104860
Extension 30 mm M6 male x M6 female	15		104861
Extension 50 mm M6 male x G1/4 female	16	Stainless steel	109697



Extension 50 mm 1/4 UNF male x G1/4 female	17	Stainless steel	109854



G Angles

Angles	Pic.	Material	Art. No.
Angle 45° G1/4 male x G1/4 female	1	Brass	104823
Angle 90° G1/4 male x G1/4 female	2		104827


1


2

Angle 45° R1/4 male x G1/4 female square	3	Brass	109853
Angle 45° R1/4 male x Rp1/4 female	4	Stainless steel	104873
Angle 90° R1/4 male x G1/4 female	5	Brass	109849
Angle 90° R1/4 male x G1/4 female square	6		109850
Angle 90° R1/8 male x G1/4 female	7		109851
Angle 90° R1/8 male x G1/4 female square	8		109852
Angle 90° R1/4 male x Rp1/4 female	9	Stainless steel	104874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Angle 45° M6 male x G1/4 female	10	Brass	104824
Angle 45° M8x1 male x G1/4 female	11		104825
Angle 45° M10x1 male x G1/4 female	12		104826
Angle 90° M6 male x G1/4 female	13		104828
Angle 90° M8x1 male x G1/4 female	14		104829
Angle 90° M10x1 male x G1/4 female	15		104830


10


11


12


13


14


15

H Others

Others	Pic.	Material	Art. No.
Swivelling screw fitting G1/4 male x G1/4 female – rotary type	16	Brass	104831
Y-Adapter 2 x G1/4 female x R1/4 male	17	Brass, nickel-plated	109002
T-Adapter 3 x G1/4 female	18	Brass	110025
	19	Stainless steel	104880
Bulkhead nipple G3/8 male x G1/4 female	20	Brass	104851
Hexagon-nipple R1/4 male	21	Brass	104852
	22	Stainless steel	104881
Sleeve G1/4 female	23	Brass	104853
	24	Stainless steel	104882


16


17


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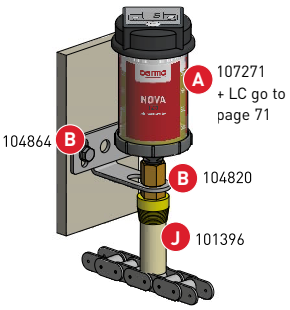
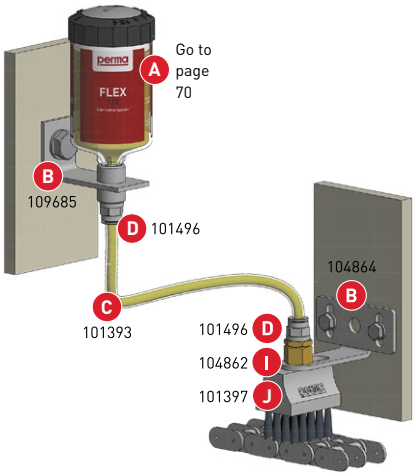
24

Pictures are not original size & may vary.

Installation example chain lubrication



Direct mounting



Remote mounting with grease line

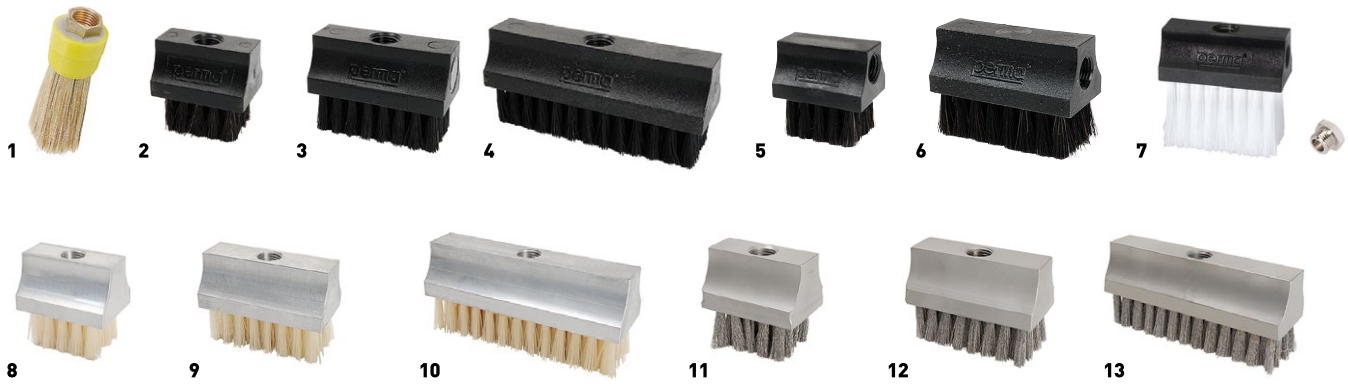
I Oil retaining valves

Oil retaining valves	Pic.	Material	Art. No.
Oil retaining valve G1/4 male x G1/4 female up to +60 °C	1	Brass with plastic valve	104862
	2	Stainless steel with plastic valve	104889
Oil retaining valve G1/4 male x G1/4 female up to +150 °C	3	Brass with metal valve	104863

Special brushes / Mounting brackets		Connecting thread	Pic.	Material	Art. No.
Special brush for large chains	up to +80 °C	Tapped bore M6	4	alu / polypropylene	101524
	up to +180 °C		5	alu / pekalon	101538
	up to +350 °C		6	alu / stainless steel	101540
Special brush for large chains	up to +80 °C	Through hole	7	alu / polypropylene	101525
	up to +180 °C		8	alu / pekalon	101539
	up to +350 °C		9	alu / stainless steel	101541
Mounting bracket left for special brush		Longitudinal holes	10	stainless steel	101533
Mounting bracket right for special brush			11		101534
Spacer for special brush, width: 13 mm		Through hole	12	alu	101535

J Oil brushes

Oil brushes		Connecting thread	Size	Pic.	Material	Art. No.
Oil brush		G1/4 female top connection	Ø 20 mm	1	PA / horsehair	101396
Oil brush, bristle height 20 mm	up to +80 °C	G1/4 female top connection	40 x 30 mm	2	PA / horsehair	101397
			60 x 30 mm	3		101398
			100 x 30 mm	4		101399
		G1/4 female side connection	40 x 30 mm	5		101411
			60 x 30 mm	6		101412
Oil brush, bristle height 40 mm	up to +100 °C	G1/4 female top + side connection including plug	60 x 30 mm	7	PA / PA	101520
High temperature brush, bristle height 20 mm	up to +180 °C	G1/4 female top connection	40 x 30 mm	8	alu / PPS	101402
			60 x 30 mm	9		101403
			100 x 30 mm	10		101404
High temperature brush, bristle height 20 mm	up to +350 °C	G1/4 female top connection	40 x 30 mm	11	stainless steel / stainless steel	101405
			60 x 30 mm	12		101406
			100 x 30 mm	13		101407



Special accessories	Pic.	Material	Art. No.
Lubrication pocket for gear lubrication Manufactured to specifications	14	Plastic	On request
Multipurpose chain lubrication box incl. 4 round brushes & 5 distance pieces	15	Plastic	101445
Rotating brush 16 mm for multipurpose chain lubrication box for re-orders	15a	Horsehair bristles	107631
CWL PLUS SET/product information, go to website www.perma-tec.com	16	-	101564
Rail oiler with foam insert – without oil retaining valve (gap widths 5, 9 and 16 mm)	17	Plastic/foam	101485

Pictures are not original size & may vary.

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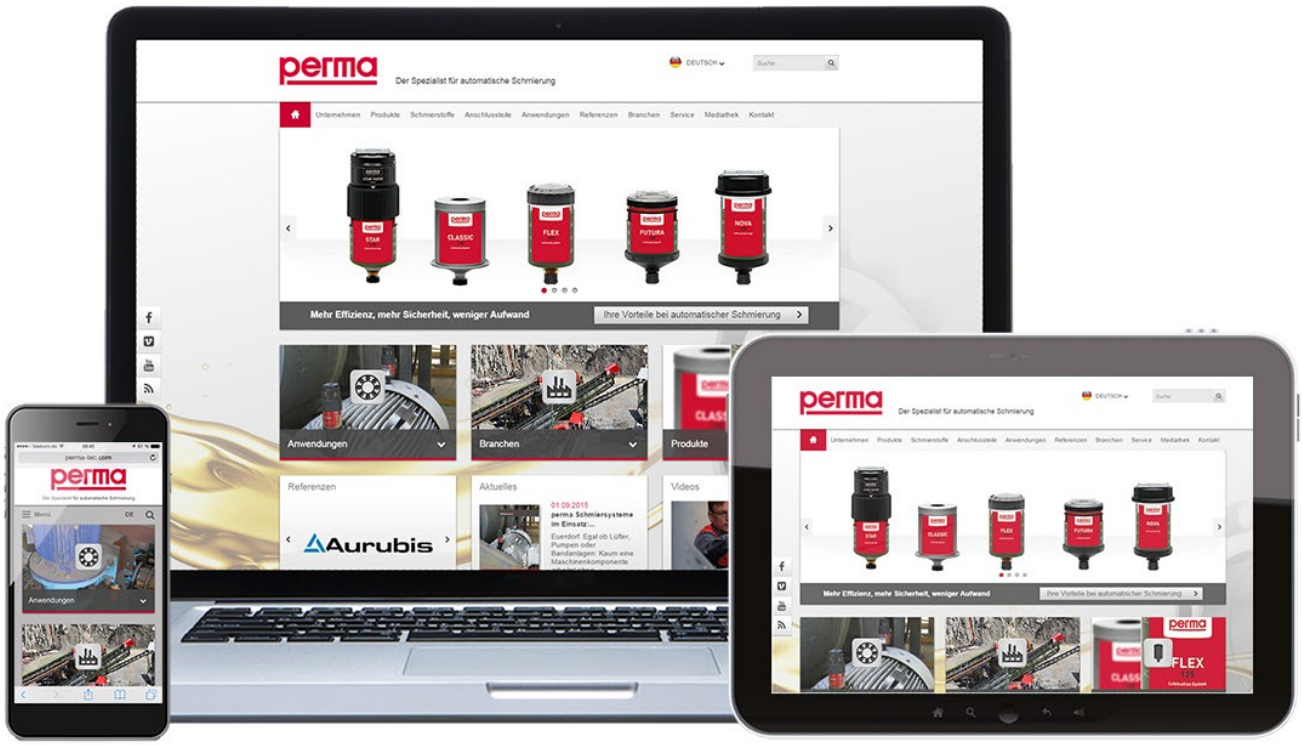

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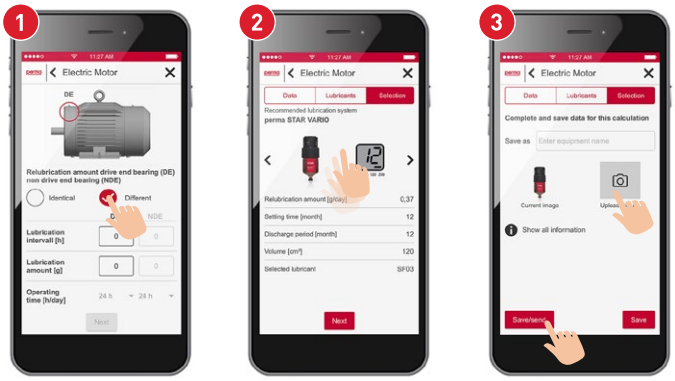
perma SELECT APP

One of the most important maintenance tasks is optimally supplying lubrication points with the correct lubricant. Incorrect metering can lead to unplanned downtimes and cause high outage costs. **Calculating** the **correct relubrication quantity** therefore represents an important factor for smooth plant operations and actively contributes to **economic success**.



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The ideal lubrication solution in only three steps

1. **Data acquisition:**
The calculation baseline is defined by entering bearing or application data.

2. **Recommendation:**
This includes a recommendation for the most suitable lubrication system, the lubricant and the correct discharge period.

3. **Selection/solution:**
Photograph the appropriate application and send us the results via email.

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Gain practical insights and hints on correct lubrication.
Our informative videos assist in the correct handling of perma lubrication systems.

Application videos:
Lubrication points, challenges, solutions

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perma SERVICE

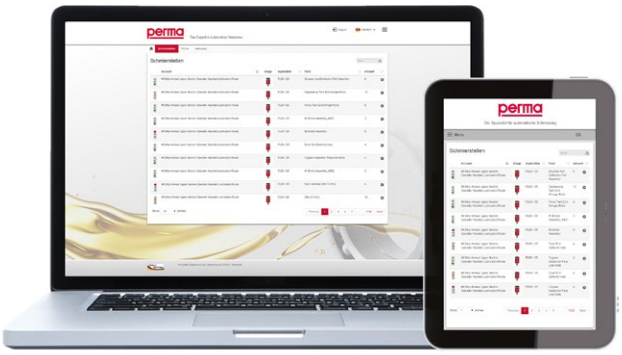
With expertise to the optimal solution!
The perma SERVICE performs project planning on-site in order to concentrate completely on the respective company conditions.

- **Project planning forms the basis for a detailed tender**
- **Compilation of servicing schedules for documentation**
- **Professional engineering consulting**

perma MLP (Maintenance Lubrication Program)

With the perma MLP you always have an up-to-date overview of your lubrication points and maintenance tasks. The online system can be used from any smartphone, tablet or PC with an Internet connection. Manage your lubrication points, get automatic reminders for upcoming maintenance tasks and print lubrication schedules and material lists for individual production or plant sections. Your perma contact will provide support in recording existing lubrication schedules.

- **Global access via any available browser**
- **Automatic notifications**
- **Store individual images and notes**
- **Exchange data with colleagues / export functions**



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perma ACADEMY

We offer seminars demonstrating the use of perma lubrication systems in practical examples.

- **Technical training at perma-tec/in-house courses on request**
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  Sales arguments, marketing tools, main applications
- **Dates can be found on our website: www.perma-tec.com**
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Roller bearings | Sliding bearings / Sliding guides | Linear guides | Open gears / Gear racks | Spindles | Shaft seals | Chains

perma Lubrication Systems - OVERVIEW

Product	Lubricatns	Discharge period	Mode	Max. lube-points	Max. pressure [bar]	Operating temperature [°C]	Content [cm³]	Drive / Power supply	Activation / Setting	Machine elements							Certifications	Catalogue page
Single-point Lubrication Systems, electrochemical																		
 **CLASSIC / FUTURA**	Grease up to NLGI 2 / Oil	1, 3, 6, 12 months (1)	Time	1	4	0 to +40	120	Electro-chemical	Activator screw	✓	✓	-	✓	✓	✓	✓	Ex	48-49
 **FLEX**		1, 2, 3, ... , 12 months (1)			5	-20 to +60	60 125	Electro-chemical / Integreated battery	Dial / Rotary switch	✓	✓		✓	✓	✓	✓	Ex, IECEx, TIIS, FM APPROVED	50-51
 **NOVA**		1, 2, 3, ... , 12 months (2)			6	-20 to +60	65 125	Gas gene-rating cell / Integreated battery	Push button control and display	✓	✓		✓	✓	✓	✓	Ex, IECEx, ANZEx	52-53
Single-point Lubrication Systems, electromechanical																		
 **STAR VARIO**	Grease up to NLGI 2 / Oil	1, 2, 3, ... , 12 months	Time	1	6	-10 to +60	60, 120, 250	Drive motor / Battery	Push button control and display	✓	✓	-	✓	✓	✓	✓	cULus LISTED	54-55
 **STAR CONTROL**		Custo-mized	Time / Impulse			-20 to +60		Drive motor / 9-30 V DC		✓	✓		✓	✓	✓	✓		56-57
Multi-point Lubrication Systems, electromechanical																		
 **PRO MP-6**	Grease up to NLGI 2	1 day to 24 months	Time / Amount	6	25	-20 to +60	250, 500	Drive motor / Pump / Battery	Display with menu navigation	✓	✓	✓	✓	✓	✓	-	cULus LISTED	58-59
 **PRO C MP-6**		Custo-mized	Time / Impulse					Drive motor / Pump / 15-30 V DC		✓	✓	✓	✓	✓	✓			
 **PRO LINE**		1 day to 24 months	Time / Amount					Drive motor / Pump / Battery		✓	✓	✓	✓	✓	✓			60-61
 **PRO C LINE**		Custo-mized	Time / Impulse					Drive motor / Pump / 15-30 V DC		✓	✓	✓	✓	✓	✓			
 **ECOSY**	Oil	Custo-mized	Time / Impuls	6	10	-20 to +60	7 l	Drive motor / Pump / 24 V DC / 85-240 V AC	Display with menu navigation	-	✓	-			✓			62-63

(1) depending on ambient temperature and counter pressure

(2) depending on counter pressure

All perma products are approved according to CE directives.

Imprint

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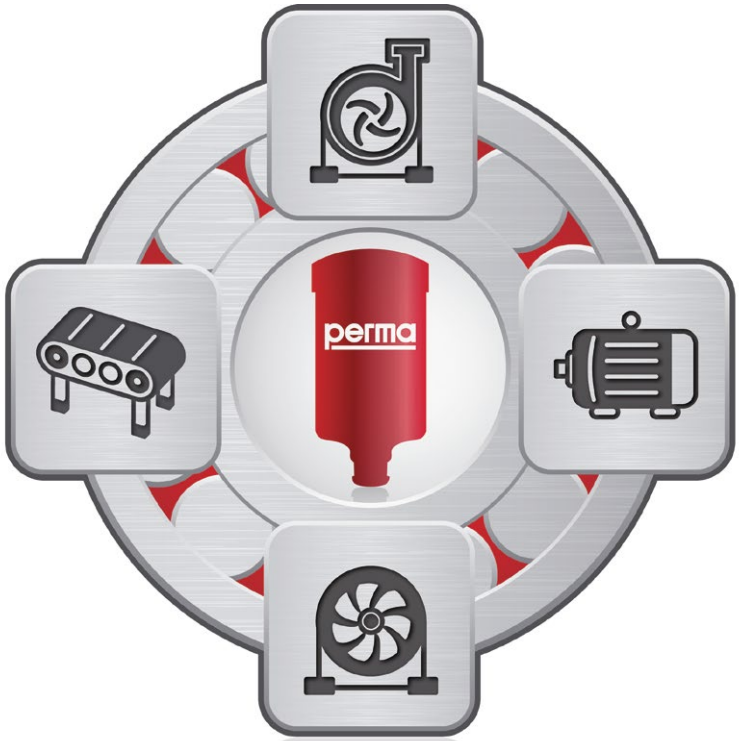

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2015/11 · Version: 3.0 en · Art. No. 111005