Your perma contact:

perma LUBE BOOK

Automatic Lubrication



The Expert in Lubrication Solutions

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	

Approvals / certifications:

FM APPROVED Canada & USA	**UL (Underwriters Laboratories)** Canada & USA	**TIIS** Japan

Ex-proof:

Ex Europe	**IECEx** Global	**ANZEx** Australia & New Zealand

Testing and certification of equipment intended for use in potentially explosive atmospheres. The approvals ensure that devices were tested and are in compliance with ex-proof requirements and safety standards.

Glossary:

Threads:
iø = Inner diameter
oø = Outer diameter
G1/4 female = Inside thread G1/4
G1/4 male = Outside thread G1/4

Materials:
PA = Polyamide
GF = Fibreglass-reinforced plastics
PTFE = Polytetrafluoroethylene
NBR = Nitrile rubber





perma – The Expert in Lubrication Solutions Page 4-13

- Company – dates, facts and figures
- Advantages at a glance
- Reference
- perma Media

3 STEPS TO THE OPTIMAL LUBRICATION SOLUTION

STEP 1



1.1 Industries Page 14-31

- Asphalt mixing plants
- Automotive industry
- Chemical & pharmaceutical industry
- Gypsum, lime & cement plants
- Quarrying industry
- Sewage treatment plants
- Power plants
- Food & beverage industry
- Refineries
- Recycling industry
- Mining & heavy industry
- Steel industry
- Wind turbines
- Pulp & paper industry
- Other industries



1.2 Applications Page 32-41

- Conveyors
- Electric motors
- Pumps
- Blowers / Fans



1.3 Machine elements Page 42-51

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

STEP 2



2.0 Determination of mounting type Page 52-55

- Direct mounting
- Remote mounting

STEP 3



3.1 perma Lubrication systems Page 56-79

- 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 Page 80-83

- Oils
- Greases



Article numbers & mounting of lubrication systems Page 84-93

- Accessories for preparing the lubrication point
- Article numbers of lubrication systems / Product accessories



Article numbers of accessories Page 94-106

- Brackets
- Tubes / Tube connectors
- Reducers / Extensions / Angles
- Oil retaining valves / Oil brushes

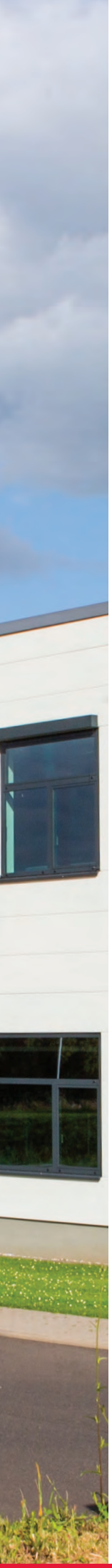
A CHAPTER



A perma lubrication system is installed every 11 seconds. Over 55 million have already been sold to all branches of industry. perma lubrication systems are distributed worldwide via eight subsidiaries and an extensive dealer network.

www.perma-tec.com

THE EXPERT IN LUBRICATION SOLUTIONS



A

- Company – dates, facts and figures Page 4-5
- Advantages at a glance Page 6-9
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The Expert in Lubrication Solutions

For more than 50 years, perma 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 experience, a global network of own subsidiaries and competent partners around the world, perma can offer customers many solutions that meet the highest technical requirements.

Milestones in company history

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 an **office building extension**

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

Dates, facts and figures

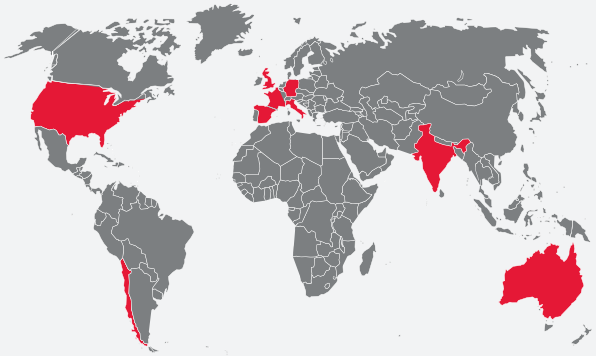
Employees worldwide: **239**

Turnover: (unconsolidated) **€89 M**

Availability: Countries: **> 80**

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



Version dated: 05/2018 | **Latest information:** www.perma-tec.com



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 ideal technical and economical solutions for any lubrication point.



Utilise the benefits of perma lubrication systems

perma simplifies maintenance work

It's easy to change from manual lubrication to perma lubrication systems: perma lubrication systems can be used wherever there are lubrication points. The product portfolio ranges from the robust single-point lubrication system to the individual supply of up to 600 different lubrication points.

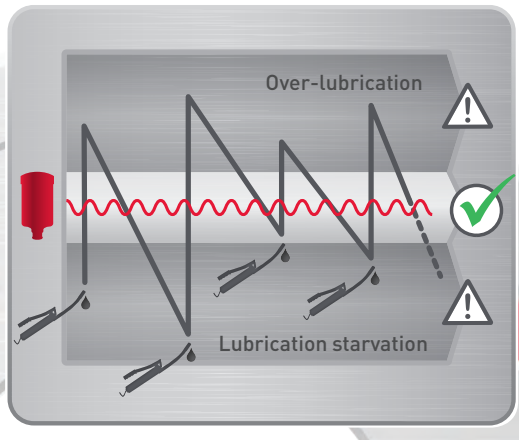
- Discharge periods from **1 day to 36 months**
- Lubricant volumes from **30 cm³ to 7,000 cm³**
- Operating temperatures from **-40 °C to +60 °C**
- Lubrication systems with high-performance **lubricants up to NLGI 2**



Since 1964 perma has been manufacturing exclusively in Germany.

Made in Germany

Manual vs. automatic lubrication



Over-lubrication (too much lubricant)
→ Increase in operating temperature
→ Damage to contact seals
→ Excessive lubricant consumption

Lubrication starvation (too little lubricant)
→ Increase in friction and wear
→ Risk of dry runs

→ **Automatic lubrication with perma lubrication systems ensures constant supply of the ideal lubricant quantity. Unlike manual lubrication, over-lubrication or lubrication starvation can be prevented.**

Sources: Internal calculations: Material, time and maintenance requirements / Figures from the roller bearing industry and insurance companies.

Equipment availability

perma helps prevent up to 75 % of roller bearing failures

Premature wear causes unwanted downtimes. Well-thought-out lubrication strategies have a great influence on extending the service life of greased bearings. Lubrication with perma lubrication systems can prevent up to 75 % of all bearing failures. The diagram below highlights the causes of premature bearing failures.

- **Reliable supply of** fresh lubricant **to lubrication points**
- **High equipment availability** with permanent relubrication
- **Reduction in maintenance costs** and unscheduled machine downtimes



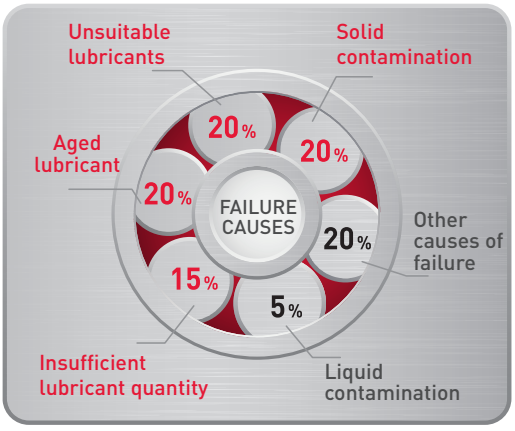
perma prevents contamination from liquids and dirt particles

Contamination due to water and solids speeds up wear and shortens bearing service life. By applying fresh lubricant, perma automatic lubrication systems prevent ingress of liquids, dirt and dust, thus increasing bearing service life.

- **Permanent lubrication** prevents **ingress** of **dirt particles** and **liquids** into bearings
- **Protection against friction and wear** in the bearings
- **Increase** in **bearing service life**



Causes of failure in roller bearings



Sources: Internal calculations: Material, time and maintenance requirements / Figures from the roller bearing industry and insurance companies.

Insufficient lubricant quantity
→ Direct contact of metal with friction points
→ Increased wear and friction

Aged lubricant
→ Due to irregular maintenance at hard-to-reach lubrication points
→ Loss of quality due to expired shelf life

Unsuitable lubricants
→ Does not meet lubrication point requirements
→ Reduced lubricant performance due to mixing

Solid contamination
→ Particle deposit with manual relubrication
→ Lack of cleanliness at workplace

Cost effectiveness

perma reduces costs by up to 25 %

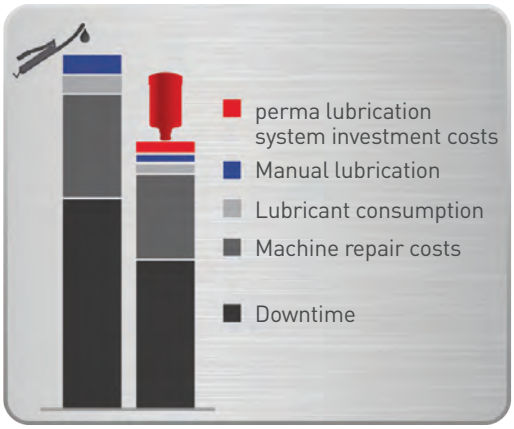
perma lubrication systems help to reduce costs significantly. Constant automatic lubrication minimises premature wear and downtimes. Expensive repair and maintenance costs are reduced.

- **High equipment availability** through automation
- **Maintenance intervals can be scheduled** during downtimes
- **Reduction in repair and maintenance costs**
- Management of lubrication points with lubrication systems using **free perma MLP Software**



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

Cost savings with automatic lubrication

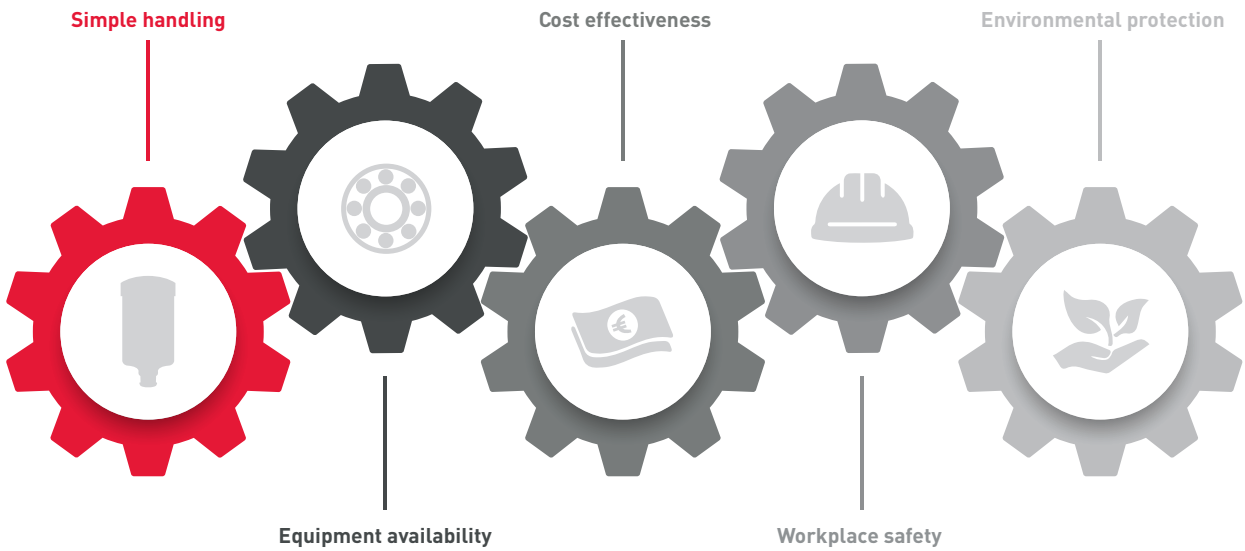


Sources: Internal calculations: Material, time and maintenance requirements / figures from the roller bearing industry and insurance companies.

Comparing manual lubrication with perma lubrication shows savings potential in different areas.

The following areas have the biggest savings potential:

- Reduction in downtimes
- Machine repair costs



Workplace safety

perma reduces the risk of accidents by up to 90 %

Using perma lubrication systems increases workplace safety. perma lubrication systems minimise contact between human and machine and make an important contribution to workplace safety.

- **Reduction** of **time spent** in hard-to-access **dangerous areas**
- Lubrication systems prevent **direct contact** with **hazardous lubricants**
- **Reduction of slipping accidents** caused by lubricant contamination



perma is a member of the German Association for Safety, Health and Environmental Protection at Work (VDSI).

VDSI Verband für Sicherheit, Gesundheit und Umweltschutz bei der Arbeit



Environmental protection

perma – certified environmental management system

The perma environmental management system is certified to DIN EN ISO 14001. Lubricant consumption is reduced by matching the lubricant quantity to the respective application. Reusable, environmentally friendly components will help to minimise energy and material costs in your company.

- **Reduction of lubricant consumption** with needs-based metering
- **No lubricant contamination** thanks to enclosed systems
- **Reusable components** help minimise energy and material costs



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



Recommendations from all over the world

Reference

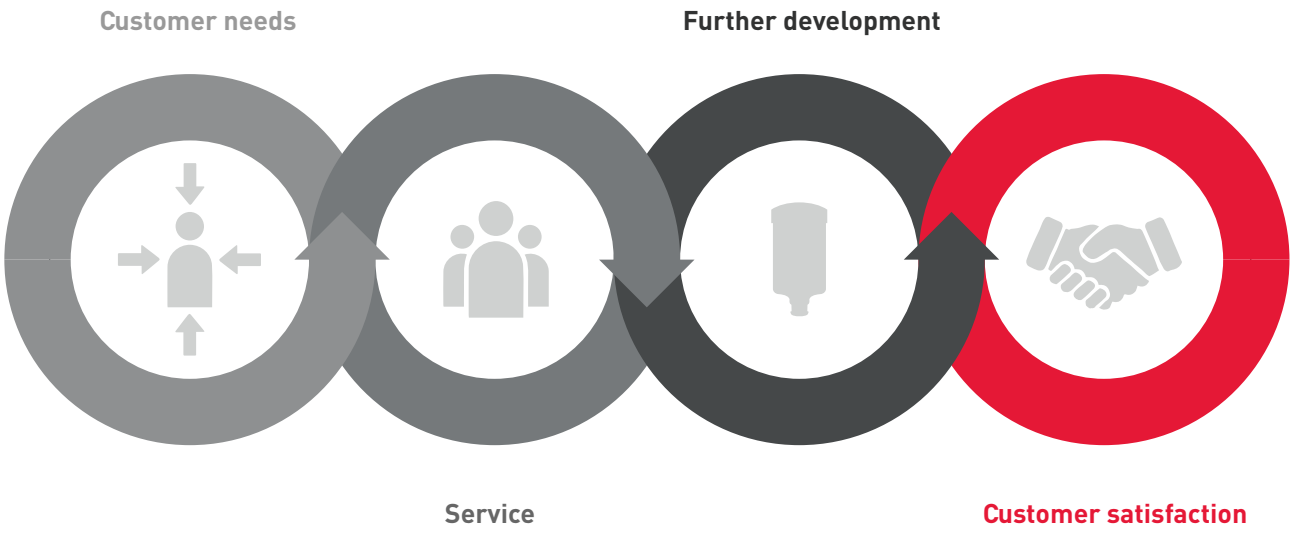
Strong brands around the world rely on perma automatic lubrication systems. For years, leading companies have profited from the performance and benefits of perma lubrication systems. perma, the expert in automatic lubrication solutions convinces with its performance, service, reliability and customer satisfaction.

Our self-image

Trusting partnerships with our customers

- Customer needs determine our actions:
  Your expectation is our driving force
- Competent service from dealers and consultants in your area:
  To satisfy your needs
- Continuous further product development:
  Our success motor for quality products
- Customer satisfaction based on dialogue and quality products:
  The basis for successful teamwork






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Aurubis
VATTENFALL
Audi
sappi
Inspired by life
SALZGITTER FLACHSTAHL
TÜNKERS
Erfindergeist serienmäßig.
KRONES
K+S
BMW GROUP
MINI
OPTERRA
A CRH COMPANY
Warsteiner
DAS EINZIG WAHRE


perma



Our all-round service for you!

perma Media

Customer satisfaction and quality products are the foundation of our cooperation. This includes numerous customer service programs which are based on many years of experience and the exchange of ideas with users. We are glad to offer them to you as part of our cooperative partnership.

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

- "Best practice" solutions
- Accessories
- Practical exercises
- Sales arguments
- Marketing tools
- Main applications

Training schedule:
www.perma-tec.com/en/service/perma-academy

perma SERVICE

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



Project planning forms the basis for a detailed tender

Preparation of service plans for documentation

Professional technical consulting

More information:
www.perma-tec.com/en/service/perma-service

HINT You will find our current flyers with detailed information on our website.

perma SELECT APP

The calculation tool for your application

The perma SELECT APP helps you determine the required lubricant amount and discharge period for the perma lubrication system while taking operating conditions into account.

You can conveniently install the perma SELECT APP on all standard iOS and Android mobile devices. A browser version is also available.



More information:
www.perma-tec.com/select

Download on the App Store GET IT ON Google Play

perma MLP / perma MLP APP

Digital lubrication point management

With the perma web application and the perma MLP APP, you always have an updated overview of all lubrication points. Coordinate upcoming maintenance tasks conveniently. The perma MLP web application is used to manage lubrication points centrally. The perma MLP APP allows you to record all maintenance and replacement tasks on site. The data is then synchronised with the perma MLP web application.



More information:
www.perma-tec.com/mlp

Download on the App Store GET IT ON Google Play

perma VR

The use of innovative technologies provides you with virtual glimpses into the real world of automatic lubrication.

- **Gain practice-based insights into the use of perma lubrication systems in real applications**
- **View information on mounting, lubricants used and perma lubrication systems**



Experience it now:
www.perma-tec.com/vr

1 STEP



THE EXPERT IN LUBRICATION SOLUTIONS



STEP 1

- Industries
- Applications
- Machine elements

STEP 2

- Direct mounting
- Remote mounting

STEP 3

- perma Lubrication systems
- perma Lubricants

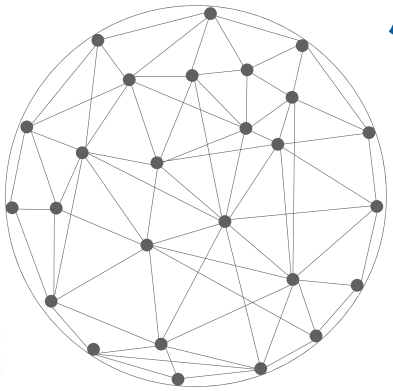
1.1 Industries

Asphalt mixing plants	Page 16
Automotive industry	Page 17
Chemical & pharmaceutical industry	Page 18
Gypsum, lime & cement plants	Page 19
Quarrying industry	Page 20
Sewage treatment plants	Page 21
Power plants	Page 22
Food & beverage industry	Page 23
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Recycling industry	Page 25
Mining & heavy industry	Page 26
Steel industry	Page 27
Wind turbines	Page 28
Pulp & paper industry	Page 29
Other industries	Page 30 - 31

Lubrication systems for your industry

perma has the right lubrication system for every industry. Depending on requirements, single- or multi-point lubrication systems are used, which have been proven in practice for more than 50 years.

Continuous product developments help to meet individual requirements on site. Since 1964 more than 55 million perma lubrication systems have been sold worldwide in all industries.





perma Lubrication systems for

Asphalt mixing plants

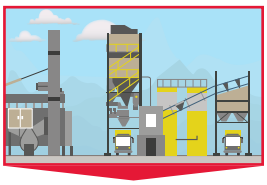
Complex procedures are required to process mineral rock, rock dust, binder (bitumen) and additives into an asphalt mixture. There are numerous safety aspects to observe and great challenges for man and machine in the production process. Fluctuating temperatures and dirt and dust need to be handled. Continuous lubrication of machine elements is a key factor in preventing machine breakdowns and ensuring high productivity for the whole system.

Reference

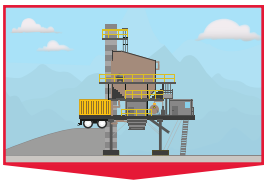
AMS

Lubrication points

1 Roller bearings
2 Sliding bearings



Raw material processing			
→ **Pre-dosage**	Metering devices, conveyors	✓	✓
→ **Drying**	Drum driers	✓	-
→ **Transporting**	Bucket conveyor, elevator	✓	✓



Final processing and loading			
→ **Weighing**	Mineral flaps	✓	✓
→ **Mixed module**	Mixing shafts, mixer flaps	✓	✓
→ **Loading**	Concrete travelling buckets, loading flaps	-	✓



Dedusting			
→ **Filtering**	Exhauster, trough screw conveyor	✓	-
→ **Conveying**	Screw conveyor	✓	-

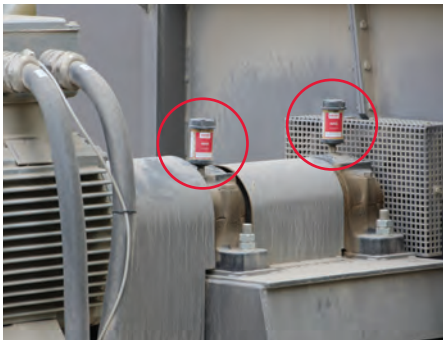
Application examples



Flange bearing lubrication on the dedusting trough screw conveyor



Roller bearing lubrication on the hot vertical bucket conveyor



Lubrication of pillow block bearing on the exhauster



perma Lubrication systems for

Automotive industry

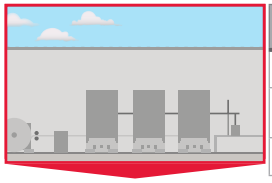
Strict quality requirements and maximum equipment availability are decisive success factors in the automotive industry. perma lubrication systems and a wide selection of high-grade lubricants ensure optimum lubrication of equipment and machines.

Reference

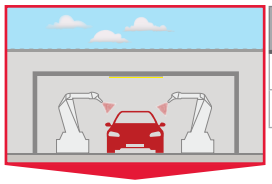
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Lubrication points

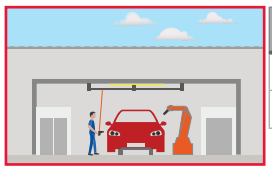
1 Roller bearings 2 Linear guides 3 Chains



Press shop & car body construction		1	2	3
→ Presses	Flat and round guides	-	✓	-
→ Welding, screw fastening, bonding	Guides, robot systems	✓	✓	-
→ Transporting	Chain conveyors, conveyor belts, paternosters	✓	-	✓



Paint finishing systems				
→ Lacquer finishes	Blowers / fans, electric motors, robots	✓	-	-
→ Transporting	Chain conveyors, belt conveyors	✓	-	✓

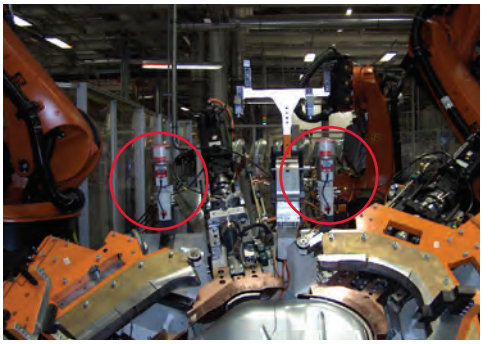


Final assembly				
→ Assembling	Robots, lifting systems	✓	-	✓
→ Transporting	Chain conveyors	-	-	✓

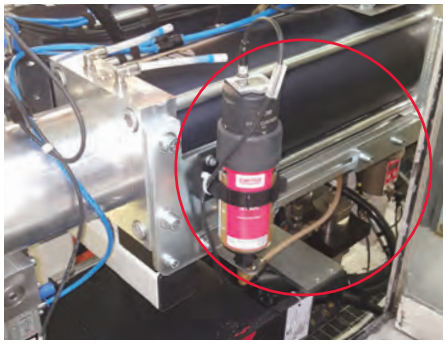
Application examples



Automatic lubrication of a sliding guide



Lubrication of spindles and flat guides



Lubrication of a pump unit with ball screw and linear guides



perma Lubrication systems for

Chemical & pharma industry

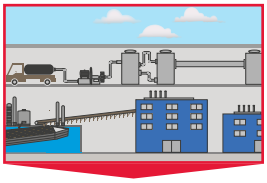
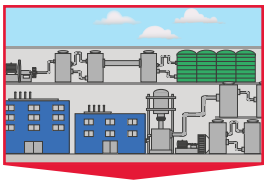
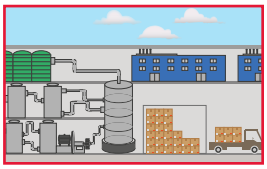
Almost no other industry features such a concentration of machines and automation. Maintenance is therefore one of the major controllable cost factors in both industries. perma automatic lubrication systems from perma are reliable partners when it comes to correct lubrication of equipment and machine elements. They increase equipment and machine element availability significantly, thus having a sustainable positive effect on the net operating profit.

Reference

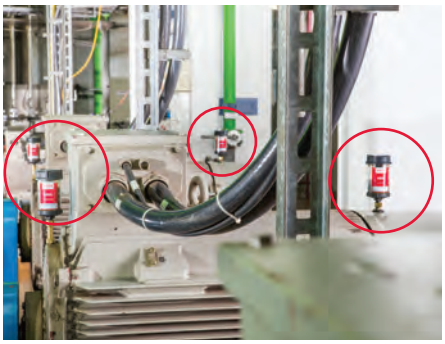
MERCK

Lubrication points

1 Roller bearings
2 Sliding bearings
3 Chains
4 Shaft seals

			1	2	3	4
	**Delivery and drying**					
	→ **Transporting**	Conveyors, screw conveyors	✓	✓	✓	-
	→ **Pumping**	Process pumps, electric motors	✓	✓	-	✓
	→ **Unloading**	Blowers / fans, electric motors	✓	✓	-	
	**Final processing**					
	→ **Drying**	Hot-air blowers, electric motors	✓	✓	-	
	→ **Heating, mixing**	Batch mixers, process pumps	✓	✓	-	✓
	→ **Cooling, transporting**	Blowers / fans, feed pumps	✓	✓	-	✓
	**Packing, loading & dispatch**					
	→ **Packing**	Conveyors, palletisers	✓	✓	✓	-
	→ **Loading**	Screw conveyors, pumps	✓	✓	-	✓
	→ **Transporting**	Chain conveyors	-	-	✓	-

Application examples



Bearing lubrication for electric motors



Bearing lubrication on a pump



Bearing lubrication on a fan



perma Lubrication systems for

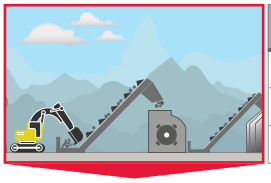
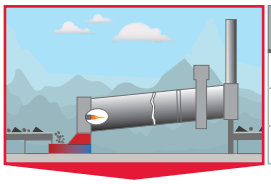
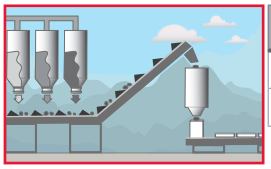
Gypsum, lime & cement plants

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

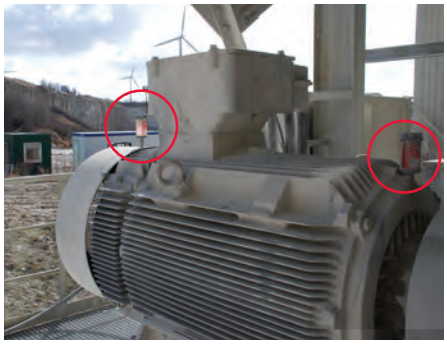
Reference

OPTERRA
A CRH COMPANY

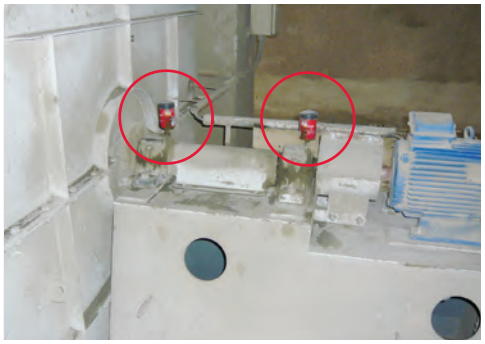
Lubrication points

		1 Roller bearings	2 Sliding bearings	3 Chains
	**Raw material processing**			
	→ Crushing	Crushers	✓	✓	-
	→ Transporting	Conveyors	✓	-	-
	→ Drying and grinding	Raw mills	✓	✓	-
	**Final processing**			
	→ Heating	Rotary kiln	✓	-	✓
	→ Fine grinding	Cement mill, fine screen	✓	✓	-
	→ Cleaning	Dust removal equipment	✓	-	-
	**Storage & packing**			
	→ Storage	Conveyors	✓	-	✓
	→ Packing	Palletiser	-	-	✓

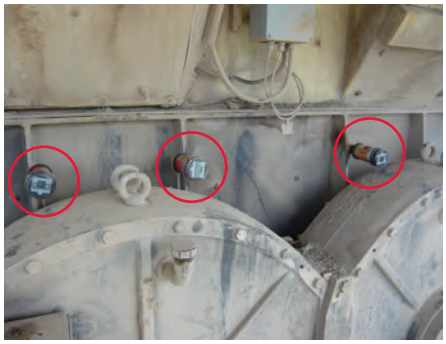
Application examples



Motor lubrication on a vibrating screen



Lubrication of pillow block bearing on a fan drive shaft



Conveyor lubrication



perma Lubrication systems for

Quarrying industry

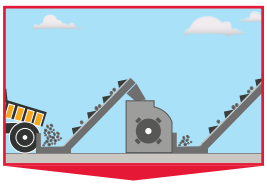
The quarry industry is very demanding for both workers and machines. Spread-out equipment, insufficient staff, tough ambient conditions and cost pressure continuously challenge quarry operators and employees. Automatic lubrication with perma lubrication systems increases workplace safety and equipment availability enormously.

Reference

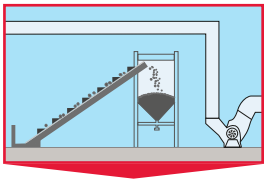
NSN

Lubrication points

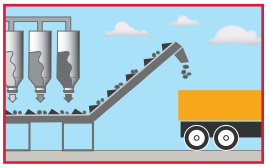
1 Roller bearings
2 Sliding bearings



Raw material processing			
→ Crushing	Jaw, cone & roll crushers	✓	✓
→ Transporting	Conveyors	✓	-



Final processing			
→ Screening	Grit & sand screens	✓	-
→ Cleaning & sorting	Conveyors	✓	-
→ Dust removal	Dedusting equipment, blowers / fans	✓	-
→ Transporting	Conveyors	✓	-



Storage & packing			
→ Packing	Conveyors	✓	-
→ Filling	Silo discharge	✓	-

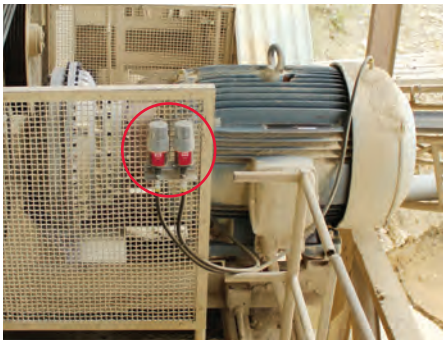
Application examples



Lubrication of pillow block bearing on a conveyor



Lubrication of pillow block bearing on grit and sand screen



Remote lubrication of electric motor



perma Lubrication systems for

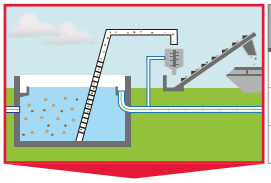
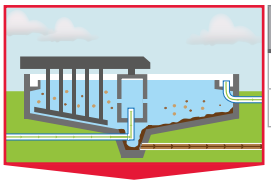
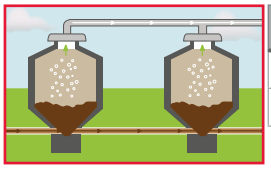
Sewage treatment plants

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

Reference

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



Roller bearing lubrication on a chain guide roller



Roller bearing lubrication on a scraper



Pivot bearing lubrication on a circular scraper bridge



perma Lubrication systems for

Power plants

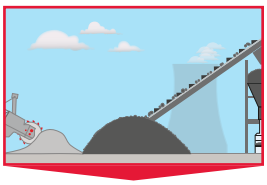
Flexible, needs-oriented energy supply poses new challenges to power plant operators, especially for maintenance departments. Frequent load changes and longer downtimes require reliable lubrication of equipment and machine elements.

Reference

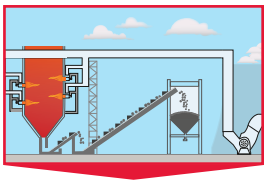
VATTENFALL

Lubrication points

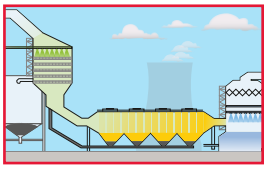
1 Roller bearings



Material transport		
→ Transporting	Portal scraper, conveyors	✓
→ Loading	Ship unloader, crane	✓

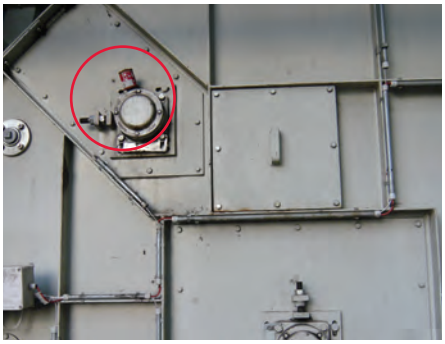


Processing		
→ Crushing	Impact hammer, coal mill	✓
→ Dust removal	Blowers / fans, electric motors	✓
→ Transporting	Conveyors	✓

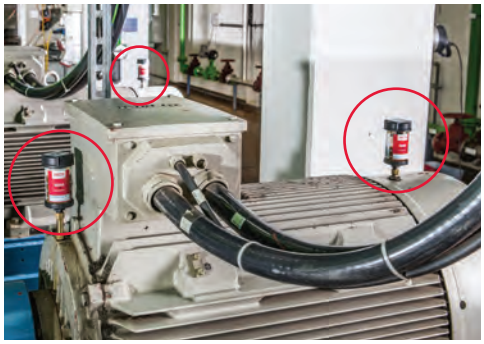


Post processing		
→ Dust extracting	Flue gas scrubbing, blowers / fans, electric motors	✓

Application examples



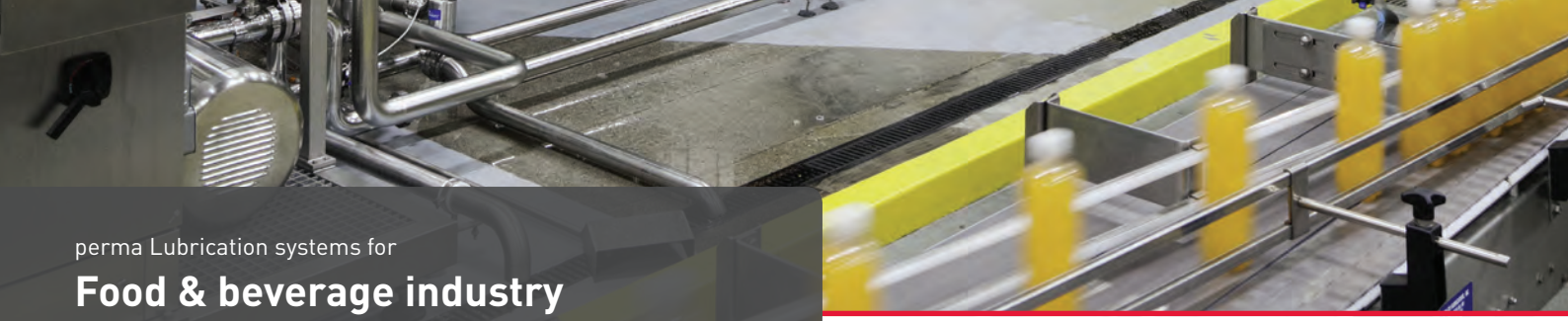
Flange bearing lubrication on bucket conveyor



Bearing lubrication for electric motors



Pillow block bearing lubrication on a fan



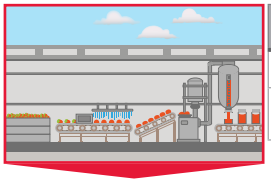
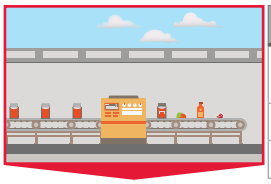
perma Lubrication systems for

Food & beverage industry

In the food & beverage industry, manufacturing processes are precisely synchronised. State-of-the-art automation requires optimal equipment and machine lubrication. perma has a wide range of automated lubrication solutions with suitable lubricants for the food sector.

Reference

Lubrication points

		1 Roller bearings	2 Sliding bearings	3 Chains
	**Delivery & storage**			
	→ **Transporting & sorting**	Conveyor belts, depalletizers, sorting systems	✓	-	✓
	→ **Cleaning**	Drum systems, belt washing systems, peeling machines	✓	✓	-
	**Final processing**			
	→ **Milling, crushing, mixing, pressing**	Presses, cutters, cutting machines	✓	✓	-
	→ **Transporting**	Wire mesh, link chain & flat top chain conveyors	✓	-	✓
	→ **Filling, portioning**	Vibrating filling system, filler, capper	✓	-	✓
	**Packing & shipment**			
	→ **Labelling**	Labelling machine	✓	-	-
	→ **Packing**	Packaging machine, film wrapping machine, shrink tunnel	✓	-	✓
	→ **Transporting, palletising**	Palletiser, pallet conveyor, chain conveyor	✓	-	✓

Application examples



Lubrication of pillow block bearing on a cooling section for baked goods



Chain lubrication on transport system box ejector



Chain lubrication on box transport system after packaging machine and full crate check



perma Lubrication systems for

Refineries

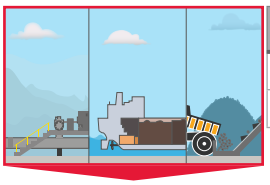
The highly engineered processing methods in refineries pose great challenges to man and machine. Pumps and fans are among the key machine elements in refineries. perma lubrication systems guarantee reliable, continuous lubrication for such applications.

Reference

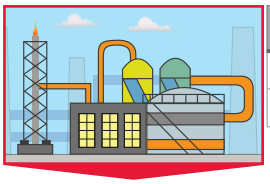
PETRO-CANADA LUBRICANTS

Lubrication points

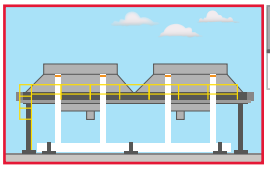
1 Roller bearings
2 Sliding bearings
3 Shaft seals



Pump stations, ship unloading		1	2	3
→ Pumps	Pumps, electric motors	✓	✓	✓
→ Transporting	Electric motors	✓	✓	-

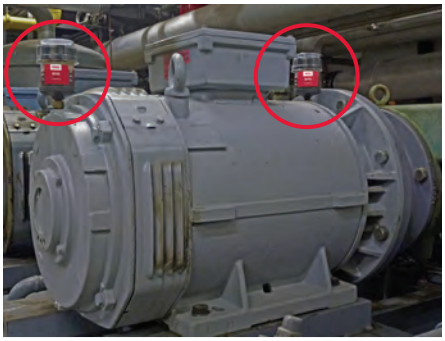


Refinery		1	2	3
→ Pumps	Electric motors, fuel pumps	✓	✓	✓
→ Venting	Blowers / fans, electric motors	✓	✓	-



Air-cooled heat exchangers		1	2	3
→ Cooling	Electric motors, blowers / fans	✓	-	✓

Application examples



Electric motor lubrication in a pump station



Fuel pump lubrication in the refinery process



Fin fan lubrication in a heat exchanger



perma Lubrication systems for

Recycling industry

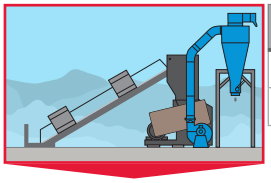
Recycling companies are constantly under pressure. Large price fluctuations, significantly changing market demands and short contract periods with buyers of recycling materials are some of the enormous challenges faced by operators. In order to run their business at a profit, operators require efficient technologies. This makes maintenance and lubrication particularly important for these industries.

Reference

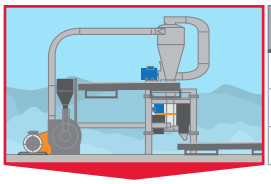
KORN RECYCLING

Lubrication points

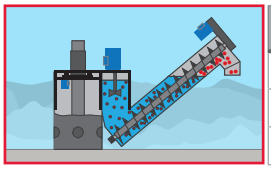
1 Roller bearings
2 Sliding bearings



Preparation		1	2
→ Crushing	Hammer / impact mills	✓	✓
→ Grinding	Granulators	✓	-



Processing		1	2
→ Screening	Vibrating screen	✓	-
→ Separating	Air separator	✓	-
→ Dust removal	Electric motors	✓	-



Final processing		1	2
→ Cleaning	Scrubbers	✓	-
→ Drying	Blowers / fans	✓	-
→ Transporting	Conveyors	✓	-

Application examples



Flange bearing lubrication on a conveyor



Flange bearing lubrication on a conveyor



Drive shaft lubrication on a pump



perma Lubrication systems for

Mining & heavy industry

In order to stay competitive, mining and heavy industry companies must increase productivity while minimising long-term operating costs. One crucial factor in this context is preventive maintenance, which extends equipment service life and minimises necessary downtimes required for maintenance, repairs and overhauls. This reduces operating costs and enhances company performance.

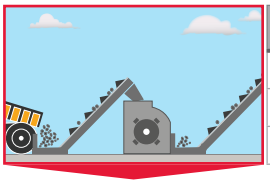
HINT

Order the free perma catalogue "Mining & Heavy Industry" Art. No. 110197

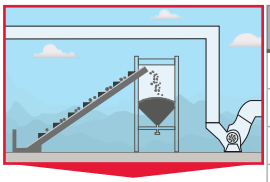


Lubrication points

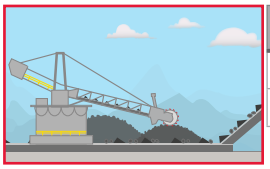
1 Roller bearings
2 Sliding bearings
3 Shaft seals



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

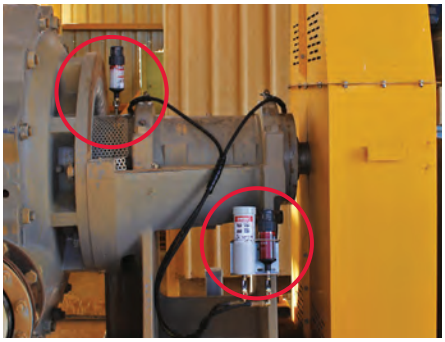


Final processing		1	2	3
→ Screening	Raw material screens	✓	✓	-
→ Cleaning & sorting	Conveyors, pumps, mixer gears	✓	-	✓
→ Dust removal	Dedusting equipment, blowers / fans	✓	-	✓
→ Transporting	Conveyors	✓	-	✓



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

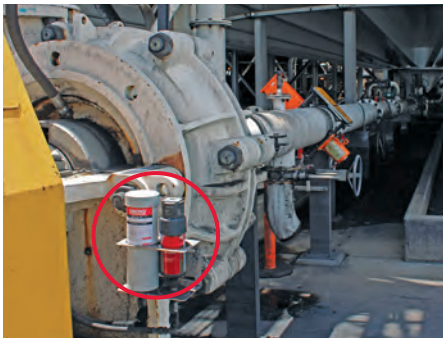
Application examples



Bearing / seal lubrication on a pump



Lubrication of pillow block bearing on a conveyor



Bearing / seal lubrication on a pump



perma Lubrication systems for

Steel industry

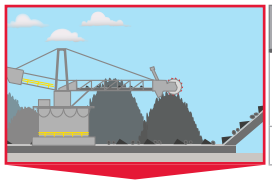
Equipment in the steel industry is constantly exposed to extreme operating conditions, especially very high temperatures, enormous loads and aggressive media. perma lubrication systems with special high-temperature lubricants provide reliable lubrication of roller bearings, chains and open gears in different production processes.

Reference

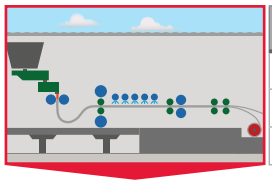
thyssenkrupp

Lubrication points

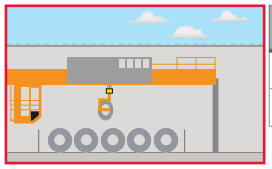
1 Roller bearings 2 Chains 3 Open gears



Coking plant & sintering plant		1	2	3
→ Transporting, mixing	Electric motors, conveyors, screw conveyors, vibrating screens, trough chain conveyors, tensioning stations	✓	✓	✓
→ Venting	Blowers / fans, electric motors	✓	✓	-



Rolling mills, continuous casting system & surface finishing		1	2	3
→ Rolling, continuous casting	Rolling systems, tensioning stations, electric motors	✓	✓	-
→ Coating	Conveyors, strip buffers	✓	-	-
→ Reeling, cutting	Coilers, shears	✓	-	-

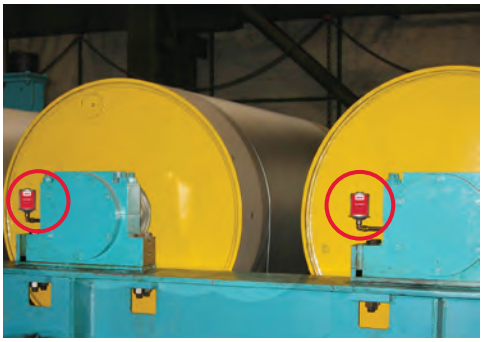


Storage & transport		1	2	3
→ Transporting	Crane systems	✓	-	✓
→ Storing	Conveyors	✓	✓	-

Application examples



Drive chain lubrication (bolt stock conveyor)



Roller bearing lubrication in a hot-dip galvanising line



Lubrication of a fan drive shaft bearing



perma Lubrication systems for

Wind turbines

Wind turbines and wind energy plants are a permanent part of energy supply. It is therefore all the more important for turbines to operate efficiently. One crucial aspect is the optimal alignment of the turbine and blades. Different sensors, drives and machine elements perform this task. perma offers special lubrication systems with the right lubricant for these drives and machine elements.

HINT

perma FUTURA PLUS is ideal for wind turbine lubrication.

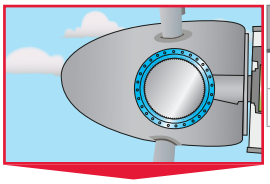
You will find more information on pages 64–65.



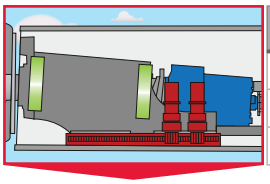
Lubrication points

1 Roller bearings

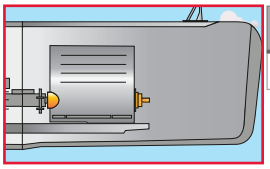
2 Open gears



Blade bearing & blade gear teeth			
→ **Blade direction**	Blade bearing	✓	-
→ **Aligning**	Blade gear teeth	-	✓



Main bearing & turbine alignement			
→ **Force transmission**	Main bearing	✓	-
→ **Wind direction tracking**	Yaw bearing	✓	-
→ **Wind direction tracking**	Yaw gear teeth	-	✓



Power generation			
→ **Generator**	Roller bearings	✓	-

Application examples



Yaw bearing lubrication



Blade bearing lubrication



Automatic relubrication of the generator bearing



perma Lubrication systems for

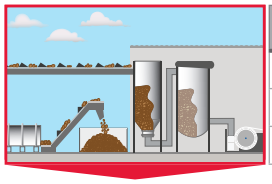
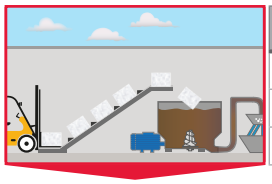
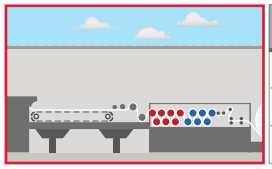
Pulp & paper industry

The paper industry is currently facing many new challenges:
An increase in international competition, falling demand due to digital media, rising energy costs and stricter health-, workplace 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 help to provide a solution to these problems.

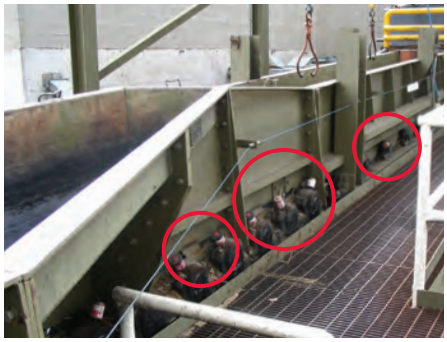
Reference

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, draining & thickening**	Pumps, electric motors	✓	-	-
	**Paper production**			
	→ **Dewatering, screening**	Vacuum units	✓	-	-
	→ **Pressing, drying**	Press pulpers, dryers	✓	-	-
	→ **Spreading, rolling**	Dryers, roller conveyors	✓	-	✓

Application examples



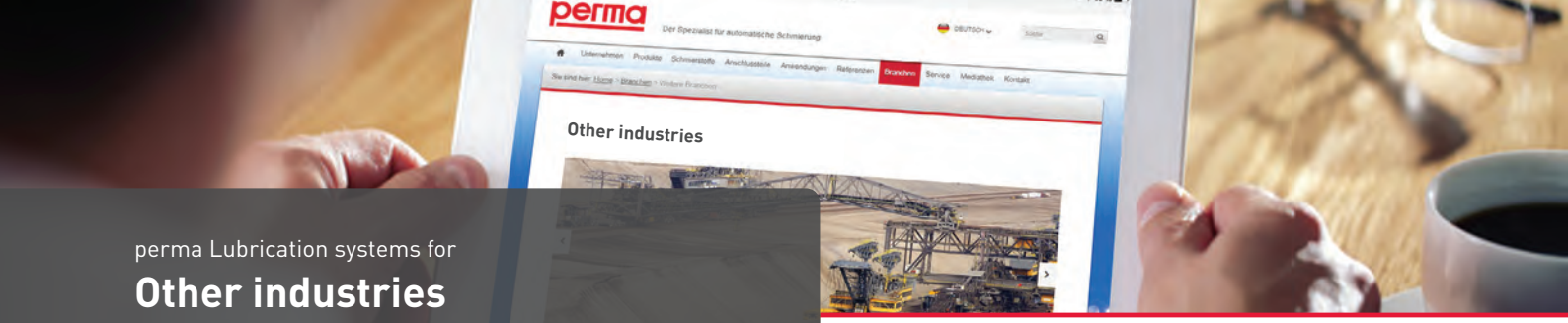
Bearing lubrication on the tree sorting system



Lubrication of pillow block bearing on a fan



Bearing lubrication on a pump



perma Lubrication systems for

Other industries

You will find information on other sectors, such as building services engineering, hospitals, hotels, cranes, the textile industry, railway transport, cable cars and mountain railways, and other industries on our website:

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

Elevators

Lubrication points:
- Rail lubrication on counterweight
- Guide rails on the elevator car





Biogas plants

Lubrication points:
- Solid input auger
- Substrate pump
- Compressor





Escalators

Lubrication points:
- Handrail drive chains
- Main drive chain
- Step chains
- Step chain rollers
- Step rollers





Timber industry

Lubrication points:
- Suction units
- Conveyors
- Veneer presses
- Veneer cutting machines
- Crane systems
- Blowers / Fans
- Buffing machines





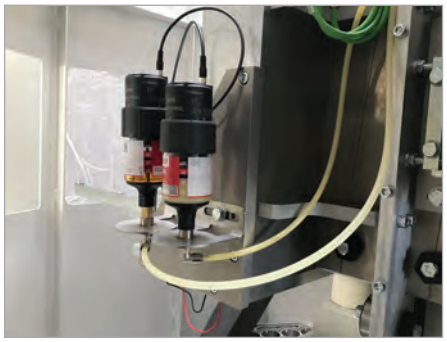
Crane

Lubrication points:
- Slew ring
- Wheels / Chassis
- Cable drum bearing & drive
- Gear rings




Plastic & rubber processing

Lubrication points:
- Extruders
- Film blowing machines
- Calenders
- Mills
- Pelletiser

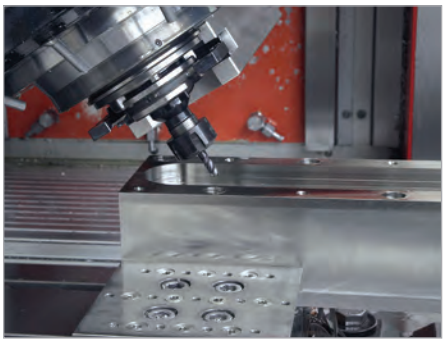
Navy & shipping

Lubrication points:
- Anchor winches
- Electric motors
- Swing arm
- Blowers / Fans
- Cable winches
- Water pumps




Mechanical engineering

Lubrication points:
- Electric motors
- Conveyors
- Blowers / Fans
- Pumps
- Chains
- Linear guides




Sluices

Lubrication points:
- Drive chains
- Conveyor chains
- Large chains
- Lock gate
- Spindles
- Gear wheels





1
STEP
perma
STAR VARIO
perma
STAR
perma
perma
THE EXPERT IN LUBRICATION SOLUTIONS



STEP 1

- Industries
- Applications
- Machine elements

STEP 2

- Direct mounting
- Remote mounting

STEP 3

- perma Lubrication systems
- perma Lubricants

1.2 Applications

- Conveyors — Page 34-35
- Electric motors — Page 36-37
- Pumps — Page 38-39
- Blowers / Fans — Page 40-41

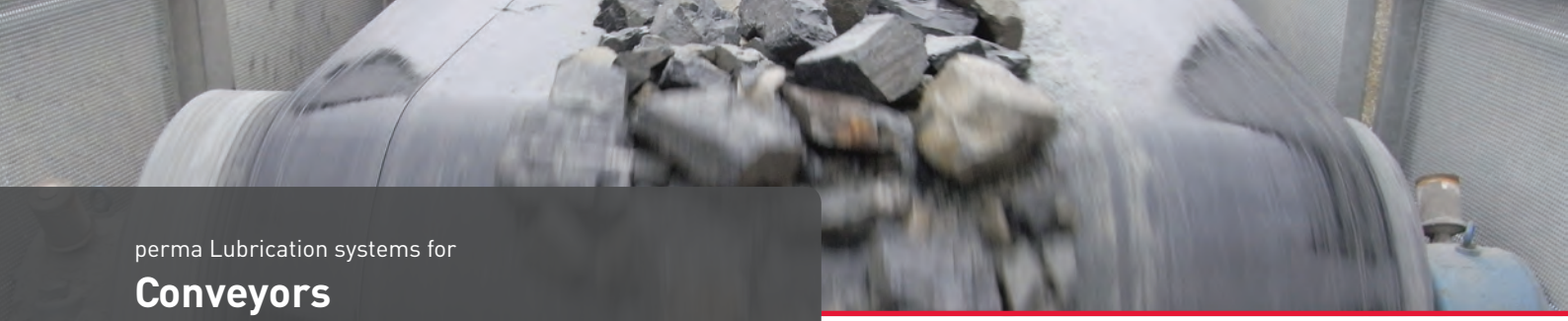
Our product recommendation for your application

For years, perma has been offering perfect solutions for the lubrication of conveyors, electric motors, pumps and blowers / fans. This chapter explains the challenges that lubrication poses for these applications in more detail and presents suitable products and installation solutions.

o Limited suitability
\+ Suitable
++ Recommended

		Conveyors	Electric motors	Pumps	Blowers / Fans
Single-point lubrication systems					
	CLASSIC FUTURA FUTURA PLUS	+	o	+	o
	FLEX FLEX PLUS	+	+*	++	++
	NOVA	+	++*	+	++
	STAR VARIO	++	++	++	++
	STAR CONTROL	+	++	+	++

* For electric motors in explosion protection areas / observe counter pressure



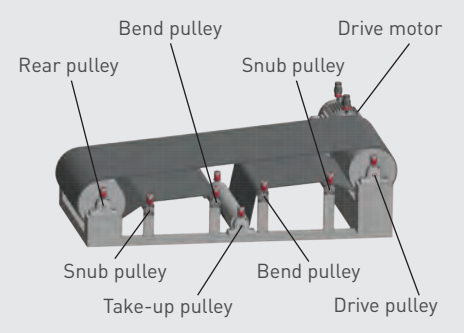
perma Lubrication systems for

Conveyors

Functioning conveyors are essential for smooth process flows. Despite dirt, dust or strong vibration, optimal lubrication is necessary to prevent equipment failures. Costly repairs and service visits represent a significant part of operating costs, which can be minimised significantly by using perma lubrication systems.

- → Gypsum, lime & cement plants
- → Quarrying industry
- → Power plants
- → Food industry
- → Recycling industry
- → Mining & heavy industry

Lubrication points



Pillow block housings with spherical roller bearings are mainly used for **drive and bend pulleys**.

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

Information about drive motor lubrication can be found on pages 36 / 37: “Electric motors”.

Challenges





Large conveyors often extend over long distances and several levels and are **difficult to access**. Relubrication should ideally take place while the equipment is running. Many transfer points can only be lubricated with the help of catwalk grating or work platforms and are therefore often **neglected**. **Accident prevention** and **workplace safety** must be ensured at all times.

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

- → **Dirt** and **water** must not enter the lubrication points
- → **No unnecessary equipment downtimes** due to relubrication
- → **Workplace safety** must be ensured

HINT Manual for conveyor lubrication available on request.

Advantages of automatic lubrication

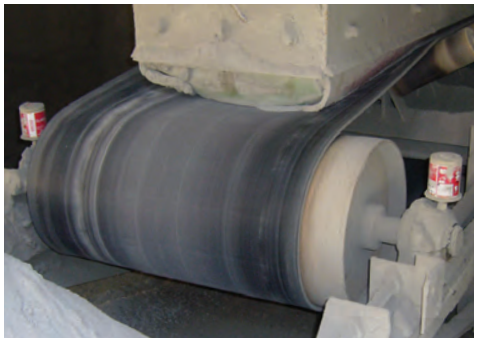
- Lubricant seals lubrication points and **prevents** ingress of **contamination.**
- **Lubrication takes place while the equipment is running** without interrupting the work process.
- perma lubrication systems are installed outside of dangerous areas (remote mounting) and **actively contribute to accident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

Reference

Solutions

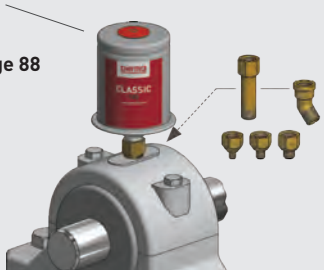
Direct mounting on the lubrication point: e.g. with perma CLASSIC

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



perma CLASSIC

Art. No. go to page 88



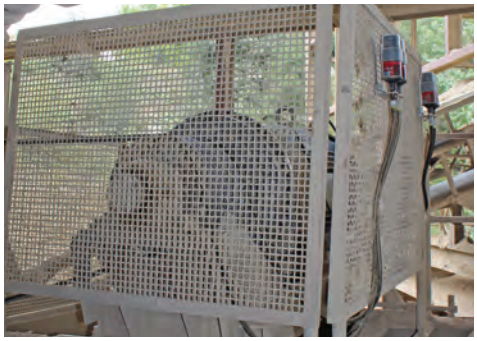
INSTALLATION KIT for perma CLASSIC
Use extensions, angles & reducers depending on the installation situation

Art. No. 101476

→ Go to page 55 for details

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

→ For lubrication points with strong vibration / shocks (isolation of lubrication system)
→ For lubrication points which are unsafe to access: 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 91

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

Art. No. 101482

→ Go to page 55 for details



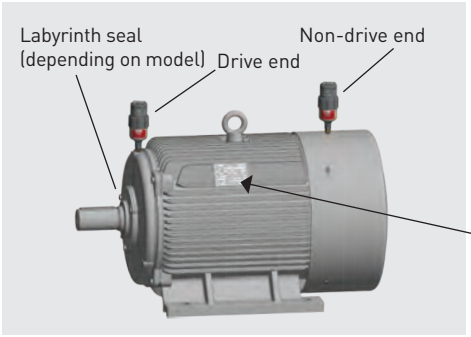
perma Lubrication systems for

Electric motors

Electric motors are used in many different applications. An electric motor is designed to convert electrical into mechanical energy. Efficient lubrication and maintenance are essential for reliable operation of electric motors. Still, many of them are lubricated at irregular intervals as they are located in areas which are difficult to reach or dangerous. Failure to adhere to manufacturer specifications frequently leads to damage and breakdowns caused by bearing over-lubrication or lubrication starvation.

- → Gypsum, lime & cement plants
- → Quarrying industry
- → Power plants
- → Food industry
- → Recycling industry
- → Mining & heavy industry

Lubrication points



Lubrication points are located on the **drive** and **non-drive end of electric motors**. When relubricating, you must ensure that **excess grease is discharged** through the discharge openings, grease relief ports or grease traps. Bearings will overheat if grease cannot escape and / or if grease traps are filled up with used grease.

The correct lubricant
Information about fitted roller bearings, lubricant and lubricant amount is found on the motor nameplate.

Speed: high	=	**Base oil:** thinner	NLGI 0-2
Speed: low	=	**Base oil:** thicker	



Challenges





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

- → **Bearing heating** and **possible fire hazard** since it takes hours to distribute excess grease
- → Possible **shut-off** with 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 operations** (manufacturer recommendations) jeopardises maintenance staff. The risk of accidents increases when people spend time in **dangerous** or **hard-to-reach areas**.

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

HINT Manual for electric motor lubrication 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**

Reference

SALZGITTER FLACHSTAHL
Ein Unternehmen der Salzgitter Gruppe

Solutions

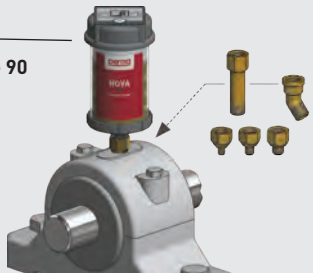
Direct mounting on the lubrication point: e.g. with perma NOVA

→ 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 90



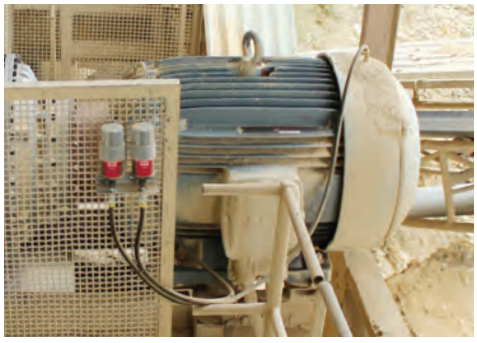
INSTALLATION KIT for perma NOVA
Use extensions, angles & reducers depending on the installation situation

Art. No. 101476

→ Go to page 55 for details

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

→ For lubrication points with strong vibration / shocks (isolation of lubrication system)
→ For lubrication points which are unsafe to access: 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 91

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

Art. No. 101482

→ Go to page 55 for details



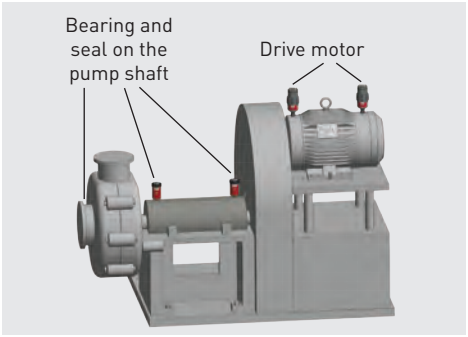
perma Lubrication systems for

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.

- → Chemical & pharmaceutical industry
- → Sewage treatment plants
- → Power plants
- → Food & beverage industry
- → Refineries
- → Mining & heavy industry
- → Environmental technology
- → Pulp & paper industry

Lubrication points

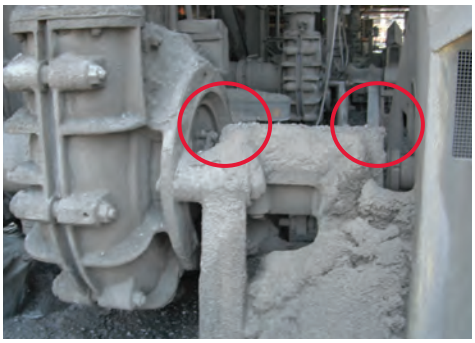


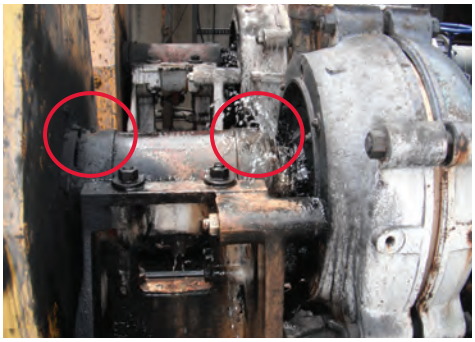
Lubrication points (roller bearings) are located on the **drive shaft** between drive motor and pump body or in the pump housing.

Lubrication of **gland seal** and **labyrinth seal** prevents the ingress of dirt and / or pumped media into the bearing. **Seals of bearings** and **bearing housings** must be permanently supplied with the specified amount of the right lubricant.

Information about drive motor lubrication can be found on pages 36 / 37: “Electric motors”.

Challenges





Pumps are normally operated under extreme conditions. These can include **heavy contamination** from slurry or dust and **hazardous materials** such as alkali solutions and weak acids.

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

Many lubrication points can only be accessed with **extreme protective measures** (safety gloves and mask). This frequently leads to neglect of the prescribed lubrication.

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

- → **Lubrication while the machine is in operation** must be ensured
- → Operation in **potentially explosive areas**
- → **Workplace safety** must be ensured

HINT Manual for pump lubrication available on request.

Advantages of automatic lubrication

- **Increased workplace safety** due to automatic lubrication of hard-to-reach lubrication points
- A precise lubricant discharge reduces lubricant consumption and **lessens environmental impacts**
- **Fewer maintenance runs** minimise the time spent in dangerous areas
- If a certified lubrication system is selected, it may be used **underground** or in **potentially explosive areas**

Reference

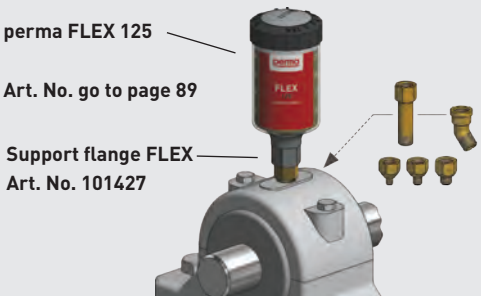
VATTENFALL

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





INSTALLATION KIT for perma FLEX
Use extensions, angles & reducers depending on the installation situation
Art. No. 101476
→ Go to page 55 for details

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

→ For lubrication points with strong vibration / shocks (isolation of lubrication system)
→ For lubrication points which are unsafe to access: Mounting in safe areas
→ For hard-to-reach lubrication points





perma STAR VARIO with LC 120
Art. No. go to page 91

INSTALLATION KIT STAR with 3.0 m tube
Use extensions, angles & reducers depending on the installation situation
Art. No. 101482
→ Go to page 55 for details



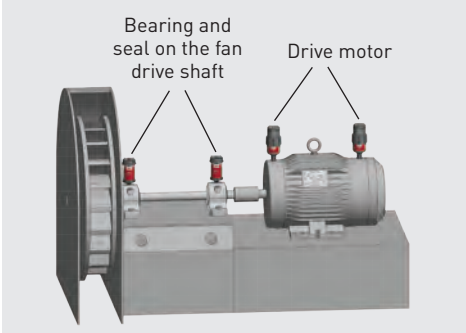
perma Lubrication systems for

Blowers / Fans

Blowers and fans are used in almost all 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 in scrubbers, dust collectors, heat exchangers and desulfurisation plants.

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

Lubrication points

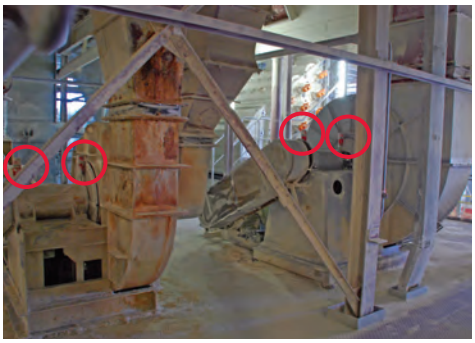


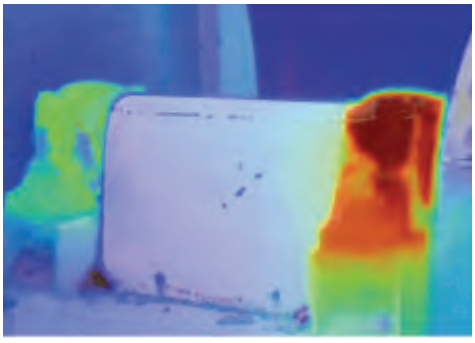
The lubrication points (roller bearings) are located at the **drive shaft** between drive motor and fan impeller.

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 36 / 37: “Electric motors”.

Challenges





Blowers / fans are normally operated under **extreme conditions**. Contaminants such as dust or pumped media are raised and may infiltrate the bearing system. This causes increased wear in individual components and reduces 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 be able to withstand **demands** , such as vibrations and high speeds
- → **Compliance with relubrication intervals**, depending on bearing type, bearing size and ambient conditions

HINT Manual for blowers / fans lubrication 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**

Reference

OPTERRA A CRH COMPANY

Solutions

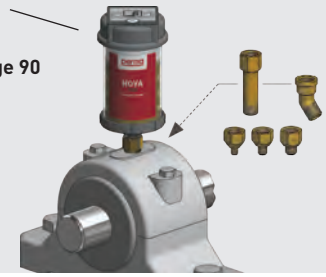
Direct mounting on the lubrication point: e.g. with perma NOVA

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



perma NOVA 125

Art. No. go to page 90



INSTALLATION KIT for perma NOVA
Use extensions, angles & reducers depending on the installation situation

Art. No. 101476

→ Go to page 55 for details

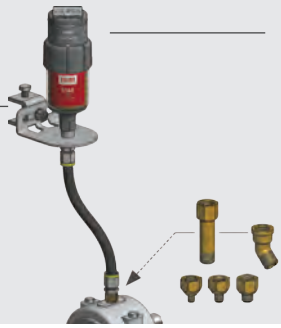
Remote mounting at lubrication point: e.g. with perma STAR VARIO

→ For lubrication points with strong vibration / shocks (isolation of lubrication system)
→ For lubrication points which are unsafe to access: 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 91

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

Art. No. 101482

→ Go to page 55 for details



THE EXPERT IN LUBRICATION SOLUTIONS



STEP 1

- Industries
- Applications
- Machine elements

STEP 2

- Direct mounting
- Remote mounting

STEP 3

- perma Lubrication systems
- perma Lubricants

1.3 Machine elements

- Roller & sliding bearings — Page 44-45
- Chains — Page 46-47
- Linear guides — Page 48-49
- Spindles & open gears — Page 50-51

Our product recommendation for your machine elements

perma convinces with perfect application solutions and constantly works on finding reliable and safe lubrication solutions for lubrication points with special demands.

- Unsuitable o Limited suitability + Suitable ++ Recommended		Roller & sliding bearings	Chains	Linear guides	Spindles & open gears
Single-point lubrication systems					
	CLASSIC FUTURA FUTURA PLUS	+	+	-	+
	FLEX FLEX PLUS NOVA	+	++	o Depending on lubricant	+
	STAR VARIO STAR CONTROL	++	++	o Depending on lubricant	++
Multi-point lubrication systems					
	PRO MP-6 PRO C MP-6	++	-	+	+
	PRO LINE PRO C LINE	++	-	++	+
	ECOSY	-	++	-	+



perma Lubrication systems for

Roller & sliding bearings

Roller and sliding bearings are used in all areas of industry. 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 machines
- → Machine tools

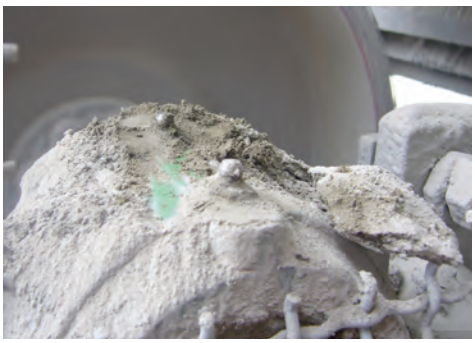
Lubrication points



In **roller bearings**, loads and movements are transferred by means of rollers, arranged between an outer and inner race. If these metallic components make direct contact with one another, the contact causes undesirable friction, wear and damage, 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 mainly depend on ambient conditions. Extreme operating conditions and the and contaminants in the bearing system lead to increased wear and to a shorter service life.

Ambient and influencing factors can be divided into three groups:

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

These factors have an impact on the service life and must be taken into account when calculating lubricant quantities. The greater the load or the influence of ambient conditions, the more lubricant is required to guarantee **optimal lubrication**.

Advantages of automatic lubrication

- **Protection against contaminant and liquid** ingress reduces wear and **extends bearing service life**
- **Permanent supply** of lubrication points with the correct amount 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

HINT

The perma SELECT APP helps you to determine the required lubricant amount for roller and sliding bearings.

You will find more information on page 13.

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





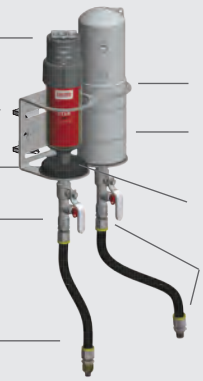




Angle 45° G1/4 male x G1/4 female
Art. No. 104823

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

perma NOVA with LC 125
Art. No. go to page 90



perma STAR VARIO with LC 250
Art. No. go to page 91

Beam clamp 65 mm
Art. No. 109958

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

Purge connection with manual valve R1/4 male x G1/4 female
Art. No. 113972 (brass)
Art. No. 113973 (stainless steel)

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
Art. No. 108606

Tube connector G1/4 male - push-lock
Art. No. 101554

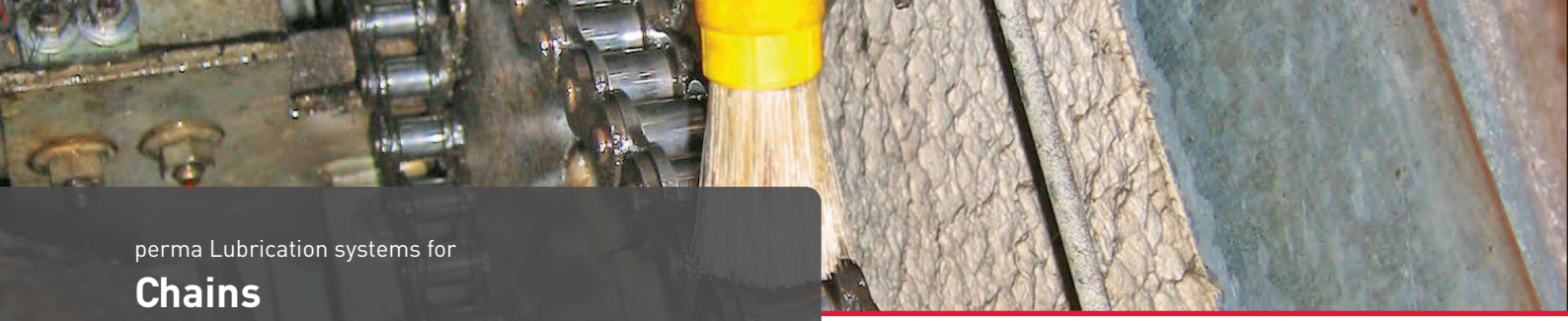


PRO LC 250
Art. No. go to page 92

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

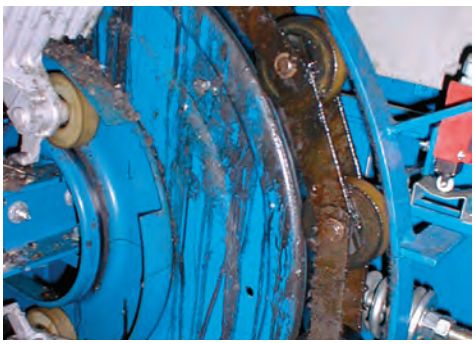
Trouble-free machine and plant operation is the utmost priority for maintenance staff and operators. Maintenance and lubrication pose numerous challenges.

Installing and operating perma lubrication systems ensures dependable, precise lubrication of chain drives and allows equipment to be operated reliably.

- → 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 **wear**
- → **Increased wear** of chain pins and rollers
- → Unpleasant **noise development**
- → **Uneven chain movement** (**jerking**)
- → Possible **equipment failure**

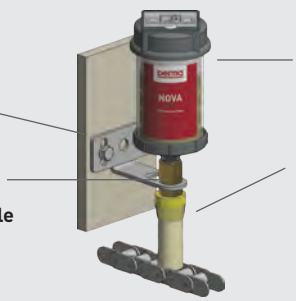
Access for equipment lubrication or cleaning is **time-consuming and not always** possible or desired
- → Additional labour input and **increased costs**
- → Equipment **shut-down** required

Suitable single-point lubrication systems: 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 90

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

When mounting perma CLASSIC or perma STAR, an oil retaining valve must be used (go to page 104).

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, away from moving parts and **actively reduce the risk of accidents**
- **Contamination** caused by over-lubrication is **prevented** and the **environmental impact is reduced**

Reference

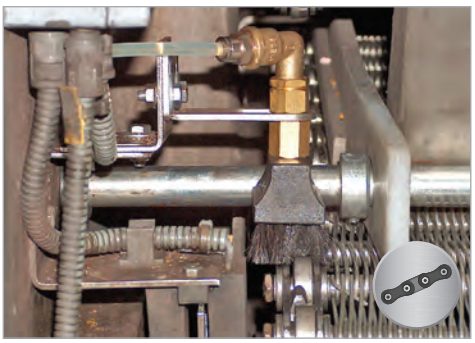
OTIS

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 with up to 10 m of grease lines per lubrication point possible







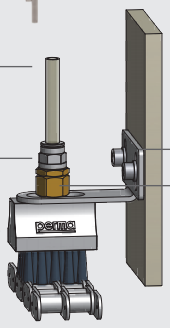


perma ECOSY
Art. No. 101700

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

Tube connector G1/4 male straight
Art. No. 101447

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

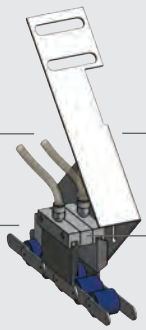


Bracket
Art. No. 104864

Oil retaining valve
Art. No. 104862

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

Oil brushes for large chains up to +80 °C including tube connector
Art. No. 101524 + 101525



Mounting bracket left for oil brush for large chains
Art. No. 101533

Spacer for oil brush for large chains, width: 13 mm
Art. No. 101535



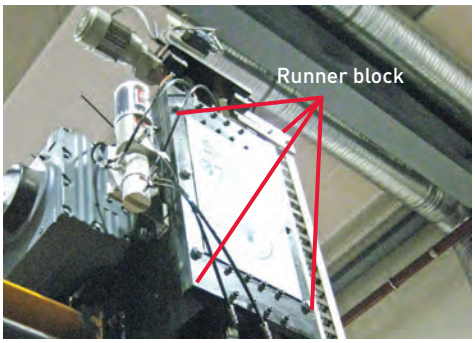
perma Lubrication systems for

Linear guides

Linear guides are machine elements that enable the movement of machines or components in linear direction. They are available in the form of roller bearing guides (e.g. linear ball 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 machines
- → Machine tools

Lubrication points

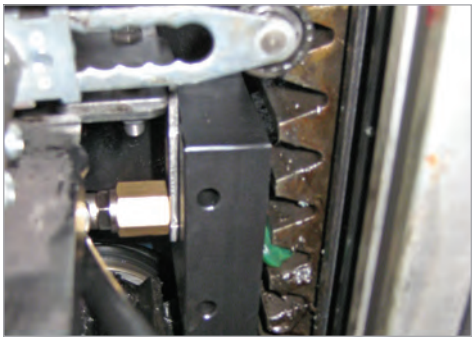


Lubrication points are located on the **runner block** and, if required, on the **drive** (spindle and / or gear rack).

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

Challenges





On account of the **special design** and varied use of linear guide systems, lubrication points in 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

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

- → Recirculating ball / Roller guides: **Even lubricant distribution** within a runner block requires an **increased lubricant volume flow**.
- → The **drive** (spindle or gear rack) often requires **more lubricant** than the runner blocks.

Advantages of automatic lubrication

- The lubricant amount can be set differently **for each one of the 6 outlets** according to manufacturer specifications.
- **Long LC exchange intervals** significantly **reduce maintenance requirements** compared to manual lubrication
- perma lubrication systems can be installed outside dangerous areas and **actively reduce the risk of accidents**
- The **precise lubricant discharge prevents over-lubrication** and protects the environment

Reference

rexroth
A Bosch Company

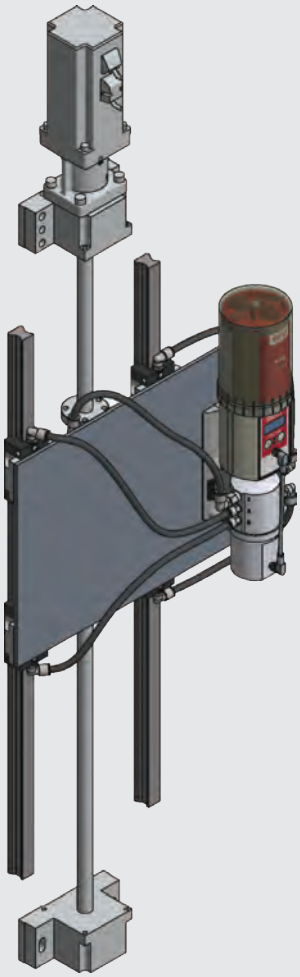
When using greases and grease line lengths (up to 3 m) approved by Bosch Rexroth at 25 °C.

Solutions

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

- → Different discharge amount can be set for each outlet
- → 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

---

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 is often difficult to achieve in practice. This makes it all the more important to apply effective lubrication, which helps to optimise spindles and open gears.

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

Lubrication points

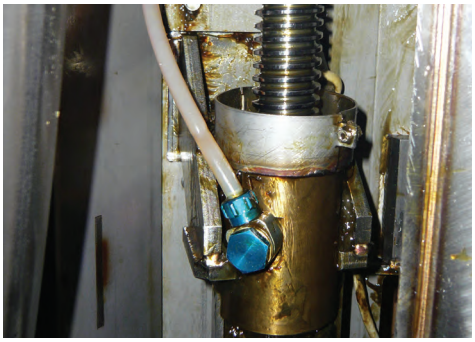


Relubrication is especially important for enhancing the service life and availability of gear ring drives. Right at the beginning of the bedding-in phase, care must be taken that the tooth flank surfaces are smooth.

During running operation, **lubricants with EP additives and MoS2** are generally used which can withstand **high stress loads** (mixed friction, load, corrosion and aggressive influences).

Challenges





perma lubrication systems with suitable accessories for applying the lubricant to the gear surface guarantee effective relubrication. Permanent renewal of the lubricant film with subsequent lubricant distribution 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 often come into contact with dirt or dust, such as cement or coal dust, which accelerates wear and corrosion.

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

Advantages of automatic lubrication

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

Solutions

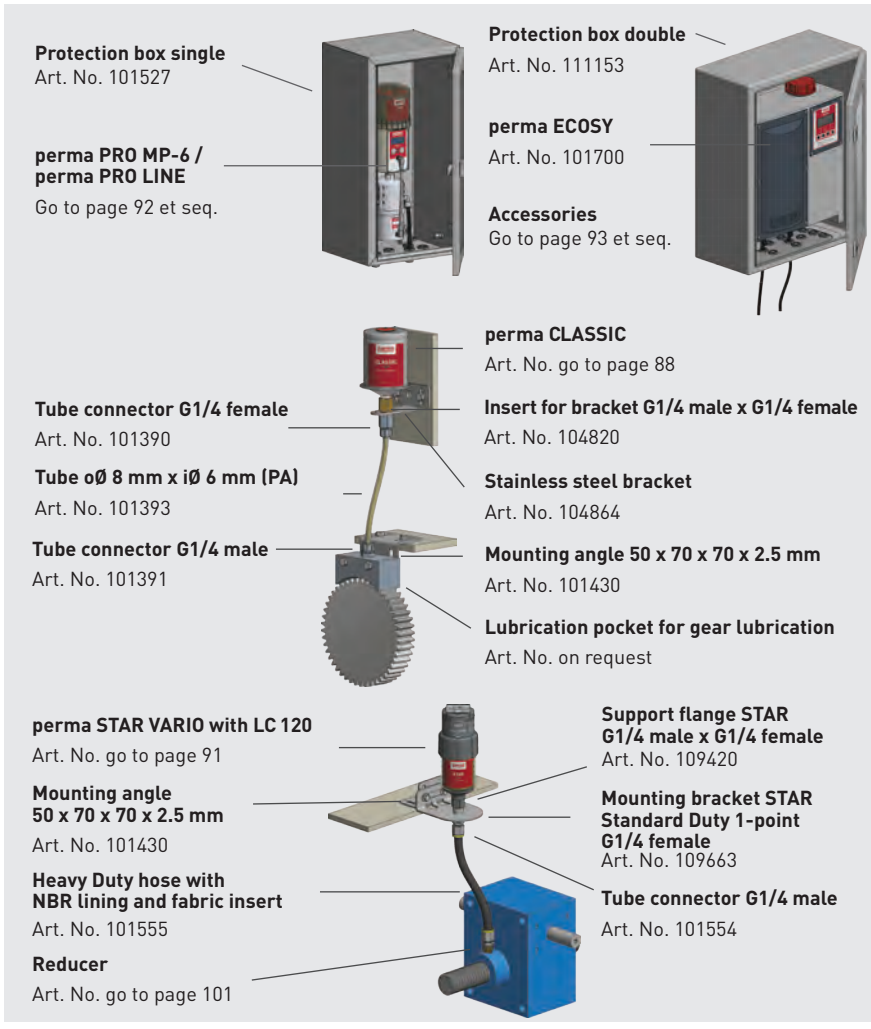
Automatic lubrication with perma lubrication systems

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









2 STEP



THE EXPERT IN LUBRICATION SOLUTIONS



STEP 1
- Industries
- Applications
- Machine elements

STEP 2
- Direct mounting
- Remote mounting

STEP 3
- perma Lubrication systems
- perma Lubricants

2. Determination of mounting type

- Recording of parameters to determine optimal mounting type — Page 53
- Determination of mounting type — Page 54-55

Recording of parameters to determine 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 safely accessed 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
- ☐ Ambient temperature
- ☐ Indoor / Outdoor
- ☐ Contamination

Bearing parameters:
- ☐ Bearing type / Size
- ☐ Relubrication quantity / Interval
- ☐ Grease drain hole
- ☐ Prescribed lubricant in accordance with manufacturers' specifications / selection of perma lubricant in step 3.2

HINT

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

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

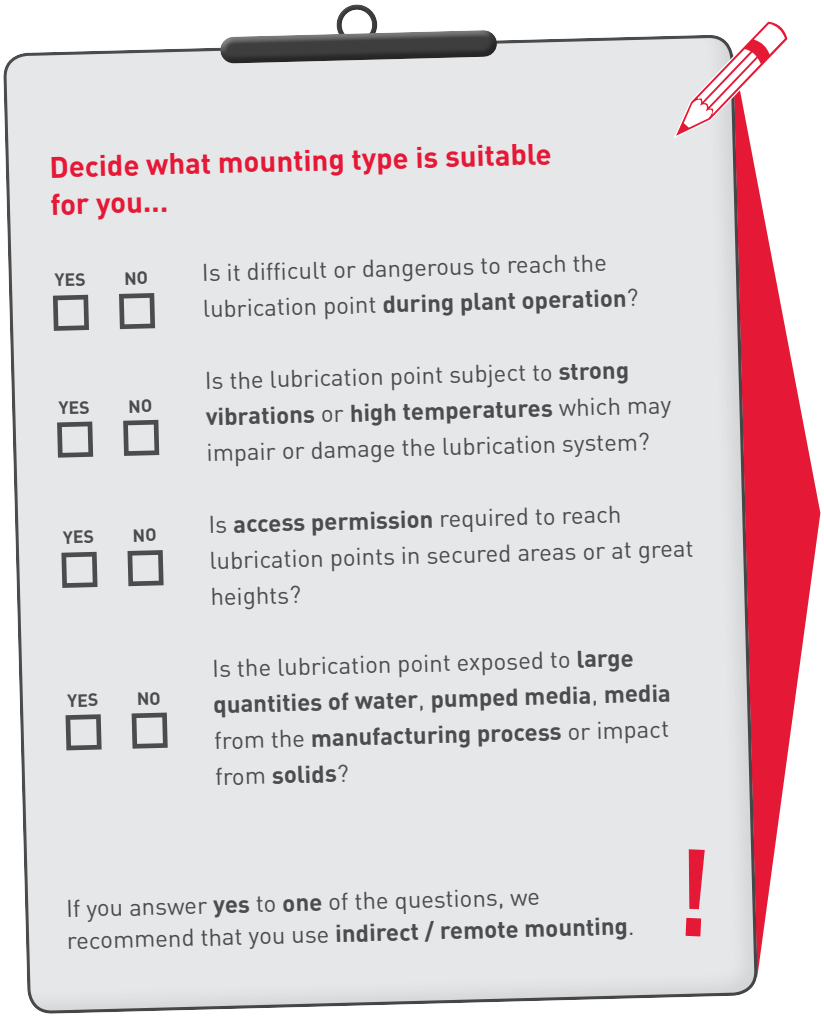
Download on the App Store | GET IT ON Google Play

Download: AppStore / PlayStore
Online: Browser version

perma Lubrication systems

Determination of mounting type

perma lubrication systems can be flexibly used in all types of applications, such as conveyors, electric motors, pumps, fans and blowers. Automatic lubrication systems can be mounted directly at the lubrication point. Remote or indirect mounting is also possible using grease lines.



Benefits: Direct mounting

- **Little installation work required**
- Automatic lubrication systems can be **screwed into position by hand**
- **Immediate supply** of lubrication points with **fresh lubricant**

Benefits: Remote mounting

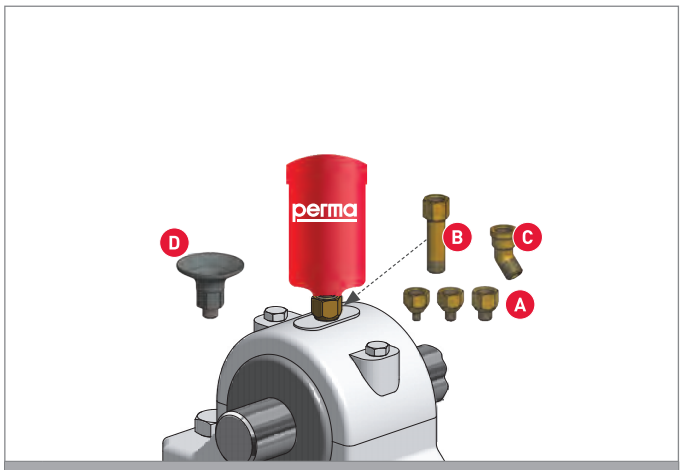
- Relocate lubrication point to a **safe area**
- **Vibrations** at the lubrication point **can be disregarded**
- Automatic lubrication systems can be **exchanged** while **the machine is in operation**



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

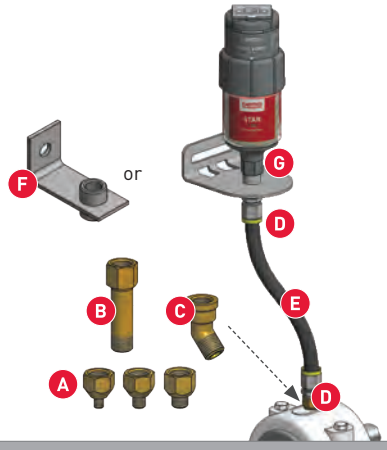
INSTALLATION KITS

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 G1/4 male x G1/4 female (only with Art. No. 101477)

Remote 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	2 x Tube connector G1/4 male for tube iØ 9.5 mm
E	Heavy Duty hose, black, up to +100 °C
F	1 x Mounting bracket G1/4 female single
G	1 x Support flange STAR G1/4 male x G1/4 female (only with Art. No. 101482)

Art. No. 101476

+

- perma CLASSIC
- perma FUTURA
- perma FUTURA PLUS
- perma FLEX
- perma FLEX PLUS
- perma NOVA

Art. No. 101477

+

- perma STAR VARIO
- perma STAR CONTROL

Art. No. 101481

+ including 1.5 m hose

- perma CLASSIC
- perma FUTURA
- perma FUTURA PLUS
- perma FLEX
- perma FLEX PLUS
- perma NOVA

Art. No. 101482

+ including 3 m hose

- perma STAR VARIO
- perma STAR CONTROL

You will find article numbers for perma lubrication systems & lubricants starting at page 88





3 STEP



THE EXPERT IN LUBRICATION SOLUTIONS

STEP 1

- Industries
- Applications
- Machine elements

STEP 2

- Direct mounting
- Remote mounting

STEP 3

- perma Lubrication systems
- perma Lubricants

3.1 Selecting the lubrication system

- Functioning of automatic lubrication — Page 58
- Comparison: Independent lubrication systems / Lubrication systems with external power supply — Page 59
- Single-point lubrication systems — Page 60-61
- Multi-point lubrication systems — Page 62

Overview of all perma lubrication systems & standard lubricants

Manual relubrication is work- and time-consuming and impractical. It leads to a rapid aging of the lubricant in the bearing or causes the lubricant level to fall excessively. Bearings are then subject to greater wear or fail completely.

With automatic lubrication systems the lubricant is discharged into the lubrication point at the right time, in the required amount and optimal quality. No mixing of lubricants occurs, because only the lubricant from the lubrication system is applied to the lubrication point.

Single-point lubrication systems

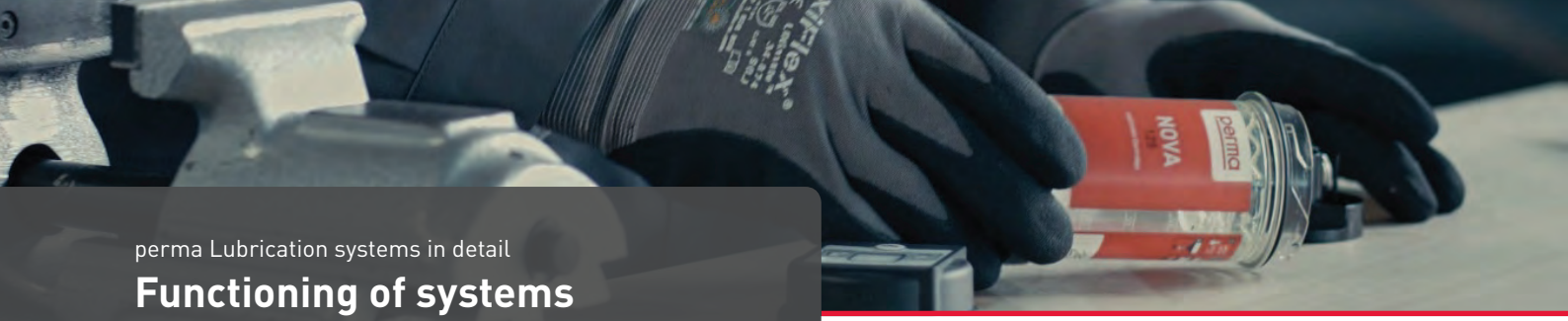


- perma CLASSIC — Page 64-65
- perma FUTURA — Page 64-65
- perma FUTURA PLUS — Page 64-65
- perma FLEX — Page 66-67
- perma FLEX PLUS — Page 66-67
- perma NOVA — Page 68-69
- perma STAR VARIO — Page 70-71
- perma STAR CONTROL — Page 72-73

Multi-point lubrication systems



- perma PRO MP-6 — Page 74-75
- perma PRO C MP-6 — Page 74-75
- perma PRO LINE — Page 76-77
- perma PRO C LINE — Page 76-77
- perma ECOSY — Page 78-79

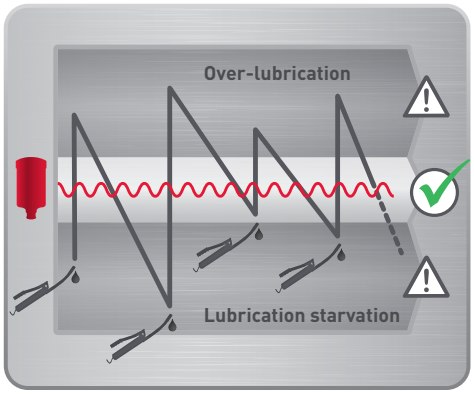


perma Lubrication systems in detail

Functioning of systems

If you are looking for safe, effective and long-term economical lubrication of equipment then you should take advantage of automatic lubrication. perma offers optimal lubrication solutions in terms of technology, efficiency and workplace safety.

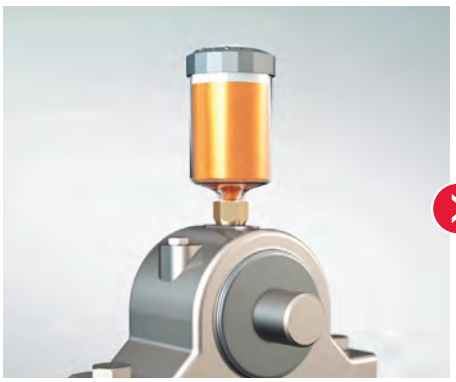
Continuous relubrication



The service life of roller and sliding bearings can be considerably extended by applying lubricant to the lubrication point in the correct amount at short intervals. With manual grease gun lubrication it is almost impossible to meet the required relubrication intervals due to the lack of manpower. This often leads to premature wear or bearing failure.

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

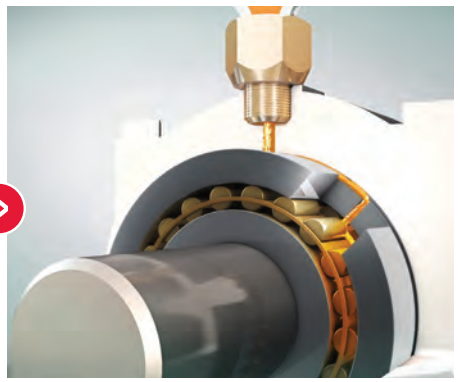
Functioning of automatic lubrication systems



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



The discharge quantity is regulated in the discharge period setting.



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

Watch now:
www.perma-tec.com/en/media/videos

Independent lubrication systems

Self-sufficient systems can be used at any location and are **immediately ready for use**. The systems are driven by an electrochemical reaction or an electromechanical drive with battery. The lubrication systems can be installed quickly and easily. There is no need for an external power supply or a connection to controls.





perma CLASSIC / perma FUTURA / perma FUTURA PLUS



perma FLEX / perma FLEX PLUS



perma NOVA



perma STAR VARIO



perma PRO MP-6 / perma PRO LINE

Lubrication systems with external power supply

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





perma STAR CONTROL



perma PRO C MP-6 / perma PRO C LINE

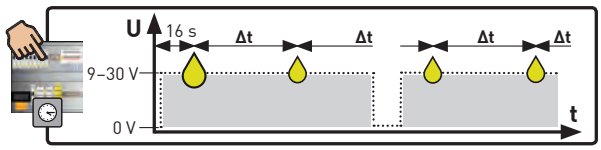


perma ECOSY

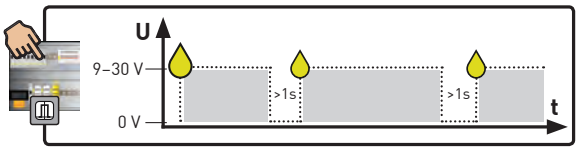
Signalling
- ✓ Operating status
- ✓ Errors
- ✓ Lubricant empty

Also included with impulse control:
- \+ Time of impulses
- \+ Number of impulses

Time control – with an external power supply, the lubrication system discharges the predefined amount per operating hour (Oh) independently. The required discharge amount setting is made via the lubrication system.



Impulse control – with external power supply, the lubrication system transmits a single lubrication impulse. The time at which discharge occurs can be programmed via the PLC.



Lubricant solutions 4.0



perma NET is a network, which can be monitored and configured online, comprising up to 100 multi-point lubrication systems. Discharge amount and discharge period can be individually defined for each lubrication point and can be changed if required.

- **Individual supply** of up to **600 different lubrication points**
- **Existing devices** incorporated into the network
- **Lubricant quantity** per lubrication point **can be adjusted on an individual basis** and can be changed at any time
- **Control** and **direct intervention** in the functions from a **central point**

perma Lubrication systems at a glance

	perma CLASSIC / perma FUTURA	perma FUTURA PLUS	perma FLEX	perma FLEX PLUS
				
Specifications				
SET	**Activator**  Order activator separately	**Activation cap**  Complete system	**Rotary switch**  Complete system	**Rotary switch**  Complete system
°C	**0 to +40 °C**		**-20 to +60 °C**	**-20 to +55 °C**
	max. 4 bar		**max. 5 bar**	
cm³	**120 cm³**		**60, 125 cm³**	**30, 60, 125 cm³**
	Self-sufficient systems: Electrochemical Irrespective of the machine status			
	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	
IP	-		**IP 68**	
	CE Ex		CE Ex TIIS IECEx FM APPROVED	CE Ex IECEx **ANZEx**
Special operating conditions				
	Low vibration		**Minor to moderate vibration**	
	We recommend remote mounting with a grease line if there are vibrations at the lubrication point			
	<1 meter grease line → Go to page 98		**<2 meters grease line** → Go to page 98	

perma Lubrication systems at a glance

	perma NOVA	perma STAR VARIO	perma STAR CONTROL
			
Specifications			
SET	**Push button** **+ LCD display**  NOVA Control unit Reusable	**Push button** **+ LCD display** **+ LED signals**  STAR VARIO Drive Reusable	**Push button** **+ LCD display** **+ LED signals**  STAR CONTROL Drive Reusable
°C	**-20 to +60 °C**		
	max. 6 bar	**6 bar**	
cm³	**65, 125 cm³**	**60, 120, 250 cm³**	
	Self-sufficient system: Electrochemical Irrespective of the machine status	**Self-sufficient system: Electromechanical** **+ Battery pack STAR VARIO** Irrespective of the machine status	**External power supply** **Electromechanical, 9–30 V DC** Machine status taken into account
	Discharge period can be altered at any time / system can be shut down		
	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	**IP 65**		
	CE Ex ANZEx IECEx	CE cULus LISTED	CE
Special operating conditions			
	Minor to moderate vibration	**Minor to heavy vibration**	
	We recommend remote mounting with a grease line if there are vibrations at the lubrication point		
	<2 meters **grease line** → Go to page 98	**<5 meters** **grease line** → Go to page 98	

perma Lubrication systems at a glance

	perma PRO MP-6	perma PRO C MP-6	perma PRO LINE	perma PRO C LINE	perma ECOSY
					
Specifications					
SET	**Push button + LCD display + LED signals**   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)**
	Self-sufficient system: Battery PRO B Irrespective of the machine status	**External power supply 15–30 V DC** Machine status taken into account	**Self-sufficient system: Battery PRO B** Irrespective of the machine status	**External power supply 15–30 V DC** Machine status taken into account	**External power supply 24 V DC/85–240 V AC** Machine status taken into account
	Discharge period can be altered at any time / system can be shut down				
	1 day to 24 months Number of active outlets selectable		**Individual discharge quantity Number of active outlets selectable**		-
	LC 250: 1 day to 24 months LC 500: 1 day to 12 months	**1 day to 24 months** (Depending on operating hours)	**1 to 99 days pause period 1-9 discharge strokes** (Depending on operating hours)		**0–9,999 ml per 1,000 operating hours**
	Discharge quantity 1.0 cm³ per impulse / outlet Same discharge quantity per outlet → 1-6 lubrication points		**Discharge quantity 0.5 to 4.5 cm³ per impulse / outlet Individual discharge quantity per outlet** → 1–6 lubrication points		**Discharge quantity 0.5 cm³ per impulse / outlet Individual discharge quantity per outlet** →1–6 lubrication points
IP	**IP 54**	-	**IP 54**	-	
	CE cULus LISTED	CE	CE	CE	CE
Special operating conditions					
	Minor to heavy vibration Remote mounting of lubrication system with grease line allows operation at lubrication points with minor to heavy vibrations				
	<5 meters grease line → Go to page 98				**<10 meters grease line** → Go to page 98

perma STAR VARIO Drive SPECIAL VERSIONS

	perma STAR VARIO Drive 500	perma STAR VARIO Drive low temperature	perma STAR VARIO Drive 500 low temperature
	 Art. No.113402	 Art. No.113355	 Art. No.113796
Specifications			
SET	Push button + LCD display + LED signals  STAR VARIO Drive Reusable	Push button + LCD display + LED signals  STAR VARIO Drive Reusable	Push button + LCD display + LED signals  STAR VARIO Drive Reusable
°C	-20 to +60 °C	-40 to +60 °C Use only in conjunction with suitable lubricants for low temperatures	
	6 bar		
cm³	60, 120, 250 or 500 cm³	60, 120 or 250 cm³	60, 120, 250 or 500 cm³
	Electromechanical + Battery pack STAR VARIO 101351 	Electromechanical + Battery housing STAR VARIO low temperature 113404 + 3 x AAA lithium battery, 1.5 V * 	Electromechanical + Battery housing STAR VARIO low temperature 113404 + 3 x AAA lithium battery, 1.5 V * 
	1, 2, 3 ... 24 weeks independent of operating temperature and counter pressure	1, 2, 3 ... 12 months independent of operating temperature and counter pressure	1, 2, 3 ... 24 weeks independent of operating temperature and counter pressure
IP	IP 65		
	CE cULus LISTED		
Special operating conditions			
	Minor to heavy vibration		
	<5 meters grease line → Go to page 98		

* Buy 3x 1.5 V AAA lithium batteries locally – they **cannot** be ordered from perma.

perma CLASSIC / perma FUTURA / perma FUTURA PLUS

The classical lubrication system

NEW



CE Ex 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, perma FUTURA and perma FUTURA PLUS 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 cm^3 is used up in 1, 3, 6 or 12 months. Reliable function is based on an electrochemical reaction. The activator is screwed into the lubrication system until the eyelet comes off. perma FUTURA PLUS is activated by simply turning the activation cap – no separate activator is required. The contained gas generator builds up a pressure of max. 4 bar, which moves the piston forward and transports lubricant into the lubrication point.

perma

Applications / Machine elements

perma CLASSIC, perma FUTURA and perma FUTURA PLUS are suitable for single-point lubrication in various applications. Main applications of perma CLASSIC are in mining and the steel industry. perma FUTURA has a corrosion-proof plastic housing which makes it ideal for hygienically clean applications (e. g. food and chemical industry). perma FUTURA PLUS is a complete unit suitable for use at many lubrication points in wind turbines.







Product characteristics — Benefits



perma CLASSIC
Metal housing

perma FUTURA / FUTURA PLUS
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



perma CLASSIC / FUTURA
Easy activation

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

- → Economical, permanent lubrication
- → Easy handling with coloured activators
- → Quick and easy exchange without special tools



perma FUTURA PLUS
Activation cap with integrated gas generator

- → Lubrication system with fixed discharge period is ready for immediate use: No activator required
- → Quick activation and exchange without any tools

Technical data

→ Refer to page 88 for article numbers

Drive
Electrochemical reaction via gas generator

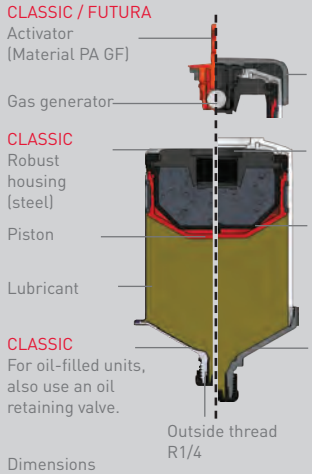
Discharge period at +20 °C / perma Multipurpose grease SF01
1, 3, 6 or 12 months

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
CLASSIC Ø 70 x 99 mm
FUTURA Ø 67 x 111 mm
FUTURA PLUS Ø 70 x 117 mm

Discharge period in months:

120 cm³	1	3	6	12
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 87 to select a suitable activator

perma FLEX / perma FLEX PLUS

The flexible, compact lubrication system for high demands



perma FLEX

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

TIIS

perma FLEX PLUS

I M1 Ex ia I Ma
II 1 G Ex ia IIC T6 Ga
II 1 D Ex ia IIIC T85 °C Da

ANZEx

Made in Germany

Flexible use – even on lubrication points with challenging requirements

perma FLEX and perma FLEX PLUS are compact, ready-to-use lubrication systems which are delivered as a complete unit. They can be used in various types of applications at temperatures ranging from –20 °C to +60 °C (FLEX PLUS: +55 °C). The discharge period setting is freely adjustable from 1 to 12 months. The required pressure of up to 5 bar is built up using 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 cm³ and 125 cm³; perma FLEX PLUS also in 30 cm³.

Applications / Machine elements

perma FLEX and perma FLEX PLUS comply with IP68 requirements (ingress of fluids / solids) and operate reliably in extremely dusty and moist ambient conditions. Lubrication can be interrupted if required. The discharge period can be changed even after activation. perma FLEX PLUS is ideal for use in the chemical-, pharma-, and food industry.







Product characteristics — Benefits



perma FLEX PLUS
Drive with gas generating cells and boost function

→ Activation of boost function ensures quick lubricant supply



All-in-one system with rotary switch for setting the discharge period:
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



Ex-proof certification 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 89 for article numbers

Drive
Electrochemical reaction

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

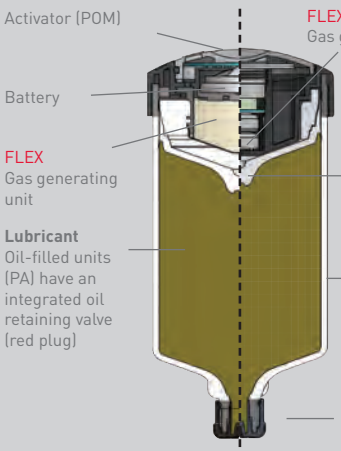
Lubricant volume
30 cm³ (FLEX PLUS)
60 cm³ or 125 cm³ (FLEX & FLEX PLUS)

Operating temperature
–20 °C to +60 °C / +55 °C (FLEX PLUS)

Pressure build-up
Max. 5 bar

Protection class
IP 68

Standard & special lubricants
Greases up to NLGI 2 / Oils



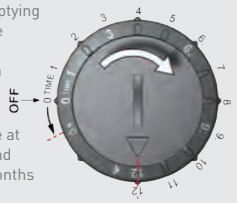
Dimensions FLEX
FLEX 60: Ø 58 x 86.5 mm
FLEX 125: Ø 58 x 117 mm

Dimensions FLEX PLUS
FLEX PLUS 30: Ø 60 x 70 mm
FLEX PLUS 60: Ø 60 x 86 mm
FLEX PLUS 125: Ø 60 x 116 mm

Discharge period setting in months:

Reference values for emptying without counter pressure with lubricant NLGI 2 for perma FLEX 125 / perma FLEX PLUS 125.

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

For applications with high temperature fluctuations

perma NOVA can be used in all application areas from -20 °C to +60 °C. A discharge period from 1 to 12 months can be entered via the setting button on the NOVA Control unit. The control unit then calculates the required quantity of gas for constant and reliable discharge while taking into account the ambient temperature. 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 65 cm³ and 125 cm³.

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 (IP65). perma NOVA with LC 65 cm³ is ideal for the lubrication of electric motors.







Product characteristics — Benefits



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

LCD display and push buttons
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 at both low and higher temperatures
- → Temperature compensation permits use with heavily fluctuating ambient temperatures
- → Extremely robust due to 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 90 for article numbers

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

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

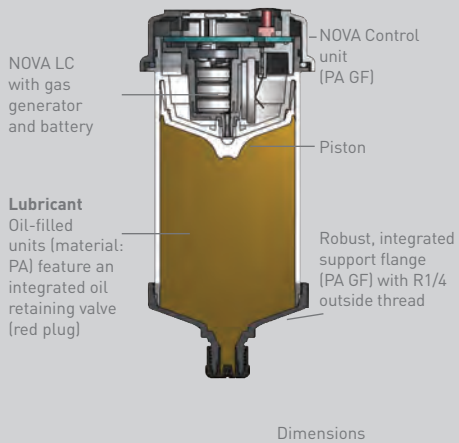
Lubricant volume
65 cm³ or 125 cm³

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



Three different sizes for individual lubricant metering

perma STAR VARIO operates fully automatically, independent of temperature and pressure with 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 push 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 recognisable from a distance.

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. Due to the 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).







Special programming available upon request!

Product characteristics

Benefits



LCD display with push 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

Manual additional discharge via button on display (purge)

- → Mounting outside of dangerous areas or at easy-to-reach locations increases workplace safety
- → Higher equipment availability since LC can be easily exchanged during running operation
- → Lubrication point can be purged to clear blockages

Technical data

→ Refer to page 91 for article numbers

Drive – reusable
Electromechanical function with Battery pack STAR VARIO

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

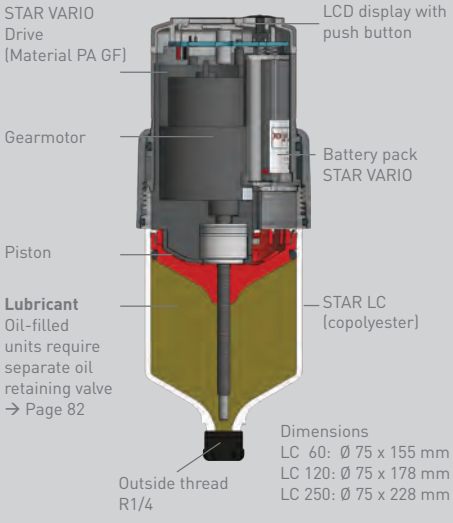
Lubricant volume
60 cm³, 120 cm³ or 250 cm³

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





For extreme operating conditions:
Protection cap STAR Standard Duty – page 91
109520 for LC 60 / 120
109519 for LC 250

perma STAR VARIO Drive including protective cover
107529
Setting: 1, 2, 3 ... 12 months
Additional options on request

Battery pack STAR VARIO
101351

STAR LC 60, 120, 250

STAR Support flange (PA GF)
109420

perma STAR CONTROL

TIME and IMPULSE mode combined in a single system



CE Made in Germany

Optimal lubricant metering based on operating hours or lubrication impulse

In contrast to the perma STAR VARIO (with battery pack), the perma STAR CONTROL is supplied with external power via cable. The operating status can be transmitted to a PLC and evaluated. The two integrated operating modes TIME and IMPULSE offer flexible use. In TIME mode, lubricant discharge is based on operating hours. In IMPULSE mode, a precisely defined quantity is dispensed as soon as voltage is supplied.
The perma STAR CONTROL consists of an electromechanical drive and an LC with 60, 120 or 250 cm^3 of lubricant. The required mode is set on the drive. Lubrication is precise and temperature-independent at a counter pressure up to 6 bar.

perma

Applications / Machine elements

perma STAR CONTROL is used to lubricate roller and sliding bearings, sliding guides, open gears, gear racks, spindles, shaft seals and chains. Due to the 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 (IP65).







Special programming available upon request!

Product characteristics	Benefits
 **LCD display with push button shows discharge settings, LC size and operating status** **Setting:** Mode, LC size, discharge quantity and PIN	→ Flexible handling via simple setting of TIME or IMPULSE mode; can be changed at any time → Fast, simple control of settings, remaining impulses or operating hours until exchange → Freely selectable PIN protects against possible tampering
 **Electromechanical drive with external power supply** **LED (red / green) visible all round** signals functioning and errors	→ Reliable, precise lubricant discharge independent of temperature and counter pressure → Quick function control due to visual or electronic signals on the lubrication system and plant error reporting system saves time and relieves maintenance workers
 **Pressure build-up to 6 bar allows remote mounting up to 5 m** **Manual additional discharge via push button on display (purge)**	→ Mounting up to 5 m outside of dangerous areas or at easy-to-access locations increases workplace safety → Higher equipment availability since LC can be easily exchanged during running operation → Lubrication point can be purged to clear blockages

Technical data

→ Refer to page 91 for article numbers

Drive – reusable
Electromechanical drive with external power supply: 9–30 V DC, Imax 0.5 A

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

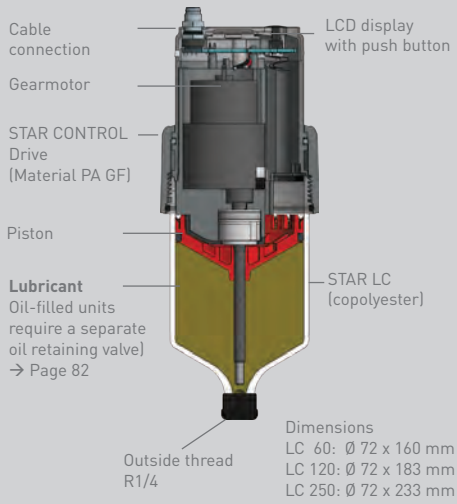
Lubricant volume
60 cm³, 120 cm³ or 250 cm³

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





For extreme operating conditions:
Protection cap STAR Standard Duty – page 91
109520 for LC 60 / 120
109519 for LC 250
+ adapter cable STAR CONTROL 109521

Cable STAR CONTROL
5 m 108432
10 m 108431

perma STAR CONTROL Drive
108985
→ **TIME mode**
Setting: 1, 2, 3 ... 12 months
Additional options on request
→ **IMPULSE mode**
Setting: 0.1–9.5 cm³ / Impulse

STAR LC 60, 120 or 250

STAR Support flange (PA GF)
109420

perma PRO MP-6 / perma PRO C MP-6

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

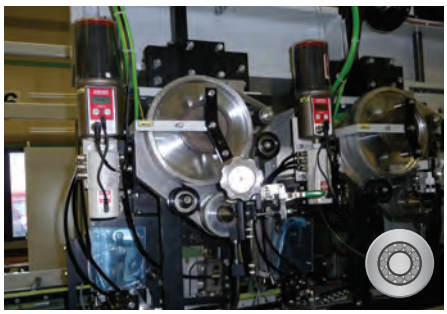


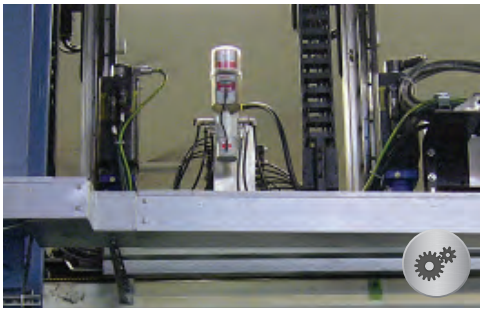
Precise lubricant supply for 1 to 6 lubrication points

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 (1 day to 24 months), the system discharges 250 or 500 cm³ from a maximum of six outlets into the lubrication points. Due to the maximum pressure build-up of 25 bar in the MP-6 distributor, the lubricant is evenly and precisely distributed using up to 5 m of grease line per outlet.

Applications / Machine elements

Applications for perma PRO MP-6 and perma PRO C MP-6 multi-point lubrication system include roller and sliding bearings, linear guides, open gears, spindles as well as shaft seals on motors, generators, pumps and fans. Applications range from the automotive industry and combined heat and power stations, to the paper industry and mining, and 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
- → Freely selectable PIN protects against possible tampering



Pressure build-up to max. 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 LC can be easily exchanged during running operation
- → 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
- → Lubrication point monitoring

Technical data

→ Refer to page 92 for article numbers

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

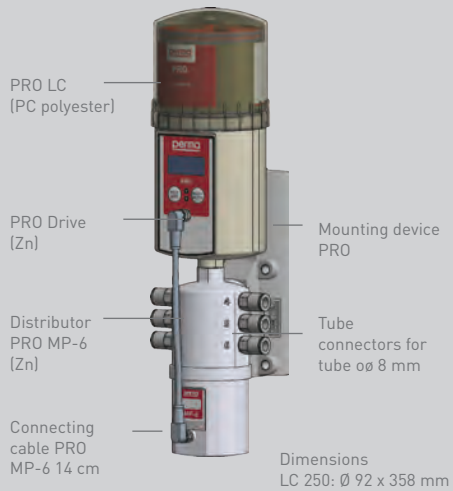
Discharge periods
1 day to 24 months

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



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 grease lines must match the grease filled in PRO LC. 400 g cartridges for prefilling can be found on page 86.

perma PRO LINE / perma PRO C LINE

Precise lubrication system for linear guides



Reference

rexroth
A Bosch Company

*When using greases and grease line lengths (up to 3 m) approved by Bosch Rexroth at 25 °C.

CE Made in Germany

Flexible multi-point lubrication systems for 1 to 6 lubrication points

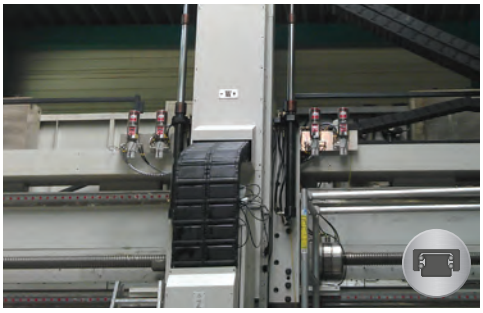
perma PRO LINE and perma PRO C LINE are flexible multi-point lubrication systems for linear guides. The discharge can be adapted precisely to the manufacturer's specifications. The lubricant quantity and relubrication interval can be set flexibly for each of the six outlets. The PRO LC is filled with 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, at the same time allowing reliable lubrication of the running system.

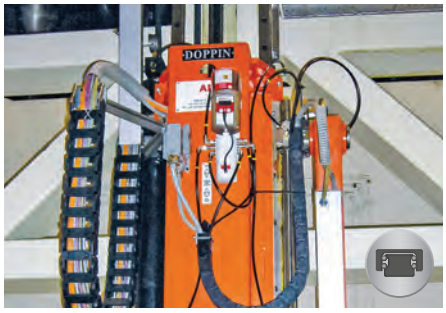
perma

Applications / Machine elements

Main applications for the multi-point lubrication systems perma PRO LINE and perma PRO C LINE are linear guides. Applications range from linear components, screw drives and gear racks in machine tools to handling systems and traversing axes on industrial robots. Other applications 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
- → Function and error immediately visible
- → Quick check of remaining 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 supply fresh lubricant after longer downtimes

Technical data

→ Refer to page 92 for article numbers

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

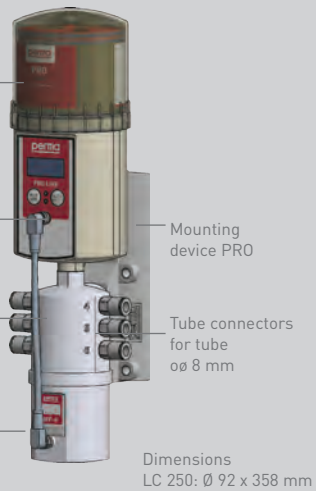
Discharge periods
Pause times in days (24 h)
Discharge quantity per outlet
Impulse mode

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 grease lines must match the grease filled in PRO LC. 400 g cartridges for prefilling can be found on page 86.

perma ECOSY

Ideal oil lubrication for demanding applications

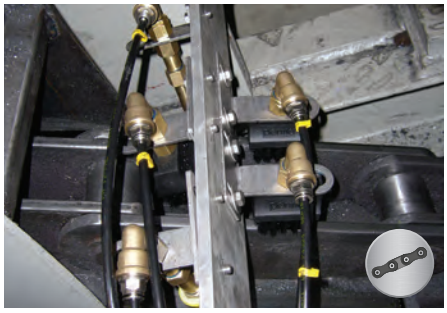


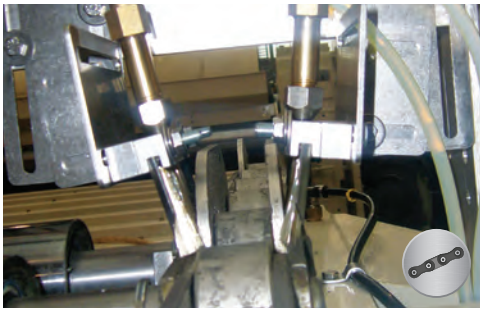
Exact oil metering for challenging applications

perma ECOSY is a multi-point lubrication system and supplies up to 6 lubrication points with a predefined quantity of oil. The control of perma ECOSY allows time, sensor or impulse mode and can be adapted to varying demands. Lubrication pump and control are integrated into a 7-litre plastic tank. The high-performance perma ECOSY pump allows lubrication points up to 10 m away to be supplied with lubricant, e.g. in difficult-to-access and soiled areas.

Applications / Machine elements

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







Product characteristics — Benefits



Multifunction display in several languages

- → Simple operation. No special programming knowledge required
- → Lubricant quantity per outlet can be individually defined
- → Display with function indicator 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



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-performance pump provides supply to remote and hard-to-reach lubrication points

Technical data

→ Refer to page 93 for article numbers

Fill volume
7 litres

Number of outlets
1–6, individual, electronically activatable

Discharge periods
Machine controlled / time controlled

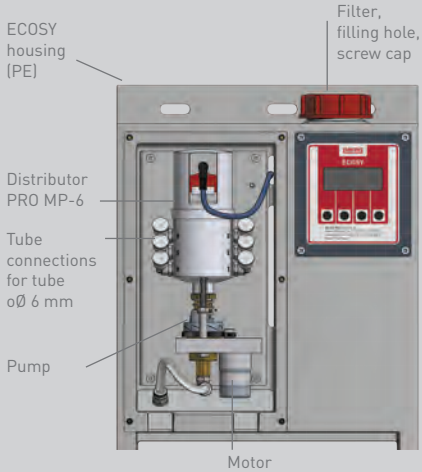
Feed rate
0–9,999 ml / 1,000 h per outlet

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

3 STEP





STEP 1
- Industries
- Applications
- Machine elements

STEP 2
- Direct mounting
- Remote mounting

STEP 3
- perma Lubrication systems
- perma Lubricants

3.2 perma Lubricants

- Oils — Page 82
- Greases up to NLGI 2 — Page 83

HINT

Safety data sheets and technical data sheets for lubricants can be downloaded from www.perma-tec.com/en/lubricants

Find the right lubricant for your application

In addition to perma lubricants, you can also use numerous other lubricants in our lubrication systems to match your particular type of application.

perma maintains an extensive lubricant database with numerous leading lubricant manufacturers, providing access to detailed information about possible applications.

AVIA · bremer & leguil · eni schmiertechnik · FUCHS LUBRICANTS. TECHNOLOGY. PEOPLE. · KLÜBER LUBRICATION · Lubrication Engineers Germany GmbH ASSET RELIABILITY SOLUTIONS™ · Mobil Performance by ExxonMobil · OKS · PHILLIPS 66 LUBRICANTS · rhenus · setral Competence in Lubricants · Shell

Lubricants by other leading manufacturers available upon request!



The correct lubricant for a longer service life

perma Lubricants

perma offers a wide range of high-quality lubricants meeting many different requirements. Their consistently high quality has impressed different industries for many years.

These lubricants are developed especially for use in perma lubrication systems in cooperation with leading manufacturers. All lubricants are tested and monitored under laboratory conditions and in real applications to ensure optimal function in perma lubrication systems.

Bio-degradable for all applications

Food, beverage, tobacco and pharma industry

Oils

Name → Lubricant properties → Labelling as per DIN 51 517-3	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 (CLPE 320) → Lubricates effectively even at high operating temperatures → Good viscosity / temperature behaviour → Special creep properties ensure rapid film formation	Ester oil + synthetic hydrocarbon oil	-20 to +250	320	-	-	-	✓
perma Multipurpose oil SO32 (CLP 100) → 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 (CLPE 100) → Low-viscosity multipurpose oil → Rapidly biodegradable → Good viscosity / temperature behaviour	Ester oil	-30 to +110	100	✓	✓	✓	✓
perma Bio oil, high viscosity SO69 (CLPE 460) → High-viscosity multipurpose oil → Rapidly biodegradable → Good wear protection	Ester oil	-20 to +110	460	✓	✓	✓	✓
perma Food grade oil H1 SO70 (CLPH 220) → Broad operating temperature range → Very good ageing & oxidation resistance → Good wear protection ISO 21469 Certified Nonfood Compounds Program Listed: H1 Registration No: 153376	PAO + ester oil	-30 to +120	220	✓	✓	✓	✓

Additives
The tribological properties of the lubricant are enhanced with additives. The additives, such as anti-wear (AW) additives or EP additives, are mixed with the base oil.

Additives are selected specifically for each particular application to ensure the required properties. Depending on the application concerned, additives can be used 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 (mm);
d = Inside (bore) bearing diameter (mm)

Operating temperature
The operating temperature is the temperature range within which the lubricant is guaranteed to function reliably. Using the lubricant outside this range can lead to damage.

Greases

Name → Lubricant properties → Labelling as per DIN 51502	NLGI grade	Thickener	Base oil	Operating temperature (°C)	Base oil 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 (KP2K-30) → Powerful multipurpose grease → Reduced wear by use of EP additives → Free of heavy metals & silicone	2	Li / Ca	Mineral oil	-30 to +130	220	300,000	✓	✓	✓	-	✓
perma Extreme pressure grease SF02 (OGF2K-30) → 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 (KE2T-20) → 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 (K1P-20) → 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 (KPF1P-20) → High load-carrying capacity → Good emergency lubrication properties (solid lubricant particles)	0/1	PHS + MoS2	Mineral oil + PAO	-20 to +160	500	200,000	✓	✓	-	✓	-
perma Liquid grease SF06 (K0K-20) → Good water resistance → High wear protection → Easily pumped	0	Al com.	Mineral oil	-20 to +130	220	300,000	✓	✓	✓	-	✓
perma High speed grease SF08 (KHC2N-40) → 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 (KPE2N-40) → Rapidly biodegradable → Water hazard class WGK 1 → Fully synthetic	2	PHS	Ester	-40 to +140	120	300,000	✓	✓	-	✓	-
perma Food grade grease H1 SF10 (KHC1K-40) → Low-temperature resistance → Good wear protection → Good water resistance NSF ISO 21469 Certified Nonfood Compounds Program Listed: H1 Registration No: 153375	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.

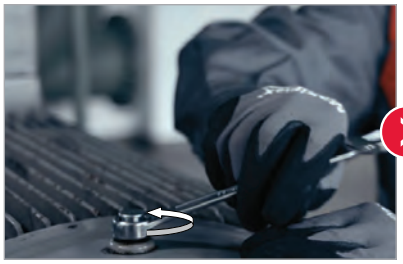
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CHAPTER



- Accessories for preparing the lubrication point — Page 86
- Article numbers of lubrication systems / product accessories — Page 88-93

Preparation



Clean the lubrication point, remove grease fitting



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



Pre-fill lubrication point, connecting parts and any grease lines with same lubricant as used in lubrication system

Activation



perma CLASSIC / perma FUTURA



perma FUTURA PLUS



perma FLEX / perma FLEX PLUS



perma NOVA / perma STAR VARIO / perma STAR CONTROL

HINT Note activation and exchange date on label!

Installation



Remove plug



Screw lubrication system into lubrication point



Carry out visual inspection during maintenance runs

Watch now:
www.perma-tec.com/en/media/videos

HINT Always pre-fill lubrication point, connecting parts and grease lines!

0 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 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 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 with rotary joint (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 R1/4 male x G1/4 female (brass nickel plated)	3	113972
Purge connection with manual valve R1/4 male x G1/4 female (stainless steel)	4	113973
Prefill adapter G1/4 male	5	109003
Hose prefill adapter for Heavy Duty hose	6	107633
Tube prefill adapter for VA-flex tubes	7	107634
Tube prefill adapter for tube oØ 8 mm	8	101526
Tube prefill adapter for tube oØ 6 mm	9	101532
50 ml Bottle Loctite® 243™ thread sealant (medium strength)	10	110278
Hydraulic-type lubricating nipple R1/4	11	101493


1


1a


2


3


4


5


6


7


8


9



10


11

Conversion tables

Download the free perma SELECT APP to your smartphone / tablet

The easy calculation tool for your application

You can use the perma SELECT APP to determine the required lubricant quantity and discharge period for the perma lubrication system while taking into account the operating conditions.

- Obtain **recommendations** for **suitable lubrication systems**
- **Send** the saved results by **email**
- **Transmit** relevant information to **perma MLP**



More information:
Page 13

Download on the App Store | GET IT ON Google Play

Alternatively, determine setting based on specified discharge quantity

Conversion: 1 stroke from perma grease gun = 1.9 cm³ ~ 1.7 g lubricant (density 0.9 g/cm³)



Lubricant: 120 cm³
CLASSIC / FUTURA / FUTURA PLUS

Activator or activation cap / 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



Lubricant: 60 - 65 cm³
FLEX / FLEX PLUS / NOVA / STAR LC

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



Lubricant: 120 - 125 cm³
FLEX / FLEX PLUS / NOVA / STAR LC

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



Lubricant: 250 cm³
STAR LC

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



The Expert in Lubrication Solutions

perma Lubrication systems

A	perma CLASSIC / perma FUTURA	perma FUTURA PLUS
Drive / Activation	 Activator **yellow** - 1 month, 101331	 **Activation cap with integrated gas generator**
	 Activator **green** - 3 months, 101332	
	 Activator **red** - 6 months, 101333	
	 Activator **grey** - 12 months, 101335	1 3 6 12

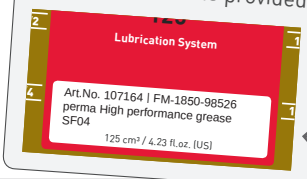
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Lubrication systems / LC (= **L**ubricant **C**artridge)	 perma CLASSIC 120 cm³	 perma FUTURA 120 cm³	 perma FUTURA PLUS 120 cm³			
			1 month	3 months	6 months	12 months
Greases						
perma Multipurpose grease SF01	100020	106997	113917	113918	113919	113920
perma Extreme pressure grease SF02	100034	107008	113921	113922	113602	113603
perma High temp. grease SF03	100045	107012	113923	113924	113925	113926
perma High performance grease SF04	100052	107016	113927	113928	113929	113930
perma High temp. / Extreme pressure gr. SF05	100063	107020	113931	113932	113933	113934
perma Liquid grease SF06	100074	107024	113935	113936	113937	113938
perma High speed grease SF08	100083	107029	113939	113940	113941	113942
perma Multipurpose bio grease SF09	100089	107032	113943	113944	113945	113946
perma Food grade grease H1 SF10	100096	107037	113947	113948	113949	113950
Oils	Order oil retaining valve separately	Oil retaining valve included				
perma High performance oil SO14	100427	107083	113951	113952	113953	113954
perma Multipurpose oil SO32	100449	107090	113955	113956	113957	113958
perma Bio oil, low viscosity SO64	100473	107099	113959	113960	113961	113962
perma Bio oil, high viscosity SO69	100483	107103	113963	113964	113965	113966
perma Food grade oil H1 SO70	100489	107107	113967	113968	113969	113970

Support flange	-	Support flange integrated

1st order vs. ReOrder	1st order = ReOrder 	1st order = ReOrder 

Which grease is in the lubrication system?
This information is provided on the label



Art. No. | Serial number
(Product designation – year / week of manufacture – internal no.)
Lubricant name

perma FLEX	perma FLEX PLUS
 **Rotary switch**	 **Rotary switch with boost function**

				
perma FLEX 60 cm³	**perma FLEX 125 cm³**	**perma FLEX PLUS 30 cm³**	**perma FLEX PLUS 60 cm³**	**perma FLEX PLUS 125 cm³**
107224	107155	112743	111761	111760
107226	107161	112745	112694	111845
107227	107163	112746	112714	111846
107228	107164	112747	112715	111847
107229	107167	112748	112716	111848
107230	107168	112749	112717	111849
107232	107170	112750	112718	111850
107233	107172	112751	112719	111851
107234	107173	112752	112720	111852
Oil retaining valve included				
107246	107199	112753	112721	111853
107247	107200	112754	112722	111854
107248	107202	112755	112723	111855
107249	107204	112756	112724	111856
107251	107205	112757	112725	111857



Support flange FLEX
G1/4 male x G1/4 female (brass / plastic)
101427



For tough ambient conditions:
Protection cap incl. support flange FLEX
G1/4 male x G1/4 female (steel / alu)
101428

1st order = ReOrder



1st order = ReOrder



A	perma NOVA
Drive	 **perma NOVA** Control unit 1, 2, 3 ... 12 months 107271

LC (= **L**ubricant **C**artridge)		
	perma NOVA LC 65 cm³	**perma NOVA LC 125 cm³**
Greases		
perma Multipurpose grease SF01	107415	110281
perma Extreme pressure grease SF02	107416	110282
perma High temp. grease SF03	107417	110283
perma High performance grease SF04	107418	110284
perma High temp. / Extreme pressure gr. SF05	107419	110285
perma Liquid grease SF06	107420	110286
perma High speed grease SF08	107421	110287
perma Multipurpose bio grease SF09	107422	110288
perma Food grade grease H1 SF10	107423	110289
Oils	**Oil retaining valve included**	
perma High performance oil SO14	107425	110290
perma Multipurpose oil SO32	107426	110291
perma Bio oil, low viscosity SO64	107427	110292
perma Bio oil, high viscosity SO69	107428	110293
perma Food grade oil H1 SO70	107429	110294

Support flange	Support flange integrated

1st order vs. ReOrder	1st order	ReOrder	1st order	ReOrder
				

perma STAR VARIO	perma STAR CONTROL	perma STAR LC 500
 **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 LC 500 (plastic)** **for LC 500** 113595
 **Protection cap STAR VARIO Heavy Duty 250 (plastic)** 109999 **> use with STAR support flange!** **Cover clip for protection cap** 108606	 **Also order the STAR CONTROL 30 cm angled adapter cable when using a protection cap** 109521	For remote mounting only. Must be used with a suitable C-shaped perma Mounting bracket and STAR Heavy Duty support flange (110757).
 **perma STAR VARIO Drive including protective cover** 1, 2, 3 ... 12 months 107529	 **perma STAR CONTROL Drive** TIME or IMPULSE mode 108985	 **perma STAR VARIO Drive 500 including protective cover** 1, 2, 3 ... 24 weeks 113402
 **Battery pack STAR VARIO** 101351	 **Cable STAR CONTROL** 5 m 108432 10 m 108431 20 m 110512	 **Battery pack STAR VARIO** 101351

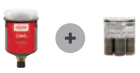
			
perma STAR LC 60 cm³	**perma STAR LC 120 cm³**	**perma STAR LC 250 cm³**	**perma STAR LC 500 cm³**
104044	100724	104473	112410
104048	100733	104480	112906
104051	100739	104485	112907
104054	100744	104488	112908
104057	100750	104492	112909
104061	100755	104497	112041
104063	100762	104500	112910
104065	100766	104502	112911
104069	100770	104506	112859
Order oil retaining valve separately			
104180	101096	104685	-
104188	101117	104696	-
104198	101137	104711	-
104202	101145	104716	-
104204	101148	104719	-



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



Support flange STAR Heavy Duty*
110757

1st order	ReOrder	1st order	ReOrder	1st order	ReOrder
					

* Use in conjunction with STAR mounting brackets only (see page 96)

1st order: perma PRO all-inclusive 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 accessory box PRO MP-6 (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 on distributor



Accessory kit PRO — 106937

30 m Tube up to +100 °C oØ 8 mm x iØ 5 mm (PA) – 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 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 H1 SF10	106649	106762
Cover for PRO LC	106959	106960

ReOrder

ReOrder PRO



ReOrder PRO C



PRO Accessories



1



2

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



3

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

Protection box PRO single (steel) including mounting plate & mounting set (cable bushings, blanking plugs and locking nuts)
→ Bores holes for outlets exist
External dimensions (H x W x D): 470 x 240 x 210 mm / IP 66
Pic. 1, Art. No. 101527

Protection box double (steel) including mounting plate & mounting set (cable bushings, blanking plugs and locking nuts)
→ Bore holes for outlets exist
External dimensions (H x W x D): 500 x 400 x 210 mm / IP 66
Pic. 2, Art. No. 111153

Protection box PRO single (plastic) including boring template & mounting set (cable bushings, blanking plugs and locking nuts)
→ Without bore holes for outlets, without cable screw connections
External dimensions (H x W x D): 640 x 310 x 215 mm
Pic. 3, Art. No. 101548

PRO Components / Accessories	Pic.	Art. No.
PRO Drive PRO LINE Drive – will only function with distributor PRO-MP6 (Art. No. 106939) including 1 x reducer coupling G3/8 female x G1/8 female, nickel-plated (Art. No. 101545) Mounting material for Mounting device PRO	1	106896 106931
Battery PRO B	2	106953
PRO C Drive PRO C LINE Drive – will only function with distributor PRO-MP6 (Art. No. 106939) including 1 x reducer coupling G3/8 female x 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 accessory box PRO MP-6: 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



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9

perma ECOSY



1

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



2

perma ECOSY including connector and 6 x tube connector G1/8 male for tube oØ 6 mm 90° – swivelling and 6 x plugs	1	101700
Control sensor ECOSY	2	109401

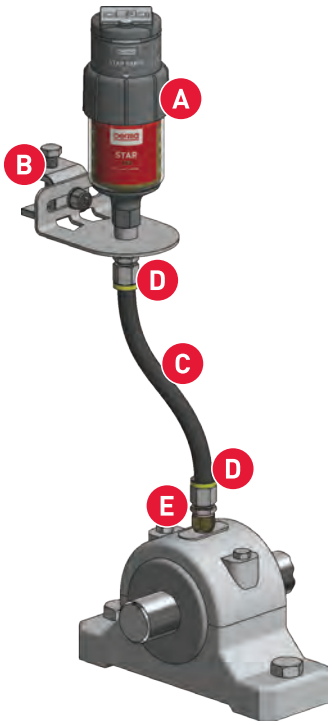
C

CHAPTER



THE EXPERT IN LUBRICATION SOLUTIONS

Guide to optimal installation of single-point lubrication systems



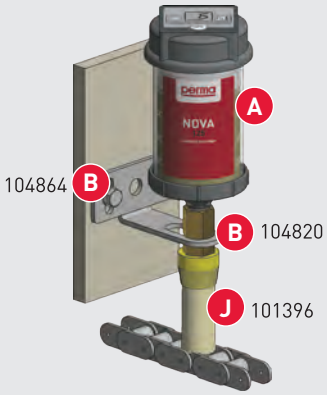
Installation example for bearing lubrication

0	**Prepare lubrication point** (without image)	Page 86
A	**perma lubrication systems**	Page 88-91
B	**Brackets / Mounting plates / Mounting angles**	Page 96-97
C	**Tubes**	Page 98
D	**Tube connectors**	Page 99-100
E	**reducers**	Page 101
F	**Extensions** (without image)	Page 102
G	**Angles** (without image)	Page 103
H	**Others** (without image)	Page 103
I	**Oil retaining valves** (without image)	Page 104
J	**Oil brushes**	Page 105

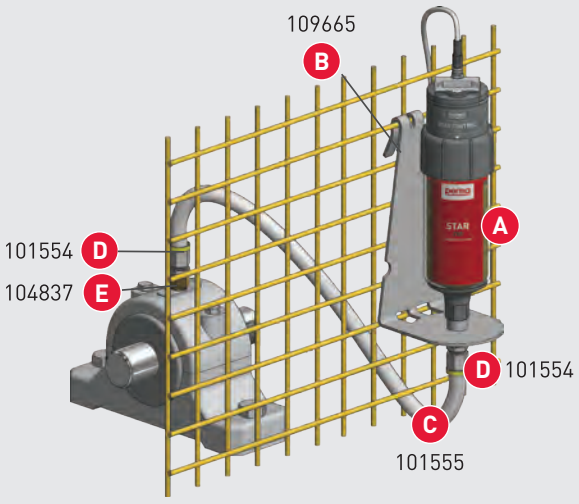
HINT

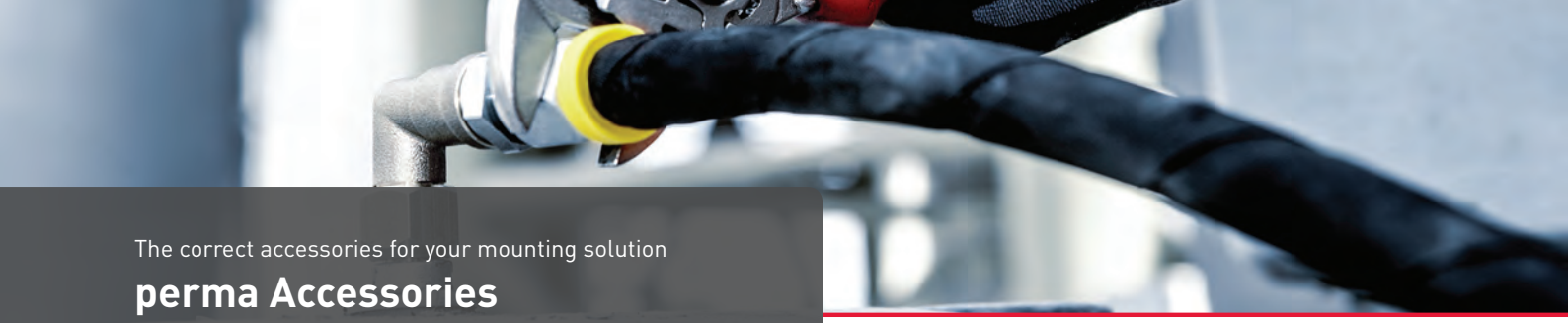
Avoid using unnecessarily long grease lines. It is best to use grease lines with an inner diameter of at least 6 mm.

Chain lubrication: Direct mounting



Bearing lubrication: Remote mounting





The correct accessories for your mounting solution

perma Accessories

It has never been so easy to integrate automatic lubrication systems in existing production processes. Our expertise is based on many years of experience and global know-how. perma customers obtain all necessary components from a single supplier and also benefit from service and support to implement customised lubrication solutions.

B Brackets



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

or



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

or



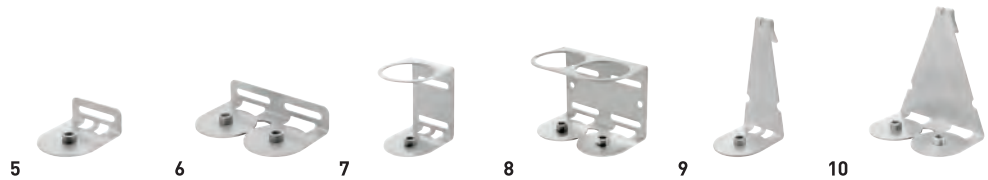
Cage hanger arm
(stainless steel)
Art. No. 109959

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





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





HINT

You will find additional brackets and complete INSTALLATION KITS in our catalogue for mining and heavy industry.

Additional brackets	Pic.	Material	Art. No.
Ground clip CLASSIC	1	Steel, zinc-plated	101384
Multipurpose clip CLASSIC, FUTURA, FUTURA PLUS, FLEX, FLEX PLUS, 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


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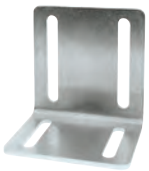

3a


3b

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

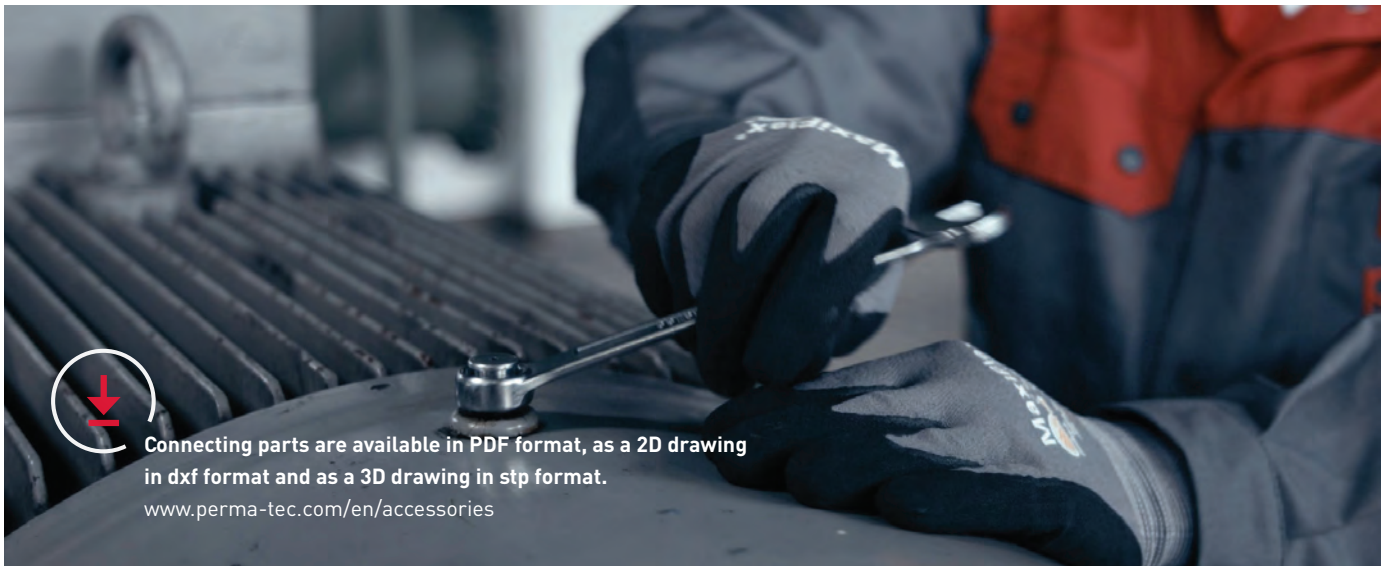

4


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Connecting parts are available in PDF format, as a 2D drawing in dxf format and as a 3D drawing in stp format.
www.perma-tec.com/en/accessories

NOTE Use the same lubricant as in the lubrication system for pre-filling grease lines

C Tubes

Name Material → Properties	Art. No. (meter goods)	i∅/o∅ [mm]	Operating temperature range [°C]	Minimum bending radius [mm]	Max. operating pressure [bar]	Initial filling amount per m [cm³]	Silicone-free / halogen-free	Max. grease line* [m]				
								CLASSIC / FUTURA / PLUS	FLEX / FLEX PLUS / 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	76	25	75	-	1	2	5		
VA-Flex tube stainless steel / PTFE → High resistance to fractures and impacts → High temperature resistance	**113864 (500 mm)** **101549 (1000 mm)** **101550 (1500 mm)** 	8/11	-150 to +260	70	220	55	✓	1	2	5	5	
Tube PA → UV-resistant → Resistant to water → Translucent	**101393**	6/8	-40 to +80	40	19	33	✓	1	2	3		
Tube PTFE → Good temperature resistance → Noncombustible (flammability class V-0) → Suitable for food and beverage → Translucent	**101394**	6/8	-70 to +260	50	9	33	-	1	2	3		
Tube PA → Highly resistant to stress cracking, pressure and impact → High mechanical strength	**101569** 	5/8	-35 to +100	45	31	25	✓				5	
Tube PA → Highly resistant to stress cracking, pressure and impact → High mechanical strength → Translucent	**101494**	4/6	-35 to +100	35	27	15	-/ ✓					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.**

D Tube connectors

Heavy duty hose connector suitable for tube 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 

VA-Flex tube connector suitable for tube iØ 8 / oØ 11 mm 113864, 101549 and 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

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Tube connector push-lock up to 25 bar suitable for tube oØ 8 mm 101393, 101394 and 101569		Pic.	Material	Art. No.
Tube connector G1/8 male	Straight	6	Brass nickel-plated	101570
Tube connector G1/8 male 90°	Rotating	7		101571
Tube connector G1/4 male	Straight	8		101496
Tube connector G1/4 female	Straight	9		101502
Tube connector G1/4 male 90°	Rotating	10		101497
Tube connector G3/8 male	Straight	11		101498
Tube connector M6 male	Straight	12		111954
Tube connector M6 male 90°	Rotating	13		111957
Tube connector M8x1 male	Straight	14		111955
Tube connector M8x1 male 90°	Rotating	15		111958
Tube connector M10x1 male	Straight	16		111956
Tube connector M10x1 male 90°	Rotating	17		111959
Y-Connector		18		101513
Tube connection for tube oØ 8 mm	Straight	19		110191

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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	20	Brass nickel-plated	101446
Tube connector G1/8 male 90°	Rotating	21		101449
Tube connector G1/4 male	Straight	22		101447
Tube connector G1/4 female	Straight	23		101511
Tube connector G1/4 male 90°	Rotating	24		101551
Tube connector M5 male	Straight	25		101448
Tube connector M5 male 90°	Rotating	26		101450
Tube connector M6 male	Straight	27		101509
Tube connector M6 male 90°	Swivelling	28		101515
Tube connector M6x0.75 male 90°	Swivelling	29		101516
Tube connector M8x1 male	Straight	30		101517
Tube connector M8x1 male 90°	Rotating	31		101507
Tube connector M10x1 male	Straight	32		101510
Tube connector M10x1 male 90°	Rotating	33		101508
Extension for tube oØ 6 mm to oØ 8 mm		34		101512
Y-Connector		35		101514


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Tube connector up to 6 bar suitable for tube iØ 6 mm / oØ 8 mm 101393 and 101394		Pic.	Material	Art. No.
Tube connector G1/4 female	max. +80 °C	36	Alu / Plastic	101390
Tube connector G1/4 male	max. +80 °C	37		101391
Tube connector G1/8 male	max. +80 °C	38		101392
Tube connector G1/4 female	max. +100 °C	39	Brass, nickel-plated	104821
Tube connector G1/4 male	max. +100 °C	40	Brass	104822
Tube connector G1/4 female	max. +260 °C	41	Stainless steel	104866
Tube connector G1/4 male	max. +260 °C	42		104867


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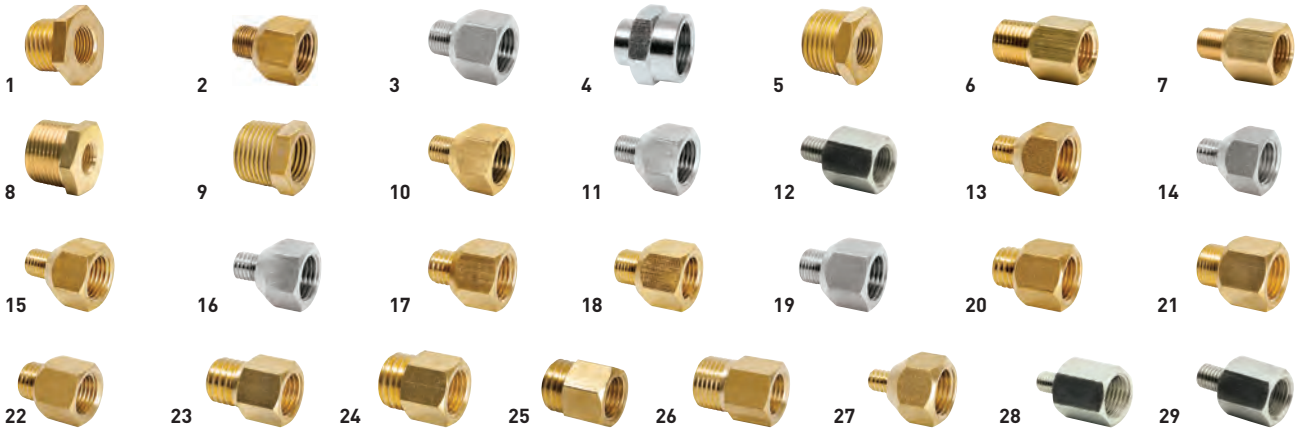

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E Reducers / Reducer coupling

Reducers / Reducer coupling	Pic.	Material	Art. No.
Reducer G1/4 male x G1/8 female	1	Brass	104834
Reducer G1/8 male x G1/4 female	2	Brass	104833
	3	Stainless steel	104875
Reducer coupling G3/8 female x G1/8 female	4	Brass, nickel-plated	101545
Reducer R1/2 male x G1/4 female	5	Brass	104832
Reducer R1/4 male x G1/4 female	6	Brass	109954
Reducer R1/8 male x G1/4 female	7	Brass	109953
Reducer R3/4 male x G1/4 female	8	Brass	104835
Reducer R3/8 male x G1/4 female	9	Brass	104836
Reducer M6 male x G1/4 female	10	Brass	104837
	11	Stainless steel	104876
Reducer M6 male x G1/8 female	12	Stainless steel	109847
Reducer M8 male x G1/4 female	13	Brass	104839
	14	Stainless steel	104878
Reducer M8x1 male x G1/4 female	15	Brass	104838
	16	Stainless steel	104877
Reducer M10 male x G1/4 female	17	Brass	104841
Reducer M10x1 male x G1/4 female	18	Brass	104840
	19	Stainless steel	104879
Reducer M12 male x G1/4 female	20	Brass	104842
Reducer M12x1 male x G1/4 female	21	Brass	104843
Reducer M12x1.5 male x G1/4 female	22	Brass	104844
Reducer M14 male x G1/4 female	23	Brass	104846
Reducer M14x1.5 male x G1/4 female	24	Brass	104845
Reducer M16 male x G1/4 female	25	Brass	104847
Reducer M16x1.5 male x G1/4 female	26	Brass	104848
Reducer Whitworth 1/4" male x G1/4 female	27	Brass	104849
Reducer 1/4 UNF male x G1/4 female	28	Stainless steel	109845
Reducer 1/4 UNF male x G1/8 female	29	Stainless steel	109846



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 14 mm M6x0.75 male x M6 female	10		104858
Extension 30 mm M6x0.75 male x M6 female	11		104859
Extension 14 mm M6 male x M6 female	12		104860
Extension 30 mm M6 male x M6 female	13		104861
Extension 50 mm M6 male x G1/4 female	14	Stainless steel	109697
Extension 75 mm M10x1 male x G1/4 female	15	Brass	108923
Extension 115 mm M10x1 male x G1/4 female	16		108924
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
Angle 45° R1/4 male x G1/4 female square	3		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
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



H Others

Others	Pic.	Material	Art. No.
Swivelling screw fitting G1/4 male x G1/4 female – rotary type	1	Brass	104831
Y-Adapter 2 x G1/4 female x R1/4 male	2	Brass, nickel-plated	109002
T-Adapter 3 x G1/4 female	3	Brass	110025
	4	Stainless steel	104880
Bulkhead nipple G3/8 male x G1/4 female	5	Brass	104851
Hexagon-nipple R1/4 male	6	Brass	104852
	7	Stainless steel	104881
Sleeve G1/4 female	8	Brass	104853
	9	Stainless steel	104882



NOTE Take lubricant flow direction into account.

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


1


2


3

J Oil brushes

Lubrication brush / Bracket		Connecting thread	Pic.	Material	Art. No.
Oil brush for large chains with tapped bore M6	up to +80 °C	including Art. No. 101509	4	Alu / Polypropylene	101524
	up to +180 °C	M6i	5	Alu / Pekalon	101538
	up to +350 °C	M6i	6	Alu / Stainless steel	101540
Oil brush for large chains with through hole	up to +80 °C	including Art. No. 101509	7	Alu / Polypropylene	101525
	up to +180 °C	M6i	8	Alu / Pekalon	101539
	up to +350 °C	M6i	9	Alu / Stainless steel	101541
Mounting bracket left for oil brush for large chains			10	stainless steel	101533
Mounting bracket right for oil brush for large chains			11		101534
Spacer for oil brush for large chains, width: 13 mm			12	alu	101535
Lubricating pinion for chains			13		On request


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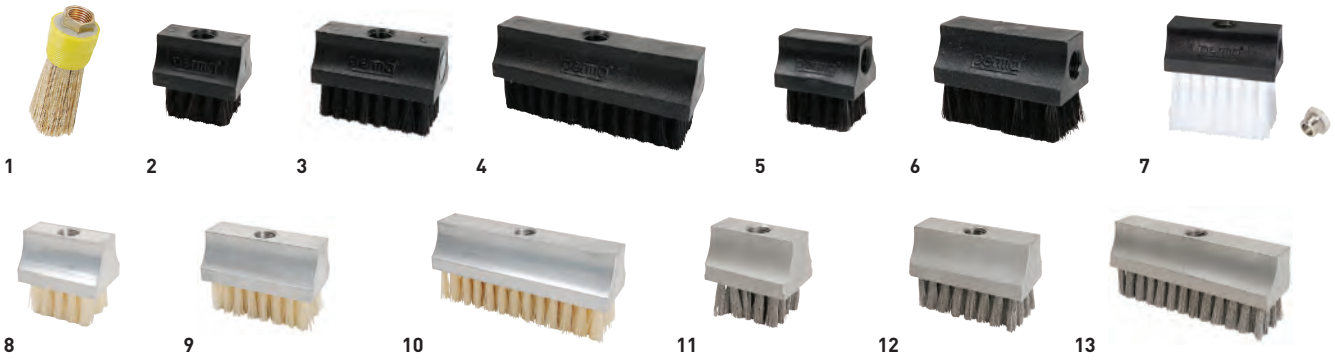

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HINT Special lubricating brushes with bristles cut to size upon request.

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 bristles	101396
Oil brush, bristle height 20 mm	up to +80 °C	G1/4 female top connection	40 x 30 mm	2	PA / Horsehair bristles	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 +80 °C	G1/4 female top + side connection including plug	60 x 30 mm	7	PA / PA	101520
Oil 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
Oil 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



1 2 3 4 5 6 7

8 9 10 11 12 13

Special accessories	Pic.	Material	Art. No.
Lubrication pocket for gear lubrication Manufactured acc. to specifications	14	Plastic	On request
Multipurpose chain lubrication box including 4 rotating brushes & 5 spacers	15	Plastic / Horsehair bristles	101445
Rotating brush 16 mm for multipurpose chain lubrication box for re-orders	15a	Horsehair bristles	107631
perma 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
perma DRAIN CUP 120 (grease catchment cup)	18	Plastic	112012
perma DRAIN CUP 250 (grease catchment cup)	19	Plastic	101718



14 15 15a 16 17 18 19

Overview of perma lubrication systems

	Product	Lubricants	Discharge periods	Controlled	Max. lubrication points	Max. pressure [bar]	Operating temperature [°C]	Volume [cm³]	Drive / Power supply	Activation / Setting	Certifications	Page
Single-point lubrication systems, electrochemical												
	**CLASSIC / FUTURA**	Greases up to NLGI 2 / Oils	1, 3, 6, 12 months*	Time	1	4	0 to +40	120	Electrochemical	Activator	Ex	64-65
	**FUTURA PLUS**		1, 3, 6, 12 months*			4	0 to +40	120	Electrochemical	Activation cap	Ex	64-65
	**FLEX**		1, 3, 6, 12 months*			5	-20 to +60	60 125	Electrochemical / Integrated battery	Rotary switch	Ex, IECEx, TIIS, FM APPROVED	66-67
	**FLEX PLUS**		1, 3, 6, 12 months*			5	-20 to +55	30 60 125	Electrochemical / Integrated battery & gas generating cell	Rotary switch	Ex, IECEx, ANZEx	66-67
	**NOVA**		1, 2, 3 ... , 12 months**			6	-20 to +60	65 125	Gas generating cell / Integrated battery	Push button with display	Ex, IECEx, ANZEx	68-69
Single-point lubrication systems, electromechanical												
	**STAR VARIO**	Greases up to NLGI 2 / Oils	1, 2, 3 ... , 12 months	Time	1	6	-20 to +60	60, 120, 250 500	Gearmotor / Battery	Push button with display	cULus LISTED	70-71
	**STAR CONTROL**		Individual	Time / Impulse			-20 to +60	60, 120, 250	Gearmotor / 9–30 V DC			72-73
Multi-point lubrication systems, electromechanical												
	**PRO MP-6**	Greases up to NLGI 2	1 day to 24 months	Time / Quantity	6	25	-20 to +60	250, 500	Gearmotor / Pump / Battery	Menu navigation with display	cULus LISTED	74-75
	**PRO C MP-6**		Individual	Time / Impulse					Gearmotor / Pump 15–30 V DC			
	**PRO LINE**		1 day to 24 months	Time / Quantity					Gearmotor / Pump / Battery			76-77
	**PRO C LINE**		Individual	Time / Impulse					Gearmotor / Pump / 15–30 V DC			
	**ECOSY**	Oils	Individual	Time / Impulse	6	10	-20 to +60	7,000	Gearmotor / Pump 24 V DC / 85–240 V AC	Menu navigation with display		78-79

* Depending on operating temperature and counter pressure

** Depending on counter pressure

All perma products conform to CE.

Publisher

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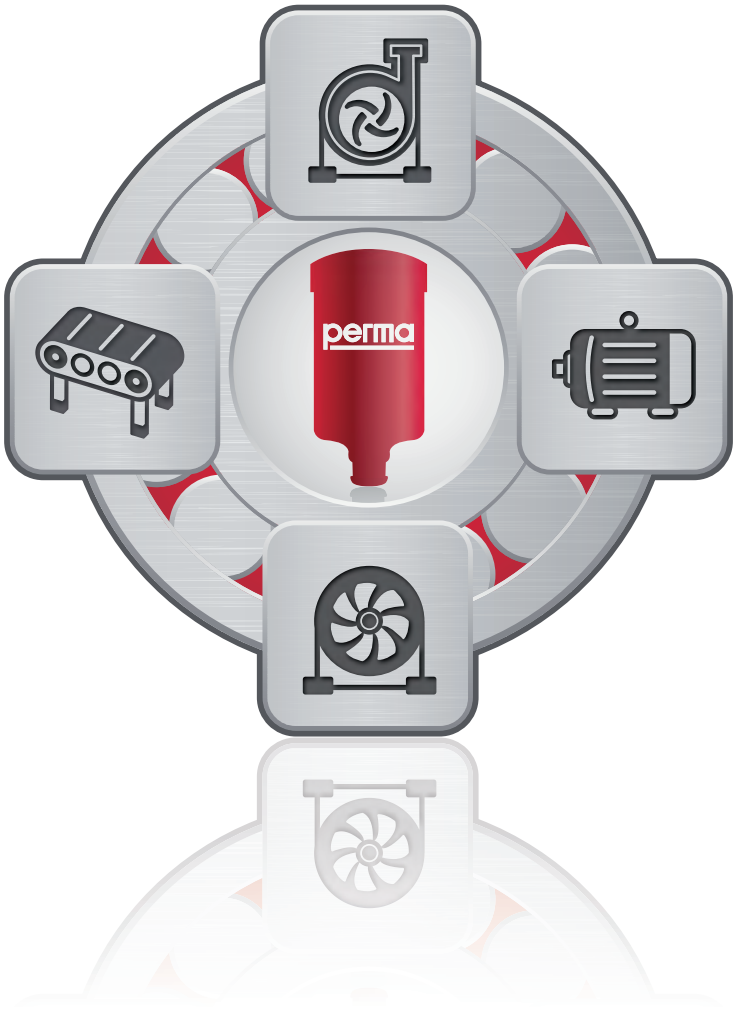
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2019/01 · Version: 4.0 en · Art. No. 114082