Your perma contact:

perma USA - CATALOG

Automatic Lubrication Solutions

The Expert in Lubrication Solutions

Applications:

Conveyors	Electric motors	Pumps	Blowers / Fans

Approvals / Certifications:

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

Ex-proof:

Ex	IECEx	ANZEx
Europe	Global	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.

Thread description

HINT

Not familiar with perma's thread descriptions?
perma uses ISO denomination. See examples:

G1/4 male = 1/4 BSPP-M
G1/4 female = 1/4 BSPP-F

R1/4 male = 1/4 BSPT -M
R1/4 female = 1/4 BSPT-F

Glossary:

Threads:
iø = Inner diameter
oø = Outer diameter

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

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.permausa.com

THE EXPERT IN LUBRICATION SOLUTIONS

perma

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 highest quality standards assosiated with "Made in Germany".

With many years of experience, a global network of wholly owned 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 reorganization

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

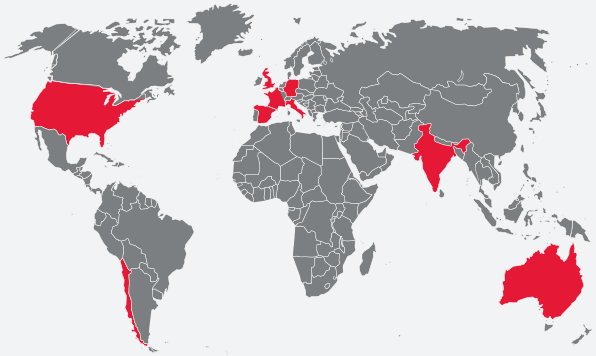
Employees worldwide: **269**

Turnover: (unconsolidated) **€97,4 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: 05/2020 | **Latest information:** www.permausa.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.

Utilize the benefits of perma lubrication systems

perma simplifies maintenance work

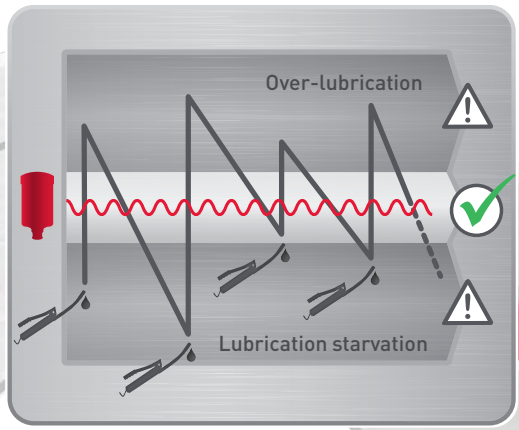
It's easy to change from manual lubrication to perma lubrication systems: perma lubrication systems can be used wherever there are lubrication points. The product portfolio ranges from the robust single-point lubrication system to the individual supply of up to 600 different types of lubrication points.

- Discharge periods from **1 day to 36 months**
- Lubricant volumes from **60cc to 500cc**
- Operating temperatures from **-40 °F to 140 °F** / -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. Up to 75% of bearing failures can be prevented through the use of proper relubrication techniques assossiated with automatic single point lubricators. The diagram below highlights the causes of premature bearing failures.

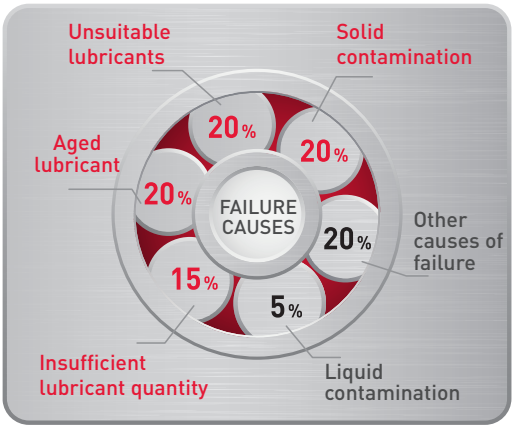
- **Reliable supply of fresh lubricant** to lubrication points
- **High equipment availability** with permanent relubrication
- **Reduction in maintenance costs** and unscheduled machine downtimes

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 in the workplace

Cost effectiveness

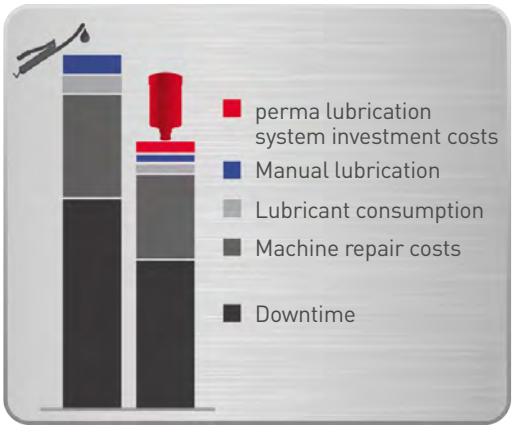
perma reduces costs by up to 25 %

perma lubrication systems help to reduce costs significantly. Constant automatic lubrication minimizes 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**

DIN EN ISO 9001

Cost savings with automatic lubrication

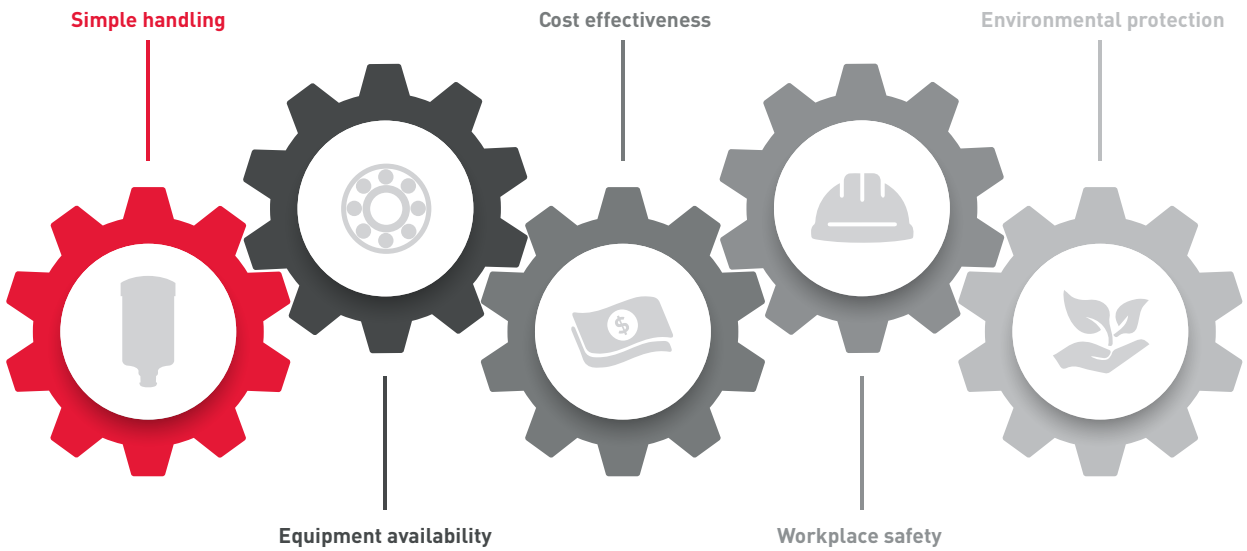


Comparing manual lubrication with perma lubrication shows savings potential in different areas.

The following areas have the biggest savings potential:

- Reduction in downtimes
- Machine repair costs

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



Workplace safety

perma reduces the risk of accidents by up to 90 %

Using perma lubrication systems increases workplace safety. perma lubrication systems minimize 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 minimize 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.

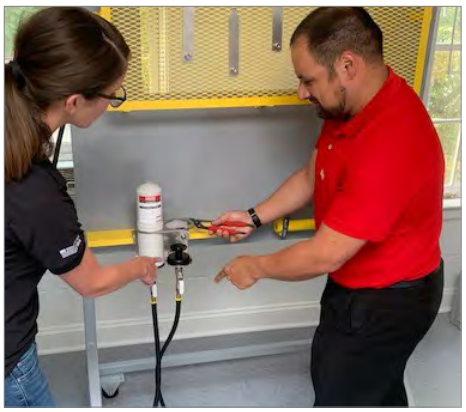
Our comprehensive service for you!

perma SERVICE

Customer satisfaction and quality products are the foundation of our corporation. This includes numerous customer service programs which are based on many years of experience and the exchange of ideas with our customers and partners. We are glad to offer these to you as part of our individual partnership programs.

perma ACADEMY

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



Technical training at perma USA / in-house courses on request

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

Training schedule:
www.permausa.com

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.permausa.com/en/service-solutions/perma-service

HINT You will find our most 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.permausa.com/en/service-solutions/perma-select-app

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.permausa.com/en/service-solutions/perma-mlp

Download on the App Store GET IT ON Google Play

perma VR

The use of innovative technologies provides you with a virtual glimpse 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.permausa.com/en/service-solutions/perma-vr

1 STEP

THE EXPERT IN LUBRICATION SOLUTIONS

STEP 1
- Industries
- Applications

STEP 2
- Assess installation method

STEP 3
- perma Lubrication Systems
- perma Lubricants
- How to order

STEP 4
- Mounting solutions
- Accessories

Industries

Applications

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.

o Limited suitability
\+ Suitable
++ Recommended

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

perma Lubrication Systems for

Mining & Mineral Processing

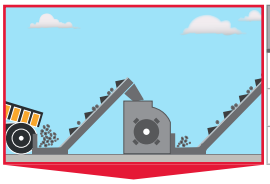
In order to stay competitive, mining and heavy industry companies must increase productivity while minimizing long-term operating costs. One crucial factor in this context is preventive maintenance, which extends equipment service life and minimizes necessary downtimes required for maintenance, repairs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

HINT

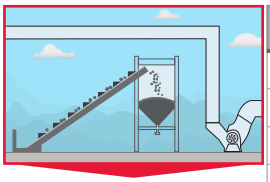
Order the free perma catalogue "Mining & Mineral Processing"

Lubrication points

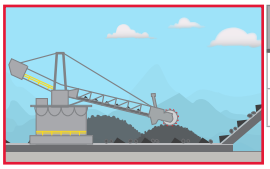
1 Roller bearings
2 Sliding bearings
3 Shaft seals



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

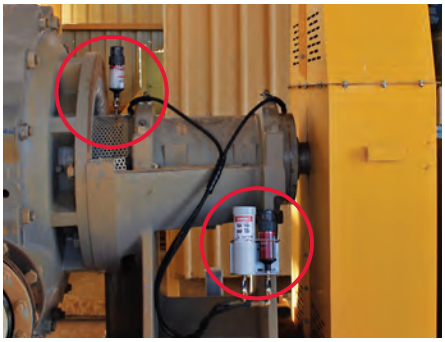


Final processing				
→ Screening	Raw material screens	✓	✓	-
→ Cleaning & sorting	Conveyors, pumps, mixer gears	✓	-	✓
→ Dust removal	Dedusting equipment, blowers / fans	✓	-	✓
→ Transporting	Conveyors	✓	-	✓



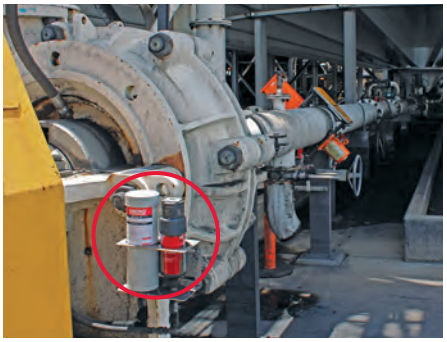
Storage & transport				
→ Storage	Conveyors	✓	-	✓
→ Transporting	Conveyors, loading stations	✓	-	-

Application examples



Bearing / seal lubrication on a pump

Lubrication systems on a conveyor



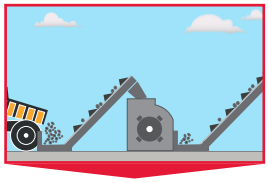
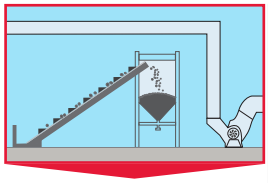
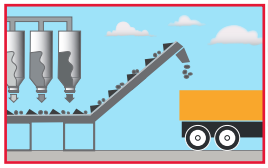
Bearing / seal lubrication on a pump

perma Lubrication Systems for

Aggregates

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.

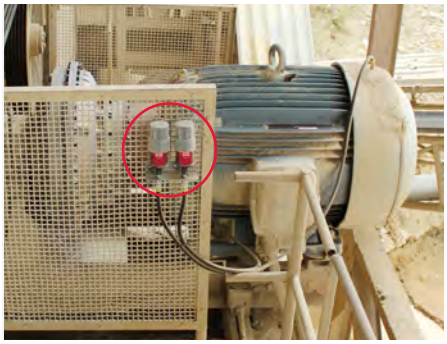
Lubrication points

		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

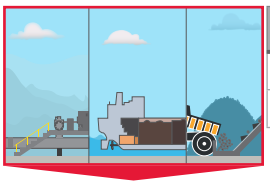
perma Lubrication Systems for

Oil & Gas

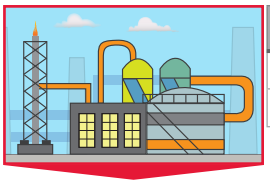
The highly engineered processing methods in refineries pose great challenges to man and machine. Pumps and fans are among the key machine elements in refineries. perma lubrication systems guarantee reliable, continuous lubrication for such applications.

Lubrication points

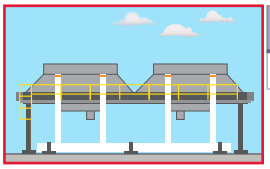
1 Roller bearings
2 Sliding bearings
3 Shaft seals



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

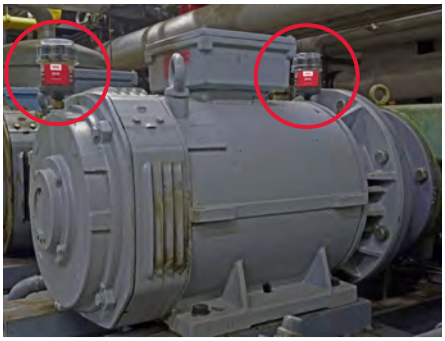


Refinery		1	2	3
→ Pumps	Electric motors, fuel pumps	✓	✓	✓
→ Venting	Blowers / fans, electric motors	✓	✓	-



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

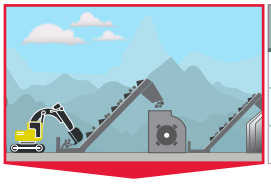
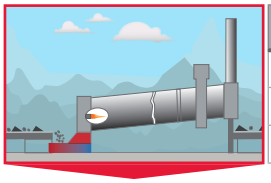
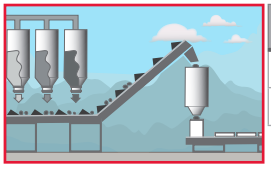
Fin fan lubrication

perma Lubrication Systems for

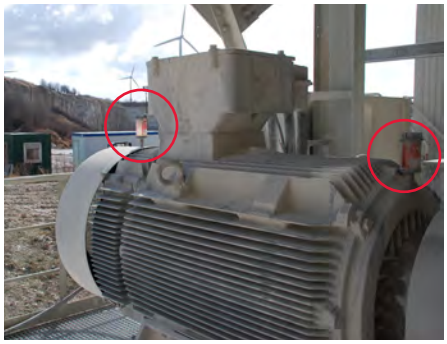
Gypsum, Lime & Cement

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.

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

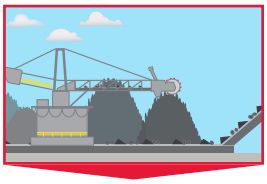
perma Lubrication Systems for

Steel & Iron

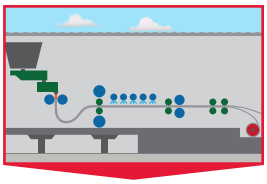
Equipment in the steel industry is constantly exposed to extreme operating conditions, especially very high temperatures, enormous loads and aggressive media. perma lubrication systems with special high-temperature lubricants provide reliable lubrication of roller bearings, chains and open gears in different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

Lubrication points

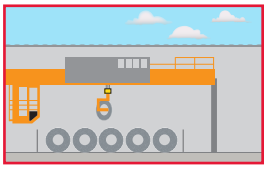
1 Roller bearings 2 Chains 3 Open gears



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)

Lubrication on a conveyor

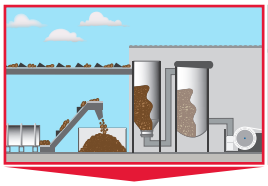
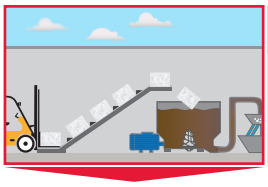
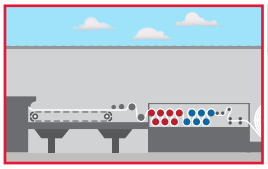
Lubrication of a fan drive shaft bearing

perma Lubrication Systems for

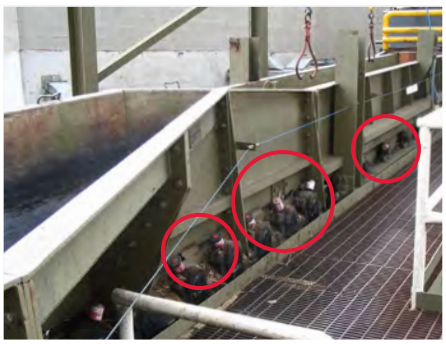
Pulp & Paper

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.

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

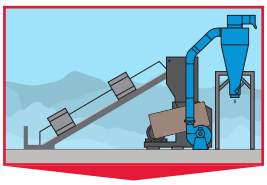
Recycling

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.

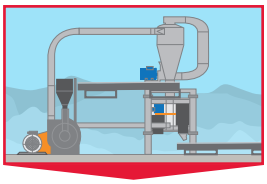
Lubrication points

1 Roller bearings

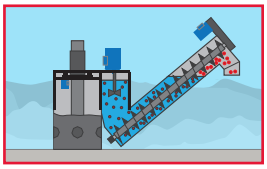
2 Sliding bearings



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



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



Final processing			
→ 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

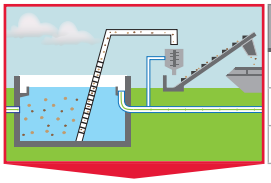
perma Lubrication Systems for

Wastewater Treatment

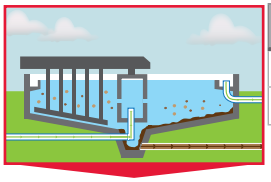
Trouble-free plant operation during the entire cleaning process is imperative for treatment of waste water. Important machine elements such as chains, spindles, roller and sliding bearings are directly exposed to dirt, water, phosphates and other chemicals. Continuous relubrication is necessary to prevent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

Lubrication points

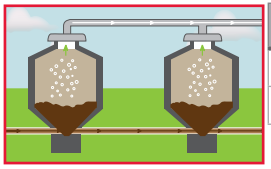
1 Roller bearings
2 Sliding bearings
3 Chains



Physical treatment		1	2	3
→ Screening	Chain guide roller	✓	-	✓
→ Grit & grease removal	Scraper	-	✓	-
→ Sedimentation tank	Impeller wheel	✓	✓	-



Biological treatment		1	2	3
→ Aerated tank	Surface aerator	✓	-	-
→ Clarification tank	Wheel bearing, pivot bearing	-	✓	-



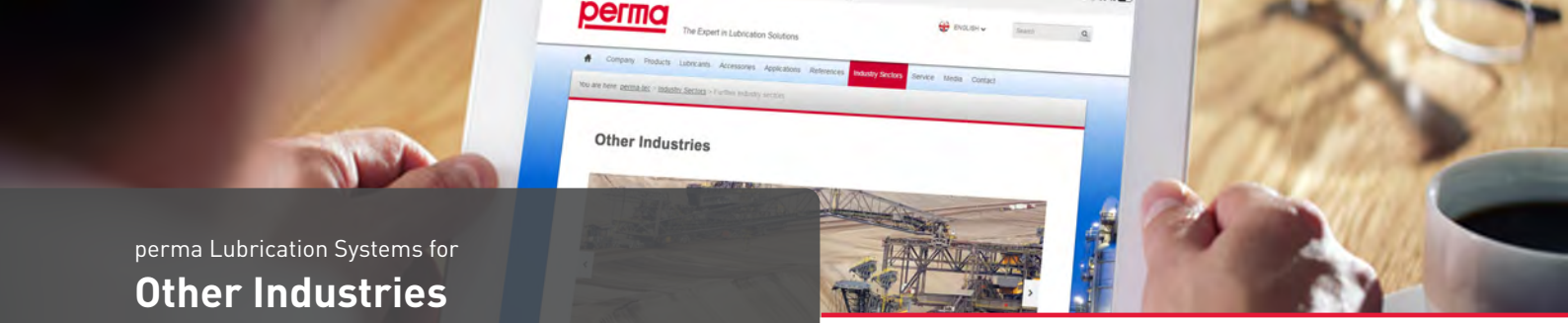
Sludge treatment		1	2	3
→ Sludge thickening	Sludge belt conveyor	✓	-	-
→ Sludge dewatering	Screw press	✓	-	-

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

Other Industries

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

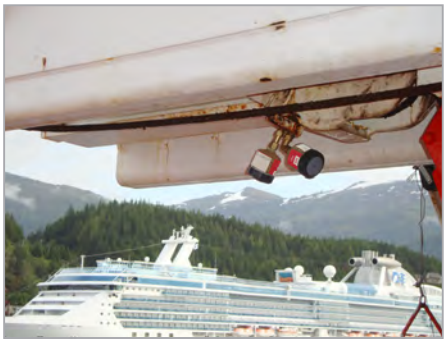
→ **www.permausa.com**

Asphalt mixing

Automotive

Food & Beverage

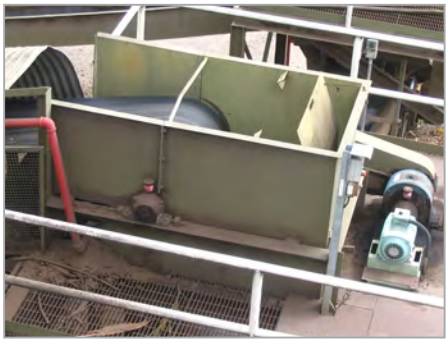
Marine



Power Generation

Ports & Ship Terminals

Timber Industry



Wind Energy

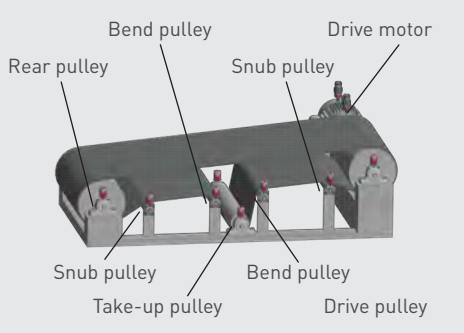
perma Lubrication Systems for

Conveyors

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

- → Mining & Heavy Industry
- → Power Generation
- → Food & Beverage
- → Recycling
- → Aggregates
- → Gypsum, Lime, Cement

Lubrication points



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

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

Challenges

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

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

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

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**

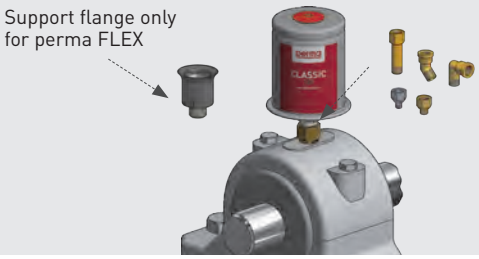
HINT

The perma SELECT APP helps you find the right lubrication system

Solutions

Direct mounting on the lubrication point: e.g. with perma CLASSIC / FUTURA / FLEX / NOVA

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



Direct Mounting Solution
Use extensions, angles & reducers depending on the installation situation

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

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

perma STAR VARIO with LC 60 / 120 / 250 / 500

Remote Mounting Solution
Use extensions, angles & reducers depending on the installation situation

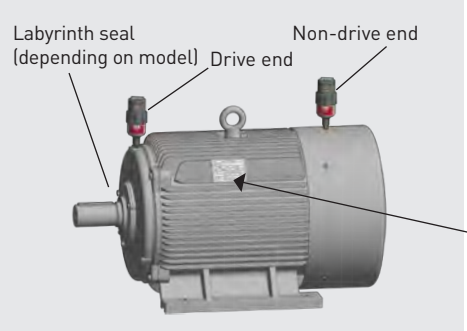
perma Lubrication Systems for

Electric motors

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

- → Mining & Heavy Industry
- → Power Generation
- → Food & Beverage
- → Recycling
- → Aggregates
- → Gypsum, Lime, Cement

Lubrication points



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

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

Speed: high	=	**Base oil:** thinner	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 temporary **over-lubrication of the bearings**. Non-adherence to relubrication intervals leads to **lubrication starvation**.

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

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

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

Advantages of automatic lubrication

- **Relubrication during running operation** minimizes 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**

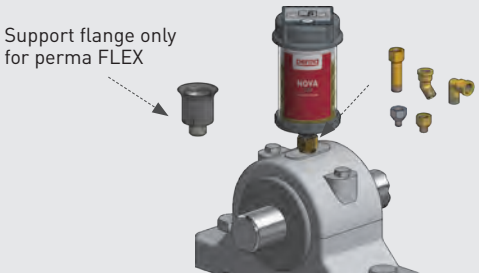
HINT

The perma SELECT APP helps you find the right lubrication system

Solutions

Direct mounting on the lubrication point: e.g. with perma CLASSIC / FUTURA / FLEX / NOVA

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



Direct Mounting Solution
Use extensions, angles & reducers depending on the installation situation

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

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

perma STAR VARIO with LC 60 / 120 / 250 / 500

Remote Mounting Solution
Use extensions, angles & reducers depending on the installation situation

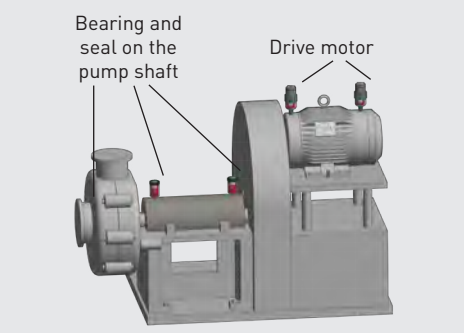
perma Lubrication Systems for

Pumps

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

- → Mining & Heavy Industry
- → Chemical Industry
- → Power Generation
- → Food & Beverage
- → Refineries
- → Paper and Paper
- → Pharma Industry
- → Environmental technology
- → Wastewater Treatment

Lubrication points

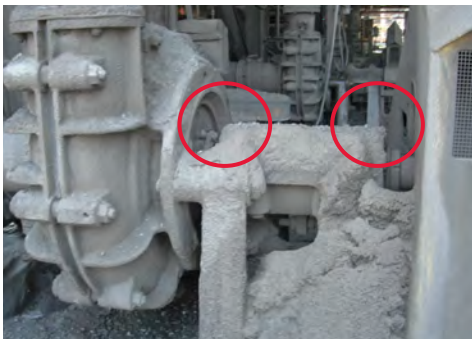


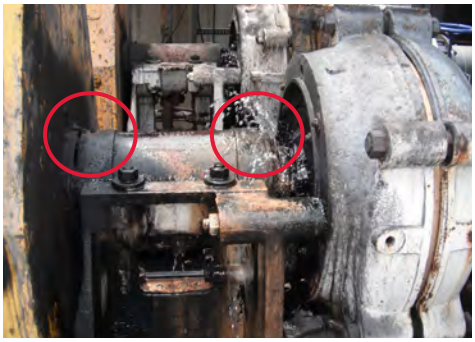
Lubrication points (roller bearings) are located on the **drive shaft** between drive motor and pump body or in the pump housing.

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

Information about drive motor lubrication can be found on pages 26 / 27, “Electric motors”.

Challenges





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

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

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

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

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

Advantages of automatic lubrication

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

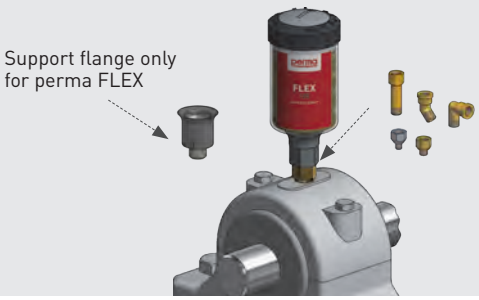
HINT

The perma SELECT APP helps you find the right lubrication system

Solutions

Direct mounting on the lubrication point: e.g. with perma CLASSIC / FUTURA / FLEX / NOVA

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



Direct Mounting Solution
Use extensions, angles & reducers depending on the installation situation

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

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

perma STAR VARIO with LC 60 / 120 / 250 / 500

Remote Mounting Solution
Use extensions, angles & reducers depending on the installation situation

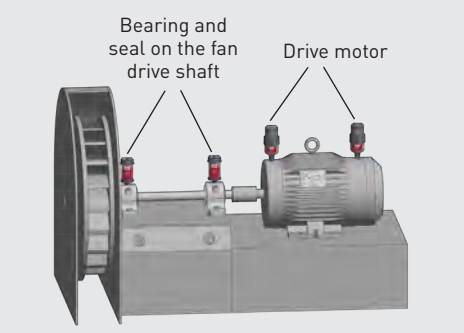
perma Lubrication Systems for

Blowers / Fans

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

- → Mining & Heavy Industry
- → Chemical Industry
- → Glass Industry
- → Wood-working
- → Power Generation
- → Food & Beverage
- → Refineries

Lubrication points

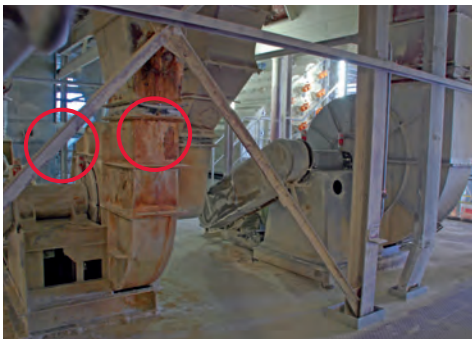


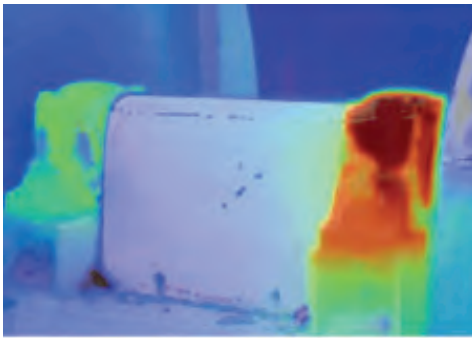
The lubrication points (roller bearings) are located at the **drive shaft** between drive motor and fan impeller.

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

Information about drive motor lubrication can be found on pages 26 / 27, “Electric motors”.

Challenges





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

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

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

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

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**

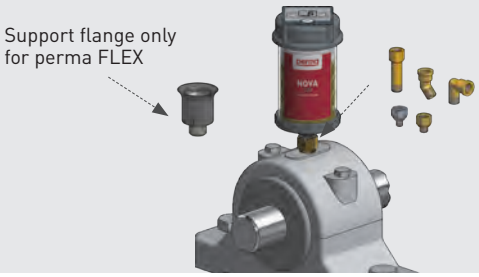
HINT

The perma SELECT APP helps you find the right lubrication system

Solutions

Direct mounting on the lubrication point: e.g. with perma CLASSIC / FUTURA / FLEX / NOVA

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



Direct Mounting Solution
Use extensions, angles & reducers depending on the installation situation

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

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

perma STAR VARIO with LC 60 / 120 / 250 / 500

Remote Mounting Solution
Use extensions, angles & reducers depending on the installation situation

2 STEP

STEP 1
- Industries
- Applications

STEP 2
- Assess installation method

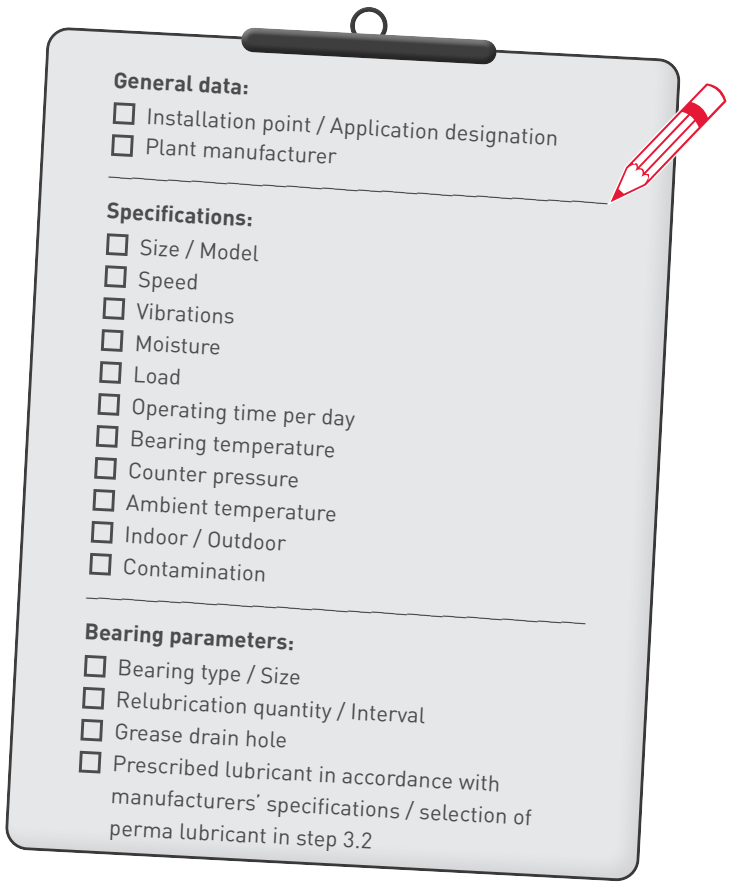
STEP 3
- perma Lubrication Systems
- perma Lubricants
- How to order

STEP 4
- Mounting solutions
- Accessories

Assess installation method

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.



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

Assess installation method

REMOTE INSTALLATION

NO!
= Direct mounting

Order lubrication system + accessories for direct mounting

For many lubrication points it is beneficial to remote mount lubrication systems at locations which are safe to access while machinery is operating. The following questions can be used to help guide remote mounting decisions.

A **"YES" to any of the questions** indicates that **remote mounting** is likely to be required.

INSTALLATION examples for direct mounting

Direct mounting example for electrochemical products e.g. perma CLASSIC / FUTURA / FLEX / NOVA

Common mounting accessories	
A	1 x Reducer 1/8" NPT male x 1/4" NPT female 1 x Reducer 1/4-28 UNF male x 1/4" NPT female 1 x Reducer M8x1o x G1/4 female
B	1 x Extension 2 inch 1/4" NPT male x 1/4" NPT female
C	1 x Angle 45° or 90° 1/4" NPT male x 1/4" NPT female
D	1 x Support flange FLEX 1/4" NPT male x G1/4 female >> only for perma FLEX

Direct mounting example for perma STAR VARIO

Common mounting accessories	
A	1 x Reducer 1/8" NPT male x 1/4" NPT female 1 x Reducer 1/4-28 UNF male x 1/4" NPT female 1 x Reducer M8x1 male x G1/4 female
B	1 x Extension 2 inch 1/4" NPT male x 1/4" NPT female
C	1 x Angle 45° or 90° 1/4" NPT male x 1/4" NPT female
D	1 x Support flange STAR 1/4" NPT male x G1/4 female

DECISION MAKING

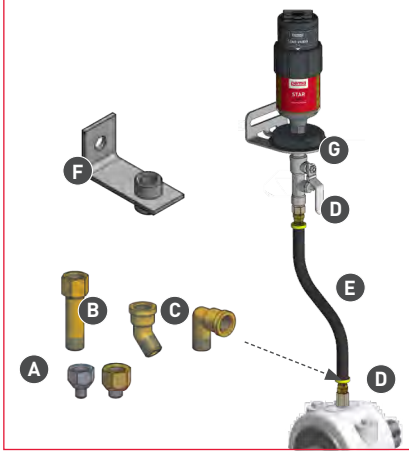
1. Is it necessary to remove protective guards or safety cages to access the lubrication point?
2. Is it difficult or unsafe to access the lubrication point while equipment is running?
3. Is the lubrication point subject to severe vibration or high temperatures which may damage the lubrication system?
4. Is it necessary to get permits to access lubrication points when in confined spaces or fall protection is required?
5. Is the lubrication point exposed to excessive amounts of water, process materials or impact from solid material?

YES!
= Remote mounting

SELECT MOUNTING TYPE / KITS

INSTALLATION examples for remote mounting with grease line

Remote mounting example for perma STAR VARIO



Common remoute mounting accessories	
A	1 x Reducer 1/8" NPT male x 1/4" NPT female 1 x Reducer 1/4-28 UNF male x 1/4" NPT female 1 x Reducer M8x1o x G1/4 female
B	1 x Extension 2 inch 1/4" NPT male x 1/4" NPT female
C	1 x Angle 45° or 90° 1/4" NPT male x 1/4" NPT female
D	2 x Hose connector 1/4" NPT male for hose iØ 3/8 - push-lock
E	1 x Heavy Duty hose up to 260 °F / 100 °C iØ 3/8 (black)
F	1 x Mounting bracket 1-point G1/4 female single for perma CLASSIC, FUTURA, FLEX, NOVA
G	1 x Support flange STAR G1/4 male x G1/4 female

electrochemical

CLASSIC, FUTURA, FLEX, NOVA

electromechanical

STAR VARIO, STAR CONTROL

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

HINT

Additional mounting brackets and complete KITS can be found in our catalog "Lubrication Solutions Mining & Mineral Processing".

3 STEP

THE EXPERT IN LUBRICATION SOLUTIONS

STEP 1
- Industries
- Applications

STEP 2
- Assess installation method

STEP 3
- perma Lubrication Systems
- perma Lubricants
- How to order

STEP 4
- Mounting solutions
- Accessories

perma Lubrication Systems

perma Lubricants

How to order

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 cc
CLASSIC / FUTURA

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 cc
FLEX / NOVA / STAR LC

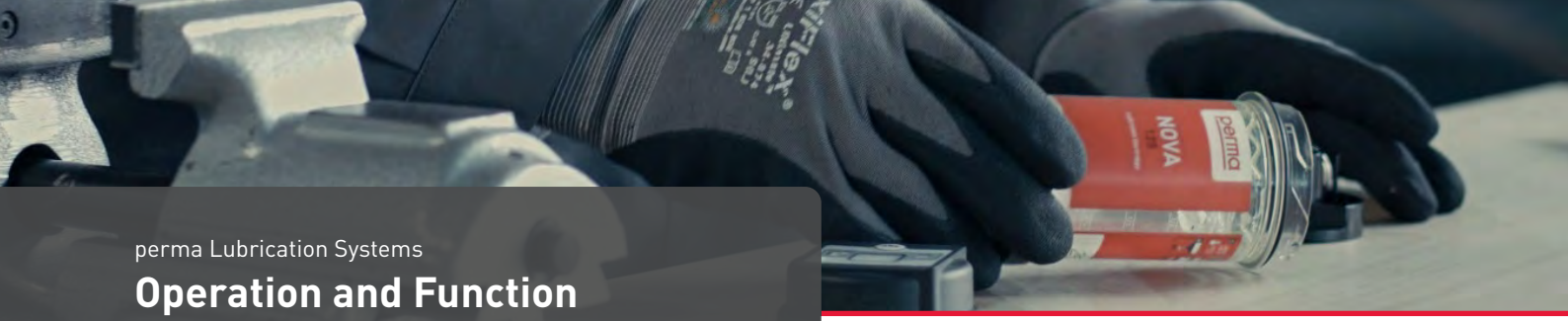
Setting / Months	1	2	3	4	5	6	7	8	9...	...12
Lubricant / Day [cm³]	2.0	1.0	0.7	0.5	0.4	0.3	0.3	0.3	0.2	0.2
Lubricant / 100 h [cm³]	8.3	4.2	2.8	2.1	1.7	1.4	1.2	1.0	0.9	0.7
Lubricant / Week [cm³]	14.0	7.0	4.7	3.5	2.8	2.3	2.0	1.8	1.6	1.6
Strokes with grease gun / Day	1–2	<1	0.5	-	-	0.25	-	-	-	0.13
Strokes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

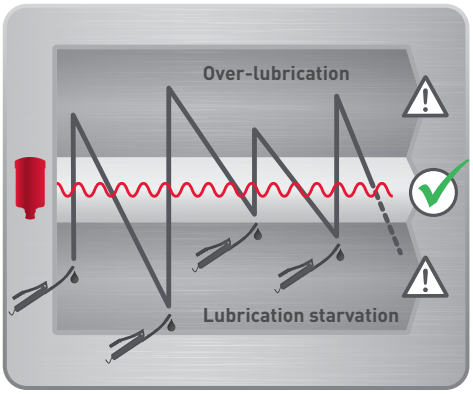


perma Lubrication Systems

Operation and Function

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.

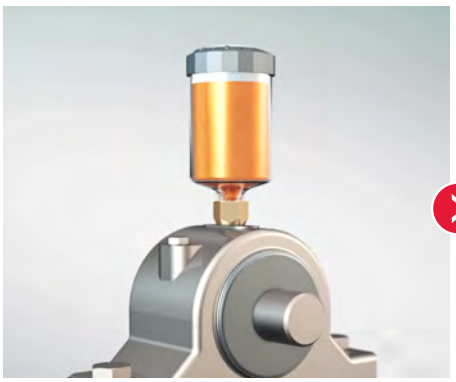
Continuous relubrication



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.

Function 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.permausa.com/en/downloads/videos/

Independent operated 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.

electrochemical

perma CLASSIC / perma FUTURA

perma FLEX

perma NOVA

electromechanical

perma STAR VARIO

Lubrication systems with external power supply

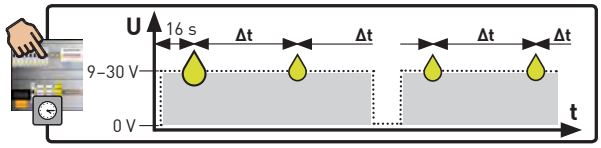
Automatic lubrication systems with an **external power supply** allow time-based or impulse-based lubrication. By coupling with a higher-level machine controller, signals about the lubrication system's operating status can be analysed.

perma STAR CONTROL

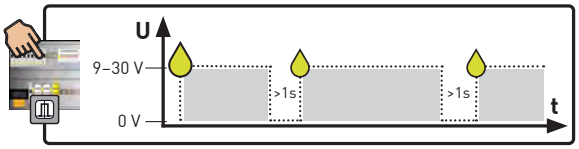
Signalling
- → Operating status
- → Errors
- → Lubricant empty / refill /replace LC (= lubricant cartridge)

In addition for 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.



Overview Single-point Lubrication Systems

	perma CLASSIC / perma FUTURA	perma FLEX	perma NOVA
			
Specifications			
SET	**Activator**  Order activator separately	**Rotary switch**  Complete system	**Push button + LCD display**  perma NOVA Control unit Reusable
°F °C	**32 °F to 104 °F** 0 °C to 40 °C	**-4 °F to 140 °F** -20 °C to 60 °C	
	max. 58 psi max. 4 bar	**max. 73 psi** max. 5 bar	**max. 87 psi** max. 6 bar
cc / oz	**120 cc** 4.06 oz	**60, 125 cc** 2.03 oz / 4.23 oz	**65, 125 cc** 2.20 oz / 4.23 oz
	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 **68 °F** / +20 °C / perma Multipurpose grease SF01	**1, 2, 3 ... 12 months** at **68 °F** / +20 °C / perma Multipurpose grease SF01	
IP	-	**IP 68**	**IP 65**
	CE Ex	CE Ex TIIS IECEx FM APPROVED	CE Ex ANZEx IECEx
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		
	<3 ft / 0.9 meter grease line	**<6 ft / 1.8 meters grease line**	

Overview Single-point Lubrication Systems

	perma STAR VARIO Standard	perma STAR VARIO 500	perma STAR CONTROL
			
Specifications			
SET	**Push button + LCD display + LED signals**  perma STAR VARIO Drive Reusable		**Push button + LCD display + LED signals**  perma STAR CONTROL Drive Reusable
	With Battery pack STAR VARIO: -4 °F to 140 °F / -20 to +60 °C **With Battery pack STAR VARIO low temperature: -40 °F to 140 °F /** -40 to +60 °C		**-4 °F to 140 °F /** -20 to +60 °C
	max. 87 psi max. 6 bar		
cm³	**60, 120, 250 cc** 2.03 oz / 4.06 oz / 8.45 oz	**60, 120, 250 , 500 cc** 2.03 oz / 4.06 oz / 8.45 oz / 16.9 oz	**60, 120, 250 cc** 2.03 oz / 4.06 oz / 8.45 oz
	Self-sufficient system: Electromechanical + Battery pack STAR VARIO or Battery pack STAR VARIO low temperature 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	**1,2,3 ... 24 weeks**	-
	-	-	**1, 2, 3 ... 12 months** Independent of operating temperature and counter pressure
	-	-	**0.1–9.5 cc per impulse** Independent of operating temperature and counter pressure
IP	**IP 65**		
	CE cULus LISTED		CE
Special operating conditions			
	Minor to heavy vibration We recommend remote mounting with a grease line if there are vibrations at the lubrication point		
	<15 ft / 4.5 meters grease line		

perma CLASSIC / perma FUTURA

The classic lubrication system

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

Made in Germany

Simple, robust, reliable

perma CLASSIC and perma FUTURA can be used in all types of applications with ambient temperatures from 32 °F to 104 °F / 0 °C to 40 °C. Depending on operating conditions, a lubricant volume of 120 cc is dispensed in 1, 3, 6 or 12 months. Reliable function is based on an electrochemical reaction. The activator is screwed into the lubrication system and the eyelet torn off. The contained gas generator generates a pressure of max. 58 psi / 4 bar, which moves the piston forward and transports lubricant into the lubrication point.

Applications / Machine elements

perma CLASSIC and perma FUTURA 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).

Product characteristics — Benefits

Simple activation through activator

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

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

perma CLASSIC
Metal housing

perma FUTURA
Transparent Plastic housing with integrated support flange

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

Ex-proof certification
Mining approval

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

Technical data

Drive
Electrochemical reaction via gas generator

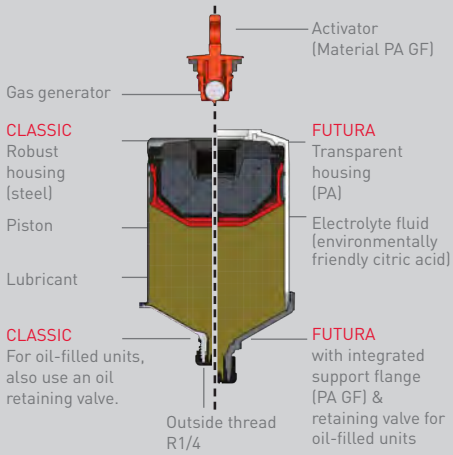
Discharge period at 68 °F / 20 °C perma Multipurpose grease SF01
1, 3, 6 or 12 months

Lubricant volume
120 cc / 4.06 oz

Operating temperature
32 °F to 104 °F / 0 °C to 40 °C

Pressure build up
Max. 58 psi / 4 bar

Standard & special lubricants
Greases up to NLGI 2 / oils



Dimensions
Ø 70 x 99 mm
Ø 2.75 x 3.90 Inch

Dimensions
Ø 67 x 111 mm
Ø 2.64 x 4.37 Inch

Discharge period in months:

120 cc / 4.06 oz				
at 32 °F / 0 °C	4	8	15	>18
at 50 °F / 10 °C	2	5	8	18
at 68 °F / 20 °C	1	3	6	12
at 86 °F / 30 °C	0.8	2	3	6
at 104 °F / 40 °C	0.6	1	2	3

perma FLEX

The all-in-one lubrication system

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

IS / I,II,III / 1 / ABCDEFG / T6 (85°C); -25°C < Ta < +65°C; IP68 I / 1 / AEx/Ex ia / IIC / T6; -25°C < Ta < +65°C; IP68

TIIS

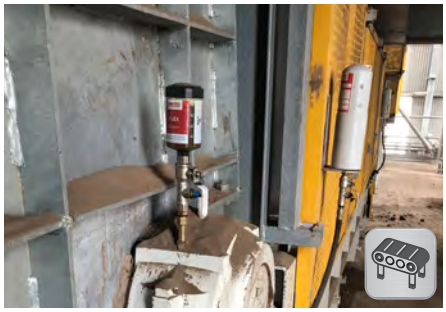
Made in Germany

Flexible use – even on lubrication points with challenging requirements

perma FLEX is a compact, ready-to-use lubrication system supplied as a complete unit. It can be used in various types of applications at temperatures ranging from -4 °F to 140 °F / -20 °C to 60 °C. Discharge period setting is freely adjustable from 1 to 12 months. The required pressure is developed via an electronically controlled chemical reaction. The lubrication point is continuously supplied with fresh lubricant throughout the selected discharge period. perma FLEX is available in sizes 60 cc / 2.03 oz and 125 cc / 4.23 oz.

Applications / Machine elements

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



Product characteristics

Benefits

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

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

System operates reliably from -4 °F to 140 °F /-20 °C to 60°C

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

Ex-proof certification
FM approval
IP 68

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

Technical data

Drive
Electrochemical reaction via gas generating unit

Discharge period at 68 °F / 20 °C perma Multipurpose grease SF01
1, 2, 3 ... 12 months

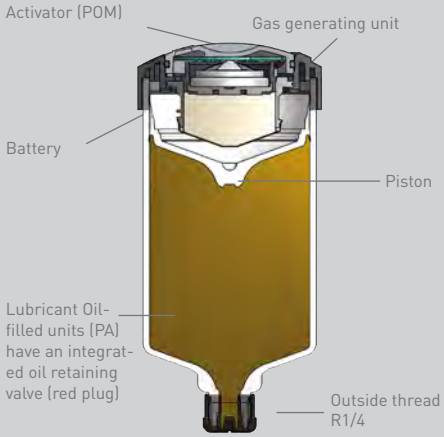
Lubricant volume
2.03 oz or 4.23 oz / 60 cc or 125 cc

Operating temperature
-4 °F to 140 °F / -20 °C to 60 °C

Pressure build up
Max. 73 psi / 5 bar

Protection class
IP 68

Standard & special lubricants
Greases up to NLGI 2 / oils



Dimensions FLEX 60:
Ø 58 x 86.5 mm
Ø 2.28 x 3.41 Inch

Dimensions FLEX 125:
Ø 58 x 117 mm
Ø 2.28 x 4.61 Inch

Discharge period setting in months:

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

Grease residues possible at temperatures >104°F / 40 °C and discharge periods >6 months.

	1	3	6	9	12
a -4 °F / -20 °C	2	5	10	13	15
a 32 °F / 0 °C	1,3	3,8	7,2	11	13
a 68 °F / 20 °C	**1**	**3**	**6**	**9**	**12**
a 104 °F / 40 °C	0,8	2,5	5,2	7,5	10
a 140 °F / 60 °C	0,6	2	4	-	-

perma NOVA

The first temperature-independent, electrochemical lubrication system

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

ANZEx

Made in Germany

For application areas with high temperature fluctuations

perma NOVA can be used in all application areas between -4 °F to 140 °F /-20 °C and 60 °C. A discharge period from 1 to 12 months can be entered via the setting button on the NOVA Control unit. Taking into account the ambient temperature, the control unit then calculates the required quantity of gas for constant and reliable discharge. perma NOVA consists of a reusable control unit, a NOVA LC filled with grease or oil and a protective cover. NOVA LC is available in sizes of 65 cc / 2.20 oz and 125 cc / 4.23 oz.

Applications / Machine elements

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



Product characteristics | Benefits

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

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

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

System operates reliably from -4 °F to 140 °F / -20 °C to 60 °C

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

Ex-proof certification IP 65

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

Technical data

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

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

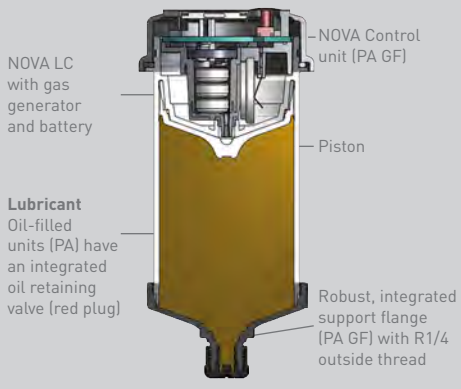
Lubricant volume
65 cc or 125 cc / 2.20 oz or 4.23 oz

Operating temperature
-4 °F to 140 °F /-20 °C to 60 °C

Pressure build up
Max. 87 psi / 6 bar

Protection class
IP 65

Standard & special lubricants
Greases up to NLGI 2 / oils



Dimensions LC 65:
Ø 65 x 101 mm
Ø 2.56 x 3.98 Inch

Dimensions LC 125:
Ø 65 x 132 mm
Ø 2.65 x 5.20 Inch

perma STAR VARIO

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

CLASS I,II,III DIVISION 2;
GROUPS A,B,C,D,F and G

Three different sizes for individual lubricant metering

perma STAR VARIO operates fully automatically, independent of temperature and pressure as well as offering a very precise discharge. The system consists of an electromechanical drive, an LC with 60, 120 or 250 cc / 2.03 oz, 4.06 oz, or 8.45 oz of lubricant and a battery pack. The desired discharge period and LC size can easily be selected with the setting button and are immediately visible in the LCD. The current operating status is indicated on the LCD and via LED signal lights (red/green) visible all around. The LED signals are also recognizable 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. Thanks to precise lubricant metering, perma STAR VARIO is ideal for lubrication of electric motors with specified lubricant quantities. perma STAR VARIO is protected against dust and water jets, subject to correct assembly of the individual parts (IP 65).

Product characteristics — Benefits

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

- → 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 around
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 87 psi / 6 bar allows remote mounting up to 15 ft / 4.5 m

Manual additional discharge

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

Technical data

Drive – reusable
Electromechanical drive with Battery pack STAR VARIO / Battery pack low temperature

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

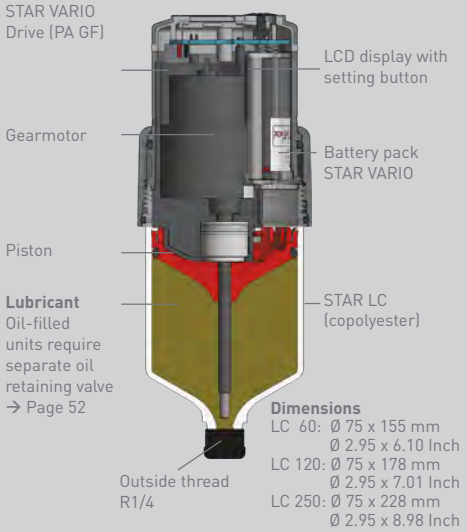
Lubricant volume
60 cc, 120 cc or 250 cc / 2.03 oz, 4.06 oz, or 8.45 oz

Operating temperature*
-40 °F to 140 °F / -40 °C to 60 °C

Pressure build up
87 psi / 6 bar

Protection class
IP 65

Standard & special lubricants
Greases up to NLGI 2/oils



*To achieve functionality below -20° C / -4° F, Battery Pack low temperature (lithium) must be used. Only to be used with suitable low temperature lubricants!

perma STAR CONTROL

TIME and IMPULSE mode combined in a single system

CE Made in Germany

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

In contrast to the perma STAR VARIO (with battery pack), the perma STAR CONTROL is supplied with external power via cable. In addition, the operating status can be transmitted to a PLC via this connection. The two integrated operating modes TIME and IMPULSE allow flexible use. In the TIME mode, lubricant dispensing is dependent on operating hours. In the IMPULSE mode, a precisely defined quantity is dispensed as soon as a voltage is applied. The perma STAR CONTROL consists of an electromechanical drive and an LC with 60, 120 or 250 cc / 2.03 oz, 4.06 oz, or 8.45 oz of lubricant. The required mode is set on the drive. Lubrication is precise, temperature-independent and with up to 6 bar counter pressure.

perma

Applications / Machine elements

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

Product characteristics | Benefits

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

Setting:
Mode, LC size, discharge quantity and PIN

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

Electromechanical drive with external power supply

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

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

Pressure build-up to 87 psi / 6 bar allows remote mounting up to 15 ft / 4.5 m

Manual additional discharge

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

Technical data

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

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

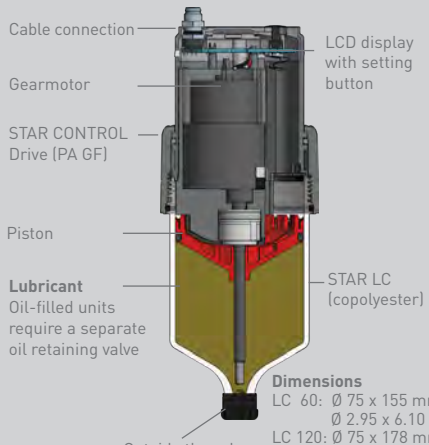
Lubricant volume
60 cc, 120 cc or 250 cc / 2.03 oz, 4.06 oz, or 8.45 oz

Operating temperature
-4 °F to 140 °F / -20 °C to 60 °C

Pressure build up
87 psi / 6 bar

Protection class
IP 65

Standard & special lubricants
Greases up to NLGI 2/oils



perma Lubrication Systems

perma Lubricants

perma USA offers a wide range of high-quality lubricants meeting a great variety of requirements. Consistently high quality has established the product in diverse industrial sectors. Lubrication systems can be filled with lubricants from other manufacturers upon request.

Bio-degradable for all applications

Oils

Name → Lubricant properties	Base oil	Operating temperature (°F)	Operating temperature (°C)	Viscosity at 40 °C [mm²/s]	Sliding bearings Sliding guides	Open gears Gear racks	Spindles	Chains
perma Multipurpose oil SO32 → High performance transmission & multipurpose oil → Aging & oxidation resistant → Good wear protection for gear teeth & roller bearings	Mineral oil	23 to 212	-5 to 100	100	✓	✓	✓	✓
perma Food grade oil H1 SO70 → Broad operating temperature range → Very good ageing & oxidation resistance → Good wear protection	PAO+ Ester	-22 to 248	-30 to 120	220	✓	✓	✓	✓

Food & Bio greases

Name → Lubricant properties	NLGI grade	Thickener	Base oil	Operating temperature (°F)	Operating temperature (°C)	Base oil viscosity at 40 °C [mm²/s]	Roller bearings	Sliding bearings Sliding guides	Linear guides	Open gears Gear racks	Spindles
Petro-Canada PURITY FG2 SYNTHETIC → Higher load carrying capabilities → Effective across a wide range of temperature extremes → Strong resistance to lubricant breakdown and water washout	2	Ca sulf.	Synthetic	-40 to 392	-40 to 200	458	✓	✓	✓	✓	-
EXXON MOBIL MOBILGREASE FM 101 → Excellent water resistance & rust protection → Excellent thickener shear stability → ISO 100 low-viscosity base oil	1	Al com.	Mineral oil	-4 to 248	-20 to 120	100	✓	✓	✓	✓	-
perma Multipurpose bio grease SF09 → Rapidly biodegradable → Water hazard class WGK 1 → Fully synthetic	2	PHS	Ester	-40 to 284	-40 to 140	120	✓	✓	-	✓	-

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Greases

Name → Lubricant properties	NLGI grade	Thickener	Base oil	Operating temperature (°F)	Operating temperature (°C)	Base oil viscosity at 40 °C [mm²/s]	Roller bearings	Sliding bearings Sliding guides	Linear guides	Open gears Gear racks	Spindles
perma Multipurpose grease SF01 → Powerful multipurpose grease → Wear reducing thanks to EP additives → Free of heavy metals & silicone	2	Li / Ca	Mineral oil	-22 to 266	-30 to 130	220	✔	✔	✔	-	✔
EXXON MOBIL MOBILGREASE XHP 221 / 222 → Broad multi-purpose applications → Superb resistance to water washout → Excellent rust & corrosion resistance	1 / 2	Li com.	Mineral oil	-4 to 284	-20 to 140	220	✔	✔	✔	-	-
Shell Gadus S3 V220C 2 (Albida EP2) → Enhanced extreme-pressure properties → Good water resistance → Effective corrosion protection	2	Li com.	Mineral oil	-4 to 284	-20 to 140	220	✔	✔	✔	-	-
EXXON MOBIL MOBILITH SHC 460 → Outstanding high & low temperature performance → Excellent thermal stability & oxidation resistance → Extreme-pressure additive protects against wear	1.5	Li com.	Synthetic	-22 to 302	-30 to 150	460	✔	✔	-	✔	-
Phillips 66 Multiplex FS 220 #2 → Superior wear protection → Superior pumpability at low temperature → Easily pumped	2	Li com.	Synthetic	-40 to 399	-40 to 204	220	✔	✔	-	-	-
Royal Purple Ultra Performance No. 2 → Exceptional water resistance → Outstanding oxidation stability → Excellent rust and corrosion protection	2	Al com.	PAO+ Ester	up to 500	up to 260	150	✔	✔	-	-	-
Phillips 66 Omniguard 220 #1 → Outstanding resistance to water washout → High dropping point (>550°F) → Excellent extreme-pressure and antiwear properties	1	Ca sulf.	Parrafinic	-9 to 500	-23 to 260	220	✔	✔	✔	-	-
Castrol Molub-Alloy 860/220 - 1 ES → Excellent mechanical stability and adhesion → Formulated to address environmental concerns → Excellent EP and anti-wear properties	1	Li com.	Mineral oil	up to 284	up to 140	460	✔	✔	-	-	-
EXXON MOBIL MOBILITH SHC 220 → Outstanding high & low temperature performance → Excellent thermal stability & oxidation resistance → Excellent protection against wear, rust & corrosion	2	Li com.	Synthetic	-40 to 302	-40 to 150	220	✔	✔	-	-	-
EXXON MOBIL MOBIL Polyrex EM → Advanced polyurea thickener → Excellent corrosion resistance → Low noise properties	2	PHS	Mineral oil	-4 to 320	-20 to 160	115	✔	-	-	-	-
Shell Gadus S5 V100 2 (Albida EMS 2) → Very good mechanical & thermal stability → Contains antioxidants, EP, wear & rust preventing additives → Can be used in electric motors, fans and pumps	2	Li com.	Synthetic	-28 to 302	-50 to 150	100	✔	-	-	-	-
Chevron SRI 2 → Wide application range → Excellent oxidation stability → Excellent rust protection	2	PHS	Mineral oil	-20 to 350	-29 to 177	116	✔	-	-	-	-

Technical data on lubricants can be sourced from perma or related oil company.

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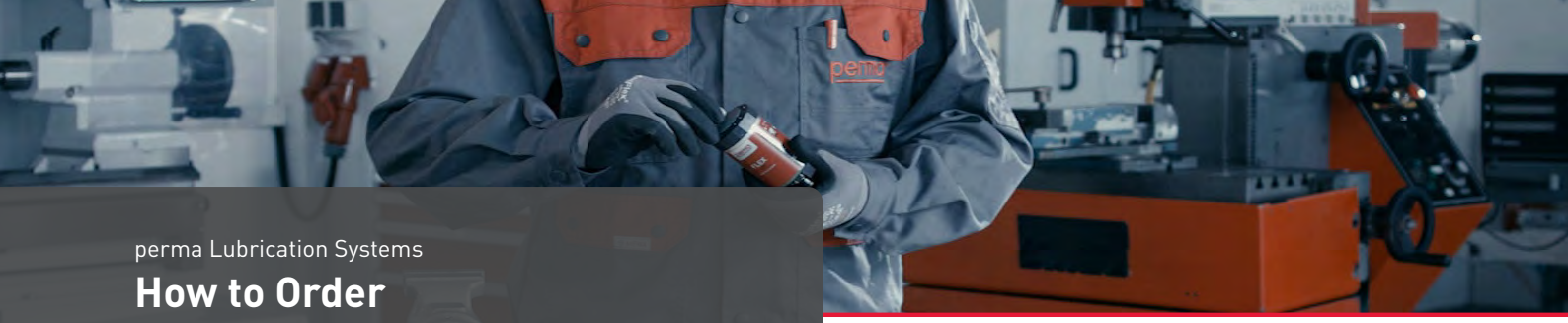


perma Lubrication Systems

How to Order

	perma CLASSIC / perma FUTURA	perma FLEX
I Drive / Activator	 Activator, **yellow** 1 month, 101331  Activator, **green** 3 months, 101332  Activator, **red** 6 months, 101333  Activator, **gray** 12 months, 101335	 **Please start with step II**

+

II Lubrication systems / LC (= Lubricant Cartridge)	 perma CLASSIC 120 cc	 perma FUTURA 120 cc	 perma FLEX 60 cc	 perma FLEX 125 cc
III Greases				
perma Multipurpose grease SF01	901389	901390	901391	901392
EXXON MOBIL MOBILGREASE XHP 221	112593	901277	901278	112595
EXXON MOBIL MOBILGREASE XHP 222	901288	901289	901291	107194
Shell Gadus S3 V220C 2 (ALBIDA EP 2)	901276	901279	901264	901265
EXXON MOBIL MOBILITH SHC 460	901328	901329	901330	901331
Phillips 66 Multiplex FS 220 #2	901415	901416	901417	901418
Royal Purple Ultra-Performance Grease 2	901427	901428	901429	901430
Phillips 66 Omniguard 220 #1	901352	901353	901354	901355
Castrol Molub-Alloy 860/220 - 1 ES	901340	901341	901342	901343
EXXON MOBIL MOBILITH SHC 220	901316	901317	901318	901319
EXXON MOBIL MOBIL Polyrex EM	901364	901365	901366	901367
Shell Gadus S5 V100 2 (ALBIDA EMS 2)	901249	901250	901251	901252
Chevron SRI 2	901403	901404	901405	901406
perma Multipurpose bio grease SF09	901439	901440	901441	901442
Petro-Canada PURITY FG2 SYNTHETIC	901377	901378	901379	901380
EXXON MOBIL MOBILGREASE FM 101	902354	910248	910249	910250
Oils	**Order oil retaining valve separately**	**Includes oil retaining valve**	**Includes oil retaining valve**	
perma Multipurpose oil SO32	901451	901452	901453	901454
perma Food grade oil H1 SO70	901463	901464	901465	901466

IV Support flange	Support flange not required	Support flange integrated	 Support flange FLEX 1/4" NPT male x G1/4 female (Brass / Plastic) **109322** Support flange FLEX 1/8" NPT male x G1/4female (Brass / Plastic) **109323**

1st order vs. Reorder	1st order = Reorder 	1st order = Reorder 

perma NOVA	perma STAR VARIO	perma STAR CONTROL	perma STAR LC 500
	Protection cap STAR Standard Duty (Plastic) 109519	**Protection cap STAR Standard Duty (Plastic)** 109519 **Adapter cable STAR CONTROL** 30 cm 109521	**Protection cap STAR VARIO Heavy Duty 500 (Plastic)** 113595
perma NOVA Control unit (reusable) 1, 2, 3 ... 12 months 107271	**perma STAR VARIO Drive (reusable)** 113355	**perma STAR CONTROL Drive (reusable)** 108985	**perma STAR VARIO Drive 500 (reusable)** 1, 2, 3 ... 24 weeks 113796
	-20 °C to +60 °C -4 °F to +140 °F **Battery pack STAR VARIO** 101351 **or** -40 °C to +60 °C -40 °F to +140 °F **Battery pack STAR VARIO low temperature** 902292	**Cable perma STAR CONTROL** 16.4 ft / 5 m 108432 32.8 ft / 10 m 108431	**Battery pack STAR VARIO** 101351

NOVA LC 65 cc	NOVA LC 125 cc	STAR LC 60 cc	STAR LC 120 cc	STAR LC 250 cc	STAR LC 500 cc
901388	901387	901393	901394	901395	910239
901275	901274	901280	112596	112594	907314
901287	901286	901293	100957	104609	910336
901260	901259	901266	901267	901268	907727
901327	901326	901332	901333	901334	910342
901414	901413	901419	901420	901421	910245
901426	901425	901431	901432	901433	910246
901351	901350	901356	901357	901358	910244
901339	901338	901344	901345	901346	910232
901313	901312	901320	901321	901322	910235
901363	901362	901368	901369	901370	910237
901247	901248	901253	901254	901255	910247
901402	901401	901407	901408	901409	910233
901438	901437	901443	901444	901445	910240
901376	901375	901381	901382	901383	910243
910251	910252	910253	903228	906861	900209
Includes oil retaining valve		**Order oil retaining valve separately**			
901450	901449	901455	901456	901457	910241
901462	901461	901467	901468	901469	910242

Support flange integrated		Support flange STAR 1/4" NPT male x G1/4 female (Brass / Plastic) **109419** Support flange STAR 1/8" NPT male x G1/4 female (Brass / Plastic) **109418**	Support flange STAR 500 G1/4 male x G1/4 female (Brass / Plastic)* **110757**

1st order	Reorder	1st order	Reorder	1st order	Reorder	1st order	Reorder

* Use in conjunction with STAR mounting brackets only (see page 68)

4 STEP

STEP 1
- Industries
- Applications

STEP 2
- Assess installation method

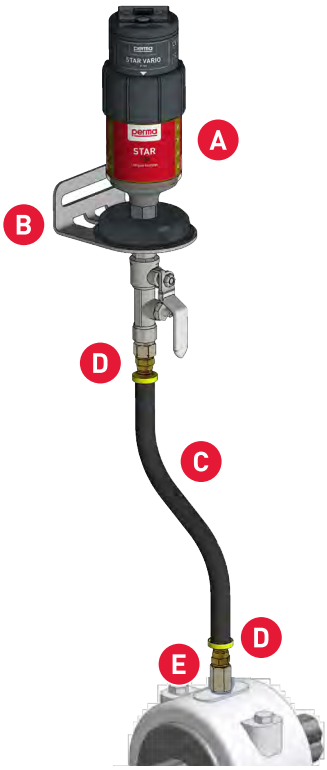
STEP 3
- perma Lubrication Systems
- perma Lubricants
- How to order

STEP 4
- Mounting solutions
- Accessories

Mounting solutions

Accessories

Guide to optimal installation of single-point lubrication systems



Installation example for bearing lubrication

HINT

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

Select mounting type / KITS

A. Brackets

Compact Stainless steel brackets are available and can be easily attached to square cage mesh using a hook attachment design or to beam sections using beam clamps.

B. Beam clamp

Easy-to-use beam clamps, supplied with case-hardened cup head set screws and Stainless steel assembly screws. Available in 1.18 inch or 2.56 inch (30 or 65 mm)

C. Purge connection with manual valve 1/4" NPT

Used for convenient additions of supplementary grease, line purging, and grease blockage clearing.

D. Angle 90° 1/4" NPT male x 1/4 NPT female

Optional use. One angle included per lubrication point.

E. Hose connector 1/4" NPT male

For hose iØ 3/8 push-lock (Stainless steel). Two included per lubrication point.

F. Heavy Duty hose

Supplied with iØ 3/8 and easy-to-use push-lock type swivel hose ends. Hose 3 ft / 0.9 m per lubrication point is included, other lengths upon request.

G. Reducing adapter

Two reducers 1/8" NPT and 1/4-28 UNF included for each lubrication point.

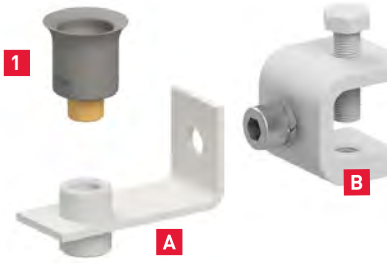
H. Hose spiral guard

Use to bundle hoses in multipoint kits.

1. Support flange FLEX G1/4 male x G1/4 female
Only for perma FLEX.
Please order separately.

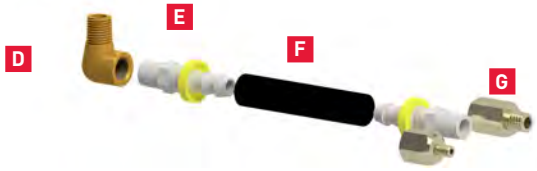
electrochemical Standard Duty remote mounting assembly

Available also as full Stainless steel KITS



KIT Standard Duty beam clamp

KIT Standard Duty cage hanger



Support flange with G-male threads required for brackets

Original size and color may vary from the illustrations

Typical KITS configuration shown below. perma lubrication systems not included.

KITS Standard Duty beam clamp

	KIT electrochemical Standard Duty 1-point beam clamp with 3 ft / 0.9 m hose	KIT electrochemical Standard Duty 2-point beam clamp with 6 ft / 1.8 m hose
1,18 inch 30 mm	901046	901048
2,56 inch 65 mm	901047	901049

KITS Standard Duty cage hanger

KIT electrochemical Standard Duty 1-point cage hanger with 3 ft / 0.9 m hose	KIT electrochemical Standard Duty 2-point cage hanger with 6 ft / 1.8 m hose
901050	901051

Original size and color may vary from the illustrations

Select mounting type / KITS

Electromechanical remote mounting assembly

A. Brackets incl.

1. Support flange STAR
2. Cover clip for protection cap
3. Protection cap STAR VARIO Heavy Duty 250 (Plastic)

Compact Stainless steel brackets are available and can be easily attached to square cage mesh using a hook attachment design or to beam sections using beam clamps.

B. Beam clamp

Easy-to-use beam clamps, supplied with case-hardened cup head set screws and Stainless steel assembly screws. Available in 1.18 inch or 2.56 inch (30 or 65 mm)

C. Purge connection with manual valve 1/4" NPT

Used for convenient additions of supplementary grease, line purging ,and grease blockage clearing.

D. Angle 90° 1/4" NPT male x 1/4 NPT female

Optional use. One angle included per lubrication point.

E. Hose connector 1/4" NPT male

For hose iØ 3/8 push-lock (Stainless steel). Two included per lubrication point.

F. Heavy Duty hose

Supplied with iØ 3/8 and easy-to-use push-lock type swivel hose ends. Hose 6 ft / 1.8 m per lubrication point is included, other lengths upon request.

G. Reducing adapter

Two reducers 1/8" NPT and 1/4-28 UNF included for each lubrication point.

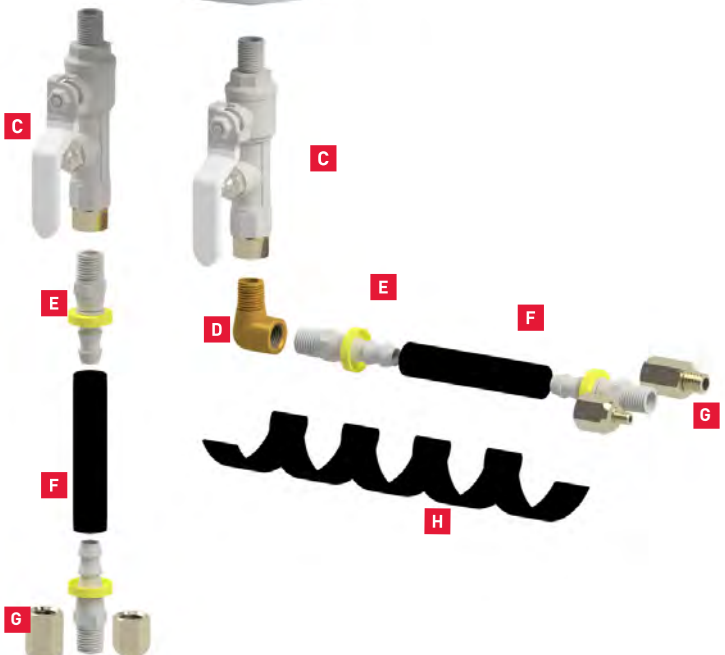
H. Hose spiral guard

Use to bundle hoses in multipoint kits.

KIT STAR Heavy Duty beam clamp

Available also as full Stainless steel KITS

KIT STAR Standard Duty beam clamp



Support flange with G-male threads required for brackets

Original size and color may vary from the illustrations

Typical KITS configuration shown below. perma lubrication systems not included.

KITS STAR Standard Duty beam clamp

KIT STAR Standard Duty 1-point beam clamp with 6 ft / 1.8 m hose	KIT STAR Standard Duty 2-point beam clamp with 12 ft / 3.6 m hose	KIT STAR Standard Duty 3-point beam clamp with 18 ft / 5.4 m hose	KIT STAR Standard Duty 4-point beam clamp with 24 ft / 7.3 m hose
1,18 inch 30 mm: 901052	901054	901056	901058
2,56 inch 65 mm: 901053	901055	901057	901059

KITS STAR Heavy Duty beam clamp

KIT STAR Heavy Duty 1-point beam clamp with 6 ft / 1.8 m hose	KIT STAR Heavy Duty 2-point beam clamp with 12 ft / 3.6 m hose	KIT STAR Heavy Duty 3-point beam clamp with 18 ft / 5.4 m hose	KIT STAR Heavy Duty 4-point beam clamp with 24 ft / 7.3 m hose
1,18 inch 30 mm: 901060	901062	901064	901066
2,56 inch 65 mm: 901061	901063	901065	901067

Original size and color may vary from the illustrations

Select mounting type / KITS

Electromechanical remote mounting assembly

A. Cage hanger incl.

1. Support flange STAR
2. Cover clip for protection cap
3. Protection cap STAR VARIO Heavy Duty 250 (Plastic)

Compact Stainless steel brackets are available and can be easily attached to square cage mesh using a hook attachment design or to beam sections using beam clamps.

B. Cage hanger

Compact Stainless steel brackets are available and can be easily attached to square cage mesh using a hook attachment design.

C. Purge connection with manual valve 1/4" NPT

Used for convenient additions of supplementary grease, line purging, and grease blockage clearing.

D. Angle 90° 1/4" NPT male x 1/4 NPT female

Optional use. One angle included per lubrication point.

E. Hose connector 1/4" NPT male

For hose iØ 3/8 push-lock (Stainless steel). Two included per lubrication point.

F. Heavy Duty hose

Supplied with iØ 3/8 and easy-to-use push-lock type swivel hose ends. Hose 6 ft / 1.8 m per lubrication point is included, other lengths upon request.

G. Reducing adapter

Two reducers 1/8" NPT and 1/4-28 UNF included for each lubrication point.

H. Hose spiral guard

Use to bundle hoses in multipoint kits.

KIT STAR Heavy Duty cage hanger

Available also as full Stainless steel KITS

KIT STAR Standard Duty cage hanger

Support flange with G-male threads required for brackets

Original size and color may vary from the illustrations

Typical KITS configuration shown below. perma lubrication systems not included.

KITS STAR Standard Duty cage hanger

			
KIT STAR Standard Duty 1-point cage hanger with 6 ft /1.8 m hose	**KIT STAR Standard Duty 2-point cage hanger with 12 ft / 3.6 m hose**	**KIT STAR Standard Duty 3-point cage hanger with 18 ft / 5.4 m hose**	**KIT STAR Standard Duty 4-point cage hanger with 24 ft / 7.3 m hose**
901068	901069	901070	901071

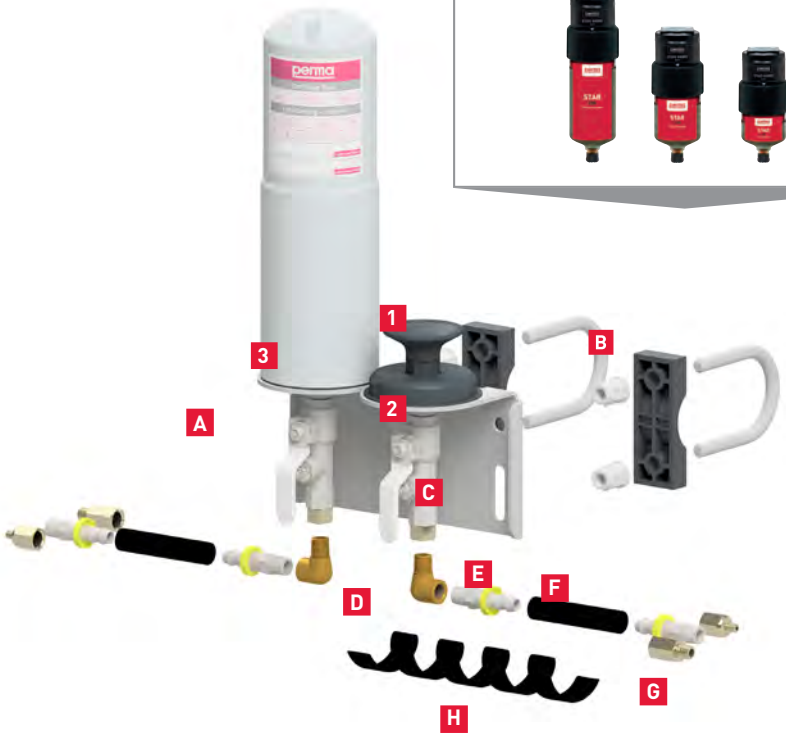
KITS STAR Heavy Duty cage hanger

			
KIT STAR Heavy Duty 1-point cage hanger with 6 ft / 1.8 m hose	**KIT STAR Heavy Duty 2-point cage hanger with 12 ft / 3.6 m hose**	**KIT STAR Heavy Duty 3-point cage hanger with 18 ft / 5.4 m hose**	**KIT STAR Heavy Duty 4-point cage hanger with 24 ft / 7.3 m hose**
901072	901073	901074	901075

Original size and color may vary from the illustrations

Select mounting type / KITS

Electromechanical remote assembly



Support flange with G-male threads required for brackets

A. Bracket STAR rail mount incl.

1. Support flange STAR
2. Cover clip for protection cap
3. Protection cap STAR VARIO Heavy Duty 250 (Plastic)

Compact Stainless steel brackets are available which can be easily attached to rail using a U-bolt design.

B. 2 U-Bolts

Used to mount bracket to rail

C. Purge connection with manual valve 1/4" NPT

Used for convenient additions of supplementary grease, line purging, and grease blockage clearing.

D. Angle 90° 1/4" NPT male x 1/4 NPT female

Optional use. One angle included per lubrication point.

E. Hose connector 1/4" NPT male

For hose iØ 3/8 push-lock (Stainless Steel). Two included per lubrication point

F. Heavy Duty hose

Supplied with iØ 3/8 and easy-to-use push-lock type swivel hose ends. Hose 6 ft / 1.8 m per lubrication point is included, other lengths upon request.

G. Reducing adapter

Two reducers 1/8" NPT and 1/4-28 UNF included for each lubrication point.

H. Hose spiral guard

Use to bundle hoses in multipoint kits.

KITS STAR rail mount (for rails up to 1 ½ inch diameter)

			
KIT STAR 1-point rail mount with 6 ft / 1.8 m hose	**KIT STAR 2-point rail mount with 12 ft / 3.6 m hose**	**KIT STAR 3-point rail mount with 18 ft / 5.4 m hose**	**KIT STAR 4-point rail mount with 24 ft / 7.3 m hose**
901076	901077	901078	901079

Original size and color may vary from the illustrations

Guidelines for remote installation

Year by year, improvements to safe work practices and increased production demands lead to an increasing requirement to remote mount automatic lubrication systems.

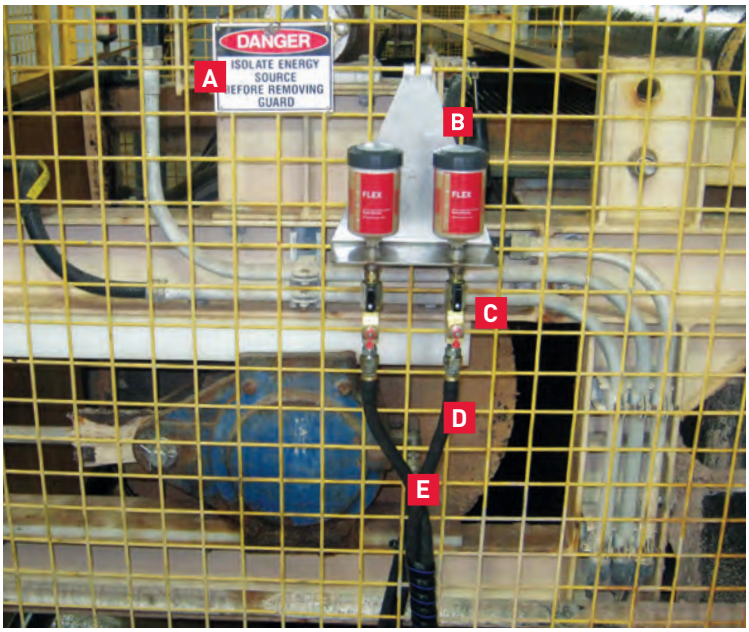
A Locate where lubrication systems can be safely and easily accessed while equipment is in operation

B Select Stainless steel brackets which can be easily removed if required for maintenance access

C Include manual purge points to provide an efficient means of occasional manual purging

D Use only full-bore elbow fittings

E Use iØ 3/8 grease hose and run lines under or around cages



Hose length installations

Restrict maximum grease hose lengths to

3 ft / 0.9 m for perma CLASSIC / FUTURA
6 ft / 1.8 m for perma FLEX / NOVA

15 ft / 4.5 m for perma STAR VARIO
Limits depend on variables such as grease hose diameter, grease type, ambient temperature and the resistance of the lubrication point itself. Please consult perma for detailed analysis.

← Prime grease hose and fittings.

→ Route grease hose under or around cage mesh, not through, and locate perma lubrication systems at a safe point of access.

Original size and color may vary from the illustrations

Select mounting type / KITS

A. Cage hanger incl.

1. Support flange STAR
2. Cover clip for protection cap
3. Protection cap STAR VARIO Heavy Duty 250 (Plastic)

Compact Stainless steel brackets are available and can be easily attached to square cage mesh using a hook attachment design or to beam sections using beam clamps.

B. Purge connection with manual valve 1/4" NPT

Used for convenient additions of supplementary grease, line purging, and grease blockage clearing.

C. Angle 90° 1/4" NPT male x 1/4 NPT female

Optional use. One angle included per lubrication point.

D. Hose connector 1/4" NPT male

For hose iØ 3/8 push-lock (Stainless steel). Two included per lubrication point.

E. Heavy Duty hose

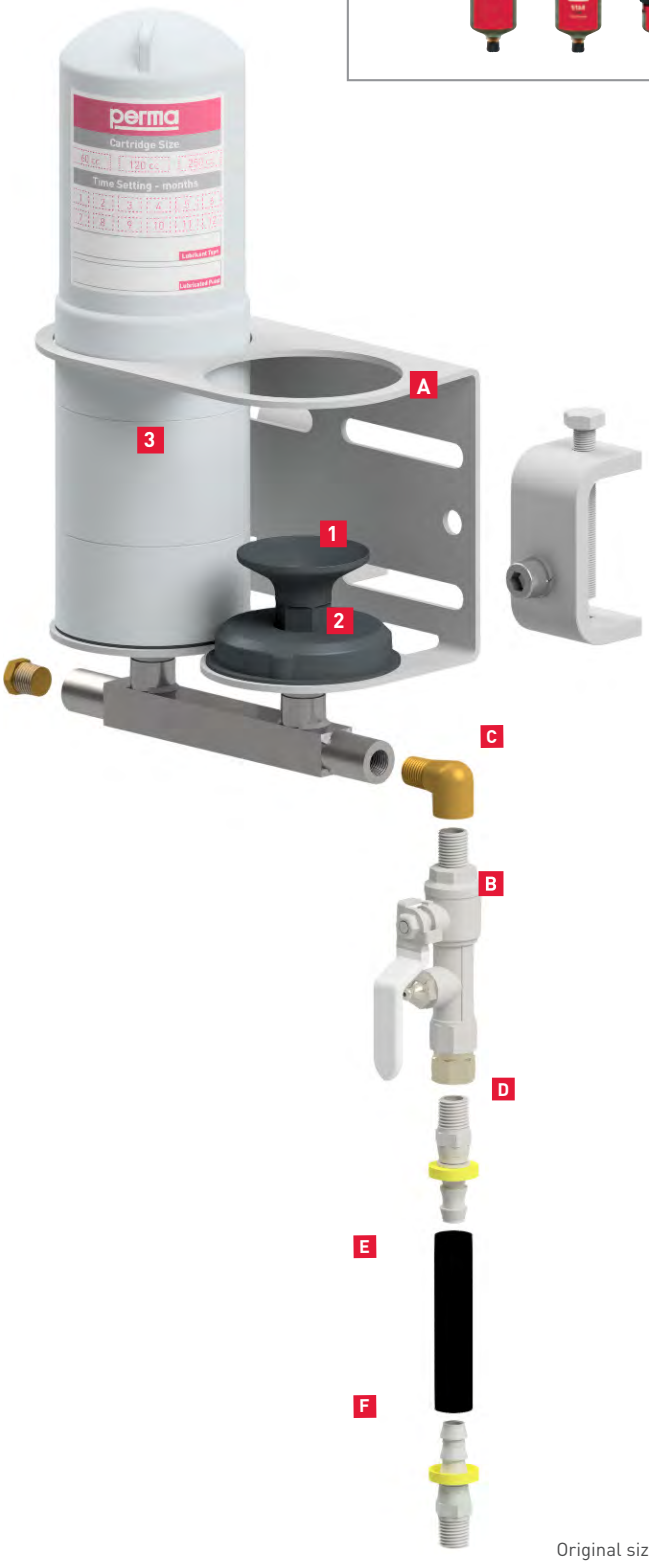
Supplied with iØ 3/8 and easy-to-use push-lock type swivel hose ends. Hose 6 ft / 1.8 m per lubrication point is included, other lengths upon request.

F. Reducing adapter

Two reducers 1/8" NPT and 1/4-28 UNF included for each lubrication point.

Electromechanical remote mounting assembly

Heavy Duty cage hanger



Original size and color may vary from the illustrations

Typical KITS configuration shown below. perma lubrication systems not included.

KITS Heavy Duty beam clamp with welded manifold

			
	KIT STAR Heavy Duty 2-point beam clamp with 10 ft / 3 m hose	**KIT STAR Heavy Duty 3-point beam clamp with 10 ft / 3 m hose**	**KIT STAR Heavy Duty 4-point beam clamp with 10 ft / 3 m hose**
 1,18 inch 30 mm	907500	907503	907506
 2,56 inch 65 mm	907501	907504	907507

KITS Heavy Duty cage hanger with welded manifold

			
	KIT STAR Heavy Duty 2-point cage hanger with 10 ft / 3 m hose	**KIT STAR Heavy Duty 3-point cage hanger with 10 ft / 3 m hose**	**KIT STAR Heavy Duty 4-point cage hanger with 10 ft / 3 m hose**
	907502	907505	907508

Original size and color may vary from the illustrations

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.

A Individual mounting brackets

Beam clamp
1.18 inch / 30 mm
(Stainless steel)
Part # 109957

or

Beam clamp
2.56 inch / 65 mm
(Stainless steel)
Part # 109958

or

Cage hanger arm
(Stainless steel)

Part # 109959

For perma CLASSIC, FUTURA, FLEX, NOVA	Pic.	Part # - Stainless steel
Mounting bracket electrochemical 1-point G1/4 female	1	109685
Mounting bracket electrochemical 2-point G1/4 female	2	109686
Mounting bracket electrochemical cage hanger 1-point G1/4 female	3	109689
Mounting bracket electrochemical cage hanger 2-point G1/4 female	4	109690

1 
2 
3 
4 

For perma STAR VARIO & STAR CONTROL	Pic.	Part # - Stainless steel
Mounting bracket STAR rail mount 1-point G1/4 female incl. 2 U-Bolts	1	110014
Mounting bracket STAR rail mount 2-point G1/4 female incl. 2 U-Bolts	2	110015
Mounting bracket STAR rail mount 3-point G1/4 female incl. 2 U-Bolts	3	110016
Mounting bracket STAR rail mount 4-point G1/4 female incl. 2 U-Bolts	4	110017

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For rails up to 1 ½ inch diameter.

For perma STAR VARIO & STAR CONTROL	Pic.	Part # - Stainless steel
Mounting bracket STAR Standard Duty 1-point G1/4 female	1	109663
Mounting bracket STAR Standard Duty 2-point G1/4 female	2	109667
Mounting bracket STAR Standard Duty 3-point G1/4 female	3	109670
Mounting bracket STAR Standard Duty 4-point G1/4 female	4	109673
1  2  3  4 		
Mounting bracket STAR Heavy Duty C-section 1-point G1/4 female	5	109664
Mounting bracket STAR Heavy Duty C-section 2-point G1/4 female	6	108648
Mounting bracket STAR Heavy Duty C-section 3-point G1/4 female	7	109671
Mounting bracket STAR Heavy Duty C-section 4-point G1/4 female	8	109674
5  6  7  8 		
Mounting bracket STAR Standard Duty cage hanger 1-point G1/4 female	9	109665
Mounting bracket STAR Standard Duty cage hanger 2-point G1/4 female	10	109668
9  10 		

B Additional mounting brackets

Additional mounting brackets	Holespacing	Pic.	Material	Part #
Clamp CLASSIC for earthing (ex-risk areas)		1	Steel, Zinc-plated	101384
Bracket		2	Stainless steel	104864
Insert for bracket G1/4 male x G1/4 female		3a	Brass	104820
		3b	Stainless steel	104865
Mounting plate 110 x 70 x 2.5 mm	45 mm	4		101432
Mounting angle 50 x 50 x 70 x 2.5 mm	45 mm	5		101429
Mounting angle 50 x 70 x 70 x 2.5 mm	45 mm	6		101430
Mounting angle 50 x 100 x 70 x 2.5 mm	45 mm / 22.5 mm	7		101431

C Accessories for brackets, FLEX & STAR

Accessories for FLEX / STAR	Pic.	Material	Part #
Purge connection with manual valve R1/4 male x 1/4 NPT female	1	Brass / Nickel-plated	113982
Purge connection with manual valve R1/4 male x 1/4 NPT female	2	Stainless steel	113983
Support flange FLEX 1/4" NPT male x G1/4 female	3	Brass / Plastic	109322
Support flange FLEX 1/8" NPT male x G1/4 female	4		109323
Support flange FLEX G1/4 male x G1/4 female *	5		101427
Protection cap STAR Standard Duty 250	6	Plastic	109519
Support flange STAR 1/4" NPT male x G1/4 female	7	Brass / Plastic	109419
Support flange STAR 1/8" NPT male x G1/4 female	8		109418
Support flange STAR G1/4 male x G1/4 female *	9		109420
Support flange STAR 500cc G1/4 male x G1/4 female	10		110757
Cover clip for protection cap STAR VARIO Heavy Duty	11	Plastic	108606
Protection cap STAR VARIO Heavy Duty	12		109999
Protection cap STAR VARIO Heavy Duty clear	13		900068
Protection cap STAR VARIO Heavy Duty 500	14		110582
Protection cap STAR VARIO 500 Heavy Duty 500 clear	15		900069


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* Cover clip can only be used with support flange and protection cap.


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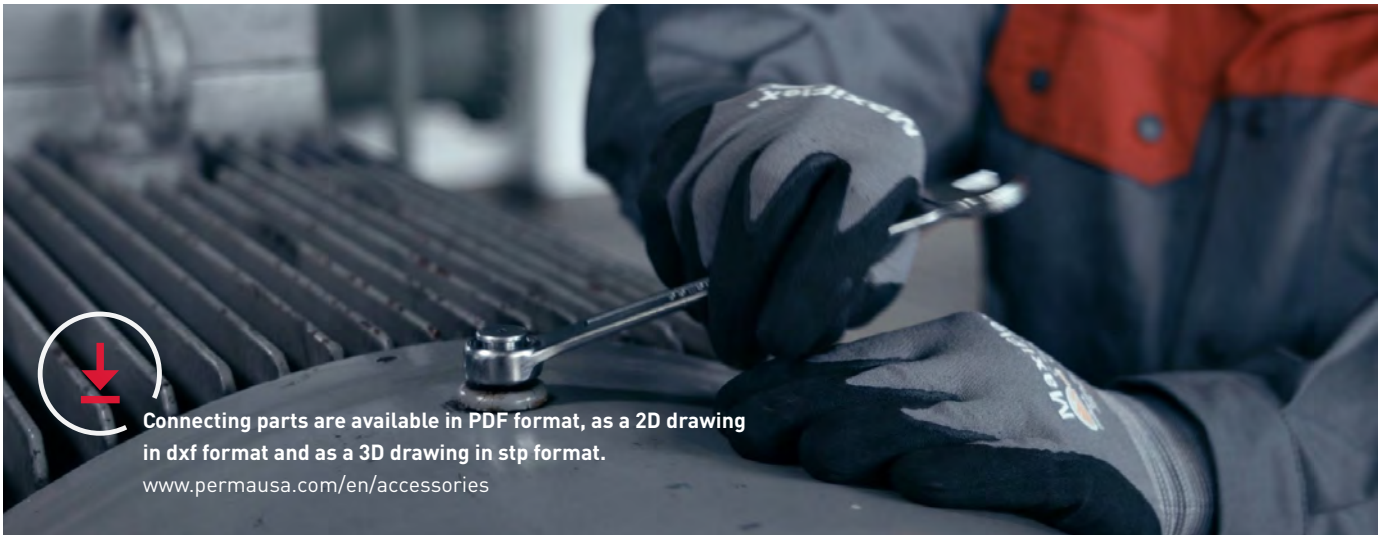

Connecting parts are available in PDF format, as a 2D drawing in dxf format and as a 3D drawing in stp format.
www.permausa.com/en/accessories

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

D Hose / tubes

Name Material → Properties	Part #	iØ / oØ [in]	Operating temperature range [°F]	Operating temperature range [°C]	Minimum bending radius [in / mm]	Max. operating pressure [psi / bar]	Max. length* ft / m		
							CLASSIC / FUTURA	FLEX / NOVA	STAR
Heavy Duty hose with NBR lining and fabric insert → Rubber with fabric insert → Oil and weather resistant outer layer	**901006** 	3/8 / 0.65	-40 to 260	-40 to 127	3.00 / 76.2	300 / 21	3 / 1	6 / 2	15 / 5
Heavy Duty hose with NBR lining and fabric insert → Rubber with fabric insert → Oil and weather resistant outer layer	**901232** 	1/2 / 0.75	-40 to 260	-40 to 127	5.00 / 127	300 / 21	3 / 1	6 / 2	15 / 5
Tube PU → Extreme Flexibility → Moisture Resistant → Abrasion Resistant	**901178** 	0.25 / 3/8	-40 to 165	-40 to 74	1.00 / 25.4	133 / 9*	3 / 1	6 / 2	15 / 5
Tube PTFE → Good temperature resistance → Suitable for food and beverages → Translucent	**901281**	0.25 / 3/8	-328 to 500	-200 to 260	2.00 / 50.8	240 / 16.5	3 / 1	6 / 2	15 / 5
Hose spiral guard 1 inch / 25 mm Plastic	**109695** 								

*** The limits depend on variables such as grease type, ambient temperature, and resistance of the lubrication point itself. Based at 68 °F / 20 °C temperatures.**

E Hose / tube connectors

Hose connector suitable for hose iØ 3/8“ 901006	Pic.	Material	Part #
Hose connector 1/4” NPT male for hose iØ 3/8” - push-on	1	Stainless steel	902160

1 

Hose connector suitable for hose iØ 1/2” 901232	Pic.	Material	Part #
Hose connector 3/8” NPT male for hose iØ 1/2” - push-on	2	Brass	901233

2 

Tube connector push-lock suitable for tube oØ 3/8” 901178 and 901281	Pic.	Material	Part #
Tube connector oØ 3/8” x 1/4” NPT female	3	Nickel-plated	901169
Tube connector oØ 3/8” x 1/8” NPT male	4		901173
Tube connector oØ 3/8” x 1/4” NPT male	5		901174
Tube connector 90° oØ 3/8” x 1/8” NPT male	6	Nickel-plated / Plastic	901175
Tube connector 90° oØ 3/8” x 1/4” NPT male	7		901176

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F Reducers

Reducers	Pic.	Material	Part #
Reducer 1/8" NPT male x 1/4" NPT female	1	Nickel-plated	901008
Reducer 1/8" NPT male x 1/4" NPT female	2	Stainless steel	902163
Reducer 1/4-28 UNF male x 1/4" NPT female	3	Nickel-plated	901009
Reducer 1/4-28 UNF male x 1/4" NPT female	4	Stainless steel	902164
Reducer 1/4-28 UNF male x 1/8" NPT female	5	Nickel-plated	901010
Bushing 1/4" NPT male x 1/8" NPT female	6	Brass	901011
Reducer 1/4" NPT male x 3/8" NPT female	7	Brass	901236

Reducer G1/4 male x 1/4" NPT female	8	Nickel-plated	901000
Reducer G1/4 male x 1/4" NPT female	9	Stainless steel	907495
Reducer R1/8 male x G1/4 female	10	Brass	109953
Reducer R1/4 male x G1/4 female	11	Brass	109954
Reducer G1/8 male x G1/4 female	12	Brass	104833

Reducer M6 male x G1/4 female	13	Brass	104837
Reducer M6 male x G1/4 female	14	Stainless steel	104876
Reducer M6 male x G1/8 female	15	Stainless steel	109847
Reducer M8 male x G1/4 female	16	Brass	104839
Reducer M10 male x G1/4 female	17	Brass	104841
Reducer M8 male x G1/4 female	18	Stainless steel	104878
Reducer M8x1 male x G1/4 female	19	Brass	104838
Reducer M8x1 male x G1/4 female	20	Stainless steel	104877
Reducer M10x1 male x G1/4 female	21	Brass	104840

Reducer 1/4 UNF male x G1/4 female	22	Stainless steel	109845
Reducer 1/4 UNF male x G1/8 female	23	Stainless steel	109846

G Angles

Angles	Pic.	Material	Part #
Angle 45° 1/4" NPT male x 1/4" NPT female	1	Brass	901019
Angle 45° 1/8" NPT male x 1/4" NPT female	2	Brass	901020
Angle 45° 1/8" NPT male x 1/4" NPT female	3	Nickel-plated	901021
Angle 45° 1/4" NPT male x 1/4" NPT female square	4	Brass	901024
Angle 90° 1/4" NPT male x 1/4" NPT female	5	Brass	901025
Angle 90° 1/4" NPT male x 1/4" NPT female	6	Stainless steel	902162
Angle 90° 1/8" NPT male x 1/4" NPT female	7	Brass	901026
Angle 90° 1/8" NPT male x 1/4" NPT female	8	Nickel-plated	901027
Angle 90° 1/4" NPT male x 1/4" NPT female square	9	Brass	901030
Angle 90° 1/8" NPT male x 1/4" NPT female square	10	Brass	901031
 1 2 3 4 5 6 7 8 9 10			
Angle 45° G1/4 male x G1/4 female	11	Brass	104823
Angle 90° G1/4 male x G1/4 female	12	Brass	104827
Angle 90° R1/4 male x G1/4 female	13	Brass	109849
Angle 90° R1/8 male x G1/4 female	14	Brass	109851
 11 12 13 14			
Angle 45° M10x1 male x G1/4 female	15	Brass	104826
Angle 90° M10x1 male x G1/4 female	16	Brass	104830
 15 16			
Angle 45° 1/4-28 UNF male x 1/4" NPT female	17	Nickel-plated	901022
Angle 45° 1/4-28 UNF male x 1/8" NPT female	18	Nickel-plated	901023
Angle 90° 1/4-28 UNF male x 1/4" NPT female	19	Nickel-plated	901028
Angle 90° 1/4-28 UNF male x 1/8" NPT female	20	Nickel-plated	901029
 17 18 19 20			

H Extensions

Extensions	Pic.	Material	Part #
Extension 2 inch 1/4" NPT male x 1/4" NPT female	1	Brass	901001
Extension 4 inch 1/4" NPT male x 1/4" NPT female	2		901002
Extension 6 inch 1/4" NPT male x 1/4" NPT female	3		901003
Extension 2 inch 1/8" NPT male x 1/4" NPT female	4		901004
Extension 4 inch 1/8" NPT male x 1/4 NPT" female	5		901005
 1  2  3  4  5			
Extension 30 mm G1/4 male x G1/4 female	6	Brass	104854
Extension 45 mm G1/4 male x G1/4 female	7		104855
Extension 75 mm G1/4 male x G1/4 female	8		104856
Extension 115 mm G1/4 male x G1/4 female	9		104857
Extension 50 mm R1/8 male x G1/4 female	10		109848
 6  7  8  9  10			
Extension 50 mm M6 male x G1/4 female	11	Stainless steel	109697
Extension 75 mm M10x1 male x G1/4 female	12	Brass	108923
Extension 115 mm M10x1 male x G1/4 female	13		108924
 11  12  13			
Extension 50 mm 1/4 UNF male x G1/4 female	14	Stainless steel	109854
 14			

NOTE Take lubricant flow direction into account.

I Oil retaining valves

Oil retaining valves	Pic.	Material	Part #
Oil retaining valve G1/4 male x G1/4 female up to **140 °F** / 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 **302 °F** / 150 °C	3	Brass with metal valve	104863


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

J Oil brushes

Oil brushes	Temperature	Connecting thread	Size (inch / mm)	Pic.	Material	Part #
Oil brush		G1/4 female top connection	Ø **0.8** / 20	1	PA / horsehair	101396
Oil brush, bristle height **0.8 inch** / 20 mm	**up to 176 °F** up to 80 °C	G1/4 female top connection	**1.6 x 1.2** / 40 x 30	2	PA / horsehair	101397
			2.4 x 1.2 / 60 x 30	3		101398
			3.9 x 1.2 / 100 x 30	4		101399
		G1/4 female lateral	**1.6 x 1.2** / 40 x 30	5		101411
			2.4 x 1.2 / 60 x 30	6		101412
High temperature brush, bristle height **0.8 inch** / 20 mm	**up to 356 °F** up to 180 °C	G1/4 female top connection	**1.6 x 1.2** / 40 x 30	7	Alu / PPS	101402
			2.4 x 1.2 / 60 x 30	8		101403
			3.9 x 1.2 / 100 x 30	9		101404


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K Special purpose fittings

Special purpose fittings	Pic.	Part #
T-Adapter 3 x 1/4" NPT female (Nickel-plated)	1	901012
Coupler 1/4" NPT female (Brass)	2	901013
Hexagon-nipple 1/4" NPT male (Brass)	3	901014
Relief valve 1/8" NPT male (5 lbs)	4	901015
Electric motor drain cup kit 120 cc / 4.06 oz	5	901085

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L Service equipment

Service equipment	Pic.	Part #
50 ml Bottle Loctite® 243™ thread sealant (medium strength)	1	110278
perma Fitting thread tester	2	110374
perma REDUCER / ANGLE KIT includes several different reducers → Detailed bill of material on request or on our website	3	901044
perma UNIVERSAL ACCESSORY KIT includes reducers, angels, extensions, hose connectors, service equipment, etc. → Detailed bill of material on request or on our website	4	901045
perma HOSE FITTING mounting tool	5	901082
Prefill adapter 1/4" NPT male	6	901041
Prefill adapter G1/4 male	7	109003
Grease gun	8	901035
Flex hose 18" with button head and hydraulic coupling for grease gun	9	901043

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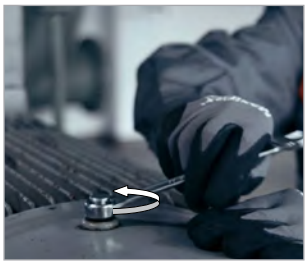
M Preparing and installing perma products

Preparing the lubrication point for direct mounting



Clean the lubrication point, remove grease fitting

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

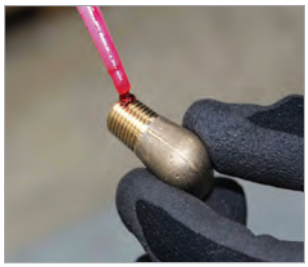
Prelubricate lubrication point and connecting parts, prefill grease lines if applicable (use the same lubricant as in lubrication system)

Remove plug and screw lubrication system into lubrication point

Preparing the equipment for remote mounting

Mount beam clamps to frame

Attach bracket to beam clamp

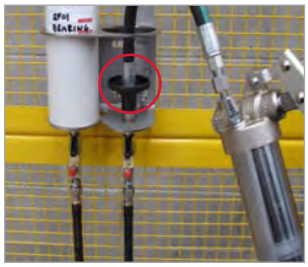


Apply thread sealant to fittings

Fit elbows and adapters to bracket

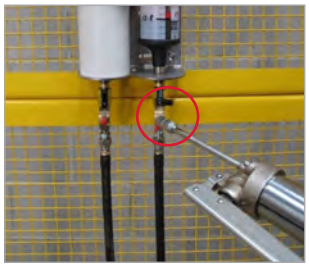
Fit reducers and elbows to application

Apply grease to hose connector



Fill grease lines using the support flange (recommended)

or



Fill grease lines using manual purge valve

HINT

Standard protection cover must be **removed** when using any of the full size protection caps


Roller bearings


Sliding bearings / Sliding guides


Linear guides


Open gears / Gear racks


Spindles


Shaft seals


Chains

perma Lubrication Systems - OVERVIEW

Product	Lubricatns	Discharge period	Mode	Max. lube-points	Max. pressure [bar]	Operating temperature [°C]	Operating temperature [°F]	Content [cc]	Drive / Power supply	Activation / Setting	Machine elements							Certifications
Single-point lubrication systems, electrochemical																		
 **CLASSIC / FUTURA**	Grease up to NLGI 2 / Oil	1, 3, 6, 12 months (1)	Time	1	4	0 to 40	32 to 104	120	Electro-chemical	Activator screw	✓	✓	-	✓	✓	✓	✓	Ex
 **FLEX**		1, 2, 3, ... , 12 months (1)			5	-20 to 60	-4 to 140	60 125	Electro-chemical / Integreated battery	Dial / Rotary switch	✓	✓		✓	✓	✓	✓	Ex IECEx TIIS FM APPROVED
 **NOVA**		1, 2, 3, ... , 12 months (2)			6	-20 to 60	-4 to 140	65 125	Gas gener-ating cell / Integreated battery	Push button control and display	✓	✓		✓	✓	✓	✓	Ex IECEx ANZEx
Single-point lubrication systems, electromechanical																		
 **STAR VARIO**	Grease up to NLGI 2 / Oil	1, 2, 3, ... , 12 months	Time	1	6	-40 to 60	-40 to 140	60, 120, 250	Drive motor / Battery	Push button control and display	✓	✓	-	✓	✓	✓	✓	c UL us LISTED
 **STAR CONTROL**		Custom-ized	Time / Impulse			-20 to 60	-4 to 140		Drive motor / 9-30 V DC		✓	✓		✓	✓	✓	✓	

(1) depending on ambient temperature and counter pressure

(2) depending on counter pressure

All perma products are approved according to CE directives.

HINT

perma USA also offers a precise multi-point lubrication system for up to 6 lubrication points even under extreme operating conditions.

Please contact your perma representative or call perma USA for additional information

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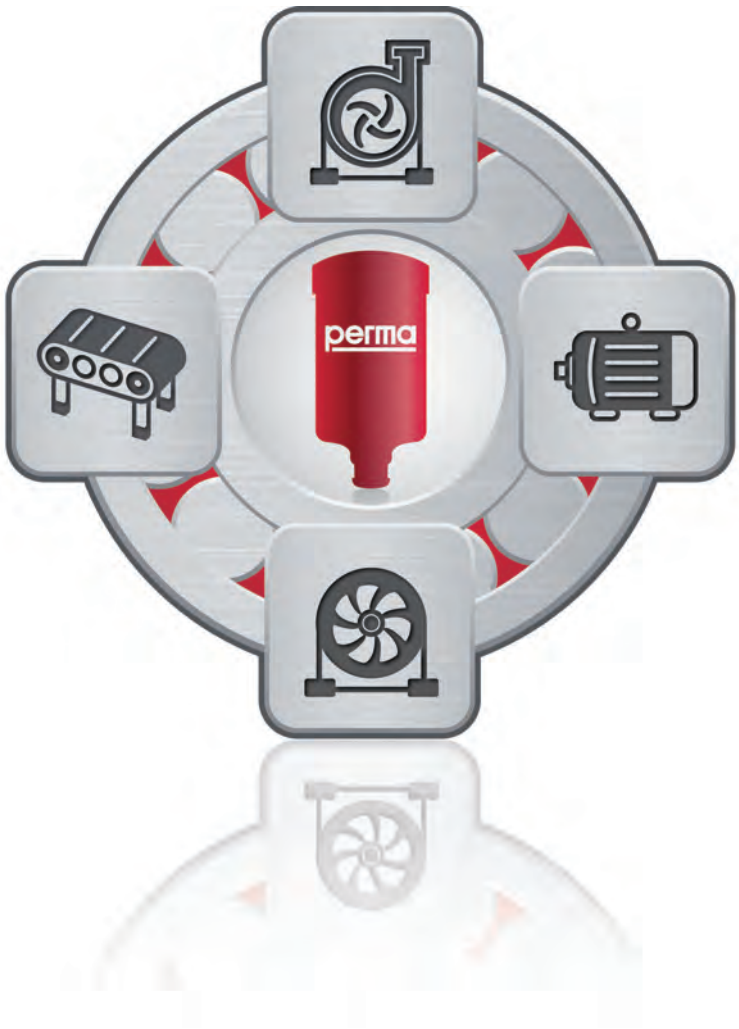
The Expert in Lubrication Solutions



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