HTL perma Australia Pty Ltd

perma Automatic Lubrication Systems

perma

Contents

Leading technology and practical solutions set the standard in lubrication

perma-tec GmbH & Co (Germany)

The name perma stands for innovative and creative solutions in lubrication. perma-tec is the global leader of single point lubrication systems and supply more single point lubrication systems than any other manufacturer worldwide.

This position is underpinned by a continual investment in research and development. More than 40 years of experience, continuous thinking ahead, and the constant implementation of new ideas has resulted in solutions that meet the highest technical requirements.

perma single and multi-point lubrication systems can be found in all types of industries and applications around the world. perma-tec has a network of subsidiaries and competent distribution partners in more than 60 countries.

perma lubrication systems are manufactured in Germany in state-of-the-art facilities. In order to conform to globally-accepted manufacturing standards, perma products are continuously tested and inspected. perma-tec has been certified according to DIN EN ISO 9001 since 1997.

HTL perma Australia Pty Ltd

HTL perma Australia Pty Ltd is dedicated to the supply, technical support and service management of the perma range of lubrication systems.

As a wholly owned subsidiary of perma-tec, we have direct access to the product and application knowledge base of our German parent, as well as perma's broader global network.

HTL perma Australia responds to the increasing demands of modern preventative maintenance programs and reliability assurance systems by focusing on customer service and the sharing of best practices. We recognise that our products, when combined with application knowledge and implementation know-how, provides maximum value to preventative maintenance and reliability programs.

Facts & Figures	
Head Office & Manufacturing Base	Germany
Employees in Germany	101
HTL perma Subsidiaries	Australia, England, France, Italy, Spain & USA
Distribution Network	Over 60 countries
Electro-chemical Lubricator Range	Classic, Futura & Frost
Electro-mechanical Lubricator Range	Star Vario, Star Control, PRO MP-6 and PRO Control MP-6

Company History

- → 1934 Formation of the metal ware factory for house and kitchen appliance in Bad Kissingen
- → 1964 Invention and patent of perma CLASSIC single point lubrication system
- → 1989 Sale / take-over by private investment group
- → 1991 New Management and extensive reorganisation
- → 1995 Foundation of subsidiaries (H-T-L perma) in USA (1995), France (1995), Spain (1996), Italy (1997), England (1998), Australia (2004)
- → 2000 Change of company name to perma-tec GmbH & Co. KG

Equipment Reliability and Asset Utilisation

Equipment reliability and asset utilisation are directly related to the financial performance of manufacturing and mining companies. Investment in lubrication preventative maintenance is directly related to reducing the wear of mechanical components and extending equipment service life. When wear is reduced and equipment service life is extended, reliability also improves, downtime is reduced and production increases while maintenance costs go down.

Lubrication Preventative Maintenance – a long term investment in reliability

Coal Mining
Coal handling and preparation presents many lubrication challenges. Contamination related wear is severe due to the high levels of solid particulates and water. Safety issues associated with manual greasing is also a factor which drives change towards automation.

Metal Ore Mining
Metal ore mining presents some of the most difficult lubrication issues associated with contamination control. Depending on the ore being mined, the solid contaminants are hard and therefore have the potential to cause serious damage. Safety issues associated with manual greasing is also a factor which drives change towards automation.

Coal Fired Power Generation
The lubrication challenges of coal fired power stations are very similar to those faced by the coal mining industry. Contamination levels are high and manual greasing programs place substantial pressure on maintenance resources and present additional safety risks when compared to programs which embrace automation.

Quarrying / Construction Material Mining
The quarrying industry faces similar lubrication challenges to the mining industry in that the key challenge is the prevention of contaminants entering bearings.

Improved safe work practices is a common focus which drives lubrication practices from traditional manual methods to automated systems or combinations of manual and automatic.

Steel Manufacturing
The steel industry presents possibly the most difficult range of lubrication challenges and as a result automatic lubrication is common.

The contamination challenges which the iron ore and coal industries tackle are just one part of the lubrication challenge of the steel industry. In addition to this there are many other factors to deal with including high temperature applications and applications where moisture and humidity levels are very high.

Non-Ferrous Metal Smelting and Refining
Smelters and refineries of non-ferrous metals such as aluminium, nickel, copper, zinc and lead must overcome a broad range of lubrication challenges. Contamination prevention is of great importance in order to keep solid contaminants, moisture and process chemicals out of bearings.

Common Applications:

- Bearings and labyrinth seals on slurry pump barrels
- Bearings and seals on materials handling conveyors
- Low voltage electric motor bearings
- Grease points on draglines, stackers and reclaimers which are not incorporated into centralised grease systems
- Trunion and pinion bearings on mills which are note incorporated into centralised grease systems
- Travel wheel bearings and conveyor pulley bearings on trippers and shuttles
- Manual grease points on flotation cells, clarifiers and filter presses
- Fan bearings

Objectives of Lubrication Preventative Maintenance Programs

The short falls of manual lubrication programs do not vary significantly across different industries. The most common objectives are:

- To reduce the rate of bearing failures where the common cause of failure is lack of lubrication.
- To reduce the rate of bearing failures where the common cause of failure is contamination by dirt, dust, chemicals and water.
- To ensure optimal lubrication of production critical bearings in order to eliminate unexpected stoppages, downtime and production losses.
- To implement an effective system of greasing bearings which are difficult or unsafe to access for manual greasing.
- To implement an effective system of greasing bearings which can otherwise only be greased when machinery is stopped, but where machinery stoppages are not frequent enough to allow correct lubrication.
- To replace manual lubrication tasks where the maintenance department has insufficient resources to ensure that manual greasing gets performed on time and correctly.

Lubrication Preventative Maintenance – a long term investment in reliability

Cement Manufacturing

The cement industry shares many lubrication challenges with the quarrying and mining industry. There are vast numbers of lubrication points, access difficulties and high levels of contamination.

The safety of lubrication technicians is a key concern, particularly in lime processing areas. Sites which embrace automation minimise these safety hazards.

Typical applications where greasing is often converted from manual to automatic include conveyor pulley bearings, elevator bearings, drag chain bearings, slurry pump barrels and fan bearings.

Water Treatment and Transport

The water treatment and transport industry must overcome the difficulty of having lubrication points which are spread across large areas, multiple sites and at remote locations which are visited infrequently.

Automation provides improved lubrication and an opportunity to achieve good equipment reliability even when the availability of maintenance staff for manual greasing is low.

Common applications for the installation of automatic lubricators includes bearings on pumps, electric motors, aerators, belt presses, automatic gate valves, clarifiers and rotary screens.

Grain Bulk Handling and Storage

Grain bulk handling and storage networks face the challenge of multiple sites which are separated by large distances. During the grain handling season the opportunity to perform adequate manual greasing places a strain on maintenance teams.

Manual greasing programs at grain terminals require maintenance staff to negotiate endless stairs and ladders in order to reach all grease points. Automation reduces this substantially and therefore reduces safety related risks.

Automatic lubricators usually have sufficient capacity to provide continuous greasing from the start to end of the grain season.

Pulp and Paper Industries

Pulp and paper manufacturers are faced with a very high number of grease points which are spread over a range of equipment and across large sites.

Raw material handling conveyors and pumps are often targeted for automation.

Large sites have a high number of pumps, electric motors and fans which are ideally suited to automation. Depending on the location of equipment, moisture and humidity levels can present additional challenges to manual greasing programs, not only for the bearings but also for the lubrication technicians.

As with other heavy industries a keen focus on safety forms part of the decision making process when implementing automatic lubricators.

Food and Beverage Manufacturing

Food and beverage manufacturers have unique lubrication requirements. Applications demand a combination of non-food grade and food grade greases.

Automatic lubricators provide a means of achieving better plant reliability and of minimising the probability of contact between lubricants and food products.

Because the lubricant is fully contained the likelihood of excessive application or spillage is very low.

Hot wash down can cause problems for bearings and chains due to water wash-out of lubricants. Automatic lubricators must provide protection against this lubrication issue and must also be able to withstand the wash down procedure. In such areas fully water proof and corrosion proof lubricators are preferred.

Oil and Gas Industry

The oil and gas industry presents a range of specific lubrication challenges. Where automatic lubricators are utilised they must generally be intrinsically safe. This rules out the use of battery powered, electro-mechanical lubricators and therefore the automated solution must rely on gas generating type lubricators. For gas plants and oil refineries applications include fin fan support bearings, pumps and electric motor bearings.

Land based oil wells face different challenges compared to gas plants and refineries. Beam pumps are often remote, spread across a large area and can be difficult to access depending on the season and location. Automatic lubricators present an option for lubricating these pumps when manual greasing is unreliable or costly to implement.

Improved reliability, reduced maintenance costs and less downtime.

From a preventative maintenance point of view there is nothing more important than the implementation of practical and fit for purpose lubrication programs. The extensive range of perma lubrication systems allows maintenance managers and reliability engineers to make informed choices allowing them to achieve an optimal mix between automated and manual lubrication.

perma automatic lubricators reduce wear rates by providing a continuous supply of fresh lubricant. By ensuring against lubricant starvation and providing a practical method of preventing the ingress of contaminants perma automatic lubricators have the potential to prevent more than 50% of premature bearing failures.

Lubrication – the foundation of successful preventative maintenance programs

Modern preventative maintenance and reliability assurance programs support the implementation of automatic lubrication systems because they are more effective and economical in the long run.
A requirement for reliable equipment operation is a permanent and sufficient supply of the right lubricant to all lubrication points. If a bearing is not sufficiently lubricated, it will fail long before it has reached its optimal service life.
In recognition of this many companies are now placing higher emphasis on automatic systems, documented procedures and practical means of contamination prevention. "Greasers" are being up-skilled to "Lubrication Technicians" and their work is being more thoroughly integrated with condition monitoring and reliability programs.
As investment in preventative maintenance is increasing so is the implementation of automated lubrication systems. But automated systems alone do not provide an adequate solution. Quality products must be combined with realistic implementation plans and practical management methods. At perma we focus on these facts to assist in the delivery of sustainable lubrication practices.

Maintenance cost reduction and increased equipment reliability:

- → less contamination and reduced wear
- → fewer breakdowns and fewer premature failures
- → increased equipment service life

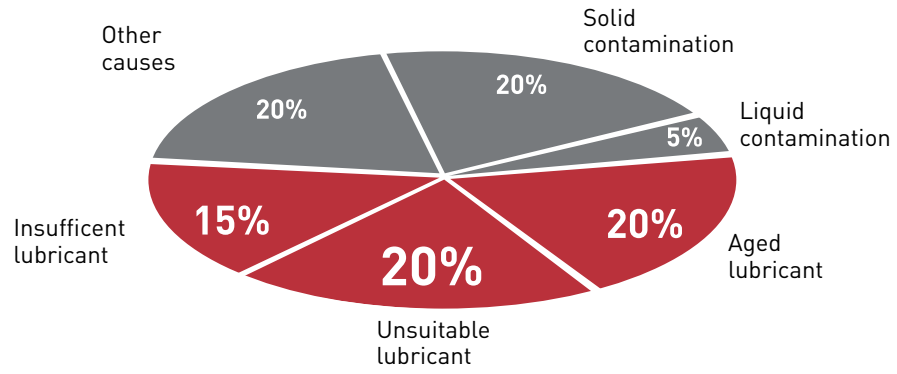
Improved work place safety:

- → reduction of labour intensive work tasks
- → remote installations for safer practices
- → lubrication occurs without the need for production stoppages

Prevention of lubricant starvation and over-lubrication:

- → consistently high lubricant quality with a vastly reduced likelihood of contamination
- → reduced manual work load liberates time which can be invested into other high priority maintenance tasks
- → reduces the likelihood of human error

Causes of rolling element bearings failures



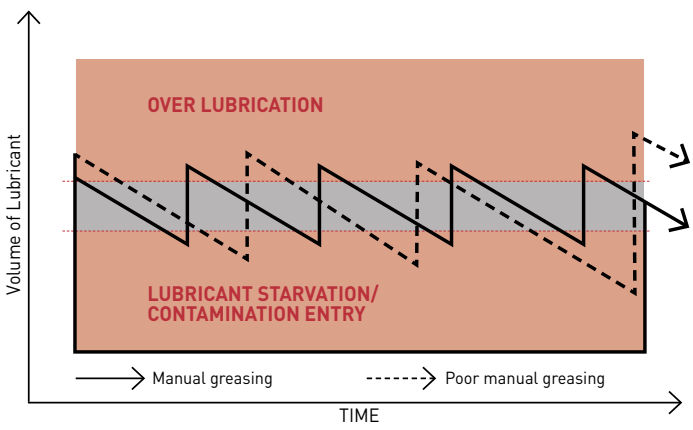
Over 50% of all rolling element bearing failures are lubrication related.

Shorter Lubrication Intervals – Longer Bearing Service Life

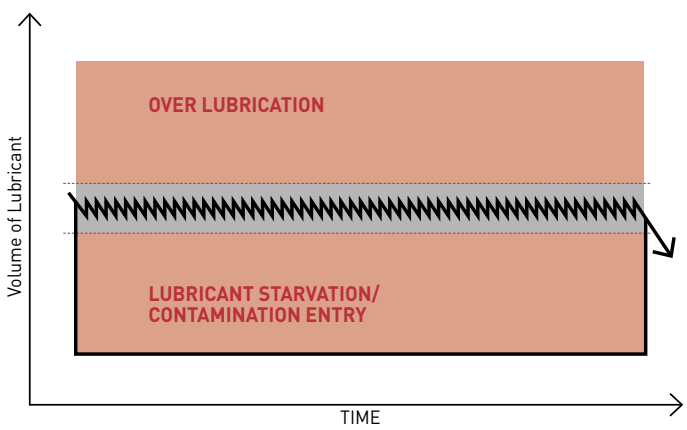
The longest bearing service life is achieved when grease is added in small amounts at short time intervals. This optimal form of greasing is achieved via automated greasing and cannot be practically achieved via manual greasing. Bearings which operate in harsh environments will demand the shortest re-greasing intervals. Conditions such as high temperatures, vibrations, shock loads, high loads and contaminants such as dirt and water demand the most frequent greasing. Under conditions such as these manual greasing programs quickly become very labour intensive and often impractical.

When manual greasing programs fail due to lack of control and lack of available resources the absence of fresh grease leads to lubrication starvation and contamination and then to premature bearing wear and eventually bearing failure.

Manual Greasing



Automatic Greasing



Addressing Contamination related wear issues for the Mining, Quarrying, Cement and Coal Fire Power Industries.

The contamination of bearings by water or solid particles causes accelerated wear and dramatically reduces bearing service life. Industries which involve the handling of solid material such as the quarrying, cement, coal fired power generation and mining industries suffer the greatest losses as a result of poor contamination control procedures and systems. perma automatic lubricators provide a means to achieving a positive purge of clean grease through taconite and labyrinth type seals in order to prevent the entry of water, dirt and dust, and therefore extend bearing service life.

Contamination Prevention – the key to longer bearing service life

Solid contaminants cause noise, accelerated wear and the early onset of fatigue. The rate of wear increases with the size, concentration and hardness of contaminants. Smaller particles lead to abrasive wear whilst larger particles can cause indentation of raceways which later become sites of fatigue related wear.

Greasing practices which provide sufficient clean grease to bearings and prevent the ingress of contaminants will provide long term economical return by means of longer bearing service lives and reduced downtime associated with breakdown maintenance.

Different bearing configurations have different greasing requirements. The examples shown here demonstrate the importance of preventing the ingress of contaminants such as dirt and water.

For sites where contamination levels are high it is common to apply grease directly to taconite and labyrinth type seals, in addition to greasing the bearing itself. An alternative to this is to apply a higher greasing rate to the bearing in order to supply sufficient grease to fulfil the needs of the bearing and the bearing seal. This method of greasing can be effective for low to medium speed bearings, but should not be employed for high speed bearings due to the risk of over-greasing. Nor is it likely to be highly effective for large bearings as the volume of grease is unlikely to be adequate.

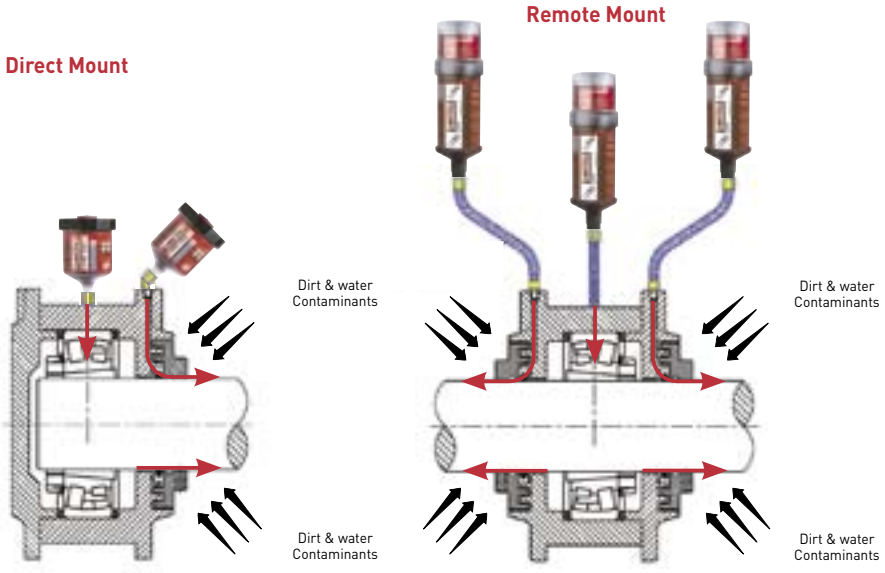
Yet another alternative is to utilise automatic lubricators for achieving constant seal purge and to continue with a manual greasing program to the bearings.

perma Futura providing bearing lubrication and seal purge to prevent the ingress of coal dust on a snub pulley bearing.

perma Classic providing bearing lubrication and a positive purge of grease to prevent the ingress of contaminants.

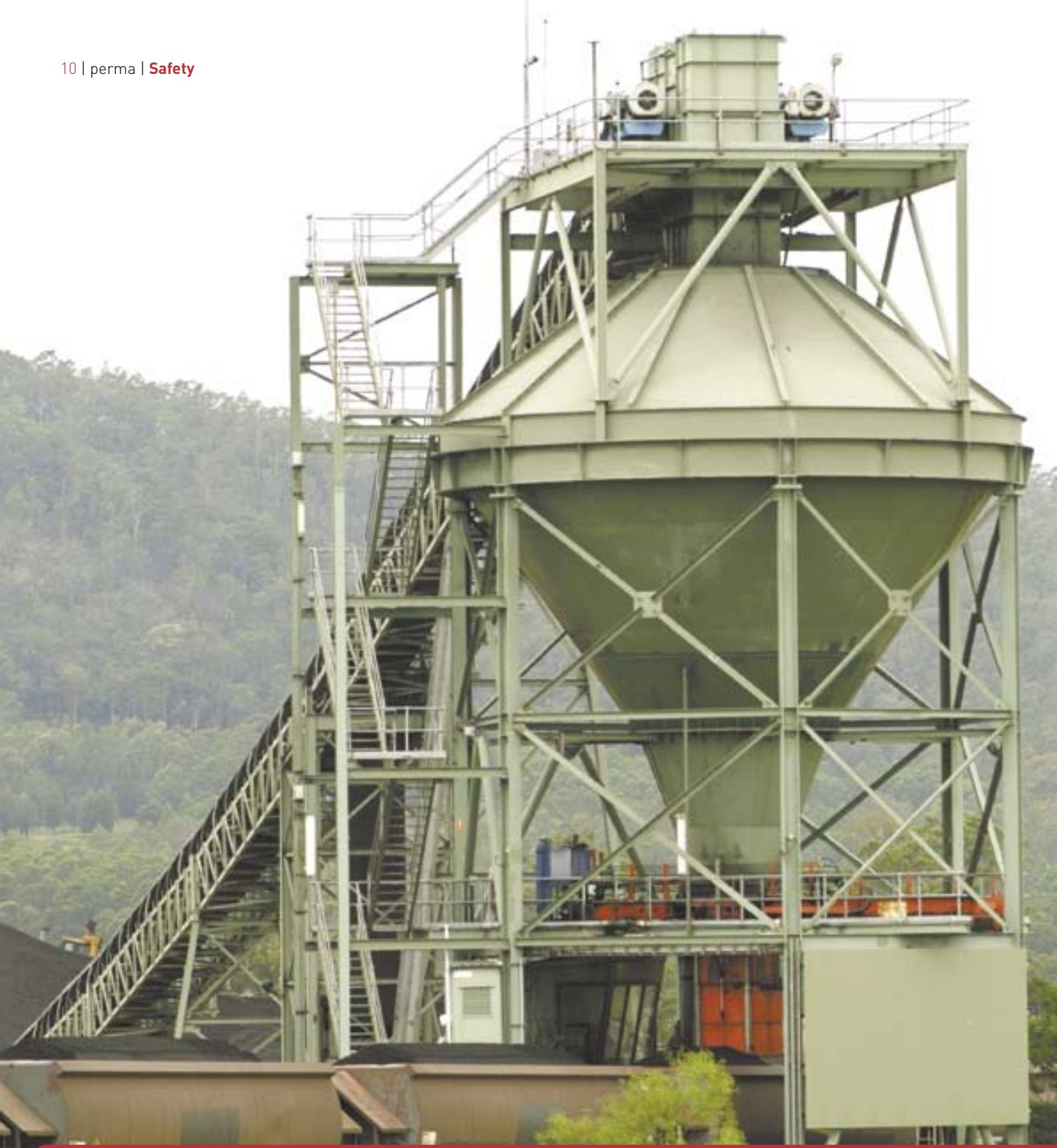
Poor manual greasing practises can lead to damaging contamination and a reduction in bearing service life. WHERE POSSIBLE FIT COVERS TO GREASE NIPPLES.

Poor manual greasing practises can lead to damaging contamination and a reduction in bearing service life. ALWAYS CLEAN FITTINGS PRIOR TO GREASING.



Extreme levels of contaminants shown here on a conveyor pulley bearing in the coal mining industry. Remote mounted automatic lubricators are providing lubrication and protection around the clock.

The harshest conditions occur when bearings are subjected to high levels of dirt and water. Direct mount perma Futura provides a positive purge of grease to protect this bearing.



Safer Lubrication Practices through Automation

Work place safety is of ultimate importance to operators in the mining and manufacturing industries. Systems which provide a means of reducing the interface between manual labour and operating equipment are a key element to reducing the likelihood of accidents.

Automatic lubricators provide a practical solution to reducing the probability of work place accidents by significantly reducing the time that it takes to effectively lubricate equipment. The adoption of a "hands-off, brains-on" approach to the lubrication of bearing and chains allows improvements in preventative maintenance practices and in safety.

Improving Safety through Automation

Manual lubrication exposes workers to a higher level of safety risk than automated systems. This is particularly the case on large sites where processing equipment may be up to eight or more stories high, meaning that lubrication technicians must frequently negotiate stairs, ladders and inclines in order to reach all lubrication points. Under these circumstances it is not practical to run remote lines from ground level and it becomes difficult to ensure that lubrication points receive the attention they require.

Automation does not mean that equipment will no longer be inspected by maintenance personnel. The move from manual to automatic saves time which can be invested into other value-adding maintenance tasks, including regular inspections of equipment and lubrication systems, basic condition monitoring, oil sampling and filtration.

Regardless of the ease or difficulty in reaching lubrication points automation reduces the time that it takes to deliver proper lubrication and therefore reduces the likelihood of work place accidents.

Automation provides real opportunities for improving safety:

→ Points which can otherwise only be accessed during maintenance shuts can be automatically lubricated while machinery is running.

→ Points located in confined spaces or at elevated heights can be automatically lubricated – manual grease points in these places are often neglected altogether.

→ Automatic lubricators can be remote mounted, away from potential hazards, at a safe to reach point of access.

→ The need to carry greasing equipment and containers of grease around site is vastly reduced.

→ Lubricant spillage is less likely and physical contact with greases and oils is reduced.

Safer Greasing – Example

When you compare a weekly manual greasing program to an automated regime it is possible to estimate the reduction in exposure to the safety hazards associated with manual greasing. This example is for demonstration purposes. Estimates will vary from site to site.

Basis for this Comparison
Number of points = 500
Time period = 3 years

Manual Greasing Program
Manual Greasing Frequency = Weekly
Manual Pumps per point per visit = 20

Time per point (including time to move between points) = 3 minutes per point

Total Time over 3 years
= 500 (points) x 3 (years) x 52 (weeks per year) x 3 (minutes per point)
= 234000 minutes = 3900 hours

Automatic Lubricators – 3 Month Setting using 250cc size perma Star Vario
Automatic greasing = 0.5cc of grease pumped every 4 hours and 37 minutes

Time to perform monthly inspections = 2 minutes per lubricator

Time to perform 3 monthly services & manual purge = 6 minutes per lubricator

Total Time over 3 years
= [500 x 3 (years) x 12 (inspections per year) x 2 (minutes per point for inspection)] + [500 x 3 (years) x 4 (service change outs per year) x 6 (minutes to change lubricator & manually purge)]
= 72000 minutes = 1200 hours

Based on this comparison the reduction in exposure to the safety hazards associated with greasing bearings is approximately 70%. The manual solution requires approximately 1.5 million pumps of a manual grease gun over a 3 year period.

perma Futura remote mounted using a 1 metre length of 8mm internal diameter grease line, lubricating a conveyor pulley bearing in the quarrying industry.

perma Classic remote mounted using a 1 metre length of 8mm internal diameter grease line, lubricating a conveyor pulley bearing in the quarrying industry.

perma Star Vario remote mounted using 3 metre lengths of 8mm internal diameter grease line, lubricating a gravity take-up pulley bearing in the coal mining industry.

CLASSIC

Robust, simple, reliable – the World's most trusted single -point automatic lubricator

A requirement for trouble-free operation is the uninterrupted supply of sufficient, fresh lubricant to all lubrication points. perma CLASSIC delivers predictable and consistent lubrication. The reliable operating principle relies upon an electrochemical reaction. perma CLASSIC is fully dust and water proof and can withstand impacts.

CLASSIC – Electro-chemical, gas generating, metal housing, flexible base.

By tightening the activating screw the gas generator drops into the electrolyte fluid where it starts an electrochemical reaction that generates gas. Gas accumulates in the elasticised chamber and forces the double-sealed piston forward in a controlled manner, gradually expelling the lubricant under pressure. The lubricant is continuously injected into the lubrication point. The lubricant cartridge is empty when the piston has reached then end of its allowable travel and becomes visible at the end of the clear cone. The lubrication period is determined by colour-coded activator screws (type 1, type 3, type 6, or type 12) and the average ambient temperature.

Discharge periods CLASSIC	Discharge period (months)	cc per day*	Discharge period (months)	cc per day*	Discharge period (months)	cc per day*	Discharge period (months)	cc per day*
Temp.-average: 0 °C	4	1	8	0.5	15	0.3	>18	<0.2
Temp.-average: +10 °C	2	2	5	0.8	8	0.5	18	0.2
Temp.-average: +20 °C	1	4	3	1.3	6	0.7	12	0.3
Temp.-average: +30 °C	0.8	5	2	2	3	1.3	6	0.7
Temp.-average: +40 °C	0.6	6.7	1	4	2	2	3	1.7
Activating screw	Type 1 (yellow)		Type 3 (green)		Type 6 (red)		Type 12 (grey)	

* There is a time delay between activation and initial grease discharge which is temperature dependent

Product Overview

- For the lubrication of a single point
- For greases up to NLGI 2 and oils
- Robust metal housing
- "Flexi-cone" mount point to withstand impacts without breakage
- Transparent cone indicates when lubricator is empty
- Simple to install and maintain
- Operates in any position
- Fully dust and water proof
- No electrical components and no batteries
- Colour coded activation screws for easy recognition and dispensing period selection

Summary of Benefits

- Improved safety compared to manual lubrication
- Controlled and consistent lubrication delivering a gradual purge of lubricant
- Extended bearing service life and less downtime
- Constant supply of fresh lubricant to bearing seals for high contamination conditions
- Significantly reduces the likelihood of accidental grease contamination
- Lubricate equipment while it is running without the need for stoppages
- Can be remote mounted to improve access and safety
- Reduced dependence on manual labour
- Suited to applications at underground coal mines and the oil and gas industry

Technical data	CLASSIC
Housing design	Metal with flexible plastic end cone
Operating principle	Electrochemical
Discharge period (at +20°C with NLGI 2 grease)	1, 3, 6 or 12 months (activator screws with black sealing ring)
Lubricant volume	120cc
Ambient temperature	0 to +40°C
Pressure build-up	Max. 4 bar / 58 psi
Remote installations	1 metre of 8mm ID line (grease)

More information:

→ Accessories pages 25 - 27
→ Remote installations page 29
→ Servicing and trouble shooting page 30
→ perma SELECT for application rate calculations page 31

FUTURA

Ideally suited to high corrosion, high humidity and high contamination environments

perma FUTURA is a robust single-point lubricator which is suited to a wide range of applications. It is fully water and dust proof and operates in any position. Its plastic composition makes it ideally suited to harsh operating conditions which may lead to the corrosion of metal lubricators or electronic systems.

FUTURA – Electro-chemical, gas generating, transparent plastic housing.

By tightening the activating screw the gas generator drops into the electrolyte fluid where it starts an electrochemical reaction that generates gas. Gas accumulates in the elasticised chamber and forces the double-sealed piston forward in a controlled manner, gradually expelling the lubricant under pressure. The lubricant is continuously injected into the lubrication point.
The progression of the piston can be observed through the transparent body of the lubricator. The lubrication period is determined by colour-coded activator screws (type 1, type 3, type 6, or type 12) and the average ambient temperature.

Discharge periods CLASSIC	Discharge period (months)	cc per day*	Discharge period (months)	cc per day*	Discharge period (months)	cc per day*	Discharge period (months)	cc per day*
Temp.-average: 0 °C	4	0.8	8	0.4	15	0.2	>18	<0.2
Temp.-average: +10 °C	2	1.6	5	0.7	8	0.4	18	0.2
Temp.-average: +20 °C	1	3.3	3	1.1	6	0.6	12	0.3
Temp.-average: +30 °C	0.8	4.7	2	1.7	3	1.1	6	0.6
Temp.-average: +40 °C	0.6	5.6	1	3.3	2	1.7	3	1.1
Activating screw	Type 1 (yellow)		Type 3 (green)		Type 6 (red)		Type 12 (grey)	

* There is a time delay between activation and initial grease discharge which is temperature dependent

Product Overview

- For the lubrication of a single point
- For greases up to NLGI 2 and oils
- Corrosion resistant, UV stable transparent plastic housing to provide a clearly visible piston position
- Simple to install and maintain
- Operates in any position
- Fully dust and water proof
- No electrical components and no batteries
- Colour coded activation screws for easy recognition and dispensing period selection

Summary of Benefits

- Improved safety compared to manual lubrication
- Controlled and consistent lubrication delivering a gradual purge of lubricant
- Extended bearing service life and less downtime
- Constant supply of fresh lubricant to bearing seals for high contamination conditions
- Significantly reduces the likelihood of accidental grease contamination
- Lubricate equipment while it is running without the need for stoppages
- Can be remote mounted to improve access and safety
- Reduced dependence on manual labour and a reduced likelihood of human error
- Suited to applications at underground coal mines and the oil and gas industry

Technical data	FUTURA
Housing design	Transparent plastic (UV stable)
Operating principle	Electro-chemical
Discharge period (at +20°C with NLGI 2 grease)	1, 3, 6 or 12 months (activator screws with pink sealing ring)
Lubricant volume	100cc
Ambient temperature	0 to +40°C
Pressure build-up	Max. 4 bar / 58 psi
Remote installations	1 metre of 8mm ID line (grease)

More information:

→ Accessories pages 25 - 27
→ Remote installations page 29
→ Servicing and trouble shooting page 30
→ perma SELECT for application rate calculations page 31

STAR VARIO

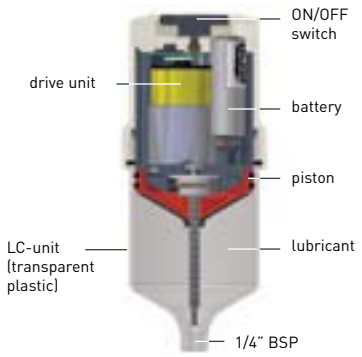
Variable dispensing rates for a broad range of applications

perma STAR VARIO provides precise dispensing at rates which range from as little as 0.17cc of lubricant per day through to as much as 8.33cc per day. This is achieved via a combination of three cartridge sizes and four time settings. As a result the STAR VARIO can lubricate equipment ranging from medium size electric motors, which require little grease, through to the wet end labyrinth seals on slurry pumps which demand a regular purge of fresh grease.

Operational Status	LED message
Initial purge when turned on	Continual red for 25 seconds
System on and operating correctly	Green flash every 15 seconds
System error (blockage detected)	Red flash every 8 seconds
Grease canister empty	Green & red flash every 15 seconds
Drive unit discharging	Continual red for 1 to 5 seconds

STAR VARIO – Electro-mechanical, variable dispensing, temperature independent.

perma STAR VARIO consists of single-use lubricant cartridge and re-usable electro-mechanical drive unit. Because the lubricator is mechanically driven the dispensing rate is independent of ambient temperature and precise. Inspections of the STAR Vario are made easy via the transparent lubricant cartridge and the alert system which utilises different flashing sequences of red and green LED's to communicate the status of the lubricator to maintenance personnel.



Discharge STAR VARIO	1 month*	3 month*	6 month*	12 month*
"VOL" S60 (60cc cartridge)	2.00 cc/day	0.67 cc/day	0.33 cc/day	0.17 cc/day
"VOL" M120 (120cc cartridge)	4.00 cc/day	1.33 cc/day	0.67 cc/day	0.33 cc/day
"VOL" L250 (250cc cartridge)	8.33 cc/day	2.78 cc/day	1.39 cc/day	0.69 cc/day

* discharge amount per day (under laboratory conditions)

Product Overview

- For the lubrication of a single point
- For greases up to NLGI 2 and oils
- Variable dispensing rates from as little as 0.17cc per day to as much as 8.3cc per day
- Corrosion resistant, UV stable transparent plastic housing
- Clearly visible piston position
- Dispensing rate is not effected by ambient temperature
- Remote mountable up to 3 metres from the lubrication point
- Green and red LED's to indicate operational status (refer to table on page 16)

Summary of Benefits

- Improved safety compared to manual lubrication
- Controlled and consistent lubrication delivering small amounts frequently
- Extended bearing service life and less downtime
- Constant supply of fresh lubricant to bearing seals for high contamination conditions
- Significantly reduces the likelihood of accidental grease contamination
- Lubricate equipment while it is running without the need for stoppages
- Can be remote mounted for ease of access and improved safety
- Reduced dependence on manual labour

Technical data	STAR VARIO
Housing design	Transparent plastic
Operating principle	Electro-mechanical (battery powered)
Discharge period	1, 3, 6 or 12 months
Lubricant volume	60, 120 or 250cc
Ambient temperature	-10 to +50°C
Pressure build-up	Max. 5 bar / 72 psi
Remote installations	3 metre of 8mm ID line (grease)

More information:

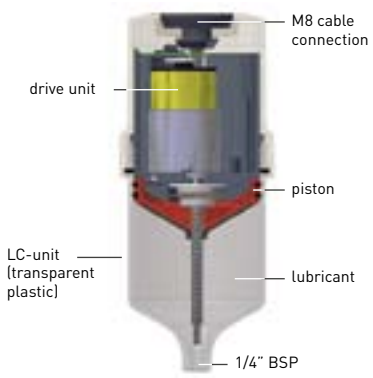
→ Accessories pages 25 - 27
→ Remote installations page 29
→ Servicing and trouble shooting page 30
→ perma SELECT for application rate calculations page 31

STAR CONTROL TIME and STAR CONTROL IMPULSE PLC / Machine Controlled Lubricator

Similar to the STAR VARIO, the STAR CONTROL delivers precise amounts of lubricant and its operation is temperature independent. The unique feature of perma STAR CONTROL is its connection to machine control. This feature makes the STAR CONTROL ideally suited to equipment where lubrication is to take place only when the machine is in operation.

STAR CONTROL – Electro-mechanical, PLC / Machine controlled, temperature independent

The main difference between the battery operated STAR VARIO and STAR CONTROL is that the STAR CONTROL is directly connected to the machine's control unit - power (low voltage DC) and control comes from the machine. The lubricator only works when power is supplied by the machine. perma STAR CONTROL is available in two versions – STAR CONTROL TIME and STAR CONTROL IMPULSE. For the IMPULSE version the lubricator discharges a set volume of lubricant as soon as voltage is applied. Before it will discharge again, voltage must be interrupted for at least 5 seconds and then reapplied. Meanwhile the TIME version dispenses lubricant at a set rate of cc per 100 hours of machine operation, stopping and starting at preset intervals.



Discharge perma STAR CONTROL	1 month*	3 month*	6 month*	12 month*
"VOL" S60 (60cc cartridge)	8.33 cc/100h	2.78 cc/100h	1.39 cc/100h	0.69 cc/100h
"VOL" M120 (120cc cartridge)	16.67 cc/100h	5.56 cc/100h	2.78 cc/100h	1.39 cc/100h
"VOL" L250 (250cc cartridge)	34.72 cc/100h	11.57 cc/100h	5.79 cc/100h	2.89 cc/100h
Impulse version (all cartridge sizes)	2.11 cc/Impuls	1.06 cc/Impuls	0.53 cc/Impuls	0.26 cc/Impuls

* discharge amount per day (under laboratory conditions)

Product Overview

- For the lubrication of a single point
- For greases up to NLGI 2 and oils
- Only dispenses lubricant when the lubricated machine is operating
- TIME function version and IMPULSE function version.
- Both versions can utilise 60, 120 or 250cc cartridges.
- Variable dispensing rates for TIME version ranging from 0.7cc up to 34.7cc per 100 hours of machine operation.
- Corrosion resistant, UV stable transparent plastic housing.
- Clearly visible piston position
- Dispensing rate is not effected by ambient temperature
- Remote mountable up to 3 metres from the lubrication point (longer lines are permissible for oil filled units).

Summary of Benefits

- Avoids the over-lubrication of machinery which operates intermittently and which is susceptible to over lubrication
- Improved safety compared to manual lubrication
- Controlled and consistent lubrication delivering small amounts frequently
- Extended bearing service life and less downtime
- Significantly reduces the likelihood of accidental grease contamination
- Lubricate equipment while it is running without the need for stoppages
- Can be remote mounted for ease of access and improved safety
- Reduced dependence on manual labour

Technical data	STAR CONTROL (TIME & IMPULSE Versions)
Housing design	Transparent plastic
Operating principle	Electro-mechanical
Available versions	TIME Version and IMPULSE version
Power Source	15 to 30 Volts DC, typical 0.2 A
Lubricant volume	60, 120 or 250cc
Ambient temperature	-10 to +50°C
Pressure build-up	Max. 5 bar / 58 psi
Remote installations	3 metre of 8mm ID line (grease)

More information:

→ perma SELECT for application rate calculations page 31

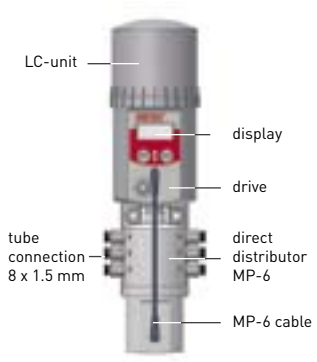
PRO MP-6

The stand alone multi-point lubricator for up to 6 points

perma PRO MP-6 is a multi-point lubrication system that can supply 2 – 6 lubrication points. The discharge period can be set from 1 day up to 12 months with a lubricant volume of 500cc. No pressure is lost due to the rotary distribution system of the MP-6. perma PRO can also be used as a single-point lubrication system without the MP-6 distributor.

PRO MP-6 – Electro-mechanical, temperature independent, high pressure, multi-point

perma PRO MP-6 provides precise lubrication even under extreme conditions. The pressure build-up to 25 bar (360 psi) allows the use of longer grease lines (up to 5 m). The lubricant is distributed directly and without loss of pressure. The display provides information about each individual outlet. perma PRO MP-6 guarantees exact lubricant doses even over longer periods. It is very easy to operate and requires little mounting space.



Discharge formula PRO MP-6: Volume of Grease Cartridge **x** Manual lubrication period in days **÷** 30 **÷** Lubricant amount per lubrication point **÷** Number of lubrication points **=** Setting of PRO MP-6 in months

Example: lubrication period: every 2 weeks; lubricant amount: 10cc; number of lubrication points: 4; PRO volume: 500cc
Calculation of setting: 500 x 14 ÷ 30 ÷ 10 ÷ 4 = 5.83 months (setting: 6 months)

(Result x 4.3 = Setting by weeks) (Result x 30 = Setting by days)

Product Overview

- For the lubrication of up to 6 points
- Suited to greases up to NLGI 2
- High operating pressure allows for long remote lines
- If one or more grease points becomes blocked the lubricator will continue to pump to the remaining points and identify the blocked points.
- Lubricant in cartridge is not held under pressure therefore minimising oil bleed
- Stand-alone battery power simplifies installation as no electrical or air power supply is required
- Easy to navigate two button menu.
- Negligible pressure drop across MP-6 distribution system
- Clearly visible grease piston position and LED indicator lamps
- Dispensing rate is not effected by ambient temperature

Summary of Benefits

- Controlled and consistent lubrication delivering small amounts frequently
- The system does not shut-down if one or more of the grease points becomes blocked.
- The lubrication of critical bearings can be easily monitored
- Extended bearing service life and less downtime
- Significantly reduces the likelihood of accidental grease contamination
- Lubricate up to 6 points while equipment is running without the need for stoppages
- Can be remote mounted for ease of access and improved safety
- Reduced dependence on manual labour

Technical data	PRO MP-6 MULTI POINT
Housing design	Metal housing with transparent plastic lubricant cartridge
Operating principle	Electro-mechanical ramp pump
Discharge period	Adjustable from 24 hours to 12 months
Lubricant volume	500cc
Ambient temperature	-20 to +60°C
Pressure build-up	Max. 25 bar / 360 psi
Remote installations	5 metre of 6mm ID line
Cabinet	For outdoor and high contamination areas

More information:

→ perma SELECT for application rate calculations page 31

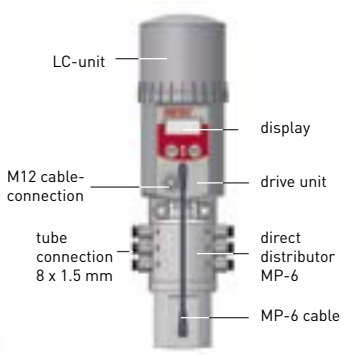
PRO CONTROL MP-6

The PLC controlled multi-point lubricator for up to 6 points

perma PRO CONTROL MP-6 is a machine controlled lubrication system with a lubricant volume of 500cc. The grease dispensing is determined by the machines control and associated inputs. perma PRO CONTROL MP-6 can individually supply 2 – 6 lubrication points. No pressure is lost due to the rotary distribution system of the MP-6 system. perma PRO CONTROL can also be used as a single-point lubrication system without the MP-6 distributor.

PRO CONTROL MP-6 – Electro-mechanical, temperature independent, high pressure, multi-point, PLC controlled

perma PRO CONTROL is a PLC controlled multi-point lubrication system. During extended downtimes of the machine, the lubrication system goes into a "waiting mode" and does not discharge again until the machine operation recommences. The system status can be monitored via a PLC-control system (e.g. warning lights) and is also displayed by the lubricator's inbuilt LED signal.
perma PRO C with distributor MP-6 can be operated with two volumes (250cc and 500cc) and can lubricate up to 6 points. High pressure build-up provides flexibility for remote installations.



Discharge formula PRO CONTROL MP-6: Volume of lubricant cartridge ÷ 7.2 ÷ Lubricant amount per 100 operating hours ÷ Number of lubrication points = Setting of PRO CONTROL MP-6 in months

Example: lubricant amount: 10cc per 100 operating hours; number of lubrication points: 4; Cartridge size: 500cc
Calculation of setting: 500 ÷ 7.2 ÷ 10 ÷ 4 = 1.74 months (setting: 2 months)

(Result x 4.3 = Setting by weeks) (Result x 30 = Setting by days)

Product Overview

- For the PLC / machine controlled lubrication of up to 6 points
- For greases up to NLGI 2
- Ensures that lubrication only occurs while machinery is operating
- High operating pressure allows for long remote lines
- If one or more grease points becomes blocked the lubricator will continue to pump to the remaining points and identify the blocked points.
- Lubricant in cartridge is not held under pressure therefore minimising oil bleed
- Negligible pressure drop across MP-6 distribution system
- Clearly visible grease piston position and LED indicator lamps
- Dispensing rate is not effected by ambient temperature

Summary of Benefits

- Controlled and consistent lubrication delivering small amounts frequently
- The system does not shut-down if one or more of the grease points becomes blocked.
- The lubrication of critical bearings can be easily monitored
- Extended bearing service life and less downtime
- Significantly reduces the likelihood of accidental grease contamination
- Lubricate up to 6 points while equipment is running without the need for stoppages
- Particularly well suited to critical equipment which is sensitive to over-greasing which do not have predictable running schedules
- Can be remote mounted for ease of access and improved safety

Technical data	PRO CONTROL MP-6 MULTI POINT
Housing design	Metal housing with transparent plastic lubricant cartridge
Operating principle	Electro-mechanical ramp pump
Dispensing period	PLC / machine controlled
Lubricant volume	500cc
Ambient temperature	-20 to +60°C
Pressure build-up	Max. 25 bar / 360 psi
Remote installations	5 metre of 6mm ID line
Cabinet	For outdoor and high contamination areas

More information:

→ perma SELECT for application rate calculations page 31

→ ACCESSORIES – Custom Solutions for Crane Wheels & Open Gears

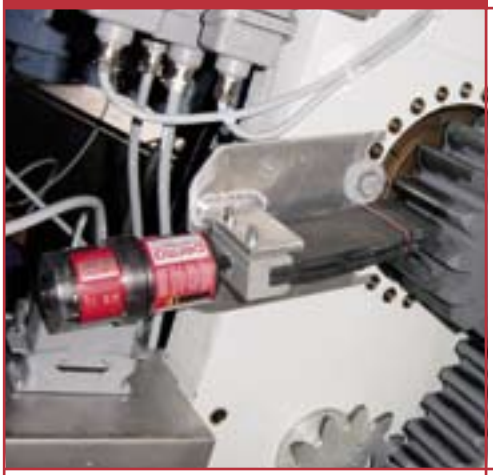
Crane Wheel Lubricator (CWL Kit)

- → Reduces crane downtime caused by unscheduled maintenance
- → Reduces maintenance costs by increasing life of wheel flanges
- → Quick and easy installation

The perma CWL kit dispensing system is designed for the lubrication of wheel flanges on cranes. The set consists of a perma STAR VARIO (250cc) and the CWL applicator assembly. The lubricator pushes lubricant into the CWL applicator assembly. The spring loaded applicator applies the lubricant to the wheel flange.

When the crane wheel turns, the lubricant is transported from the wheel flange to the side of the rail. This reduces the wear on the wheel flange and therefore reduces maintenance costs.

Open Gear Lubricator (OGL Kit)



- → The OGL works in any direction
- → Lubricant effects the complete contact area
- → Easy installation and permanent discharges of small lubricant doses saves time and lubricant

The OGL-system (Open Gear Lubrication) is a solution for applying grease to slow moving open gears. A perma lubricator pushes grease into the rubber applicator of the OGL. When the gear turns, grease is applied to the face of each tooth. Because the OGL only applies small grease amounts, it is both economical and environmentally friendly.

→ ACCESSORIES – Heavy Duty 304 Stainless Steel Brackets

Stainless Steel Brackets

MB105 – Shown here complete with A105 bracket.

A620P – Support adaptor for Star Vario.

MB01A620P – Shown here with BC30 (30mm beam clamp).

MB02A620P – Shown here with BC65 (65mm beam clamp).

MB04A620P – Shown here with BC30.

BC65 – 65mm Stainless Steel beam clamp with set screw.

MB01 – Stainless steel bracket for 1 lubricator.

708V – Manual purge kit.

A619X – Clip on protective cover.

MB02A620P – Stainless steel bracket complete with A620P support flanges and BC30 beam clamps.

30mm - BC30

65mm - BC65

708V – Manual purge kit

Part #	Description
MB01	S/S bracket for 1 lubricator
MB02	S/S bracket for 2 lubricators
MB03	S/S bracket for 3 lubricators
MB04	S/S bracket for 4 lubricators
MB01A620P	As for MB01 plus 1xA620P
MB02A620P	As for MB02 plus 2xA620P
MB03A620P	As for MB03 plus 3xA620P
MB04A620P	As for MB04 plus 4xA620P
MB0203M	As for MB02 plus 3 manual
MB02A620P03M	As for MB02A620P plus 3 manual
MB01PVC	S/S for 1 lubricator with PVC cover
MB02PVC	S/S for 2 lubricators with PVC cover
BC30	30mm S/S beam clamp
BC65	65mm S/S beam clamp
BP	S/S backing plate
MBA105	S/S bracket to suit A105
A620P	Support adaptor for STAR
708V	Manual greasing kit
708VHD	H/D Manual greasing kit

The range includes brackets suited to 1, 2, 3 and 4 lubricators. For ease of use the brackets can be mounted using either a beam clamp or backing plate arrangement. Beam clamps are ideal for mounting onto beam sections ranging up to 60mm in thickness. Each beam clamp is supplied with a case hardened cup-point set screw and stainless steel assembly screws. These methods of mounting eliminate the need to cut, weld or drill and allow for the quick removal of brackets if required during maintenance shuts.

The range also includes the MB0203M which combines two installation points for automatic lubricators plus three points for remote manual greasing.

Meanwhile the MB01PVC and MB02PVC brackets offer full protection for Star Vario lubricators for environments which are particularly harsh. The robust design which incorporates full length PVC covers keeps the lubricators free of dirt and totally protected from the environment.

The MBA105 is a stainless steel bracket which adapts to the A105 'quick-clip' plastic bracket (refer to page26). This bracket provides the convenience of the A105 to be combined a beam clamp attachment.

A620P (Support Adaptor) – This accessory provides a robust point of connection for the STAR Vario. It is also compatible with the Futura but is only recommended where accidental knocks and impacts are likely.

708V (Manual greasing kit) – This kit can be incorporated with lubricator installations to provide a practical means of manually purging grease points and priming remote lines.

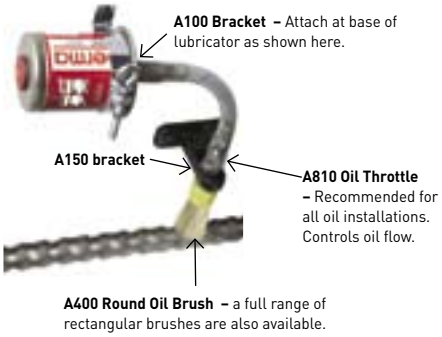
708VHD (Heavy Duty Manual greasing kit) – Functionally this kit is the same as the 708V. The material is stainless steel and it incorporates a screw on dust cap to protect the grease nipple from contamination build-up.

→ ACCESSORIES – Brushes and Brackets for One Lubricator

Brushes for Chain Lubrication

A411 – rectangular brush for oil

A400 – round brush for oil



Part #	Description
A400	2cm Round brush 1/4"BSP
A410*	3x4cm rectangle brush 1/4"BSP
A411*	3x6cm rectangle brush 1/4"BSP
A412*	3x10cm rectangle brush 1/4"BSP
A810	One-way oil throttle

This configuration shows the perma Classic remote mounted for chain lubrication. An A100 bracket has been used to mount the lubricator and an A151 (with insert) has been used to permanently position the applicator brush (A400). An A810 oil throttle (one-way valve) must be used with all oil systems. This example uses an 8615 pre-assembled hose set (see page 27 for more information).

* Rectangular brushes A410, A411 and A412 have internal galleries for oil distribution.

Brackets for single lubricators

A100 – Metal bracket

A105 – Plastic bracket

A150 – Plastic bracket with brass insert

Part #	Description
A100	Metal bracket
A105	Plastic bracket with two position quick clip
A150	Plastic "T' bracket including 1/4" BSP brass insert

This configuration shows the perma Futura remote mounted for chain lubrication. An A105 bracket has been used to mount the lubricator and an A150 has been used to permanently position the brush (A810). The A105 bracket is suited to the perma Futura, STAR VARIO and STAR CONTROL. An A810 oil throttle (one-way valve) must be used with all oil systems. This example uses an 8630 pre-assembled hose set.

→ ACCESSORIES – General

Reducers, Extensions & Elbows	Part #	Description
	2461/8	1/4 " BSPF - 1/8 " BSPM Brass Straight Adaptor
	2461/8SAESS	1/8 " BSPF – 1/4 " SAEM Stainless Steel Straight Adaptor
	2461/4	1/4 " BSPF – 1/4 " BSPM Brass Straight Adaptor
	2461/4SAE	1/4 " BSPF - 1/4 " SAEM Brass Straight Adaptor
	2461/4SAESS	1/4 " BSPF – 1/4 " SAEM Stainless Steel Straight Adaptor
	2463/8	1/4 " BSPF-3/8" BSPM Brass Straight Adaptor
	2461/2	1/4 " BSPF- 1/2 " BSPM Brass Straight Adaptor
	2466	1/4 " BSPF- 6mm M Brass Straight Adaptor
	2468	1/4 " BSPF- 8mm M Brass Straight Adaptor
	24610	1/4 " BSPF- 10mm Brass M Straight Adaptor
	921/8	90 Degree Brass Elbow 1/8
	92	90 Degree Brass Elbow 1/4
	1211/8	1/4 " BSPF- 1/8" BSPM 45 Degree Brass Elbow
	1211/4	1/4 " BSPF- 1/4 " BSPM 45 Degree Brass Elbow
	1211/4SAE	1/4 " BSPF- 1/4 " SAEM 45 Degree Brass Elbow
	1216	1/4 " BSPF - 6mm 45 Degree Brass Elbow
	52740	40mm long 1/4" BSP Brass Extension Tube
	52785	85mm long 1/4" BSP Brass Extension Tube
	527125	125mm long 1/4" BSP Brass Extension Tube

Hoses & Fittings	Part #	Description
	8615	15cm Reinforced nylon flexible tube assembly
	8630	1/8 "30cm Reinforced nylon flexible tube assembly
	8645	45cm Reinforced nylon flexible tube assembly
	8660	60cm Reinforced nylon flexible tube assembly
	8690	90cm Reinforced nylon flexible tube assembly
	86150	150cm Reinforced nylon flexible tube assembly
	87	Male Barb brass fitting for reinforced nylon hose
	88	Female Barb brass fitting for reinforced nylon hose
	90	Reinforced Nylon Hose – Per Mtr
	OTK CLIP	OTK Clip-13-15mm. For reinforced nylon hose.
	Eaton 3/8 D600-06	Heavy duty hose – Per Mtr
	Eaton 3/8 – 1/4	Hose end fitting 3/8" – 1/4"BSP F for Eaton 3/8 hose

* All hoses suited to both oils and greases

Protective Covers	Part #	Description
	A619	Clear Protective Cap - soft, tight fit.
	A619X	Protective Cap - hard, transparent, clip-on.
	A619FL	Full length cover for Star Vario L250
	PVC-210	Full length PVC cover for Star Vario

Greases and Oils - Right lubricant, right place, right time

The frequent addition of small volumes of lubricant provides the longest bearing service life and therefore reduces maintenance costs and improves reliability. Lubricant selection is an important factor for achieving extended bearing service life.

To fulfil this requirement perma lubricators are filled standard with a range of quality German manufactured lubricants. HTL perma Australia also has the capability of custom filling greases and oils. This ensures that users of perma lubricators are not forced to make compromises when it comes to choice of lubricant.

Where sites have invested effort in to rationalisation programs or where specialty lubricants are necessary we can fill lubricators with your chosen lubricant. A broad range of grease and oils from the majors and specialty lubricant companies are permanently stocked for this purpose.

Standard Fills - German Manufactured Lubricants

Summary information regarding the standard fill lubricants is provided below. For more detailed information please contact us for a copy of the relevant Technical Data Sheet for each lubricant or visit our website to access Technical Data Sheets and Material Safety Data Sheets.

Perma Code	Lubricant	NLGI Class	Base Lubricant Type	Thickener	Viscosity at 40°C	Colour	Temperature Range from	Temperature Range to	d x n Characteristic Value
SF01	perma multipurpose grease	2	Mineral oil	Lithium/Calcium mixed soap	220	brown	-30°C(-22°F)	+130°C (+266°F)	400000
SF02	perma extreme pressure grease	2	Mineral oil	Lithium Soap with MoS2	105	grey	-30°C (-22°F)	+120°C (+248°F)	350000
SF04	perma high performance grease	0/1	Mineral oil	Polyurea	500	light brown	-20°C (-4°F)	+160°C (+320°F)	200000
SF05	perma high performance grease	0/1	Mineral oil	Polyurea with MoS2	500	black	-20°C (-4°F)	+200°C (+392°F)	200000
SF06	perma liquid grease	0	Mineral oil	Aluminium Complex	220	brown	-20°C (-4°F)	+130°C (+266°F)	400000
SF10	perma food grade grease	1/2	Mineral & Synthetic	Aluminium Complex	230	beige	-40°C (-40°F)	+120°C (+248°F)	300000
SO14	perma high temperature chain oil	N/A	Synthetic Ester	N/A	320	green	-20°C (-4°F)	+250°C (+482°F)	N/A
SO32	perma multipurposes oil	N/A	Mineral oil	N/A	100	brown	-10°C (+14°F)	+100°C (+212°F)	N/A

Custom Fills

Whilst perma lubricators are filled standard with a range of quality, German manufactured lubricants, there are circumstances where users of perma lubricators prefer to nominate greases or oils of their choice. Key reasons for nominating custom filled lubricants are:

- Where rationalisation programs have been implemented and it is preferred that the lubricants in automatic lubricators conform to the rationalisation decisions.
- Where certain applications demand specialty lubricants.
- Where the mixing of different greases is likely to cause incompatibility problems.
- Where it is necessary for contractual purposes to use lubricants which are manufactured by a specific company.
- For quality control reasons (food industry) or environmental reasons specific lubricants are preferred.
- Where specific lubricants are necessary in order to conform to warranty requirements.

Grease Pumpability

The pumpability of grease depends on many factors but the most influential are the grease type, ambient temperature (grease temperature) and the dimensions of grease delivery lines.

Grease Type – The lower the NLGI rating (consistency / thickness) the easier grease is to pump. So NLGI 1 greases are easier to pump than NLGI 2 greases. Thickener type, base fluid viscosity and manufacturing methods also have an effect on grease pumpability.

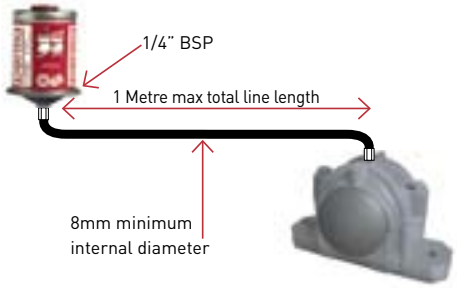
Ambient Temperature (grease temperature) – Grease is much easier to pump in warmer environments than cold environments. The relationship between pumpability and temperature is non-linear, meaning that as temperature drops it is difficult to predict the point at which grease will start to become substantially more difficult to pump.

Grease Line Dimensions and Fittings – The nature of grease flow through lines and fittings is different to that of oils. Consequently pressure drop across grease lines or fittings cannot be calculated on the basis of "pipe friction" style calculations which would normally be used for oil. In general it is best to minimise grease line length and the use of small diameter fittings wherever practical. The diameter of grease lines is also of critical importance. For automatic lubricators it is best to use grease lines which have an internal diameter of at least 8mm.

Remote Installations – CLASSIC, FUTURA & STAR

Classic and Futura Lubricators

Direct mount where safe to do so as this provides maximum pressure to the bearing. If remote mounting is necessary use lines which are no more than 1 metre long and with an internal diameter of at least 8mm. Smaller diameter lines increase resistance to grease flow.

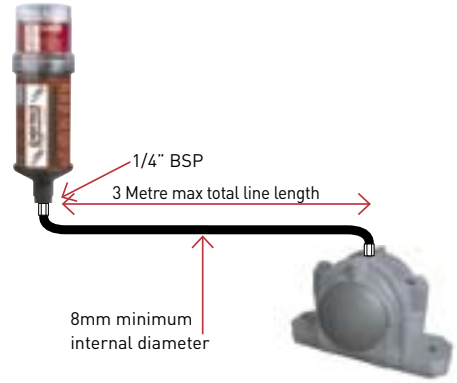


Remote installed perma Classic utilising the MB01 stainless steel bracket and backing plate (BP).

Always prime grease lines and pre-grease bearings. Minimise small diameter restrictions and ensure that the bearing will freely receive grease.

Star Vario Lubricators

Use flexible lines which are no more than 3 metres long and have an internal diameter of at least 8mm. Smaller diameter lines present increased resistance to grease flow.



Always prime grease lines and pre-grease bearings. Minimise small diameter restrictions and ensure that the bearing will freely receive grease.

The choice between direct or remote mounting depends upon:

→ Access for safe and efficient servicing.

→ Protection of the lubricator from causes of damage such as accidental knocks.

Where practical, direct mounting is preferred as this presents maximum pressure to the lubrication point.

For each installation consider the questions below:

Q1. Is the bearing subject to high vibration or temperatures which may damage the lubricator?
Yes (remote) No (direct)

Q2. Is it difficult or unsafe to access the bearing?
Yes (remote) No (direct)

Q3. Is the lubrication point exposed to excessive amounts of water or impact of solid material?
Yes (remote) No (direct)

Q4. Do protective guards have to be removed to access the bearing?
Yes (remote) No (direct)

Installation Tips and Trouble Shooting Quick Reference for Classic, Futura and Star Vario

CLASSIC and FUTURA

Installation & Servicing Tips

1. Always ensure that newly installed bearings are pre-packed prior to fitting lubricator.
2. Pre-grease bearings using a grease gun to ensure that the point can receive grease freely. Clean all fittings to prevent contamination.
3. Select the activator type to suit the application and average ambient temperature.
4. Decide whether to direct or remote mount depending on access and safety implications. Do not exceed the recommended line dimensions.
5. Activate the lubricator prior to installation by inserting the activation screw fully – twist only, do not push to the side to break eyelet.
6. Write the date of installation on the lubricator and record the date of installation in the site maintenance scheduling system or keep a separate record.
7. Screw the lubricator into the grease port by hand – tools are not necessary.
8. Once installed the lubricator should be periodically inspected to check that accidental damage has not occurred.
9. Change-out lubricator on the planned date.
10. When 'changing-out' empty lubricators manually purge the bearing to ensure that lubrication conditions have not changed.

Trouble Shooting

Observation	Solution
Grease dispensing too quickly	**Average ambient temperature too high for activator type –** • Select slower activator type. OR • Remote mount away from heat source. OR • Change to STAR Vario for temp independent dispensing.
Grease dispensing too slowly	**Average ambient temperature too low for activator type –** • Select faster activator type. OR • Change to STAR Vario for temperature independent dispensing. **Resistance to grease flow too high –** • Manually purge point to ensure that grease can be freely received by bearing. THEN • Reduce grease line length AND/OR increase line diameter. OR • Eliminate restrictions caused by small diameter fittings. OR • Select faster activator type. OR • Select grease with better pumpability.
Grease 'spurts' from lubricator when removed from service	**Blockage or resistance to grease flow too high –** • Manually purge point to ensure that grease can be freely received by bearing THEN • Reduce grease line length AND/OR increase line diameter. OR • Eliminate restrictions caused by small orifice fittings. • Change to STAR Vario for higher pressure output.

Correct installation is essential for correct lubricator operation.

STAR VARIO

Installation & Servicing Tips

1. Always ensure that newly installed bearings are pre-packed with grease.
2. Pre-grease bearings prior to installation using a manual grease gun to ensure that the grease point can receive grease freely. Clean all fittings prior to greasing.
3. Decide whether to direct or remote mount depending on access and safety.
4. Do not exceed the recommended line dimensions.
5. Select the desired TIME and VOLUME settings for the application.
6. Assemble the lubricator –
   a. Seat the Drive unit correctly onto the Lubricant Cartridge (you will feel it seat into the correct position). Insert battery pack.
   b. Fit the Drive cover and screw into position. Do not overtighten – screw down to the stop point and then turn back 1/4 of a turn.
   c. Turn unit on and check that grease is being discharged.
   d. Attach the support adaptor (A620P) for direct mount applications.
   e. Fit the protective cover (the A619, A619X or STP2001).
7. Write the date of installation on the lubricator and record the date of installation in the site maintenance scheduling system or keep a separate record.
8. Screw the lubricator into the grease port by hand. If necessary the Support Adaptor may be 'nipped-up' using the flats at the base & an open ended spanner.
9. Once installed the lubricator should be periodically inspected to check that accidental damage has not occurred. Observe the LED signals and the position of the piston.
10. When 'changing-out' empty lubricators manually purge the bearing to ensure that lubrication conditions have not changed.

Trouble Shooting

Observation	Solution
Lubricator will not run	• Check that the ON/OFF switch is set to "ON". • Check that assembly is correct and that the screw on cover for the Drive unit is fully engaged. • Check that batteries are installed. • Ensure that new batteries are used with every new lubricant cartridge.
Grease piston stops part way down with green & red LED flashing	Volume setting on Drive unit does not match lubricant cartridge size. Change Volume setting to the correct cartridge size and install new cartridge and battery set.
Dispensing is too fast or too slow	Check that the Time setting on the Drive unit is set correctly to either 1, 3, 6 or 12 months..
The red LED is flashing every 8 seconds	This indicates that the Drive unit has experienced excessive back pressure from the grease point and is not able to develop sufficient pressure to pump: • Remove or isolate the lubricator and manually purge the grease point in order to assess the blockage. • Check for small diameter fittings which may be causing unnecessary resistance to grease flow. • For remote installations check that the grease line is not too long or too narrow. • For remote installations which use old grease lines check that the lines have not become coated with hardened grease on their internal walls. • Grease can become very hard to pump when temperatures drop to low levels. Has a cold snap caused the problem?
Water has entered the Drive unit	• Remote mount away from water hazards. • Apply a wet cap or full length cover for water protection.

Customer Resources – www.perma.com.au

At HTL perma Australia we believe in sharing knowledge about our products, applications and implementation know-how.

Our web site is updated frequently with information including downloads related to our products and lubrication in general.

Go to www.perma.com.au for:

- → MSD and Tech Data Sheets
- → Product information
- → FAQ's
- → Application and installation examples
- → Accessory information
- → Installation examples
- → Application examples
- → perma SELECT
- → General lubrication information

Work Shop Quick Reference Posters

The perma range of workshop posters provide a source of quick reference to the users of perma products. They are A2 in size and gloss laminated making them ideally suited to workshops and lube rooms.

The posters include technical information about dispensing rates, remote installations, contamination prevention, accessories, service practices and basic trouble shooting.

perma SELECT Lubrication Calculation Software

Introduction

perma SELECT is lubrication calculation software which has been developed by perma in cooperation with one of the world's leading bearing manufacturers.

The program requires bearing details and information regarding operational conditions to be entered. The program matches the nearest lubricator setting for your chosen perma lubricator. Because perma SELECT requires qualitative information to be entered for operational conditions and because the variations in equipment installations are endless, the perma SELECT results should be considered as a guide only.

Operators should always take additional factors into account when determining grease application rates including site specific maintenance experience, condition monitoring results and original equipment manufacturers recommendations.

Some of the factors which influence greasing rates:

- → Bearing type
- → Bearing dimensions
- → Lubricant type
- → Speed
- → Ambient temperature
- → Bearing temperature
- → Load
  - → Solid contaminants
  - → Moisture (water)
  - → Shock loads
  - → Vibration

Theory Versus Practices

Theoretical calculations of grease replenishment rates provide a guide only and are a good starting point when working to determine optimal lubrication rates for site specific equipment. They do not provide exact answers.

The calculations cannot take into account all of the specific operational parameters which are relevant on different sites and different applications. Because the calculations draw on parameters which are qualitative estimates the end result of the calculations are also qualitative estimates.

For example the perma SELECT program requires inputs relating to operating conditions such as ambient temperature, dust and humidity levels and vibration. Selections made for these operating conditions can have a dramatic effect on the lubrication calculations.

So while the calculations provide a useful starting point for grease replenishment rates it is the experience of competent maintenance and reliability professionals, with input from original equipment manufacturers, who can ultimately determine optimal greasing rates for site specific equipment.

Notes

HTL perma Australia Pty Ltd

1/41 Lexton Road
Box Hill North
Melbourne Australia

P.O. Box 70
Box Hill VIC 3128

Phone: +61 3 9890 4386
Fax: +61 3 9898 7202

www.perma.com.au