



**perma Automatic Lubrication Systems
Catalogue – 2nd Edition**



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Leading technology and practical solutions set the standard in lubrication

perma-tec GmbH & Co (Germany)

perma-tec GmbH & Co is the Germany based global leader in the research, development and manufacturing of automatic, single-point lubricators.

More than 40 years of experience, continuous thinking ahead, and the constant implementation of new ideas has resulted in lubrication 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 implementation of lubrication solution.

As a wholly owned subsidiary of perma-tec GmbH & Co, we have direct access to the Research & Development Centre and Engineering Group in Germany.

HTL perma Australia Pty Ltd responds to the demands of preventative maintenance programs by focusing on service, customised solutions and knowledge sharing. We understand that our products deliver maximum value when combined with robust installation systems, a practical approach to maintenance scheduling and ongoing technical support.

Facts & Figures	
Head Office & Manufacturing Base	Germany
Employees in Germany	140 (approx)
HTL perma Subsidiaries	Australia, England, France, India, 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-2, 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 Acquisition 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), India (2008)
- 2000 Change of company name to perma-tec GmbH & Co. KG



Improved reliability, reduced maintenance costs and less downtime.

From a preventative maintenance point of view there is nothing more important than the implementation of reliable and practical lubrication programs. Maintenance managers and reliability engineers must make informed choices to achieve an optimal balance between automated and manual lubrication.

The example below provides a statistical demonstration of how automated greasing provides a lubrication regime which maximises bearing service life.

A site with 500 perma single-point lubricators*, with an average setting of 3 months, reveals the following statistics.

- 1,946 equally spaced injections of grease per year to each point.
- An injection of grease, somewhere on site, every 32 seconds.
- 2,667 individual injections per day.
- Almost 1 million individual injections each year.

* For this example perma Star Vario L250

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 more 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 there is an ever increasing emphasis on automated systems, documented procedures and practical means of contamination prevention.

“Greasers” are being up-skilled to “Lubrication Technicians” and their work is being integrated with condition monitoring and reliability programs.

As investment in preventative maintenance is increasing so too is the implementation of automated lubrication systems. But automated systems alone do not provide an adequate solution. Quality products must be combined with practical implementation plans and robust management methods. At perma we focus on these facts to assist in the delivery of sustainable, high quality lubrication practices.

Tribology, A Means to Increase Profitability:

The Australian Section of The American Society of Lubrication Engineers define wear as ‘progressive damage, usually involving material loss, which occurs to the surface of a component as a result of relative motion at the surface’.

They go on to state...

“The costs of wear are widespread, involving not only replacement parts but also down time, lost production and loss of opportunity.”

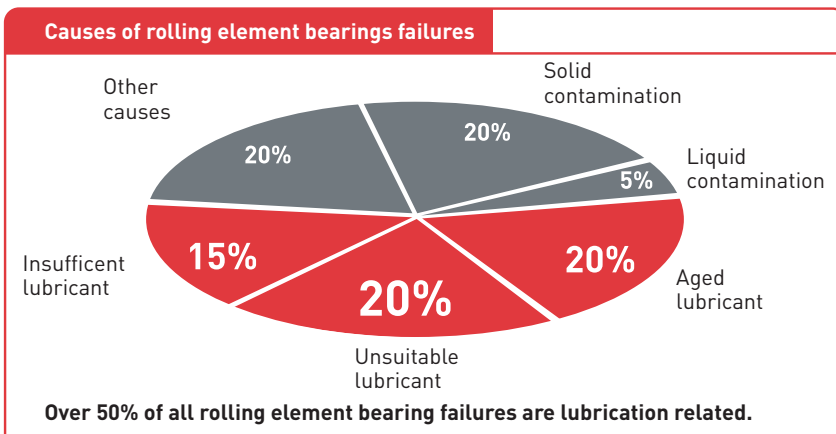
“Countries which rely on mining as a means of elevating their relative prosperity will, of necessity, suffer an even greater penalty unless the advantages of tribological knowledge are used to offset the ravages of abrasion.”

“The essence of the majority of machine breakdown is tribological; about one percent of the Gross Domestic Product of industrialised nations is lost due to abrasive wear alone.”

“The cost of wear to the Australia community represents approximately 6 percent of the Gross Domestic Product.”

Quoted from – “Tribology, A Means to Increase Profitability”

Published by The Australian Section of The American Society of Lubrication Engineers



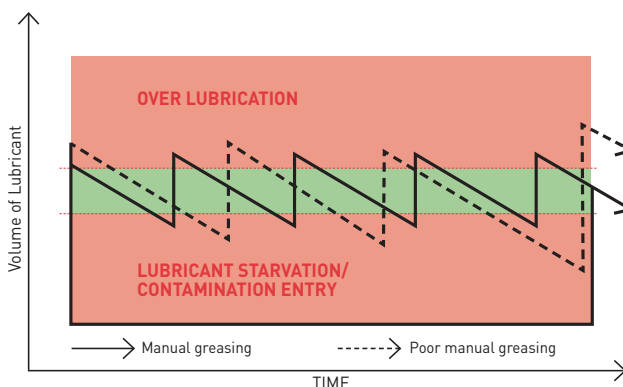
Shorter Lubrication Intervals – Longer Bearing Service Life

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 demand the shortest

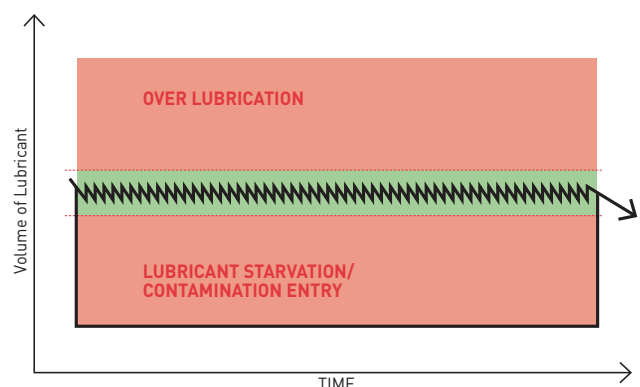
re-greasing intervals. Conditions such as high temperature, vibrations, shock loads, high loads and contaminants such as dirt and water increase the required frequency of greasing. Under conditions such as these manual greasing programs become very labour intensive and often impractical.

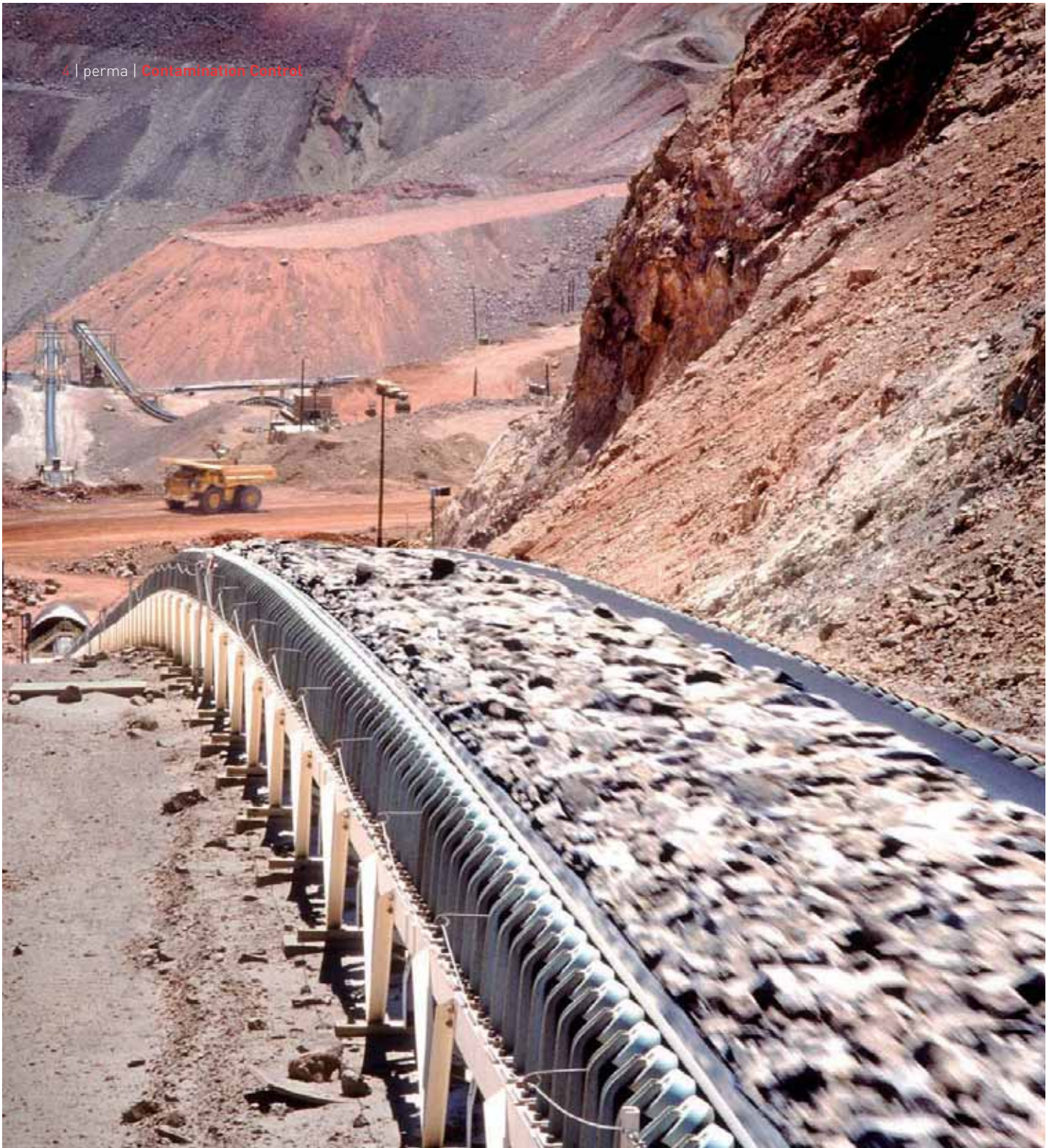
When manual greasing programs fail due to lack of control and lack of available resources the absence of fresh grease leads to lubrication starvation and contamination and then to premature bearing wear and eventually to bearing failure.

Manual Greasing



Automatic Greasing





Addressing Contamination related wear.

The contamination of bearings by water and solid particles causes accelerated wear and dramatically reduces bearing service life. Industries which involve the handling of abrasive material suffer the greatest losses as a result of inadequate contamination control procedures and systems. perma automatic lubricators provide a means to achieving a purge of clean grease through bearing seals in order to prevent the entry of water, dirt and dust, and thereby 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 financial return by means of longer bearing service lives and reduced downtime.

Different bearing configurations have different greasing requirements. The examples shown below 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. However, this is not likely to be highly effective for large bearings as the volume of grease is unlikely to be adequate.

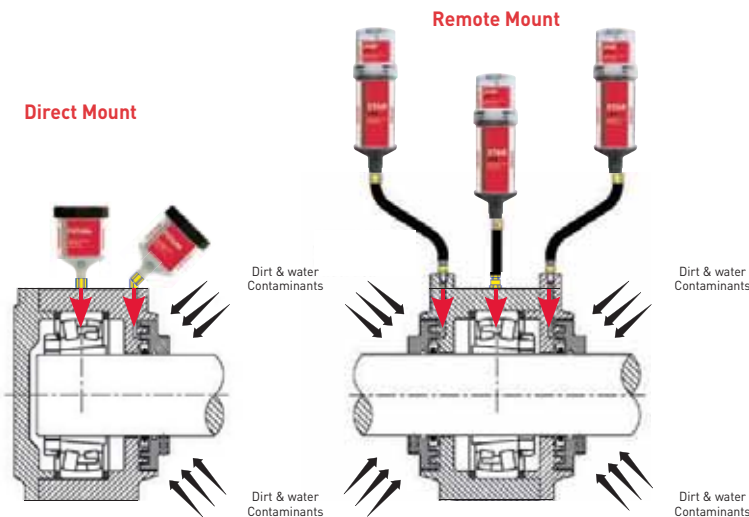
Yet another alternative is to utilise automatic lubricators for achieving constant seal purge and to continue with a manual greasing program to the bearings.



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



perma Star Vario providing a constant grease purge to the labyrinth seal of a Warman pump, thereby protecting against water ingress.



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



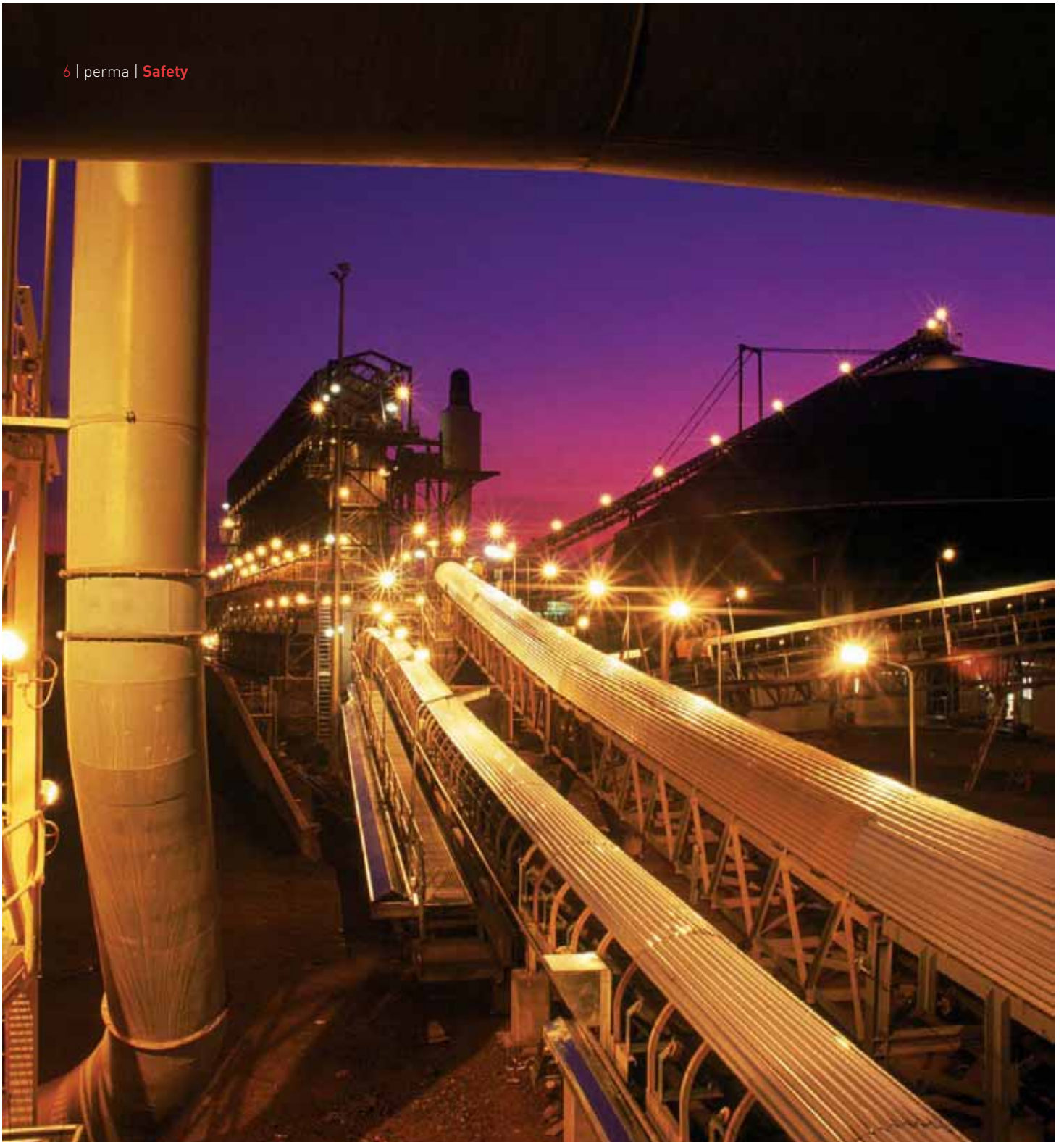
Poor manual greasing practises lead to contamination and a reduction in bearing service life. ALWAYS CLEAN FITTINGS PRIOR TO GREASING.



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



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



Safer Lubrication Practices.

Workplace safety is of ultimate importance. Reliable systems which reduce the interface between manual labour and operating equipment are a key element to reducing the likelihood of workplace accidents.

Automated systems provide a practical solution to reducing the likelihood of workplace accidents by significantly reducing the time required to lubricate equipment. Automated systems also dramatically reduce the risk of repetitive strain injuries which can develop due to the demands of intensive manual greasing programs.

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 is located on multiple levels, 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 demand.

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

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 pinch points, at a safe to reach point of access.

Safer Greasing – Example

Comparing manual greasing programs to automated programs provides an estimate of the reduction in exposure to the safety hazards associated with manual greasing such as slips, trips and repetitive strain injuries. Comparisons 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

- The need to carry heavy greasing equipment and large containers of grease around site is vastly reduced.
- Lubricant spills are less likely and physical contact with greases and oils is reduced.

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 Star Vario lubricator remote mounted to a conveyor pulley bearing using a K1CH installation kit. Access is safe and the safety cages can still be easily removed if required during maintenance shuts.



perma Classic remote mounted to the outside of a conveyor safety cage in the quarrying industry, providing safe access for lubricator inspections and servicing.



perma Star Vario lubricators remote mounted using a K365C2M installation kit. This kit facilitates the relocation of all (5) grease points for the pump to a safe to access location. The top of this pump barrel is at head height.







CLASSIC

Simple, reliable – the World's most robust single point automatic lubricator

perma CLASSIC delivers predictable and consistent lubrication. The operating principle relies upon an electrochemical reaction. perma CLASSIC is fully dust and water proof and can withstand impacts and accidental knocks.

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.

Activator Color	Time Period	Dispensing Rate*, cc per day
 Yellow	1 month	4 cc per day
 Green	3 months	1.4 cc per day
 Red	6 months	0.7 cc per day
 Grey	12 months	0.3 cc per day



* Grease discharge rates are temperature dependent

Product Overview

- Robust metal housing
- Flexible end-cone which can withstand impacts and knocks
- Quick start technology
- Transparent end-cone indicates when lubricator is empty
- Simple colour coded time settings
- Can be remote mounted up to 1 meter from the lubrication point
- Fully dust and water proof; operates in any orientation
- No electrical components or batteries
- For the lubrication of a single point only
- For greases up to NLGI 2 and oils
- Comprehensive range of mounting systems and accessories to ensure fast, robust and practical installations

Summary of Benefits

- Controlled supply of fresh grease provides maximum bearing service life
- Continual purge of fresh grease to labyrinth and taconite seals protects against contaminant ingress
- Color coded time settings provide for easy recognition and simple management
- Less labour intensive when compared to manual greasing, thereby improving productivity and safety performance
- Equipment is lubricated while it is running without the need for shutdown and isolation
- Remote mounting options provide safe and efficient access for servicing



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 (incorporating quick start technology)
Lubricant volume	120cc
Ambient temperature	0 to +40°C
Pressure build-up	Max. 4 bar / 58 psi
Remote installations	1 meter of 3/8" ID line (grease)

More information:

- Installation kits page 24
- Remote installations page 33
- perma SELECT for application rate calculations page 36







FUTURA

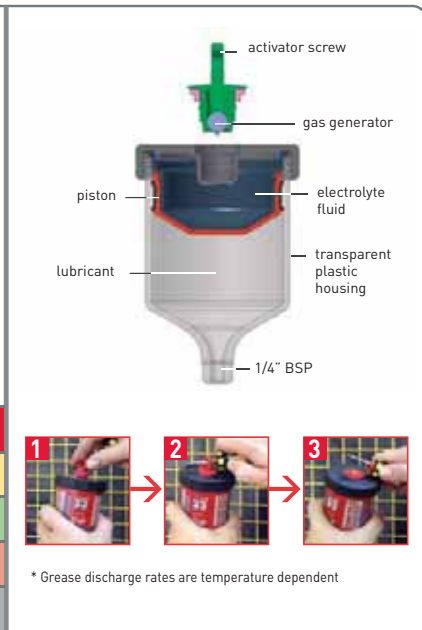
Ideally suited to corrosive, high humidity and high contamination environments.

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.

Activator Color	Time Period	Dispensing Rate*, cc per day
 Yellow	1 month	3.3 cc per day
 Green	3 months	1.1 cc per day
 Red	6 months	0.6 cc per day
 Grey	12 months	0.3 cc per day



Product Overview

- For the lubrication of a single point only
- For greases up to NLGI 2 and oils
- Corrosion resistant, UV stable transparent plastic housing to provide a clearly visible piston position
- Quick start technology
- 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
- Comprehensive range of mounting systems and accessories to ensure fast, robust and practical installations

Summary of Benefits

- Improved safety compared to manual lubrication
- Controlled and consistent lubrication delivering a gradual purge of lubricant
- Extended bearing service life
- Constant purge of 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
- Less labour intensive when compared to manual greasing, thereby improving productivity and safety performance



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 (incorporating quick start technology)
Lubricant volume	100cc
Ambient temperature	0 to +40°C
Pressure build-up	Max. 4 bar / 58 psi
Remote installations	1 meter of 3/8" ID line (grease)

More information:






- Installation kits page 24
- Remote installations page 33
- perma SELECT for application rate calculations page 36



STAR VARIO

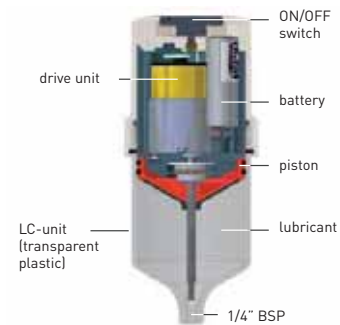
Precise grease delivery with LED alert system.

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 8.3cc 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 re-usable electro-mechanical drive unit and single-use lubricant cartridge. 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 months	6 months	12 months
"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

- Variable dispensing rates from 0.17cc per day to 8.3 cc per day
- Dispensing rates are effected by ambient temperature
- Can be remote mounted up to 3 meters from the lubrication point
- Extensive range of stainless steel mounting systems available
- Green and red LED system to indicate lubricator operational status (refer to table on opposite page)
- Transparent grease cartridge for easy piston position inspection
- For the lubrication of a single point only
- For greases up to NLGI 2 and oils
- Comprehensive range of mounting systems and accessories to ensure fast, robust and practical installations

Summary of Benefits

- Frequent injection of small volumes of grease provides maximum bearing service life
- Continual supply of fresh grease to labyrinth and taconite seals to protect against contaminant ingress
- Remote mounting options provide safe and efficient access for servicing
- Less labour intensive when compared to manual greasing, thereby improving productivity and safety performance
- Equipment is lubricated while it is running without the need for shutdown and isolation
- LED alert system supports proactive lubricator management programs (see opposite page for detail)



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 meters of 3/8" ID line (grease)

More information:

- Installation kits pages 20 - 23
- Remote installations page 33
- perma SELECT for application rate calculations page 36

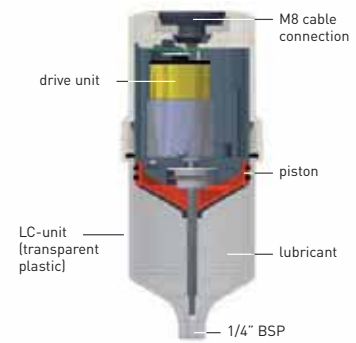


STAR CONTROL TIME and STAR CONTROL IMPULSE PLC / Machine Controlled Lubricators.

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 and for critical equipment which has low utilisation.

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 such that 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 only
- 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 meters 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 meters of 3/8" ID line (grease)

More information:

→ perma SELECT for application rate calculations page 36



PRO500, PRO-MP2 & PRO-MP6

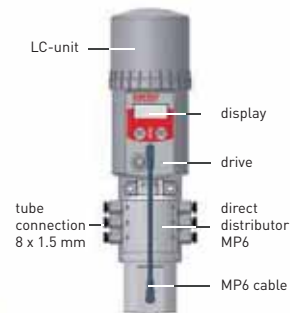
High pressure, stand-alone lubrication systems for up to 6 points

The perma PRO family of battery powered systems includes three options. Each product in the range is programmable for grease dispensing in days, weeks or months, up to a maximum dispensing period of 1 year.

- | | |
|---------|---|
| PRO500 | Single point lubricator containing 500cc of grease |
| PRO-MP2 | Two point lubricator utilising a mechanical splitter system |
| PRO-MP6 | Six point lubricator utilising a rotary distributor system |

PRO-MP6 – Electro-mechanical, temperature independent, high pressure, multi-pointx

perma PRO-MP6 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-MP6 guarantees exact lubricant doses even over longer periods. It is compact and simple to operate.



Discharge formula PRO-MP6: 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: $500 \times 14 \div 30 \div 10 \div 4 = 5.83$ 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 MP6 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 PRODUCT FAMILY
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 meter of 10mm ID line
Cabinet	For outdoor and high contamination areas



More information:

→ perma SELECT for application rate calculations page 36



PRO CONTROL MP6

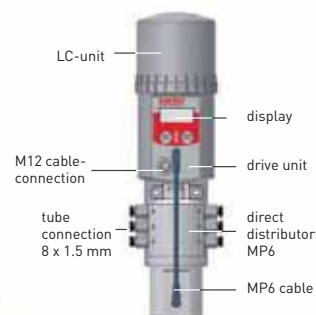
The PLC controlled multi-point lubricator for up to 6 points

perma PRO CONTROL MP6 is a machine controlled lubrication system with a grease cartridge volume of 500cc. The grease dispensing is determined by the machines control and associated inputs. perma PRO CONTROL MP6 can individually supply up to 6 lubrication points. Negligible pressure is lost within the rotary distribution system of the MP6 system. perma PRO CONTROL can also be used as a single-point lubrication system without the MP6 distributor.

PRO CONTROL MP6 – 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 CONTROL with distributor MP6 can lubricate up to 6 points. High pressure build-up provides flexibility for remote installations.



Discharge formula PRO CONTROL MP6: Volume of lubricant cartridge ÷ 7.2 ÷ Lubricant amount per 100 operating hours ÷ Number of lubrication points = Setting of PRO CONTROL MP6 in months

Example: lubricant amount: 10cc per 100 operating hours; number of lubrication points: 4; Cartridge size: 500cc

Calculation of setting: $500 \div 7.2 \div 10 \div 4 = 1.74$ 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 MP6 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 meter of 6mm ID line
Cabinet	For outdoor and high contamination areas
Power source	PLC 12 - 30 V DC

More information:

→ perma SELECT for application rate calculations page 36



MOUNTING SYSTEMS

For robust installations which provide for safe and efficient servicing.

- ✔ Safe Access
- ✔ Efficient Servicing
- ✔ Robust Installations

Good installation practices are essential to the implementation of lubrication programs which will stand the test of time. Care taken to get it right during implementation will ensure long-term lubricator reliability and sets the foundation for a robust maintenance solution.

→ MOUNTING SYSTEMS – for perma STAR VARIO

Perma supplies a comprehensive range of brackets to enable simple and robust installations. The brackets are made from stainless steel and are attached to beam sections, square cage mesh or horizontal rails using simple hand tools.

The brackets are available in a range of configurations:

Available Configuration	Description of Configuration
Individual parts	Individual brackets and attachment options.
MOUNTS	Pre-assembled mounts which include brackets, attachment option, support flanges, manual purge kits and covers.
KITS	Installation kits including brackets, attachment option, support flanges, manual purge kits, covers, elbows, reducers, grease line and fittings.

There are four methods of attachment. The three most common are 30mm beam clamps, 65mm beam clamps and cage hooks. Some brackets are designed for rail attachment using U-bolts.



BC30 30mm beam clamp



BC65 65mm beam clamp



CH-ARMS Cage hook arm pair

Part numbers for KITS and MOUNTS are explained below. The first 4 digits indicate the part type, the number of lubricators held by the bracket and the type of attachment option. Additional suffixes are used to indicate design variations.

1st Four Digits of Part Numbers

Digit Reference	Meaning
1st digit	Denotes part type; M = Mount, K = Kit
2nd digit	Denotes the number of lubricator points
3rd and 4th digits	Denotes the attachment type; 30 = 30mm beam clamps, 65 = 65mm beam clamps, CH = cage hangers, RR = round rail U-bolts

Suffixes of Part Numbers

Suffix (in order of use)	Meaning of Suffix
2M	Bracket includes 2 manual grease points
3M	Bracket includes 3 manual grease points
C	Bracket is heavy duty C-Section design
J	Bracket points joined by manifold
VA	Point for VA data cable included
S	Stainless reducers to 1/4 SAE included
NC	Heavy duty grease nipple cover included

→ MOUNTING SYSTEMS – Customised fabrication

Examples of special purpose brackets are shown below. Perma can custom design and fabricate brackets to meet site specific requirements.

Manifold Designs

For applications where higher grease rates are required or when the rationalisation of lubricator time settings is important.



Manual Grease Points

For applications where a combination of automated and manual greasing is required.



VA Data Collection Points

For applications where remote mounting of vibration analysis data collection points is also a requirement



Perma Star Vario lubricators greasing the labyrinth seals of a large, reverse-overhead, slurry pump. The lubricators are installed using a K2652MC installation kit which provides two points for manual greasing of the bearing points.

→ MOUNTING SYSTEMS – Standard Duty Brackets for perma STAR VARIO

The range of STANDARD DUTY brackets includes 1, 2, 3 and 4 point versions. Brackets in this range are installed using beam clamps.



Bracket Part #	MB01A620P
Attachment Options	BC30 or BC65
Relevant Mount Part #'s	M130, M165
Relevant Kit Part #'s	K130, K165



Bracket Part #	MB02A620P
Attachment Options	BC30 or BC65
Relevant Mount Part #'s	M230, M265
Relevant Kit Part #'s	K230, K265



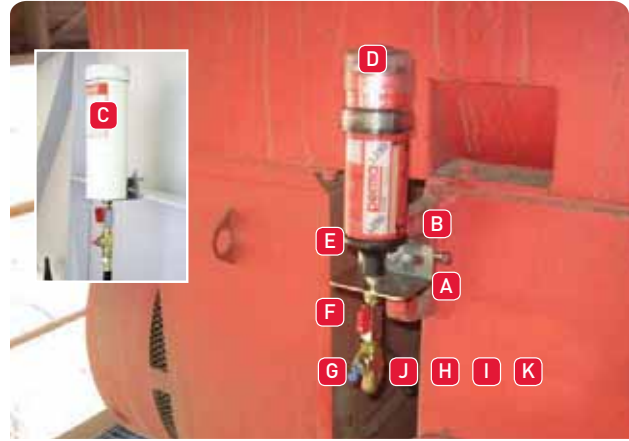
Bracket Part #	MB03A620P
Attachment Options	BC30 or BC65
Relevant Mount Part #'s	M330, M365
Relevant Kit Part #'s	K330, K365



Bracket Part #	MB04A620P
Attachment Options	BC30 or BC65
Relevant Mount Part #'s	M430, M465
Relevant Kit Part #'s	K430, K465

Kit Example.

Kit Part #	Description
K130	Kit 1 point with standard duty bracket and 30mm beam clamps



A	1 x 1 point standard duty bracket	G	1 x 90 degree elbow
B	1 x 30mm S/S beam clamp	H	1 x 1/4" BSPF-1/8" BSPM reducer
C	1 x PVC lubricator cover	I	1 x 1/4" BSPF -1/4" BSPM ext.
D	1 x Soft wet cap	J	2m of 3/8" ID grease line
E	1 x Lubricator support flange	K	2 x Female swivel hose ends
F	1 x Manual purge kit		

→ MOUNTING SYSTEMS – Heavy Duty Brackets for perma Star Vario

The range of HEAVY DUTY brackets includes 1, 2, 3 and 4 point versions. Brackets in this range are installed using beam clamps or cage hanger arms.

HEAVY DUTY brackets are a C-Section configuration designed for high contamination or heavy wash-down areas.



Bracket Part #	MB01 C-Section
Attachment Options	BC30 or BC65
Relevant Mount Part #'s	M130C, M165C
Relevant Kit Part #'s	K130C, K165C



Bracket Part #	MB02 C-Section
Attachment Options	BC30, BC65 or CH-ARMS
Relevant Mount Part #'s	M230C, M265C
Relevant Kit Part #'s	K230C, K265C



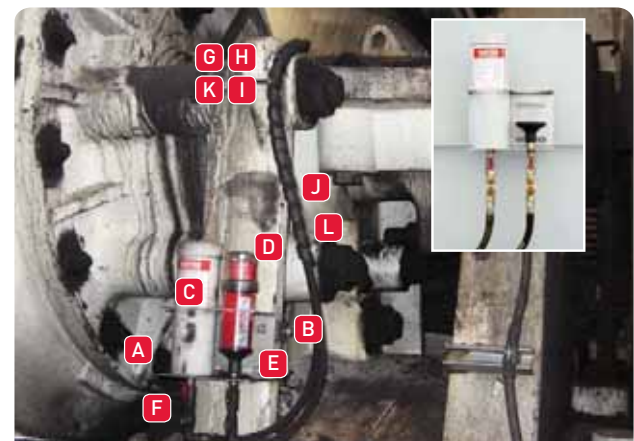
Bracket Part #	MB03 C-Section
Attachment Options	BC30, BC65 or CH-ARMS
Relevant Mount Part #'s	M330C, M365C
Relevant Kit Part #'s	K330C, K365C



Bracket Part #	MB04 C-Section
Attachment Options	BC30, BC65 or CH-ARMS
Relevant Mount Part #'s	M430C, M465C
Relevant Kit Part #'s	K430C, K465C

Kit Example.

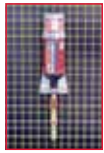
Kit Part #	Description
K230C	Kit 2 points with C-Section bracket, manual purge kits, covers, 30mm beam clamps, elbows, reducers, hose ends, grease line and spiral wrap



A	1 x 2 point C-Section bracket	G	4 x 90 degree elbows
B	2 x 30mm S/S beam clamps	H	2 x 1/4" BSPF-1/8" BSPM reducers
C	2 x PVC lubricator covers	I	2 x 1/4" BSPF -1/4" BSPM exts.
D	2 x Soft wet caps	J	4m of 3/8" ID grease line
E	2 x Lubricator support flanges	K	4 x Female swivel hose ends
F	2 x Manual purge kits	L	0.5m of Spiral wrap

→ MOUNTING SYSTEMS – Cage Hanging Brackets for perma Star Vario

The range of CAGE brackets includes 1, 2, 3 and 4 point versions. All brackets are suited to square mesh down to 25mm x 25mm.



Bracket Part #	CH01A620P
Attachment Options	None required (part of bracket)
Relevant Mount Part #'s	M1CH
Relevant Kit Part #'s	K1CH



Bracket Part #	CH02A620P
Attachment Options	None required (part of bracket)
Relevant Mount Part #'s	M2CH
Relevant Kit Part #'s	K2CH



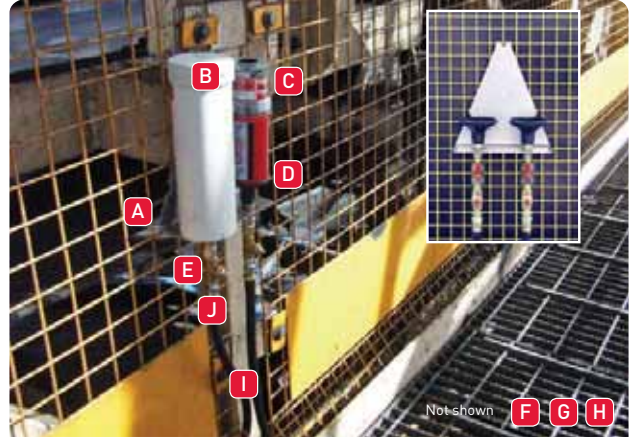
Bracket Part #	CH03A620P
Attachment Options	None required (part of bracket)
Relevant Mount Part #'s	M3CH
Relevant Kit Part #'s	K3CH



Bracket Part #	CH04A620P
Attachment Options	None required (part of bracket)
Relevant Mount Part #'s	M4CH
Relevant Kit Part #'s	K4CH

Kit Example.

Kit Part #	Description
K2CH	Kit 2 points with cage hanger bracket, manual purge kits, covers, elbows, reducers, hose ends, grease line and spiral wrap



A	1 x 2 point Cage bracket	F	2 x 90 degree elbows
B	2 x PVC lubricator covers	G	2 x 1/4" BSPF-1/8" BSPM reducers
C	2 x Soft wet caps	H	2 x 1/4" BSPF -1/4" BSPM exts.
D	2 x Lubricator support flanges	I	4m of 3/8" ID grease line
E	2 x Manual purge kits	J	4 x Female swivel hose ends

→ MOUNTING SYSTEMS – Rail Mount Brackets for perma Star Vario

The range of Rail brackets includes 1, 2, 3 and 4 point versions. All rail mount brackets are suited to round rails ranging from 30mm to 50mm outer diameter.



Bracket Part #	MB01RRA620P
Attachment Options	U-bolts* (included with bracket)
Relevant Mount Part #'s	M1RR
Relevant Kit Part #'s	K1RR



Bracket Part #	MB02RRA620P
Attachment Options	U-bolts* (included with bracket)
Relevant Mount Part #'s	M2RR
Relevant Kit Part #'s	K2RR



Bracket Part #	MB03RRA620P
Attachment Options	U-bolts* (included with bracket)
Relevant Mount Part #'s	M3RR
Relevant Kit Part #'s	K3RR



Bracket Part #	MB04RRA620P
Attachment Options	U-bolts* (included with bracket)
Relevant Mount Part #'s	M4RR
Relevant Kit Part #'s	K4RR

Kit Example.

Kit Part #	Description
K2RR	Kit 2 points with Rail Mount bracket, manual purge kits, covers, U-bolts, elbows, reducers, hose ends, grease line and spiral wrap



A	1 x 2 point Rail Mount bracket	G	4 x 90 degree elbows
B	4 x 30mm U-bolts	H	2 x 1/4" BSPF-1/8" BSPM reducers
C	2 x PVC lubricator covers	I	2 x 1/4" BSPF -1/4" BSPM exts.
D	2 x Soft wet caps	J	4m of 3/8" ID grease line
E	2 x Lubricator support flanges	K	4 x Female swivel hose ends
F	2 x Manual purge kits	L	0.5m of Spiral wrap

*U-bolts suited to rails up to 50mm outer diameter are included.

→ MOUNTING SYSTEMS – for Single perma Classic and perma Futura

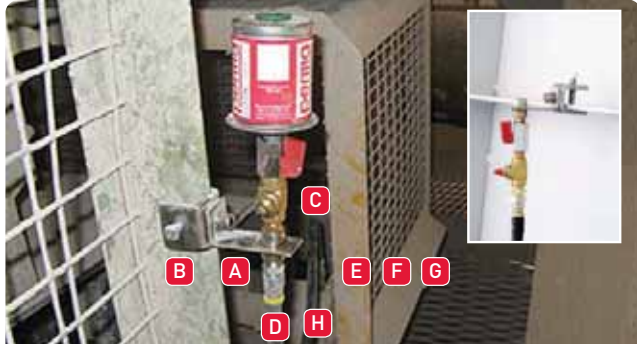
For the installation of Perma Classic and Futura lubricators compact beam mount and cage mount brackets are available.

These compact brackets are fabricated from stainless steel and are also available in a range of pre-assembled kits.

Part Number	Description
MB01SBC30	Bracket SS compact 1 point with 30mm beam clamp
K130S50	Kit SS 1 point BC30 0.5m hose with fittings
K130S75	Kit SS 1 point BC30 0.75m hose with fittings
K130S100	Kit SS 1 point BC30 1.0m hose with fittings

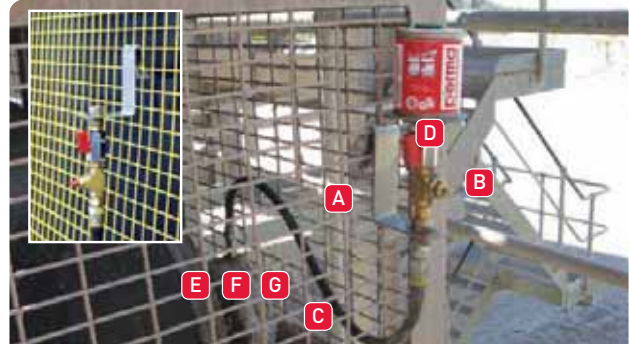
Part Number	Description
CH01S	Bracket SS compact 1 point cage mount
K1CHS50	Kit SS 1 point cage 0.5m hose with fittings
K1CHS75	Kit SS 1 point cage 0.75m hose with fittings
K1CHS100	Kit SS 1 point cage 1.0m hose with fittings

Example of Kit Assembly – K1CHS75



A	1 x 1 point compact beam bracket	E	1 x 90 degree elbow
B	1 x 30mm S/S beam clamp	F	1 x 1/4" BSPF-1/8" BSPM reducer
C	1 x Manual purge kit	G	1 x 1/4" BSPF -1/4" BSPM extension
D	2 x Female swivel hose ends	H	0.5m of 3/8" ID grease line

Example of Kit Assembly – K1CHS75



A	1 x 1 point compact cage bracket	E	1 x 90 degree elbow
B	1 x Manual purge kit	F	1 x 1/4" BSPF-1/8" BSPM reducer
C	0.75m of 3/8" ID grease line	G	1 x 1/4" BSPF -1/4" BSPM extension
D	2 x Female swivel hose ends		

→ MOUNTING SYSTEMS – for Multiple perma Classic and perma Futura

The range of STANDARD DUTY brackets includes 1, 2, 3 and 4 point versions. Brackets in this range are installed using beam clamps.

The range of CAGE brackets includes 1, 2, 3 and 4 point versions. Suited to square mesh down to 25mm x 25mm.

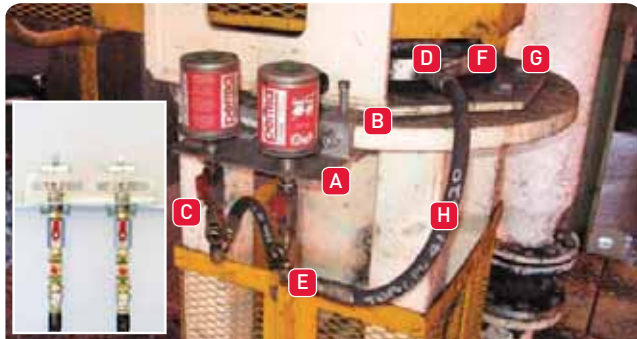
Points	Bracket Part No.	Kit with BC30*	Kit with BC65**
2 points	MB02	K230G	K265G
3 points	MB03	K330G	K365G
4 points	MB04	K430G	K465G

*BC30 = 30mm beam clamp

**BC65 = 65mm beam clamp

Points	Bracket Part No.	Kit Versions
2 points	CH02	K2CHG
3 points	CH03	K3CHG
4 points	CH04	K4CHG

Example of Kit Assembly – K230G



A	1 x 2 point standard duty bracket	E	2 x 90 degree elbows
B	2 x 30mm S/S beam clamps	F	2 x 1/4" BSPF-1/8" BSPM reducers
C	2 x Manual purge kits	G	2 x 1/4" BSPF -1/4" BSPM extensions
D	4 x Female swivel hose ends	H	2m of 3/8" ID grease line

Example of Kit Assembly – K2CHG



A	1 x 2 point cage bracket	E	2 x 90 degree elbows
B	2m of 3/8" ID grease line	F	2 x 1/4" BSPF-1/8" BSPM reducers
C	2 x Manual purge kits	G	2 x 1/4" BSPF -1/4" BSPM extensions
D	4 x Female swivel hose ends		

→ ACCESSORIES – Adaptors, Elbows, Extensions & General

Perma Classic, Futura and Star lubricators have a 1/4 " BSP male nozzle at the grease outlet. Where reducers, elbows or extension are required to facilitate installation it is important to adhere to the following guidelines:

- When using reducing adaptors down to fine threads such as 6mm metric, 1/4 " SAE or 1/4 " UNF select stainless steel to avoid breakage.
- Minimise the number of elbow fittings and always select full bore elbows.



General Accessories	Part #	Description
 2461/8 – reducer 1/4" BSP to 1/8" BSP	2461/8	1/4 " BSPF – 1/8 " BSPM Brass Straight Adaptor
 2461/4SAESS – reducer 1/4" BSP to 1/4" SAE	2461/8SAESS	1/8 " BSPF – 1/4 " SAEM Stainless Steel Straight Adaptor
 1211/4 – 45° elbow 1/4" BSP to 1/4" BSP	2461/4	1/4 " BSPF – 1/4 " BSPM Brass Straight Adaptor
 92 – 90° elbow 1/4" BSP to 1/4" BSP	2461/4SAE	1/4 " BSPF – 1/4 " SAEM Brass Straight Adaptor
 52740YL	2461/4SAESS	1/4 " BSPF – 1/4 " SAEM Stainless Steel Straight Adaptor
 52740GR	2463/8	1/4 " BSPF – 3/8 " BSPM Brass Straight Adaptor
 52740RD	2461/2	1/4 " BSPF – 1/2 " BSPM Brass Straight Adaptor
 52740 – 40mm riser 1/4" BSP to 1/4" BSP	2466SS	1/4 " BSPF – 6mm M Stainless Steel Straight Adaptor
 A620P – support flange 1/4" BSP	2468	1/4 " BSPF – 8mm M Brass Straight Adaptor
 708V – manual purge kit 1/4" BSP	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
	52740YL	40mm long 1/4 " BSP Brass Extension Tube Yellow
	52740GR	40mm long 1/4 " BSP Brass Extension Tube Green
	52740RD	40mm long 1/4 " BSP Brass Extension Tube Red
	52740GY	40mm long 1/4 " BSP Brass Extension Tube Grey
	708V	Manual greasing kit 1/4 " BSP
	708VYW	Manual greasing kit 1/4 " BSP yellow nipple cover
	708VWH	Manual greasing kit 1/4 " BSP with white nipple cover
	708VBL	Manual greasing kit 1/4 " BSP with blue nipple cover
	708V-T52	Manual greasing kit 1/4 " BSP with button head nipple
	A620P	Support flange 1/4 " BSP (suits Star & Futura)

→ ACCESSORIES – Pre-Assemble & Pre-Filled Lubricator Grease Lines

Pre-assembled, pre-filled grease lines are supplied ready to use. They save time, ensure against the accidental inclusion of contaminants when making grease lines on site and remove the need for laborious manual filling. The range of grease lines from perma come in pre-set lengths.



- 3/8" internal diameter with single, synthetic fibre braid.
- Full bore female swivel, push-lock fittings at each end of hose for convenient fitting with adaptors to 1/4" BSP male for simple connection to brackets and grease point
- Minimum burst pressure = 84 bar
- Complies with FRAS AS2660
- Minimum bend radius 76mm

Line Length	0.5m	0.75m	1.0m	1.5m	2.0m	2.5m	3.0m
Generic Part #	PSFXXX90HD0.5	PSFXXX90HD.75	PSFXXX90HD1.0	PSFXXX90HD1.5	PSFXXX90HD2.0	PSFXXX90HD2.5	PSFXXX90HD3.0

The table above provides generic part numbers for different length hose assemblies. The first 6 digits of each part number identifies the grease type. To match the correct part number to the preferred grease type replace the first 6 digits of the generic part numbers by the relevant code from the table below.

For example, a pre-assembled grease line with a length of 1.5 meters which is filled with Shell Stamina RL2 grease:

→ Generic part number for 1.5 meter line is PSFXXX90HD1.5

→ 6 digit reference code for Shell Stamina RL2 grease is PSF811

→ Hence, part number for required line is PSF81190HD1.5

Grease Type	Code	Grease Type	Code	Grease Type	Code	Grease Type	Code
BP LC2	PSF826	Castrol EPL2	PSF857	Mobil Polyrex EM	PSF941	Shell Albida HDX2	PSF866
BP LC2-T	PSF915	Fuchs Renolit LX2	PSF917	Mobil XHP222	PSF237	Shell Alvania RL2	PSF019
Caltex Liplax EP2	PSF879	Mobil Mobilith SHC100	PSF865	Mobilux EP2	PSF029	Shell Stamina EP2	PSF845
Castrol APX-T	PSF815	Mobil Mobilith SHC220	PSF813	Shell Albida EP2	PSF830	Shell Stamina RL2	PSF811

→ ACCESSORIES – Pre-Assemble & Pre-Filled Manual Grease Lines

Pre-assembled, pre-filled high pressure lines for manual greasing are included in the perma range. 3/8" internal diameter lines are user friendly for manual greasing and provide the opportunity to switch from manual to automatic greasing without the need to upsize from smaller, restrictive lines.



The general specification for the range of manual grease lines is:

- 3/8" internal diameter with two wire braid.
- Full bore female swivel fittings at each end of hose for convenient fitting with adaptors to 1/4" BSP male for simple connection to grease manifolds and grease points
- Maximum operating pressure 5000psi
- Complies with FRAS AS2660
- Minimum bend radius 60mm

Line Length	0.5m	0.75m	1.0m	1.5m	2.0m	2.5m	3.0m
Generic Part #	PSFXXX90GH0.5	PSFXXX90GH.75	PSFXXX90GH1.0	PSFXXX90GH1.5	PSFXXX90GH2.0	PSFXXX90GH2.5	PSFXXX90GH3.0

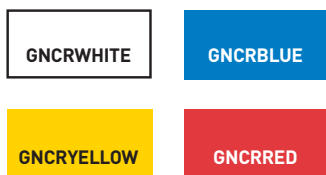
→ ACCESSORIES – Grease Nipple Risers & Cover Combinations

One of the challenges to manual greasing is the exclusion of contaminants. The use of perma riser and grease nipple cover combinations provides a range of advantages:

- Prevents the introduction of contaminants
- Removes the need to clean grease nipples prior to greasing
- Enlarged cover design allows easy manipulation
- Color coding available for color matching to site grease type
- Ideally suited to small electric motors which are too small for the installation of automatic lubricators.
- Ideally suited to grease points on slurry pumps to which automatic lubricators have not been installed.

The combination grease nipple risers and covers are adaptable to different thread sizes and grease nipple types featuring:

- Color options for nipple cover
- Large nipple cover with o-ring seal
- 25mm stainless steel riser
- Adaptable to different thread sizes
- Stainless steel lanyard



Grease nipple cover colour range.

*The sample shown is for a 1/4" BSP greasing port and has a button head type nipple.

→ ACCESSORIES – for Chain Lubrication Using Oil

There are two key elements of a chain which require lubrication:

→ Pins and bushes

→ Rollers and sprockets

In addition to this corrosion protection is important and it is also beneficial to minimise the likelihood of solid contaminants sticking to the chain.

Pin and Bush Lubrication

Roller chain articulates as it is driven around drive and tail sprockets. This articulation creates friction between the pins and bushes which causes wear.

As wear progresses chains elongate. To successfully lubricate the pin and bush combination it is necessary for lubricant to reach these elements. This is most likely to be achieved using a chain lubricant rather than grease. Grease lubrication presents the risk of only coating the outside of chain surfaces and not reaching these important areas of contact between the pins and bushes.

Roller and Sprocket Lubrication

Roller and sprocket lubrication requires lubricant to be present between the chain rollers and the drive / tail sprockets.

This lubrication can be reasonably well achieved using grease. However, greased chains are more likely to suffer from contamination build-up. Consequently, for roller lubrication the use of a dedicated fluid chain lubricant is preferred.

It is recommended that all installations of oil filled perma Lubricators for the purpose of chain lubrication be installed using a check-valve (part # A810) to prevent the chain oil from draining out of the lubricator prematurely. Where practical the check-valve should be installed at the end of remote oil delivery lines.

Chain Lubrication Accessories		Part #	Description
		A400	Brush 20cm round 1/4 " BSP for oil
		A410*	Brush 3 x 4cm rectangular 1/4 " BSP for oil
		A411*	Brush 3 x 6cm rectangular 1/4 " BSP for oil
		A412*	Brush 3 x 10cm rectangular 1/4 " BSP for oil
		A810	Throttle one-way valve 1/4 " BSP for oil
		A100	Metal bracket standard duty
		A105	Plastic bracket with two position quick clip
		A150	T-piece bracket with 1/4 " BSP insert
		8615	Tube assembly complete flexible reinforced nylon 15cm
		8630	Tube assembly complete flexible reinforced nylon 30cm
		8645	Tube assembly complete flexible reinforced nylon 45cm
		8660	Tube assembly complete flexible reinforced nylon 60cm
		8690	Tube assembly complete flexible reinforced nylon 90cm
		86150	Tube assembly flexible reinforced nylon 150cm
		90	Reinforced nylon hose 3/8" internal diameter (per meter)
		87	Male barbed brass fitting for type 90 nylon hose
		88	Female barbed brass fitting for type 90 nylon hose
		OTK CLIP	OTK Clip 13 – 15mm for type 90 nylon hose assembly
			

* Rectangular brushes (A 410, A411 and A412) have internal galleries for oil distribution



Quality Installations – the key to robust lubricator programs

To get maximum value out of perma Lubricator Maintenance Programs it essential to first select the correct accessories and mounting systems. The following section provides examples of good installation practices on equipment such as electric motors, pumps and conveyor pulley bearings. For more information on a particular installation example contact perma and quote the example reference number.

Installation examples – pumps

Determining factors for pump lubrication system selection:

- Manufacturer’s lubrication guidelines
- Site specific conditions, especially contamination levels
- Bearing service life history
- Desired maintenance service schedule
- Safe access requirements (service while running)
- Pump speed
- Points to be lubricated (bearings or seals or both)
- Lubricant type
- Pump duty cycle



Equipment: Warman pump perma Classic Direct
Lubricator: perma Classic Direct
Bracket: Direct
Ref #: PUMP01



Equipment: Warman pump perma Futura Direct
Lubricator: perma Futura Direct
Bracket: Direct
Ref #: PUMP02



Equipment: Metso sump pump perma Classic MB02 with BC30
Lubricator: perma Classic MB02 with BC30
Bracket: K230G
Install Kit: K230G
Ref #: PUMP03



Equipment: Warman pump perma Futura MB02 with BC30
Lubricator: perma Futura MB02 with BC30
Bracket: K230G
Install Kit: K230G
Ref #: PUMP04



Equipment: Warman sump pump perma Futura Direct
Lubricator: perma Futura Direct
Bracket: Direct
Ref #: PUMP05



Equipment: Warman sump pump perma Star Vario MB03-C with BC30
Lubricator: perma Star Vario MB03-C with BC30
Bracket: K330C
Install Kit: K330C
Ref #: PUMP06



Equipment: Pump perma Star Vario Direct
Lubricator: perma Star Vario Direct
Bracket: Direct
Ref #: PUMP07



Equipment: Warman pump perma Star Vario MB02-C with BC30
Lubricator: perma Star Vario MB02-C with BC30
Bracket: K230C
Install Kit: K230C
Ref #: PUMP08



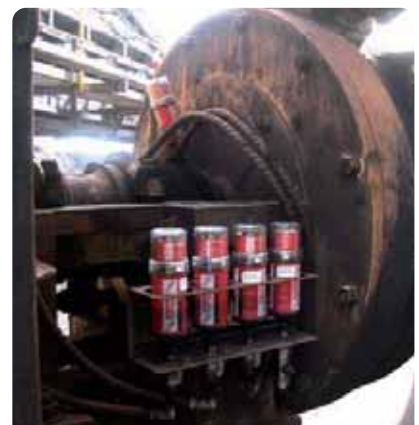
Equipment: Warman pump perma Star Vario MB02-C with BC65
Lubricator: perma Star Vario MB02-C with BC65
Bracket: K265C
Install Kit: K265C
Ref #: PUMP09



Equipment: Warman pump perma Star Vario MB02-C with BC65
Lubricator: perma Star Vario MB02-C with BC65
Bracket: K265C
Install Kit: K265C
Ref #: PUMP10



Equipment: Metso pump perma Star Vario MB02-C with BC30
Lubricator: perma Star Vario MB02-C with BC30
Bracket: K230C
Install Kit: K230C
Ref #: PUMP11



Equipment: Krebs pump perma Star Vario MB04-C with BC30
Lubricator: perma Star Vario MB04-C with BC30
Bracket: K430C
Install Kit: K430C
Ref #: PUMP12

Installation examples – conveyors

Determining factors for conveyor pulley lubrication system selection:

- Location of grease entry point on bearing housing
- Re-lubrication calculations
- Site specific conditions, especially contamination levels
- Seal types and seal grease purge requirements
- Bearing service life history
- Desired maintenance service schedule
- Grease performance characteristics
- Safe access requirements (service while running)



Lubricator: perma Futura
Bracket: Direct
Ref #: CONV01



Lubricator: perma Classic
Bracket: CH01-S
Install Kit: K1CH100
Ref #: CONV02



Lubricator: perma Futura
Bracket: CH02
Install Kit: K2CHG
Ref #: CONV03



Lubricator: perma Star Vario
Bracket: MB03 with BC30
Install Kit: K330
Ref #: CONV04



Lubricator: perma Star Vario
Bracket: CH03
Install Kit: K3CH
Ref #: CONV05



Lubricator: perma Star Vario
Bracket: CH01
Install Kit: K1CH
Ref #: CONV06



Lubricator: perma Star Vario
Bracket: Direct
Ref #: CONV07



Lubricator: perma Star Vario
Bracket: CH02
Install Kit: K2CH
Ref #: CONV08

Installation examples – electric motors

Determining factors for electric motor lubrication system selection:

- Manufacturer’s lubrication guidelines
- Site specific conditions, especially contamination levels
- Bearing service life history
- Desired maintenance service schedule
- Grease escape port / trap maintenance schedule
- Lubricant type (consideration of polyurea grease technology)
- Viscosity ratio calculations (especially for slower motors in hot environments)
- Safe access requirements (service while running)
- Duty cycle



Lubricator: perma Star Vario
Bracket: Direct
Ref #: MOTOR01



Lubricator: perma Star Vario
Bracket: Direct
Ref #: MOTOR02



Lubricator: perma Star Vario
Bracket: MB02 with BC30
Install Kit: K230
Ref #: MOTOR03



Lubricator: perma Star Vario
Bracket: MB02-R with BC65
Install Kit: K2RR (modified)
Ref #: MOTOR04



Lubricator: perma Star Vario
Bracket: MB02-C with BC30
Install Kit: K230C
Ref #: MOTOR05



Lubricator: perma Star Vario
Bracket: MB02-C with BC30
Install Kit: K230C
Ref #: MOTOR06



Lubricator: perma Star Vario
Bracket: MB01 with BC65
Install Kit: K165
Ref #: MOTOR07



Lubricator: perma Star Vario
Bracket: Direct
Ref #: MOTOR08



Lubricator: perma Star Vario
Bracket: MB02-C with BC30
Install Kit: K230C
Ref #: MOTOR09

Installation examples – fans

Determining factors for fans bearing lubrication system selection:

- Site specific conditions, especially contamination levels
- Bearing service life history
- Desired maintenance service schedule
- Lubricant type (consideration of polyurea grease technology)
- Viscosity ratio calculations (especially for slower fans in hot environments)
- Safe access requirements (service while running)



Lubricator: perma Futura
Bracket: Direct
Ref #: FAN01



Lubricator: perma Star Vario
Bracket: Direct
Ref #: FAN03



Lubricator: perma Star Vario
Bracket: MB01 with BC30
Install Kit: K130
Ref #: FAN04



Lubricator: perma Star Vario
Bracket: MB02 with BC30
Install Kit: K230
Ref #: FAN02

Installation examples – other

Examples of single point lubricator installations on equipment such as overhead cranes and draglines are shown below.



Lubricator: perma Futura
Equipment: Wire rope pins & sockets
Bracket: Direct
Ref #: OTHER01



Lubricator: perma Star Vario
Equipment: Overhead crane travel wheels
Bracket: Direct
Ref #: OTHER03



Lubricator: perma Futura
Equipment: Wire rope sheaves
Bracket: Direct
Ref #: OTHER04



Lubricator: perma Star Vario
Equipment: Crane cable reeler
Bracket: MB01 with BC30
Install Kit: K130
Ref #: OTHER02

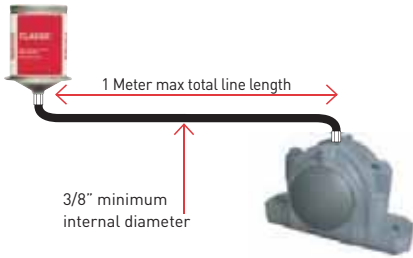
Remote Installations – CLASSIC, FUTURA & STAR

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 meter long and with an internal diameter of at least 3/8" (10mm). Smaller diameter lines increase resistance to grease flow.



Remote installed perma Classic utilising the CH01-S stainless steel bracket.



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)

Star Vario Lubricators

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





Remote installed perma Star Vario using a 2-point stainless steel bracket.





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



→ CUSTOM SOLUTIONS – Crane Wheels & Open Gears

<p>Crane Wheel Lubricator (CWL Kit)</p>		
<ul style="list-style-type: none"> → Reduces crane downtime caused by unscheduled maintenance → Reduces maintenance costs by increasing life of wheel flanges → Quick and easy installation 	<p>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 transferred from the wheel flange to the side of the rail. This reduces the wear on the wheel flange and therefore reduces maintenance costs.</p>	

<p>Open Gear Lubricator (OGL Kit)</p>		
<ul style="list-style-type: none"> → 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 	<p>The OGL-system (Open Gear Lubrication) is a solution for applying grease to slow, medium sized 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.</p>	



**Global leaders
in automatic
lubricator
Research &
Development**

perma®

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

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.

Custom Fills

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 preferred 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.

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
SF10	perma food grade grease	1/2	Mineral & Synthetic	Aluminium Complex	230	beige	-40°C (-40°F)	+120°C (+248°F)	300000
S014	perma high temperature chain oil	N/A	Synthetic Ester	N/A	320	green	-20°C (-4°F)	+250°C (+482°F)	N/A
S032	perma multipurposes oil	N/A	Mineral oil	N/A	100	brown	-10°C (+14°F)	+100°C (+212°F)	N/A

Grease Pumpability

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

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.

Temperature (grease temperature) – Grease is much easier to pump in warmer environments than cold environments. The relationship between pumpability and temperature is non-linear, so as temperature drops it is difficult to predict the point at which grease will 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. Pressure drops 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 eliminate the use of small diameter fittings wherever practical. The diameter of grease lines is critical. For automatic lubricators it is best to use grease lines which have an internal diameter of 3/8”.

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:

- MSDS and TDS
- 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 posters provides a source of quick reference to 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, service practices and basic trouble shooting.



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

Pocket Size Quick Reference Guides

For the convenient use by the users of perma lubricators a range of pocket sized quick reference guides are available.

Pocket guides are available for the perma Classic, Perma Futura, perma Star Vario and Perma Mounting Systems.

perma SELECT Lubrication Calculation Software

Introduction

perma SELECT is lubrication calculation software. 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.



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