HTL perma Australia Pty Ltd

perma Automatic Lubrication Systems

3rd Edition Catalogue

Reliable products delivering practical lubrication solutions

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

perma 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
As a wholly owned subsidiary of perma-tec GmbH & Co, HTL perma Australia Pty Ltd has 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.

Company history

1934
Formation of the metal ware factory for house and kitchen appliances 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**
USA (1995), France (1995)
Iberica (1996), Italia (1997)
UK (1998), Australia (2004)
India (2008)

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

2005
New manufacturing and warehouse building and office building expansion

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Improved reliability, reduced maintenance costs and less downtime

Lubrication systems which deliver small volumes of lubricant at short time intervals extend bearing service life and deliver a reliability advantage.

The example below provides a statistical demonstration of a single point lubricator program at work:

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

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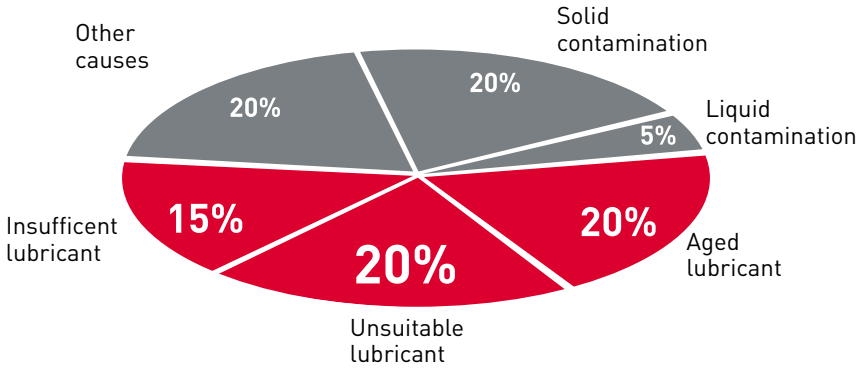
Bearing service life extension

Effective preventative maintenance programs support the implementation of automatic lubrication systems because they extend the service life of bearings and deliver superior reliability results compared to manual lubrication.

A requirement for optimal bearing service life is the reliable supply of clean lubricant. If bearings are not sufficiently lubricated, they prematurely fail, resulting in maintenance cost increases and equipment downtime. In recognition of this, industry leading businesses invest in automated systems, lubrication competency development, procedure documentation and the implementation of practical systems for contamination prevention.

As investment in preventative maintenance increases to help meet production demands, the investment in automated lubrication systems also increases. But automated systems alone do not provide an adequate solution. Quality systems must be combined with straightforward implementation methods and realistic management plans. At perma we focus on these facts to deliver high quality, sustainable lubrication programs.

Causes of rolling element bearings failures



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

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

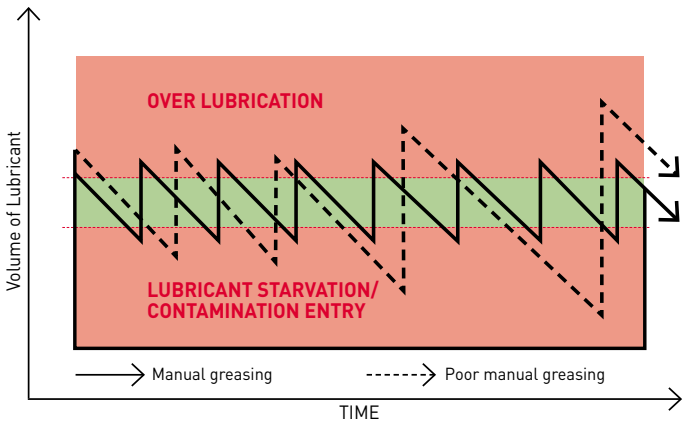
Benefits of short re-lubrication intervals

The longest bearing service life is achieved when grease is added in small amounts at short time intervals. This optimal form of lubrication is achieved using automated systems and cannot be practically achieved via manual lubrication programs.

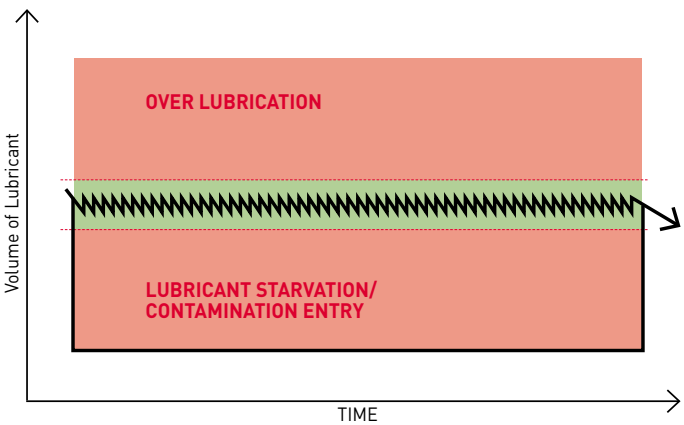
Bearings which operate in harsh environments demand the shortest re-lubrication intervals. Conditions such as high temperature, vibrations, shock loads, high loads and contaminants such as dirt and water increase the required frequency of lubrication. Under conditions such as these manual programs become very labour intensive and often impractical.

When manual lubrication programs fail to lubricate regularly due to lack of available resources the absence of fresh grease leads to lubrication starvation and contaminant entry, eventually resulting in premature 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.

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Contamination prevention for harsh operating environments

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 bearing raceways which later become sites of fatigue related wear.

Greasing practices which prevent the ingress of contaminants will provide long term financial return by means of longer bearing service lives and reduced downtime.

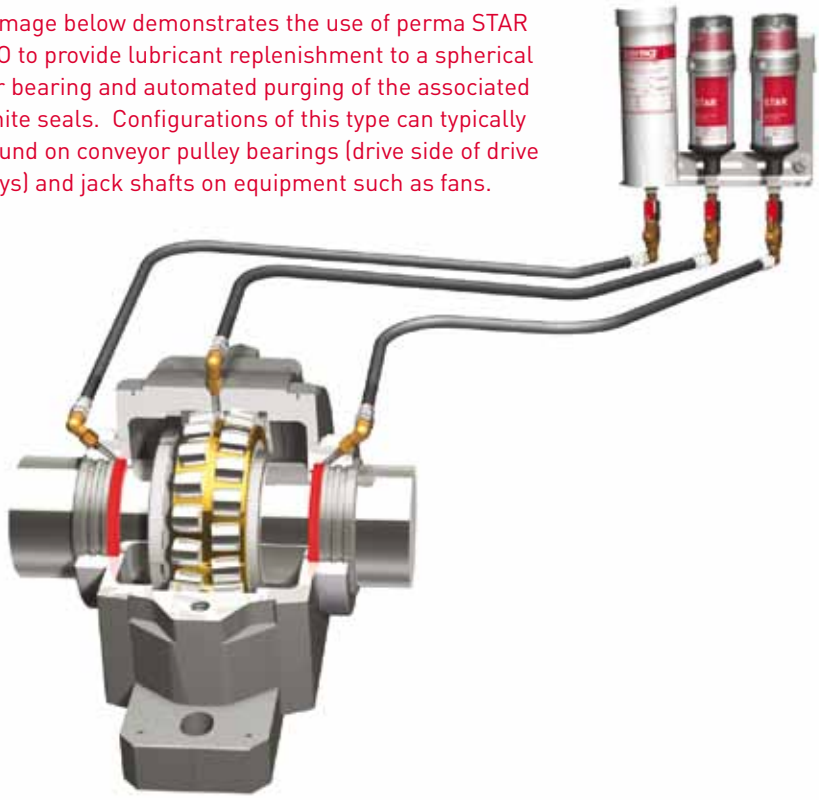
Different bearing configurations have different greasing requirements. Three of the commonly accepted methods of contamination prevention for rolling element bearings are listed below:

→ For sites where the threat of contamination entry is high it is a common strategy to apply grease directly to taconite and labyrinth seals, in addition to automatically lubricating the bearing itself.

→ For modest sized bearings running at relatively low speeds it is sometimes practical to apply an elevated lubrication rate to the bearing grease point only in order to fulfill the requirements of the bearing and the seal.

→ Yet another strategy is to automatically lubricate seal purge points in combination with a manual lubrication program for bearing lubrication points.

The image below demonstrates the use of perma STAR VARIO to provide lubricant replenishment to a spherical roller bearing and automated purging of the associated taconite seals. Configurations of this type can typically be found on conveyor pulley bearings (drive side of drive pulleys) and jack shafts on equipment such as fans.



The daily, automatic lubrication of labyrinth seals on horizontal Warman pumps provides protection from contamination from the operating environment, wash down and water spray from poorly adjusted glands.

Taconite seal purging example:

Automatic lubrication of taconite seals provides constant protection against the ingress of contaminants.

Labyrinth seal purging example:

Automatic lubrication of labyrinth seals provides constant protection against the ingress of contaminants.

Safer Lubrication Practices

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

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

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Workplace safety and efficiency improvements

Automated lubrication systems are maintenance tools which make a positive contribution to work place safety and efficiency. This is particularly the case for large sites in hot climates where the physical demands of performing regular manual greasing "runs" increase the risk of heat exhaustion compared to automated alternatives.

The implementation of automatic lubrication systems does not mean that the frequency of equipment inspections will be reduced. The integration of automated systems liberates time which can be invested into other preventative maintenance tasks such as regular equipment inspections, condition monitoring data collection, filter and breather maintenance and oil cleanliness management activities such a filtration.

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 heat stress, 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

Based on this comparison the reduction in exposure to the safety hazards associated with greasing bearings is approximately 70% and an estimated 2,700 hours are liberated which can be invested into other preventative maintenance tasks which may otherwise be neglected. In addition to this, the automatic solution removes the need for 1.5 million pumps of a manual grease gun over a 3 year period.

3 ways to improve safety and save time:

1. **Reduce working at heights and confined space entry requirements -** Improve safe work practices by extending the time periods between access requirements. Save time otherwise required for permits, isolations and access.
2. **Remove reliance on downtime to access points behind cages and avoid unnecessary manual handling of cages -** Improve safe work practices via the remote installation of lubricators to avoid the need to lift and handle cages and guards. Save time otherwise required during shutdowns for permits, isolations and cage removal and re-instatement.
3. **Minimise highly repetitious use of manual grease guns -** Improve safe work practices by reducing the risk of repetitive strain injury associated with excessive grease gun use. Save time by automating an otherwise laborious manual task.

perma STAR VARIO remote mounted to a conveyor pulley bearing providing safe access for inspections and servicing.

perma STAR VARIO remote mounted to a fan jack shaft providing safe access for inspections and servicing.

perma STAR VARIO remote mounted to an overhead electric motor.

perma CLASSIC

The world's most robust lubricator

Made in Germany

Simple, robust, reliable

By tightening the activating screw the gas generator drops into the electrolyte fluid where it starts an electrochemical reaction that generates gas. The accumulation of gas forces the 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.

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Application

perma CLASSIC is a single-point lubricator which is suited to a broad range of bearing and chain applications. perma CLASSIC is particularly well suited to low to medium speed bearings in harsh operating environments. For example, the steel body and flexible base make the perma CLASSIC ideal for conveyor pulley bearing lubrication in arduous operating environments such as can be found in the mining and quarrying industries.

Characteristics

- Metal housing with flexible base which can withstand impacts and knocks
- Transparent base reveals red lubricant piston to indicate when lubricator is empty
- Colour coded system to identify time setting
- Quick Start technology
- Dust and water proof and able to operate in any orientation
- No electrical components or batteries
- Lubricates a single point with greases up to NLGI 2 or oils

Benefits

Simple conversion from manual to automatic lubrication

- Simple and low cost to implement to provide a no-fuss solution
- Can withstand knocks and impacts to provide reliable lubrication under the harshest conditions without the need for protection

Extends Equipment Service Life

- Lubricates equipment while it is running to provide optimal lubricant exchange
- Delivers gradual purge of fresh grease to labyrinth and taconite seals to prevent the ingress of contaminants

Safer lubrication option compared to manual greasing

- Reduces manual work load by automating an otherwise laborious manual process
- Continues to lubricate without the need for equipment shutdown and isolation
- Provides the option for conservative remote mounting, up to 1 meter from the lubrication point

Technical data

Housing
Metal

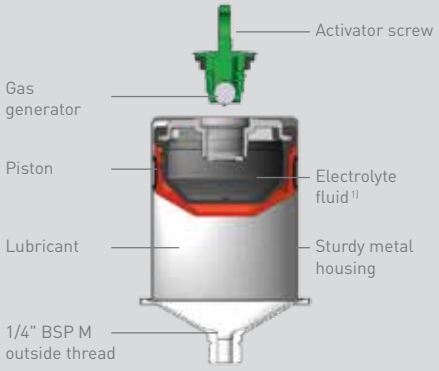
Drive
Electrochemical reaction

Discharge period at +20 °C with SF01
1, 3, 6 or 12 months

Lubricant volume
120 cm³

Operating temperature
0 °C to +40 °C

Remote installations
1 meter of 3/8" ID line (grease)



[1] environmentally friendly citric acid

Discharge period in months:

Time between activation and first discharge: **1 day**

120 cm³				
Time period*	1	3	6	12
cc per day	4	1.4	0.7	0.3

* Grease discharge rates are temperature dependent

perma FUTURA

Transparent housing with intergrated support flange

NEW

Made in Germany

For high corrosion, high humidity and high contamination environments

By tightening the activating screw the gas generator drops into the electrolyte fluid where it starts an electrochemical reaction that generates gas. The accumulation of gas forces the 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.

perma®

Application

perma FUTURA is a single-point lubricator which is suited to a range of rolling element and plane bearing applications. perma FUTURA is particularly well suited to low to medium speed bearings in wet operating environments. The transparent body of the perma FUTURA allows inspection of the piston position while the integrated support flange provides protection against damage in the event of accidental impacts.



Characteristics

- Transparent housing allowing inspection of the lubricant piston position
- Integrated support flange to protect against accidental damage
- Colour coded system to identify time setting
- Quick Start technology
- Dust proof, water proof and corrosion proof
- No electrical components or batteries
- Lubricates a single point with greases up to NLGI 2 or oils

Benefits

Simple conversion from manual to automatic lubrication with a clear bodied lubricator

- Simple to implement to provide a no-fuss solution with the benefits of a clear lubricator body
- Can withstand impacts and will not rust to provide reliable lubrication under the harshest conditions

Extends Equipment Service Life

- Lubricates equipment while it is running to provide optimal lubricant exchange
- Delivers gradual purge of fresh grease to labyrinth and taconite seals to prevent the ingress of contaminants

Safer lubrication option compared to manual greasing

- Reduces manual work load by automating an otherwise laborious manual process
- Continues to lubricate without the need for shutdown and isolation
- Provides the option for conservative remote mounting, up to 1 meter from the lubrication point

Technical data

Housing
Transparent plastics

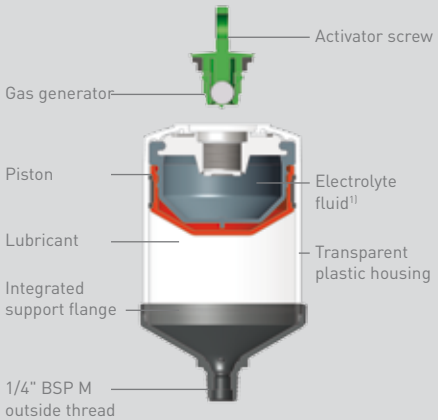
Drive
Electrochemical reaction

Discharge period at 20 °C with SF01
1, 3, 6 or 12 months

Lubricant volume
120 cm³

Operating temperature
0 °C to +40 °C

Remote installations
1 meter of 3/8" ID line (grease)



[1] environmentally friendly citric acid

Discharge period in months:

Time between activation and first discharge: **1 day**

120 cm³				
Time period*	1	3	6	12
cc per day	4	1.4	0.7	0.3

* Grease discharge rates are temperature dependent

perma NOVA

The first temperature compensating electrochemical lubrication system

NEW

Ex ia I Ma
ANZEx 10.2007X
-20 °C ≤ Ta ≤ +60°C

I M1 Ex ia I
II 2G Ex ia IIC T6
II 2D Ex iaD 21 T80°C
ZELM 09 ATEX 0420 X
-20 °C ≤ Ta ≤ +60°C

I M1 Ex ia I
II 2G Ex ia IIC T6
II 2D Ex ia IIIC T80°C
IEC Ex ZLM 09.0013X

Made in Germany

For applications with high variations in temperature

perma NOVA can be used for applications that are within a temperature range of -20 °C up to +60 °C. A discharge period of 1 to 12 months can be easily programmed by pushing the selection button on the NOVA control unit. A temperature sensor regularly measures the ambient temperature and the control unit calculates the required gas generation based on this data. This ensures a continuous and controlled discharge. perma NOVA consists of a reusable control unit, a lubricant canister filled with 130 cm^3 of lubricant and a protection cover.

perma®

Application

perma NOVA is especially suited to single-point lubrication of rolling element bearings, seals and chains located in areas with considerable temperature variations or where intrinsic safety is a requirement (as in the oil and gas industry). The lubrication system is dust-tight and protected against water jets.



Characteristics

- Intelligent gas generation which adapts lubricator performance to the temperature of the operating environment
- Transparent housing allowing inspection of the lubricant piston position
- Integrated support flange to protect against accidental damage
- Separate Control Unit providing time settings from 1 to 12 months
- Higher pressure delivery compared to CLASSIC and FUTURA
- Certified as intrinsically safe
- Lubricates a single point with greases up to NLGI 2 or oils

Benefits

Provides an accurate lubrication solution for operating environments which require intrinsically safe products

- Provides accurate lubricant delivery across a broad range of settings in extreme temperature environments
- Simple to set, install and maintain with a highly intuitive operating menu.

Extends Equipment Service Life

- Lubricates equipment while it is running to provide optimal lubricant exchange
- Delivers gradual purge of fresh grease to labyrinth and taconite seals to prevent the ingress of contaminants

Safer lubrication option compared to manual greasing

- Reduces manual work load by automating an otherwise laborious manual process
- Continues to lubricate without the need for shutdown and isolation
- Provides the option for conservative remote mounting, up to 1 meter from the lubrication point

Technical data

Housing
Transparent plastic

Drive - reusable
Gas generating cell

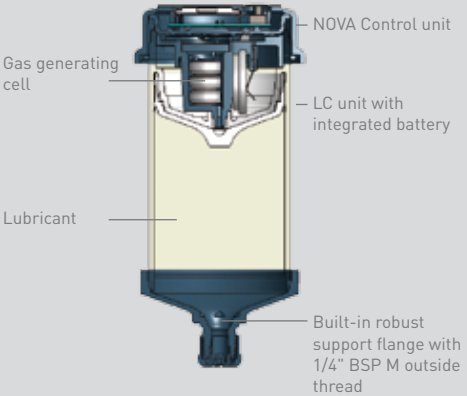
Discharge period
1, 2, 3... through to 12 months

Lubricant volume
130 cm³

Operating temperature
-20 °C to +60 °C

Protection class
IP 65

Remote installations
1 meter of 3/8" ID line (grease)



Oil-filled units come with an integrated oil retaining valve and can be recognized by a red plug.

Cover for protection during transport and against dust and dirt. Recommended for all installations.

perma STAR VARIO

Temperature independent, precise lubrication

Made in Germany

Electro-mechanical, variable time settings, temperature independent

perma STAR VARIO consists of a reusable electro-mechanical drive unit and a single-use lubricant cartridge. Because the lubricator is mechanically driven the dispensing rate is independent of ambient temperature and back pressure*. 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.

The label of the lubricant cartridge includes allocated spaces for recording the date of installation and the date of next service. The label also confirms the % of grease remaining. These features support responsible lubricator management.

perma®

Application

perma STAR VARIO is a single-point, automatic lubricator which is suited to a broad range of bearing and chain applications. perma STAR VARIO is ideal for applications which demand precise grease delivery or for operating environments which include significant temperature fluctuations. The remote mounting options for the perma STAR VARIO provides practical options for lubricators to be installed in safe and easy to access locations.



Characteristics

- Precise lubricant delivery which is independent of temperature and back pressure*
- Transparent housing to facilitate inspection of the lubricant piston position
- LED alert system to provide feedback to users confirming operational status
- Reusable Drive Unit
- Immediate pressure generation
- Broadest range of options for safe, robust and easy to implement remote mounting
- Lubricates a single point with greases up to NLGI 2 or oils
- Lubricant canisters are filled under controlled conditions in order maintain lubricant cleanliness and are not refillable

Benefits

Facilitates precise lubrication programs across a broad range of equipment, particularly where remote mounting is required

- Provides accurate lubricant delivery with immediate pressure build-up to help ensure that lubricant starvation or over lubrication do not occur.
- Whilst requiring an initial investment in Drive Units and Mounting Systems, provides long term cost benefits compared to gas type lubricators.

Extends Equipment Service Life

- Lubricates equipment while it is running to provide optimal lubricant exchange
- Delivers intermittent injections of fresh grease to labyrinth and taconite seals to prevent the ingress of contaminants

Safer lubrication option compared to manual greasing

- Reduces manual work load by automating an otherwise laborious manual process
- Continues to lubricate without the need for shutdown and isolation
- Provides extensive options for safe remote mounting, up to 3 meters from the lubrication point

* Total back pressure must be less than the pressure delivery capability of the lubricator

Technical data

Housing
Transparent plastic

Drive – reusable
Electromechanical

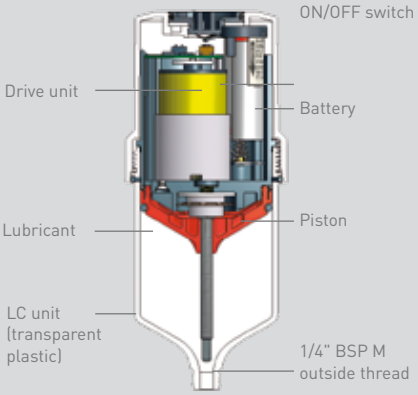
Power supply
STAR battery pack

Discharge period
1, 3, 6 or 12 months

Lubricant volume
60 cm³, 120 cm³ or 250 cm³

Operating temperature
-10 °C to +50 °C

Remote installations
3 meter of 3/8" ID line (grease)



LED Flashing Sequence	Alert System Message
Flash every 15 sec	Normal operation
Flash every 8 sec	Blockage
Flash every 3 sec	Lubricator empty

Discharge amounts in cm³ per day:

TIME	Time setting	Dwell time h:min	S60 60 cm³ VOL 3 4	M120 120 cm³ VOL 3 4	L250 250 cm³ VOL 3 4
1 2	1 month	1:30	2.0 cm³	4.0 cm³	8.3 cm³
1 2	3 months	4:37	0.67 cm³	1.3 cm³	2.8 cm³
1 2	6 months	9:17	0.33 cm³	0.67 cm³	1.4 cm³
1 2	12 months	18:36	0.17 cm³	0.33 cm³	0.7 cm³

1 2 ← Switch position indicated by white square

perma STAR CONTROL TIME / STAR CONTROL IMPULSE

PLC / machine controlled

Made in Germany

Controlled and consistent lubrication - temperature independent

Similar to perma STAR VARIO, the perma STAR CONTROL delivers precise amounts of lubricant and its operation is temperature independent. The unique feature of perma STAR CONTROL TIME and IMPULSE is their connection to machine control. This feature makes perma STAR CONTROL TIME and IMPULSE 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. perma STAR CONTROL is available in three different sizes.

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Application

perma STAR CONTROL is a PLC controlled single-point, automatic lubricator which is suited to a range of bearing and chain applications. There are two version of perma STAR CONTROL – TIME and 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 cm^3 per 100 hours of machine operation, stopping and starting at preset intervals.



Characteristics

- Precise lubricant delivery which is independent of temperature and back pressure*
- Transparent housing to facilitate inspection of the lubricant piston position
- PLC / machine control
- Separate Drive Unit
- Immediate pressure generation
- Broadest range of options for safe, robust and easy to implement remote mounting
- Lubricates a single point with greases up to NLGI 2 or oils

Benefits

Provides a PLC controlled lubrication solution for critical equipment which does not operate continuously

- Provides accurate lubricant delivery to equipment only while the equipment is operating, based on PLC or machine control.
- Ensures that over lubrication of non-operational equipment does not occur, while ensuring that re-lubrication is not overlooked upon restart.

Extends Equipment Service Life

- Lubricates equipment while it is running to provide optimal lubricant exchange
- Delivers intermittent injections of fresh grease to labyrinth and taconite seals to prevent the ingress of contaminants

Safer lubrication option compared to manual greasing

- Reduces manual work load by automating an otherwise laborious manual process
- Provides extensive options for safe remote mounting, up to 3 meters from the lubrication point

* Total back pressure must be less than the pressure delivery capability of the lubricator

Technical data

Housing
Transparent plastic

Drive – reusable
Electromechanical

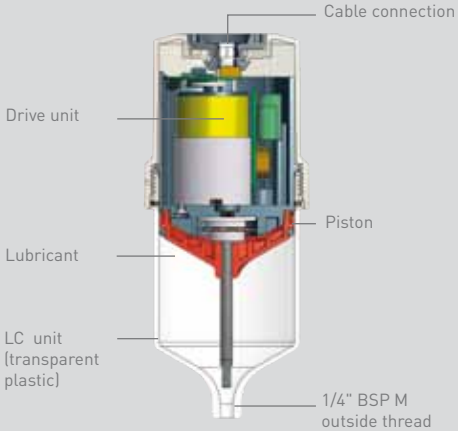
Power supply
External 15-30 V DC / typ. 0.2 A

Discharge period
STAR CONTROL TIME: Time controlled
STAR CONTROL IMPULSE: Impulse controlled

Lubricant volume
60 cm^3, 120 cm^3 or 250 cm^3

Operating temperature
-10 °C to +50 °C

Remote installations
3 meter of 3/8" ID line (grease)



Discharge amounts per discharge cycle:

		STAR CONTROL TIME Discharge amount in cm^3 per 100 operating hours			STAR CONTROL IMPULSE Discharge amount in cm^3 per impulse		
LC unit		S60 60 cm^3	M120 120 cm^3	L250 250 cm^3	S60 60 cm^3	M120 120 cm^3	L250 250 cm^3
Setting position of code switches	Dwell time h:min	3 4	3 4	3 4	3 4	3 4	3 4
1 2	1:30	8.33	16.67	34.72		2.11	
1 2	4:37	2.78	5.56	11.57		1.06	
1 2	9:17	1.39	2.78	5.79		0.53	
1 2	18:36	0.69	1.39	2.89		0.26	

1 2 ← Switch position indicated by white square

perma PRO MP-2 / PRO C MP-2

High pressure system with 2 point splitter

Made in Germany

Precise lubricant delivery for two lubrication points

Both systems, perma PRO MP-2 and PRO C MP-2, consist of a mechanical distributor and a special PRO / PRO C drive unit. Lubricant is transported from the grease cartridge through the drive unit into the MP-2 distributor. Each outlet discharges 0.25 cm^3 of lubricant per discharge cycle in even amounts, regardless of counter pressure*.
The perma PRO can also be used as a single point lubricator.

Application

perma PRO MP2 is ideally suited to equipment with two grease points which require equal lubrication rates via pre-existing long or narrow remote grease lines which may otherwise be unserviceable with lower pressure lubricators. For example, the 25 bar output pressure capability of the perma PRO MP2 provides the necessary capability to lubricate bearings on large cooling tower fans with existing narrow grease lines.* The system is delivered fully assembled, ready for immediate installation.



Characteristics

- Lubrication of two points at equal rates, independent of backpressure*
- High pressure capability
- PLC / machine control option
- Broad range of time settings ranging from 1 day to 12 months
- LED alert system to communicate operational status to users
- LCD display showing lubricant delivery status

Benefits

Provides an high pressure solution for applications with 2 lubrication points

- Provides accurate lubricant delivery to two points
- Where the PLC control version is selected, ensures that over lubrication of non-operational equipment does not occur, while ensuring that re-lubrication is not overlooked upon restart.

Extends Equipment Service Life

- Lubricates equipment while it is running to provide optimal lubricant exchange
- Delivers intermittent injections of fresh grease to labyrinth and taconite seals to prevent the ingress of contaminants

Safer lubrication option compared to manual greasing

- Reduces manual work load by automating an otherwise laborious manual process
- Provides extensive options for safe remote mounting, up to 5 meters from the lubrication point

* Total back pressure must be less than the pressure delivery capability of the lubricator

Technical data

Housing
Metal / transparent plastic

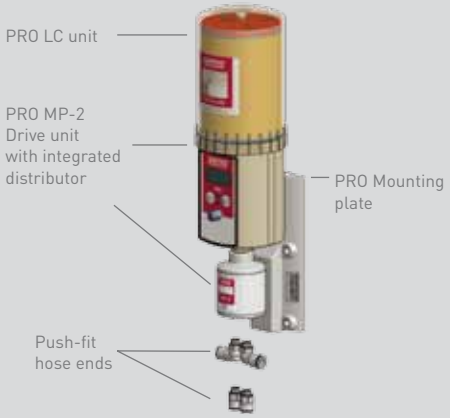
Drive – reusable
PRO MP-2: Battery operated
PRO C MP-2: External power supply (15–30 V)

Discharge periods
Programmable by days, weeks or months

Lubricant volume
500 cm³

Operating temperature
-20 °C to +60 °C

Remote installations
5 meter of 3/8" ID line (grease)



Calculation of total discharge amount for the correct discharge period setting:

	Number of manual grease points	2 x
	Volume applied per point	20 strokes at 1.5* cm³ per stroke = 30 cm³
	Manual lubrication interval	Every 2 weeks (14 days)

$$\frac{30\ cm^3 \cdot 2}{14\ days} = 4.3\ \frac{cm^3}{per\ day}$$

$$\frac{500\ cm^3}{4.3\ \frac{cm^3}{per\ day}} = 116\ days = 3.9\ months$$

4 months = lubricator time setting

* 1 stroke with a typical grease gun = approx. 1.5 cm³ of lubricant

perma PRO MP-6 / PRO C MP-6

The stand-alone multi-point lubrication system for up to 6 lubrication points

Made in Germany

Precise, intelligent lubrication

perma PRO MP-6 is a battery operated multi-point lubrication system.
perma PRO C MP-6 is the machine or PLC controlled version with external power supply. Each perma PRO can be programmed for grease dispensing in days, weeks or months, up to a maximum dispensing period of 1 year. The MP-6 distributor dispenses directly without pressure loss. The perma PRO can also be used as a single point lubricator.

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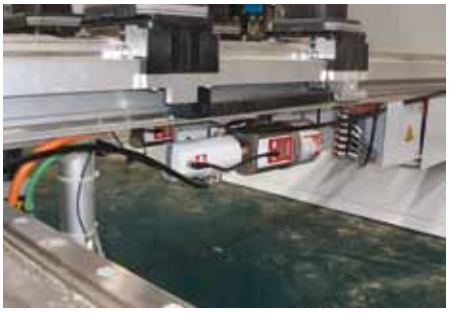
Application

perma PRO MP-6 is suited to equipment which has up to 6 lubrication points which require equal lubrication rates. The 25 bar output pressure of the PRO MP-6 means that grease line length of up to 5 meters can be easily serviced. The high pressure output means that applications which typically have a higher resistance to lubricant delivery such as linear slideways can also be serviced.





Characteristics

- Lubrication of up to 6-points at equal rates, independent of backpressure*
- High pressure capability
- PLC / machine control option
- Broad range of time settings ranging from 1 day to 12 months
- LED alert system to communicate operational status to users
- LCD display showing lubricant delivery status

Benefits

Provides an intelligent, high pressure solution for applications with up to 6 lubrication points

- Provides accurate lubricant delivery to six points
- Via the rotary distributor, if one point becomes blocked, the other points will continue to be lubricated.
- Where the PLC control version is selected, ensures that over lubrication of non-operational equipment does not occur, while ensuring that re-lubrication is not overlooked upon restart.

Extends Equipment Service Life

- Lubricates equipment while it is running to provide optimal lubricant exchange
- Delivers intermittent injections of fresh grease to labyrinth and taconite seals to prevent the ingress of contaminants

Safer lubrication option compared to manual greasing

- Reduces manual work load by automating an otherwise laborious manual process
- Provides extensive options for safe remote mounting, up to 5 meters from the lubrication point

* Total back pressure must be less than the pressure delivery capability of the lubricator

Technical data

Housing
Metal / transparent plastic

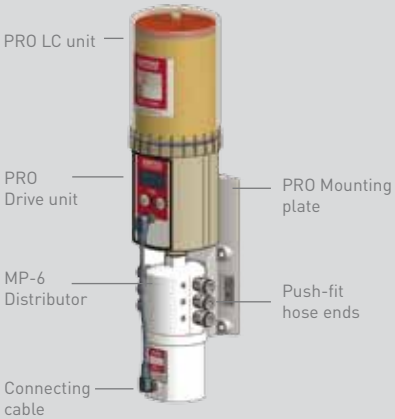
Drive – reusable
PRO MP-6: Battery operated
PRO C MP-6: External power supply (15–30 V)

Discharge periods
Programmable by days, weeks or months

Lubricant volume
500 cm³

Operating temperature
-20 °C to +60 °C

Remote installations
5 meter of 3/8" ID line (grease)



Calculation of total discharge amount for the correct discharge period setting:

	Number of manual grease points	6 x
	Volume applied per point	10 strokes at 0.6* cm³ per stroke = 6 cm³
	Manual lubrication interval	Every week (7 days)

$$\frac{6\ \text{cm}^3 \cdot 6}{7\ \text{days}} = 5.1\ \frac{\text{cm}^3}{\text{per day}}$$

$$\frac{500\ \text{cm}^3}{5.1\ \frac{\text{cm}^3}{\text{per day}}} = 98\ \text{days} = 3.3\ \text{months}$$

3 months = lubricator time setting

* 1 stroke with a typical grease gun = approx. 1.5 cm³ of lubricant

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. Lubricant selection is also an important factor for achieving extended bearing service life.
To fulfill this requirement perma lubricators are filled standard with a range of high quality German manufactured lubricants.
HTL perma Australia also has the capability to custom fill greases and oils. This ensures that users of perma lubricators are not forced to make compromises when it comes to choice of lubricant.

perma®

Lubricants
Choose the right lubricant for your application

Standard fill lubricants

The basic characteristics of the Standard Fill lubricants are provided below. For more detailed information visit www.perma.com.au to download the Technical Data Sheets and Material Safety Data Sheets.

perma Code Description	NLGI-class	Thickener	Base oil	Operating temperature range (°C)	Viscosity at +40 °C	Applications						
						Roller bearings	Sliding bearings / guides	Linear guides	Open gears / gear racks	Spindles	Shaft seals (1)	Chains
Grease												
SF01 **Multipurpose grease**	2	Li / Ca	Mineral oil	-30 to +130	220	✓	✓	✓	-	✓	✓	-
SF02 **Extreme pressure grease**	2	Li + MoS2	Mineral oil	-30 to +120	105	-	✓	-	✓	-	-	-
SF04 **High performance grease**	0/1	Polyurea	Mineral oil + PAO	-20 to +160	500	✓	✓	✓	-	✓	-	-
SF05 **High temp. / EP grease**	0/1	Polyurea + MoS2	Mineral oil + PAO	-20 to +160	500	✓	✓	-	✓	-	-	-
SF10 **Food grade grease**	1	Al-Com,	PAO	-45 to +120	150	✓	✓	✓	✓	-	-	-
Oil												
SO14 **High performance oil**	Oil	-	PAO + Ester	-20 to +250	320	-	-	-	-	-	-	✓
SO32 **Multipurpose oil**	Oil	-	Mineral oil	-5 to +100	100	-	✓	-	✓	✓	-	✓
SO70 **Food grade oil**	Oil	-	PAO + Ester	-30 to +120	220	-	✓	-	✓	✓	-	✓

Custom fill lubricants

Typical reasons for choosing custom filled lubricants are:

→ Where lubricant 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 lubricants presents a real risk of incompatibility problems.

→ Where specific lubricants are required in order to satisfy warranty requirements.

Grease pumpability

The pumpability of grease depends on a range of factors, the most influential being the grease type, temperature (of the grease) and the internal dimensions of delivery lines and fittings.

Grease type - The lower the NLGI rating the easier grease is to pump. NLGI 2 greases are easier to pump than NLGI 3 greases and so on. Grease thickener type, base fluid viscosity and manufacturing methods also have an effect on grease pumpability.

Temperature - Grease is much easier to pump in warmer environments than in cold environments. However, the relationship between pumpability and temperature is not 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 liquid lubricants such that pressure drops cannot be calculated on the basis of "pipe friction lose" style calculations. In general it is best to minimise grease line length, use generous sized grease line (perma recommends 3/8" internal diameter) and eliminate the use of restrictive elbow fittings.

Correct practices for remote installations

Year by year, improvements to safe work practices and increased production demands lead to an increasing requirement to remote mount automatic lubricators. Correct remote mounting practices require that simple, yet important guidelines be followed:

A - Locate lubricators where they can be safely and easily accessed while equipment is operating
B - Select stainless steel brackets which can be easily removed if required for maintenance access
C - Include manual purge points to provide an efficient means of occasional manual purging
D - Use only full bore elbow fittings
E - Use 3/8" internal diameter grease line and run lines under or around cages

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Remote mounting guidelines
for perma single point lubricators

Remote mounting decision making

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 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 or cages have to be removed to access the bearing?	Yes (remote) No (direct)

Remote mounting for perma CLASSIC, FUTURA & NOVA

Guidelines:

→ Select grease line with 3/8" internal diameter

→ Restrict the maximum grease line to a length of 1 meter

→ Select full bore hose end fittings and elbows

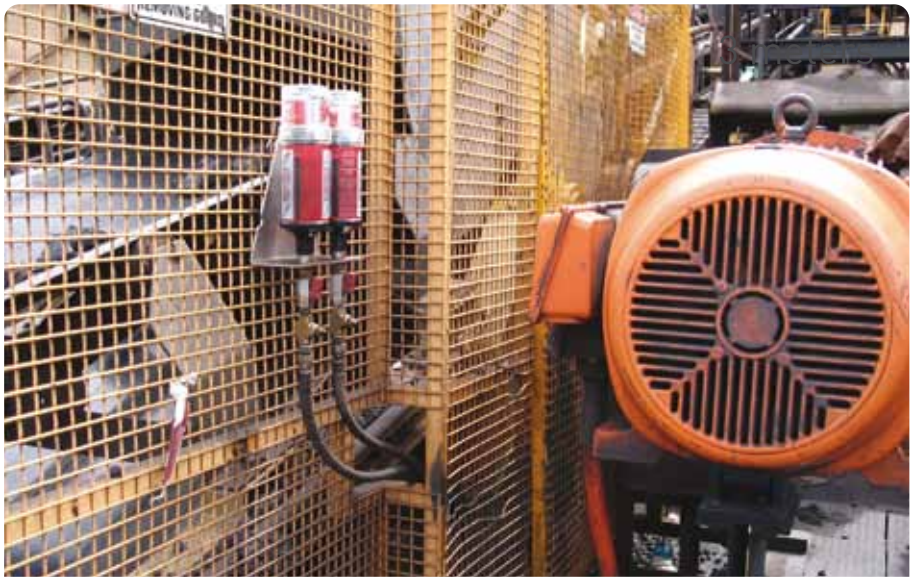
→ Select stainless steel bracket and locate at a safe point of access

→ Route grease lines under or around cage mesh, not through

→ Prime grease lines and fittings

→ Test the grease delivery path to the lubrication point after priming to ensure that back pressure is not excessive

Remote mounting for perma STAR VARIO, STAR CONTROL



Guidelines:

→ Select grease line with 3/8" internal diameter

→ Restrict the maximum grease line to a length of 3 meters

→ Select full bore hose end fittings and elbows

→ Select stainless steel bracket and locate at a safe point of acces

→ Route grease lines under or around cage mesh, not through

→ Prime grease lines and fittings

→ Test the grease delivery path to the lubrication point after priming to ensure that back pressure is not excessive

Remote installation kits for robust installations which provide for safe and efficient servicing

Quality installations 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.

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Explanation of kit part numbers

Perma supplies a comprehensive range of installation kits to enable simple and robust installations of perma STAR VARIO.
The brackets are made from stainless steel and are attached to beam sections, square cage mesh or horizontal rails using simple hand tools.
Part numbers for remote mount kits are explained below. The first 4 digits indicate the part type, the number of lubricators held by the kit assembly and the attachment method. Additional suffixes are used to indicate design variations.

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

1st Four Digits of Part Numbers

Digit Reference	Meaning
1st digit	Denotes part type; 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

Customised fabrication

Examples of customised installation kits are shown below. Perma can custom design and fabricate remote installation kits 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.

Example: K230CJ

Manual Grease Points

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

Example: K265C1M

perma MOUNTING SYSTEMS

Standard Duty installation kits for perma STAR VARIO

STANDARD DUTY installation kits include stainless steel brackets and beam clamps.
Lubricators are not included in kits.

Attachment option	Kit Part Number
30mm beam clamp	K130
65mm beam clamp	K165

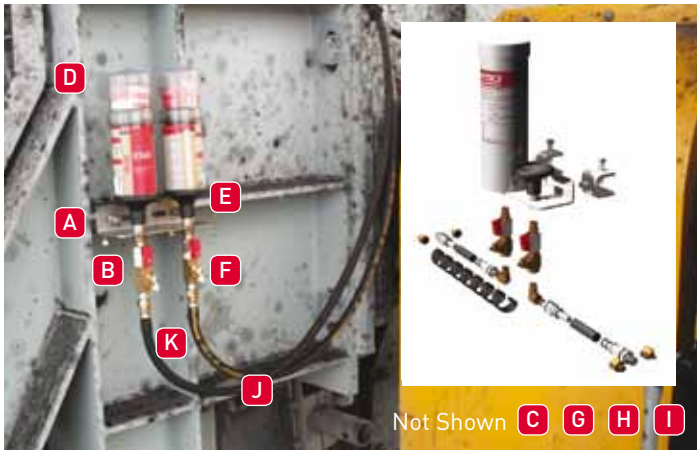
Attachment option	Kit Part Number
30mm beam clamp	K230
65mm beam clamp	K265

Attachment option	Kit Part Number
30mm beam clamp	K330
65mm beam clamp	K365

Attachment option	Kit Part Number
30mm beam clamp	K430
65mm beam clamp	K465

Kit Example.

Kit Part #	Description
K230	Kit 2 point with standard duty bracket and 30mm beam clamps



A	1 x 2 point standard duty bracket	G	2 x 90 degree elbow
B	2 x 30mm S/S beam clamp	H	2 x ¼" BSPF–1/8"BSPM reducer
C	2 x PVC lubricator cover	I	2 x ¼" BSPF -¼"BSPM ext.
D	2 x Soft wet cap	J	4m of 3/8" ID grease line
E	2 x Lubricator support flange	K	4 x Female swivel hose ends
F	2 x Manual purge kit		

Heavy Duty installation kits for perma STAR VARIO

HEAVY DUTY installation kits include stainless steel C-section brackets designed for high contamination areas which can be attached using beam clamps or cage hanger arms.
Lubricators are not included in kits.

Attachment option	Kit Part Number
30mm beam clamp	K130C
65mm beam clamp	K165C
Cage hanger arms	K1CHC

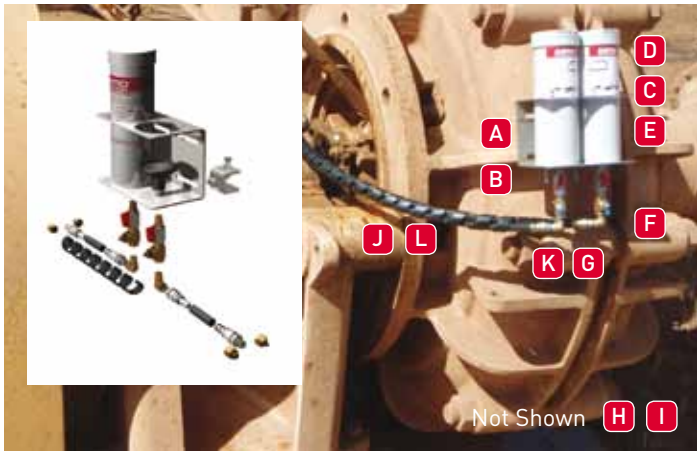
Attachment option	Kit Part Number
30mm beam clamp	K230C
65mm beam clamp	K265C
Cage hanger arms	K2CHC

Attachment option	Kit Part Number
30mm beam clamp	K330C
65mm beam clamp	K365C
Cage hanger arms	K3CHC

Attachment option	Kit Part Number
30mm beam clamp	K430C
65mm beam clamp	K465C
Cage hanger arms	K4CHC

Kit Example.

Kit Part #	Description
K230C	Kit 2 point with heavy duty bracket and 30mm beam clamps



A	1 x 2 point heavy duty bracket	G	2 x 90 degree elbow
B	2 x 30mm S/S beam clamp	H	2 x ¼" BSPF–1/8"BSPM reducer
C	2 x PVC lubricator cover	I	2 x ¼" BSPF -¼"BSPM ext.
D	2 x Soft wet cap	J	4m of 3/8" ID grease line
E	2 x Lubricator support flange	K	4 x Female swivel hose ends
F	2 x Manual purge kit	L	0.5 of Spiral Wrap

Cage installation kits for perma STAR VARIO

CAGE installation kits are designed for quick attachment to square cage mesh down to 25mm x 25mm.
Lubricators are not included in kits.

Kit Example.

Kit Part #	Description
K2CH	Kit 2 point with cage bracket

Attachment option	Kit Part Number
Cage hanger arms	K1CH

Attachment option	Kit Part Number
Cage hanger arms	K2CH

Attachment option	Kit Part Number
Cage hanger arms	K3CH

Attachment option	Kit Part Number
Cage hanger arms	K4CH

A	1 x 2 point standard duty bracket	F	2 x 90 degree elbow
B	2 x Manual purge kit	G	2 x ¼" BSPF–1/8"BSPM reducer
C	2 x PVC lubricator cover	H	2 x ¼" BSPF -¼"BSPM ext.
D	2 x Soft wet cap	I	4m of 3/8" ID grease line
E	2 x Lubricator support flange	J	4 x Female swivel hose ends

Rail installation kits for perma STAR VARIO

RAIL installation kits incorporate rail mount brackets suited to round rails ranging from 30mm to 50mm outside diameter.
Lubricators are not included in kits.

Kit Example.

Kit Part #	Description
K2RR	Kit 2 point with rail bracket

Attachment option	Kit Part Number
U-bolts	K1RR

Attachment option	Kit Part Number
U-bolts	K2RR

Attachment option	Kit Part Number
U-bolts	K3RR

Attachment option	Kit Part Number
U-bolts	K4RR

A	1 x 2 point rail duty bracket	G	2 x 90 degree elbow
B	2 x U-bolts	H	2 x ¼" BSPF–1/8"BSPM reducer
C	2 x PVC lubricator cover	I	2 x ¼" BSPF -¼"BSPM ext.
D	2 x Soft wet cap	J	4m of 3/8" ID grease line
E	2 x Lubricator support flange	K	4 x Female swivel hose ends
F	2 x Manual purge kit	L	0.5 of Spiral Wrap

Remote mount best practice examples
Electric motors

Lubrication Assessment Criteria

For electric motor lubrication the following factors are generally assessed in order to develop the lubrication solution:

- → Motor manufacturer's recommendations
- → Motor speed
- → Grease trap / escape port design, access and condition
- → Operating conditions
- → Characteristics of proposed lubricant
- → Bearing types
- → Safe access requirements
- → Desired service schedule
- → Duty cycle
- → Motor orientation (vertical or horizontal)

Best practice installation examples

Application	Motor driving Warman slurry pump
Lubricator	STAR VARIO L250
Install Kit	K230C

Application	Motors driving scrubber
Lubricator	STAR VARIO L250
Install Kit	K230C

Application	Motor driving Krebs slurry pump
Lubricator	STAR VARIO L250
Install Kit	K230C

Application	Dragline hoist motor
Lubricator	STAR VARIO M120
Install Kit	Customised kit

Remote mount best practice examples
Slurry pumps

Lubrication Assessment Criteria

For slurry pump lubrication the following factors are generally assessed in order to develop the lubrication solution:

- → Pump manufacturer's recommendations
- → Seal types
- → Wash down procedures
- → Operating conditions
- → Characteristics of proposed lubricant
- → Bearing types & grease entry points
- → Safe access requirements
- → Desired service schedule
- → Duty cycle
- → Typical bearing operating temperatures

Best practice installation examples

Application	Krebs slurry pump
Lubricator	STAR VARIO L250
Install Kit	K265C

Application	Warman slurry pump
Lubricator	STAR VARIO L250
Install Kit	K265C

Application	Warman slurry pump
Lubricator	STAR VARIO L250
Install Kit	K265C

Application	Metso slurry pump
Lubricator	STAR VARIO M120
Install Kit	K230C

Remote mount best practice examples
Conveyor pulley bearings

Lubrication Assessment Criteria

For conveyor pulley bearing lubrication the following factors are generally assessed in order to develop the lubrication solution:

- → Bearing types & speeds
- → Operating conditions
- → Safe access requirements
- → Grease performance characteristics
- → Location of grease entry points on bearing housings
- → Seal types
- → Desired service schedule

Best practice installation examples

Application	Bearing & seal
Lubricator	STAR VARIO L250
Install Kit	K2CH

Application	Seal purging with manual bearing lubrication
Lubricator	STAR VARIO L250
Install Kit	K1CHC

Application	Bearing & seals
Lubricator	STAR VARIO L250
Install Kit	K330

Application	Bearing & seals
Lubricator	STAR VARIO L250
Install Kit	K3CH

Remote mount best practice examples
Fans

Lubrication Assessment Criteria

For fan lubrication the following factors are generally assessed in order to develop the lubrication solution:

- → Bearing types & speeds
- → Operating conditions
- → Safe access requirements
- → Grease performance characteristics
- → Grease base oil viscosity
- → Location of grease entry points on bearing housings
- → Seal types
- → Desired service schedule
- → Bearing temperatures

Best practice installation examples

Application	Jack shaft bearings
Lubricator	STAR VARIO M120
Install Kit	K230

Application	Jack shaft bearings
Lubricator	STAR VARIO M120
Install Kit	K2CH

Application	Jack shaft bearings
Lubricator	STAR VARIO L250
Install Kit	K230C

Application	Jack shaft bearings
Lubricator	STAR VARIO L250
Install Kit	K230C

Accessories to achieve durable installations and reliable lubricator performance

Minimising the pressure loss between single point lubricators and lubrication points is an important factor for achieving long term, reliable lubricant delivery. The range of accessories available from perma have been carefully selected to ensure that pressure losses are minimised and that installations will stand the test of time in harsh operating environments.

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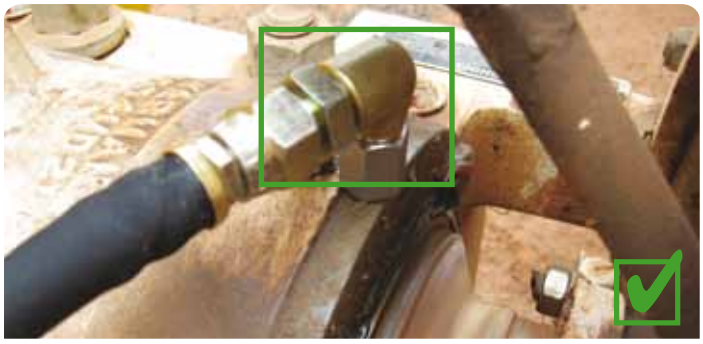
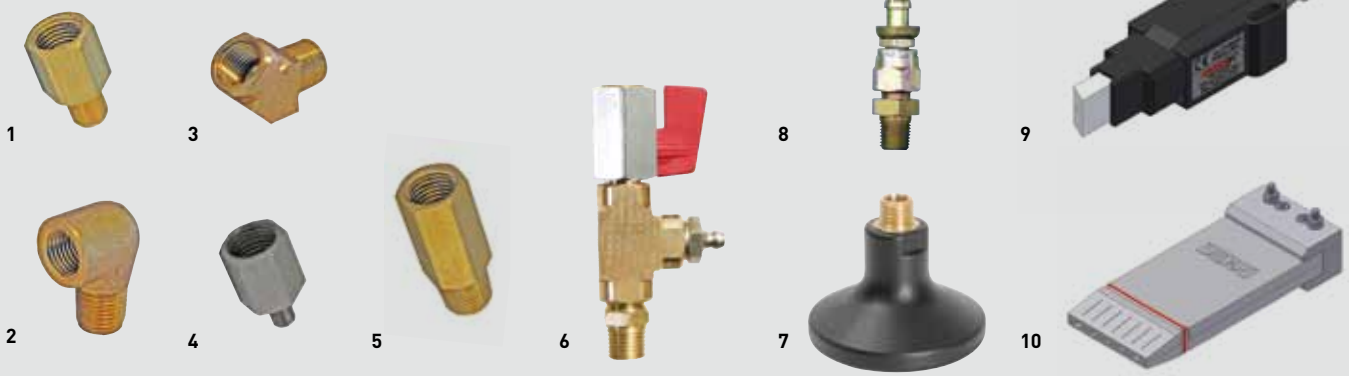
perma MOUNTING SYSTEMS
Adaptors, elbows, extensions, grease lines & general

perma CLASSIC, FUTURA and STAR lubricators have a 1/4 " BSP male thread 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 or 1/4 " UNF select stainless steel to avoid breakage.
→ Minimise the number of elbow fittings.
→ Always select full bore elbows.



Part #	Description	Pic.	Part #	Description	Pic.
2461/8	1/4 " BSPF – 1/8 " BSPM Brass Straight Adaptor	**1**	92	90 Degree Brass Elbow 1/4	**2**
2461/8SAESS	1/8 " BSPF – 1/4 " SAEM Stainless Steel Straight Adaptor	-	1211/8	1/4 " BSPF – 1/8" BSPM 45 Degree Brass Elbow	-
2461/4	1/4 " BSPF – 1/4 " BSPM Brass Straight Adaptor	-	1211/4	1/4 " BSPF – 1/4 " BSPM 45 Degree Brass Elbow	**3**
2461/4SAESS	1/4 " BSPF – 1/4 " SAEM Stainless Steel Straight Adaptor	**4**	52740	40mm long 1/4 " BSP Brass Extension Tube	**5**
2463/8	1/4 " BSPF – 3/8" BSPM Brass Straight Adaptor	-	52785	85mm long 1/4 " BSP Brass Extension Tube	-
2461/2	1/4 " BSPF – 1/2 " BSPM Brass Straight Adaptor	-	527125	125mm long 1/4 " BSP Brass Extension Tube	-
2466SS	1/4 " BSPF – 6mm M Stainless Steel Straight Adaptor	-	708V	Manual greasing kit 1/4 " BSP	**6**
2468	1/4 " BSPF – 8mm M Brass Straight Adaptor	-	708V-T52	Manual greasing kit 1/4 " BSP with button head nipple	-
24610	1/4 " BSPF – 10mm Brass M Straight Adaptor	-	A620P	Support flange 1/4 " BSP (suits Star & Futura)	**7**
921/8	90 Degree Brass Elbow 1/8	-	PVC120	Full length cover heavy duty PCV for M120 Star	-
88HDJ	Hose end swivel 3/8" hose to ¼" BSP M	**8**	PVC250	Full length cover heavy duty PVC for L250 Star	-
90HD	Hose baryon fibre reinforced internal diameter 3/8"	-	CWL	Crane Wheel Lubricator applicator	**9**
WC120	Full length cover translucent for M120 Star	-	OGL	Open Gear Lubricator applicator	**10**
WC250	Full length cover translucent for L250 Star	-			



perma MOUNTING SYSTEMS
Stainless steel brackets & attachment options

The range of stainless steel brackets and attachments options which are included in perma Remote Installation Kits can also be purchased as separate components. Stainless steel brackets are available as bare brackets or complete with A620P support flanges.

The A620P support flange provides reinforcement to the base of perma STAR VARIO lubricators to protect against accidental breakage. The table below includes part number references for the bare brackets and brackets complete with A620P's. Note that Heavy Duty C-Section brackets always include A620P's and full length PVC covers. With the exception of Heavy Duty brackets, only bare brackets are pictured below.

Part # (bare)	Description	Pic.	Part # (with A620P)	Compatible attachment options
MB01	Standard duty 1 point stainless steel bracket	1	MB01A620P	BC30 or BC65
MB02	Standard duty 2 points stainless steel bracket	2	MB02A620P	BC30 or BC65
MB03	Standard duty 3 points stainless steel bracket	3	MB03A620P	BC30 or BC65
MB04	Standard duty 4 points stainless steel bracket	4	MB04A620P	BC30 or BC65
-	Heavy duty C-section 1 point SS bracket	5	MB01C	BC30 or BC65 or CH-ARMS
-	Heavy duty C-section 2 points SS bracket	6	MB02C	BC30 or BC65 or CH-ARMS
-	Heavy duty C-section 3 points SS bracket	7	MB03C	BC30 or BC65 or CH-ARMS
-	Heavy duty C-section 4 points SS bracket	8	MB04C	BC30 or BC65 or CH-ARMS
CH01	Cage hanger 1 point SS bracket	9	CH01A620P	Cage hooks supplied with bracket
CH02	Cage hanger 2 points stainless steel bracket	10	CH02A620P	Cage hooks supplied with bracket
CH03	Cage hanger 3 points stainless steel bracket	11	CH03A620P	Cage hooks supplied with bracket
CH04	Cage hanger 4 points stainless steel bracket	12	CH04A620P	Cage hooks supplied with bracket
MB01R	Rail mount 1 point stainless steel bracket	13	MB01RA620P	U-bolts supplied with bracket
MB02R	Rail mount 2 points stainless steel bracket	14	MB02RA620P	U-bolts supplied with bracket
MB03R	Rail mount 3 points stainless steel bracket	15	MB03RA620P	U-bolts supplied with bracket
MB04R	Rail mount 4 points stainless steel bracket	16	MB04RA620P	U-bolts supplied with bracket

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16

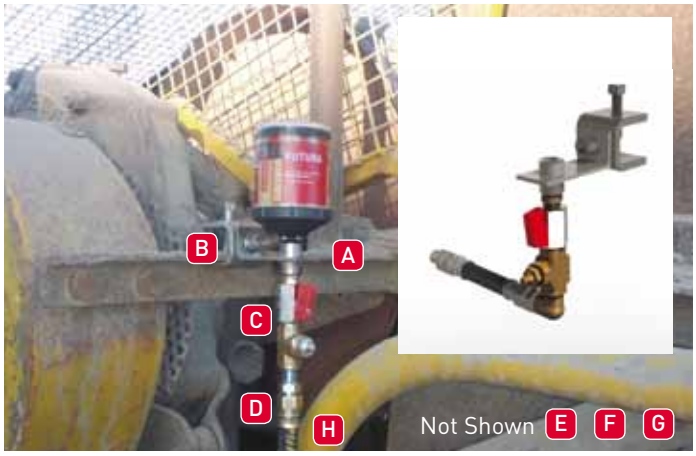

perma MOUNTING SYSTEMS

Remote mount installation kits for single perma CLASSIC and perma FUTURA

Kit Part #	Description
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

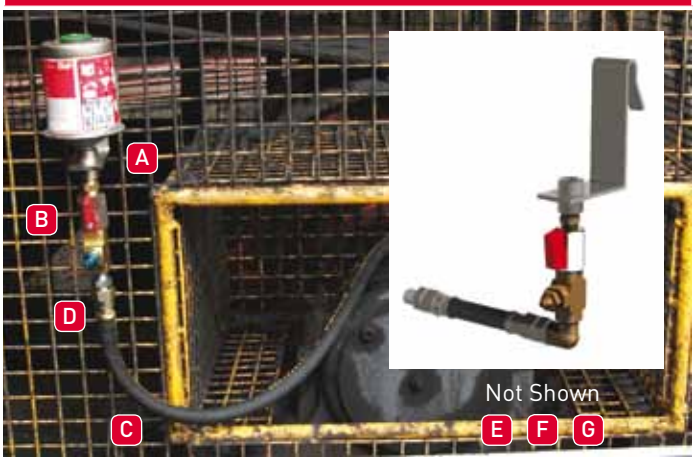
Kit Part #	Description
K1CHS50	Kit SS 1 point cage 0.5m hose with fittings
K1CHS75	Kit SS 1 point cage 0.75m hose with fittings
K1CHS100	Kit SS 1 point cage 1.0m hose with fittings

Kit Example.



A	1 x 1 point bracket	E	1 x 90 degree elbow
B	1 x 30mm S/S beam clamp	F	1 x ¼" BSPF–1/8"BSPM reducer
C	1 x Manual purge kit	G	1 x ¼" BSPF -¼"BSPM ext.
D	2 x Female swivel hose ends	H	0.5m of 3/8" ID grease line

Kit Example.



A	1 x 1 point cage bracket	E	1 x 90 degree elbow
B	1 x Manual purge kit	F	1 x ¼" BSPF–1/8"BSPM reducer
C	0.75m of 3/8" ID grease line	G	1 x ¼" BSPF -¼"BSPM ext.
D	2 x Female swivel hose ends		

perma MOUNTING SYSTEMS

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

→ 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

perma Chain Lubrication
For chain lubrication using oil

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

→ Pins and bushs

→ 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 be installed using a check-valve (part # A810) to prevent the lubricant from draining out of the lubricator prematurely. The check-valve should be installed at the end of remote oil delivery lines.

Part #	Description	Pic.	Part #	Description	Pic.
A400	Brush 20cm round 1/4 " BSP for oil	1	8615	Tube assembly complete flexible reinforced nylon 30cm	-
A410*	Brush 3 x 4cm rectangular 1/4 " BSP for oil	2	8630	Tube assembly complete flexible reinforced nylon 45cm	-
A411*	Brush 3 x 6cm rectangular 1/4 " BSP for oil	3	8645	Tube assembly complete flexible reinforced nylon 60cm	-
A412*	Brush 3 x 10cm rectangular 1/4 " BSP for oil	4	8660	Tube assembly complete flexible reinforced nylon 90cm	-
A810	Throttle one-way valve 1/4 " BSP for oil	5	8690	Tube assembly flexible reinforced nylon 150cm	-
A100	Metal bracket standard duty	6	86150	Reinforced nylon hose 3/8" internal diameter (per meter)	-
A105	Plastic bracket with two position quick clip	7	90	Male barbed brass fitting for type 90 nylon hose	-
MBA105	A105 (see above) with SS 30mm beam clamp	8	87	Female barbed brass fitting for type 90 nylon hose	-
A150	T-piece bracket with 1/4 " BSP insert	9	88	OTK Clip 13 – 15mm for type 90 nylon hose assembly	-

Technical support

HTL perma Australia are dedicated to providing quality technical advice and implementation support to ensure the correct use of perma products. Technical services include:

- → Point-by-point surveys & audits
- → Lubricant selection reviews
- → Electric motors grease escape port & grease trap reviews
- → Lubricator installation support
- → Re-lubrication rate calculations
- → Lubricant rationalisation advice
- → Lubricator safe access reviews
- → On-site product training
- → OEM recommendation reviews

Lubrication surveys are carefully documented including relevant lubrication data, site application photographs and implementation options.

Implementation support helps to ensure that new lubrication programs are implemented using best practice installation methods. Implementation support also provides an ideal opportunity for "hands-on" training of site personnel.

www.perma.com.au

Visit www.perma.com.au to access the following technical information:

- → Product operators guides
- → Electronic copies of pocket guides
- → Electronic copies of workshop posters
- → Lubricant technical data sheets
- → Lubricant material safety data sheets
- → Quality system certificates

Notes

Notes

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