

**LINCOLN**



# Centralized lubrication for construction and mining equipment

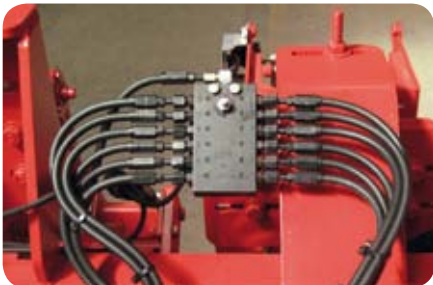
*Centralized lubrication for all applications*

- Construction machines and trucks
- Mining and material handling equipment
- Hydraulic hammers, grippers, pliers and breakers



**SKF**

# Centralized lubrication for all applications



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# Centralized lubrication

## The path to cost reduction

From a few lubrication points to a few thousand – Lincoln offers the complete range of lubrication equipment and systems for professional lubrication of construction and mining equipment.

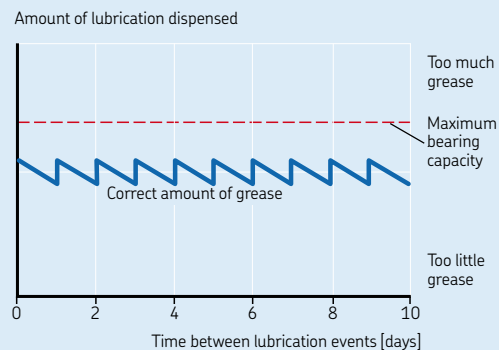
Lincoln lubrication systems are based on the principle of grouping lubrication points together that can be serviced from one supply point. Our modules build upon each other – enabling the system to grow in accordance with our customer's requirements. This enables us to offer a custom-tailored lubrication solution for individual needs.

## Advantages of automated lubrication

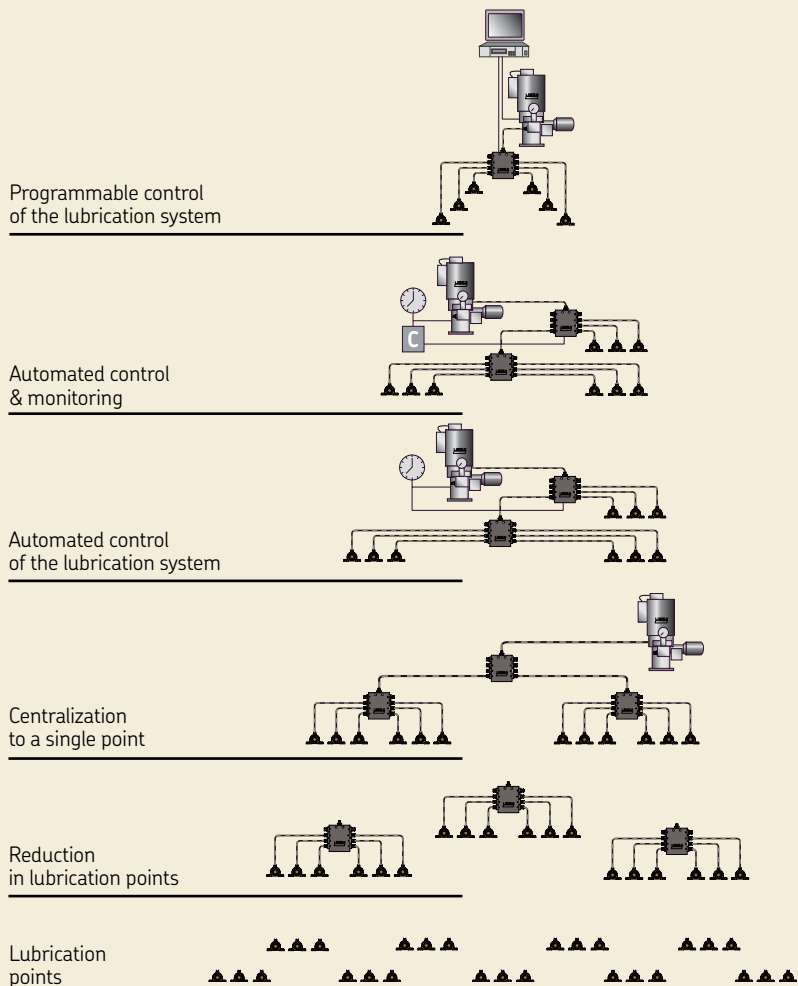
Centralized or automated lubrication offers several advantages when compared to manual lubrication.

- Increased profits and productivity
- Improved operating times; less costly downtime resulting from improper lubrication
- Lower costs for repairs and spare parts
- Exactly matched metering reduces the cost of lubricant
- Precise metering reduces the environmental impact. No dripping of "too much" lubricant
- Improved safety by minimizing slipping
- Hard-to-reach points are easily accessible from a convenient point – which also improves safety
- Reliable supply of all connected lubrication points. No point is "overlooked"

## Lincoln Quicklub cycles



## Lincoln optimization pyramid for centralized lubrication



# BDS bearing dosage system

## Easy

All lubrication points are supplied from a central point. Lube points which are normally difficult to access can now be serviced quickly and efficiently – with the right quantity of lubrication for every point

## Flexible

Depending on the environmental conditions, you can choose the proper lubrication interval without a tedious procedure. Frequent lubrication builds-up a grease collar protection that inhibits water and dirt from penetrating the bearing, preventing premature wear.

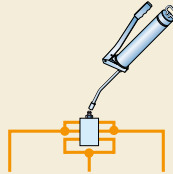


## Retrofittable

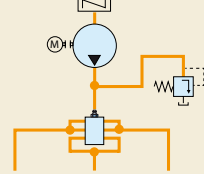
Due to its modular design, the BDS can be expanded or retrofitted with an automated lubrication pump at any time. High-pressure Quickline plugin fittings assure an easy and quick installation. The advantages of easy maintenance procedures are affordable and can be achieved with little effort.



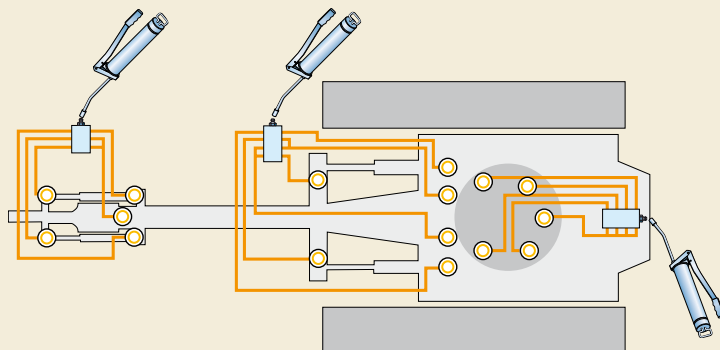
BDS bearing dosage system for lubricating connected lubrication points through one single inlet



BDS bearing dosage system complemented by an automatic pump



BDS bearing dosage system for three lubrication circuits



# PowerLuber cordless grease gun

Lincoln's new, heavy-duty 14,4 volt or 18 volt PowerLuber gives you the power to lubricate just about anything, anytime, anywhere.

- Two-speed switch for high-pressure or high-volume delivery
- Cycle indicator pin to monitor grease output
- One-hour charging system delivers reliable power

All the features you need, including comfortable grip and balanced design; hook for shoulder strap; built-in hose and coupler holder; and a slim, compact carrying case.



Packed in a heavy-duty compact case molded from impact- and stain-resistant plastic, this package comes complete with the 14,4 V or 18 V PowerLuber and battery, a 230 volt one-hour charger (model 1410-E), and a 760 mm flex hose with spring guard (model 1430).

## SSV/SSV E, SSV D and varieties – solid block progressive lubricant dividers

- Solid block construction – reduces fault potential and eliminates leaks
- A higher operating pressure ensures functional reliability – even at minus temperatures
- Easy to monitor
- Easy exchange as the entire block is exchanged. Mistakes in connections or settings are avoided

### SSV/SSV L

SSV and SSV L are piston-type metering devices that reliably divide the supplied lubricant into predetermined individual quantities. Lincoln progressive metering devices do not have fault-prone seals. As a result they can be used without problems at high back pressure and are suitable for a wide range of temperatures. The maximum operating pressure is 350 bar. SSV progressive metering devices are available from 6 to 22 outlets and SSV L from 6 to 14.

### SSV D/SSVD L

Easy adjustment of lubricant output with Lincoln metering screw technology

- Single-block progressive metering device – now with flexible metering
- Wide range of adjustment – meets most needs
- Metering screws enable easy adjustment – without the removal of segments – also easy to readjust after installation

SSVD metering devices are adjustable per outlet pair, thus enabling lubricant requirements to be better met. The metering occurs within the metering block via metering screws that are available in 10 different sizes.

The adjustable SSVD lubricant dividers are available in the standard sizes from 6 to 22 outlets. Metering screws per outlet pair are available in 10 sizes – 0,8 cm<sup>3</sup>, 0,14 cm<sup>3</sup>, 0,2 cm<sup>3</sup>, 0,3 cm<sup>3</sup>, 0,4 cm<sup>3</sup>, 0,6 cm<sup>3</sup>, 0,8 cm<sup>3</sup>, 1,0 cm<sup>3</sup>, 1,4 cm<sup>3</sup> and 1,8 cm<sup>3</sup> per outlet and stroke.

***The proven SSV progressive lubricant dividers are now available in a stretched SSV L version for larger tube diameter connections.***

SSV 12-E



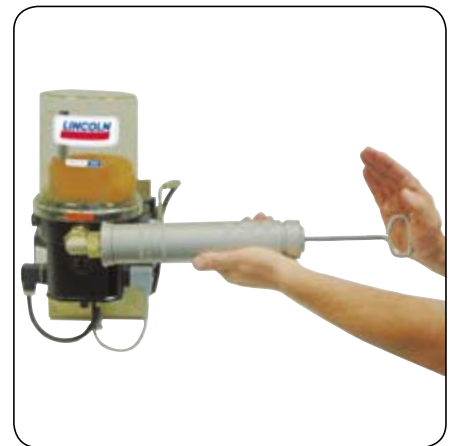
# New generation of Quicklub progressive system

The new generation of Quicklub systems now offers the following enhancements and product characteristics – standard:

- The new material of the pump housing is extreme weather resistant and not susceptible to UV rays
- The pump housing has a larger filling port for easy filling of the reservoir
- The strengthened “Polar” stirring paddle is now available in the standard version. This provides a good lubricant mixing even at extreme sub-zero temperatures
- The stronger spring of the S7 pump element is now used for all pump elements thus providing an improved return of the piston
- The filling adapter has a fixed, “captive” cap



*Lincoln offers the possibility to reduce installation cost with pre-assembled kits. A considerable advantage for OEMs!*



*Filling of Quicklub pumps: fast and easy*



## System benefits

**No corrosion of the light-weight pump housing which is made of heavy-duty, fiber-reinforced resin:**

- The pump motor is protected against damage and moisture (IP6K9K)
- 2, 4, 8 and 15 liter reservoir (Optional with filling from the top and a lockable lid)
- Various pump elements with fixed or variable output
- Over-pressure valve – also equipped with an indicator and reservoir return
- Fully-automated option via integrated PCB

- Optional integrated display, touch pad and data logger function for the storage of important information such as operating time, faults or blockages and low-level
- Installation can be performed with threaded or 350 bar rated Quicklinec plug-in type fittings

# Quicklub QLS 401

## Compact lubrication system for grease

The QLS 401 is a complete lubrication system that includes all necessary monitoring and control functions. All components including an internal overpressure valve are part of the complete package. The comprehensive list of standard features is a remarkable characteristic of the QLS 401. The integrated, all-in-one system concept reduces installation time and costs.

A newly enhanced stirring paddle in the reservoir prevents grease separation – even with long service intervals.

The QLS 401 is designed for all industrial and mobile applications. Up to 18 lubrication points can reliably be supplied directly from the pump and monitored.

### Multifunctional

The QLS 401 is versatile. An integrated circuit board optimally controls the pause time and the pump cycles for a regular supply of lubricant. All settings are performed with ease via the keypad. Settings and messages are shown on the built-in LED display.

The QLS 401 is also available in a “key lock” version that locks the programming function.

### Sturdy

The QLS 401 is shock and vibration proof and operates reliably, even when exposed to severe operating conditions such as temperatures ranging from -25 to +70 °C or high pressure wash-downs (IP6K9K, NEMA 4 protection).

### Compact

The QLS 401 is a high-pressure grease pump with a controller and monitoring, a function display and a divider block. All system components and all the functions that are needed to lubricate at a professional level are included.



*Also available in a “key lock” version that locks the programming function.*



### System benefits

- 1 and 2 litre reservoir capacity
- Small compact, ready-to-install package
- Space requirements – 230 x 230 x 215 mm
- Integrated controller with monitoring – optionally without controller
- Low-level control, optional
- Integrated display and keypad
- Easy refilling – please inquire for further information
- Built-in over-pressure valve with return
- Available in 12 or 24 V DC as well as 120 V AC, 60 Hz and 230 V AC, 50/60 Hz
- Attached divider block – optionally with external divider block
- Internal outlet lubricant return possibility
- Large spectrum of usable lubricants – for multipurpose grease up to NLGI 2

# 603S/653S

## Single-line lubrication system

Equipment that operates in harsh conditions requires regular lubrication to ensure performance. When a bearing or component fails as a result of insufficient lubrication the result is downtime and losses. The single-line 603S and 653S pumps automatically supply the lubrication points with exact metered quantities in programmed interval while the equipment is in operation.

### Pump and accessories – All-in-one

The single-line system's design and layout is uncomplicated, making it easy to install, program and operate. A single mainline reduces material and installation costs. The all-in-one design of the pump includes the programmable controller, a pressure switch/transducer and a vent valve. The 603S/653S pumps can internally combine the lubricant output of up to 3 pump elements. The output performance is 12 cm<sup>3</sup>/min for the 603S and up to 24 cm<sup>3</sup>/min for the 653S.

### Easy to service

It is quick and easy to exchange an injector. The mainline or neighbouring injectors do not have to be removed. The exchange can be performed between lubrication cycles so that there is no wastage of lubricant or excessive costly downtime.

### QSL and SL injectors

QSL metering devices are designed for high pressure up to 300 bar, as they have a metal-to-metal fit only. SL-1, SL-32 and SL-33 injectors work at up to 240 bar. As a result, NLGI 2 greases can be pumped at temperatures below zero without problems. All injectors operate independently of each other. This means that in the event of a blockage or fault of one injector, all other injectors will continue to supply lubricant. Each QSL injector has an individual output quantity of 0,05 to 0,4 cm<sup>3</sup>/stroke.





# QSL/SL

## Lubrication injectors for single-line systems

QSL and SL injectors are designed for 300 bar pressure. As a result, NLGI 2 greases can be pumped at temperatures below zero without problems. All injectors operate independently of each other. This means that in the event of a blockage or fault of one injector, all other injectors will continue to supply lubricant.

### QSL injectors for grease

To be combined with 603 and 653 pumps, for max operating pressure of 300 bar. 5 types – dosage from 0,05 cm<sup>3</sup> to 0,4 cm<sup>3</sup>.

### SL/SL-V injectors for grease

To be combined with single-line pump 653 and Centro-Matic pumps. The maximum operating pressure is 240 bar for SL and 400 bar for SL-V. The metal-to-metal fit of the injectors makes them suitable for high pressure.



Each injector's output can be individually set. The injector function is visually monitored. Single injectors or with manifold banks are available.

Injectors Type SL-33, SL-32 and SL-1 are also available in stainless steel.

Dosage from 0,016 cm<sup>3</sup> to 1,31 cm<sup>3</sup>

## Polyurethane (PU) lubrication pinion

### PU lubrication pinion for gear drive lubrication:

- Even, constantly renewed lubrication film
- Corrosion protection
- Simple installation
- Short service time

The new Lincoln lubrication pinion made from wear-resistant polyurethane, was specially developed for the lubrication of gear drives. The lubrication pinion applies a 100%, constantly renewed lubrication film to the tooth flank, thus reducing wear and

providing corrosion protection of the gear drive.

The new lubrication pinion applies the lubricant only to the loaded area of the tooth flank and not over the entire tooth or root.

An important factor when lubricating is the usage of a suitable lubricant that doesn't drip under high temperatures. We will gladly supply the results of detailed tests for new lubricants.



# Reputable centralized lubrication systems for large machinery

Lincoln lubrication systems are designed to keep your machinery running and to match your needs. Our systems help reduce your maintenance work. Depending on the application, systems such as two-line, single-line or hybrid systems are all part of the Lincoln range.



## Experience productivity

- Contribute to process safety
- Quick payback
- Electric, pneumatic or hydraulic driven pumps
- Choice of reservoir, drum or container pumps
- Controllers and monitoring features that meet your needs

*Container pump*

## Centro-Matic single-line system

QSL and SL injectors are designed for 300 bar pressure. As a result, NLGI 2 greases can be pumped at temperatures below zero without problems. All injectors operate independently of each other. This means that in the event of a blockage or fault of one injector, all other injectors will continue to supply lubricant. For decades Centro-Matic single-line systems have been used for the automated lubrication of large mining equipment.

The Centro-Matic system has proven its reliability in harsh conditions and in severe climates. Injectors meter the lubricant and are individually adjustable to match the requirements of each lubrication point.

Centro-Matic single-line systems operate at high pressures – up to 240 bar for grease systems; and the system may also use high-viscous lubricants.

Custom-designed, robust pump stations are available to meet your exact requirements.



*Centro-Matic SL11 injectors*

### Features

- Adjustable lubricant output per injector
- Visual monitoring of each injector (indicator pin)
- Lubricant supply at high pressure
- Easy to layout and install
- System can readily be extended
- Injectors also available in stainless steel

*600 liter pump station*



# SL, SL-V and SL-V XL lubricant injectors

## SL-1, SL-11, SL-V and SL-V XL lubricant injectors

SL-1, SL-11, SL-V and SL-V XL injectors are designed for automated grease lubrication systems for machines and equipment that require large amounts of lubricant.

### New Series SL-V

The high-performance SL-V injectors are designed to work at a maximum pressure of 400 bar. The patented two-chamber design and a pressure differential piston enable a much faster vent time.

The benefits of this quick venting capability enable you to pump thicker greases and run longer supply lines with a smaller diameter which reduces material and installation costs. SL-V injectors are maintenance-friendly.

A visual bypass indicator eliminates the need to inspect injectors for internal bypass or defective seals.



SL and SL-V injectors

SL-V XL injectors

# Classic Helios two-line system

Even in severe conditions such as cold or hot temperatures, dirty and wet environments, Helios Two-line systems provide a reliable means of supplying lubricant to lubrication points. One centrally located pump is capable of consistently supplying a large number of points with lubricant.

VSG/VSL metering devices are used to accurately meter the lubricant. A higher flexibility in the metering of lubricant may be achieved in combination with Quicklub progressive divider blocks. Also the cost effectiveness often speaks for such a hybrid system.



## Features

### Perfect for widely dispersed lubrication points:

- A maximum system pressure of 400 bar enables the usage of smaller tube diameter
- Visual or electrical monitoring of each outlet pair
- If one bearing should block-up, all other outlet pairs continue to supply lubricant

- Simple and individual metering of the lubricant – each outlet pair can be adjusted separately
- Metering device pistons do not have seals or springs
- Easily extendable

# PowerMaster III pumps

PowerMaster pumps are used as drum or container pumps for large lubrication systems, service bays and mobile service trucks.

The modular design of the PowerMaster III piston pumps provides flexibility to suit individual requirements.

PowerMaster III pumps are available in pneumatic or hydraulic versions. The double-acting pumps supply lubricant on both the up and down stroke. The long pump stroke and a precision fit piston plunger provide reliability for long duty cycles and demanding performance.



*Lubrovan service truck with hydraulic PowerMaster III pumps*

# FlowMaster container pumps

**The FlowMaster is a powerful lubrication pump for mining and construction machinery**

These pumps are versatile – as a centralized lubrication pump for progressive, single-line or two-line systems; for lubrication of breaker hammers; or for manually activated lubrication of points that are not connected to an automated system.

The high performance of the pump enables lubricant to be pumped at low temperatures. The lubricant output is easily adjustable by varying the speed of the drive.

FlowMaster pumps are rotary-activated piston pumps. They are available in hydraulic or 24 V DC versions. Custom-tailored pump stations are designed and manufactured to suit your needs.



*FlowMaster centralized lubrication system*



*Hydraulic or 24 V DC electric FlowMaster pumps*



*FlowMaster pump station*

# Lubrication systems for hydraulic auxiliary equipment

## HTL 101 – hydraulic driven lubrication pump

### Enables a continuous lubrication supply during operation

The HTL 101 lubrication pump is especially designed to minimize friction and reduce wear on hard-working tools such as hydraulic hammers, grippers and other hydraulic driven devices that are subjected to heavy mechanical loads. The pump is suitable for all sizes of machines; even for mini excavators and small equipment. The HTL is mounted directly to the machine, and it lubricates continuously throughout the machine's operation.

### Smooth operation

A simple visual check is enough to tell if the HTL 101 is functioning correctly. When the cam shaft rotates and the red follower plate in the cartridge descends, the pump is running smoothly. Even when it is cold, an oil bypass system assists the operation at temperatures down to  $-25^{\circ}\text{C}$ .

### Exchangeable cartridges eliminate filling

Exchangeable 380 g cartridges make refilling procedures quick and easy. Cartridges are available with chisel paste lubricant or with NLGI 2 grease.

### Simple installation and easy maintenance

The HTL 101 lubrication pump is driven by the machine's on-board hydraulic system. Extra drives, auxiliary power or control valves are all redundant.

The HTL 101 mounts directly on the accessory, minimizing tubing and drastically reducing installation costs.



HTL 101 pump



### System benefits

- Compact design – mounts directly on the hydraulic tool
- Adjustable small quantities (from  $0,2\text{ cm}^3/\text{min}$ ) – thus optimizing lubricant consumption
- Exchangeable 380 g cartridge with visual level control
- Oil inlet strainer reduces damage potential caused by contamination
- Highly reliable operation
- Suitable for hydraulic tools that operate under water
- Economical lubrication solution
- An integrated hydraulic throttle enables the lubricant quantity to be adjusted to suit the machine

# HTL 201 – compact hydraulic lubrication pump – version 2011 with technical innovations

The HTL 201 lubrication pump mounts directly to the hydraulic tool and lubricates continuously throughout the working phase of the tool. The hydraulics of the carrier machine drive the lubrication pump. The pump stays on the tool that is to be lubricated, even if the carrier machine is exchanged.

The HTL 201 is ideal for minimizing friction and wear on small-sized hydraulic hammers, grippers or pliers that are greater than 300 kg carrier weight, as well as for mini excavators. This pump is a miniature version of the successful Lincoln HTL 101 hydraulic pump series and can be installed in places where there is “virtually no room” to spare.



The new 2011 version of the HTL 201 offers an optimized function through a new technical design and innovation, for example, a change-over piston made from aluminum. The pump now comes with a larger pump element so that the output per stroke is increased to 0,22 cm<sup>3</sup> (instead of 0,14 cm<sup>3</sup>), so that at 200 bar an output of 6,7 cm<sup>3</sup>/min is possible.

The pump comes standard with a 120 bar pressure relief valve. An optional 270 bar pressure relief valve is available that enables the usage of a progressive system with main and secondary metering devices.

A new check valve in the return line is designed to avoid damage in the event that the pressure and return lines are mixed. A larger, threaded strainer enables simple cleaning of the unit.

An integrated fine throttle adjusts the variable lubricant output. The HTL 201 uses 150 g or 310 g cartridges with chisel paste or with grease up to NLGI 2.

An adapter now also enables the usage of 380 g standard cartridges.



*Compact hydraulic pump HTL 201*

## Manual grease gun MTL 01

The two-hand grease gun MTL 01 is for the manual lubrication of small to mid size hydraulic equipment that is not equipped with an automated lubrication system.

The MTL 01 utilizes the 380 g cartridges for chisel paste or grease. The maximum pressure is rated at 300 bar according to DIN 1283.



# Lubricant supply pump P 502

P 502 is a simple, small and compact lubricant supply pump. It can be used to provide progressive centralized lubrication systems or also a maximum of two lubrication points individually with lubricant.

## Fields of application

- Commercial vehicles; on- or off-road
- Small construction machines
- Stackers
- Agricultural machines
- Industrial applications
- The optimized design of its housing and reservoir make the P 502 a very good solution for splash zones in the food and beverage industry



# Pump P 243 with integrated data logger Quickdata 2.0

## P 243

The new P 243 centralized lubrication pump for progressive systems with readable data memory Quickdata 2.0 is already well-known and proven in the market thanks to its basic pump P 203.

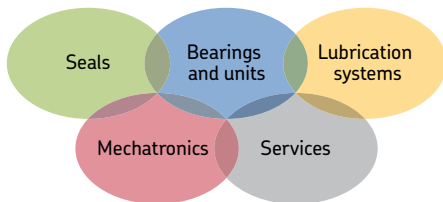
## Quickdata 2.0 data logger

In combination with the new Quickdata 2.0, the P 243 pump is applicable universally. Thanks to a wide variety of individual combinations of time or cycle settings, the P 243 covers the whole range of control options available in the market.

## Fields of application of the Quickdata 2.0

- Rental parks, construction machinery rentals
- Construction machinery
- Agricultural machines
- Contractors in the agricultural machinery sector
- Railroad tamping machines
- General machinery rental





### The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide. These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management systems. A global presence provides SKF customers uniform quality standards and worldwide product availability.

#### Important information on product usage

All products from SKF may be used only for their intended purpose as described in this brochure and in any instructions. If operating instructions are supplied with the products, they must be read and followed.

Not all lubricants are suitable for use in centralized lubrication systems. SKF does offer an inspection service to test customer supplied lubricant to determine if it can be used in a centralized system. SKF lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1 013 mbar) by more than 0,5 bar at their maximum permissible temperature.

Hazardous materials of any kind, especially the materials classified as hazardous by European Community Directive EC 67/548/EEC, Article 2, Par. 2, may only be used to fill SKF centralized lubrication systems and components and delivered and/or distributed with the same after consulting with and receiving written approval from SKF.

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