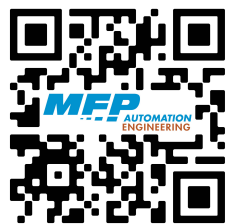
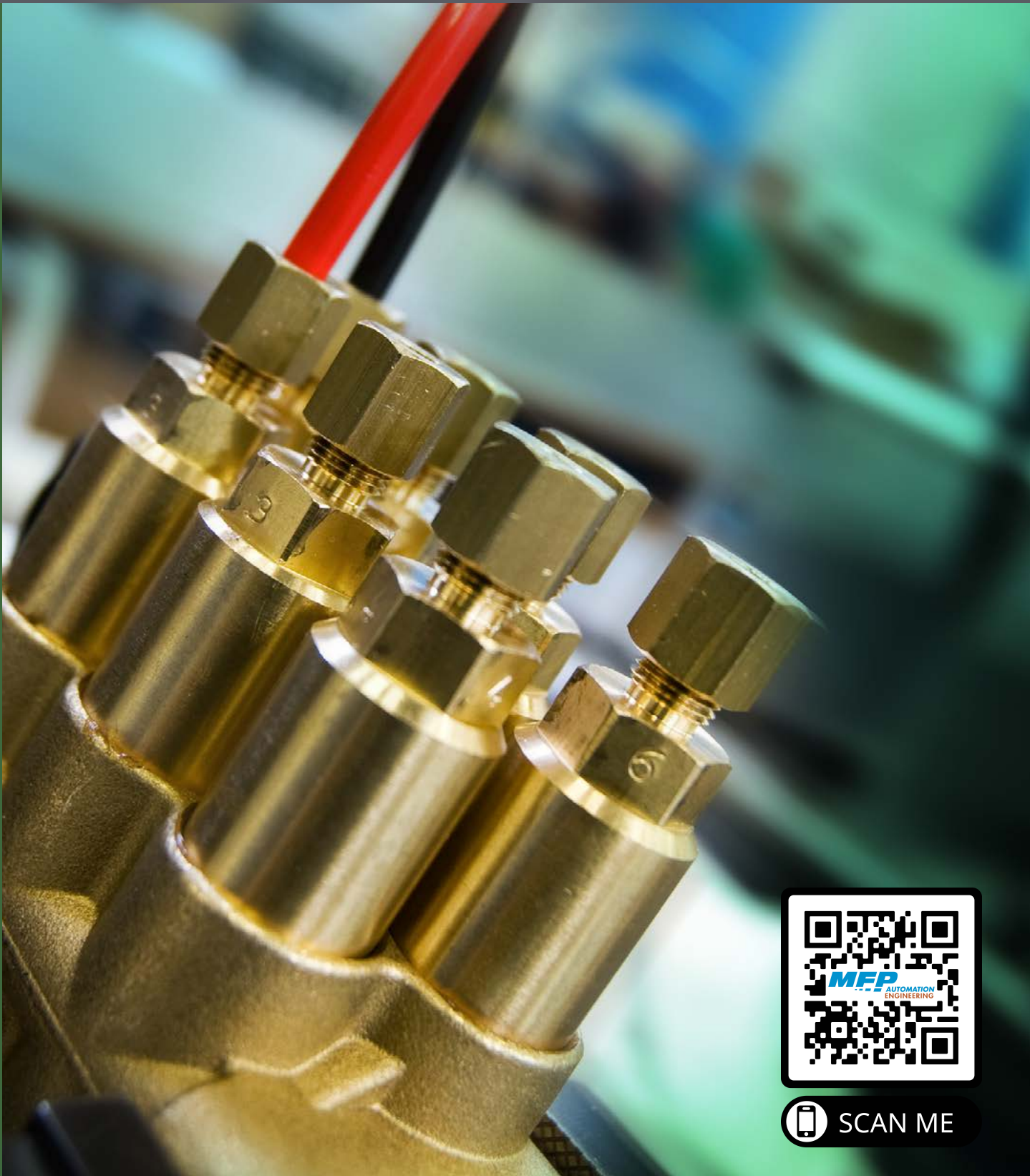


## Dual Line Systems

For the most demanding applications



## Groeneveld-BEKA

**Reducing customers' operational costs and at the same time increasing uptime, productivity, efficiency and safety of their vehicles and machines. That is what it's all about at Groeneveld-BEKA. We accomplish this by developing, producing, supplying and servicing industry-leading automatic lubrication, fluid control and safety support systems.**

Groeneveld-BEKA, part of The Timken Company, is the world's second largest producer of automatic lubrication systems, fluid management and safety support systems. Groeneveld-BEKA products improve equipment lifetime and reliability, while reducing the total cost of ownership.

Groeneveld-BEKA was formed through the merger of two well-established companies: Groeneveld and BEKA. Groeneveld was founded in 1971 and acquired by Timken in 2017. BEKA was founded in 1927 and acquired by Timken in late 2019. Groeneveld has also incorporated Interlube into their brand. Interlube was acquired by Timken in 2013.

Groeneveld-BEKA products are supplied for ex-factory installs to leading manufacturers of trucks, trailers, buses, wind turbines, industrial applications, agricultural, mining and construction equipment. In addition Groeneveld-BEKA systems are installed in the after-market for a wide variety of transport, construction, agricultural, port equipment and industrial applications. Groeneveld-BEKA strives to develop and manufacture all of its products in-house according to World Class Manufacturing principles.

## Automatic Lubrication Systems

Groeneveld-BEKA offers dedicated automatic lubrication systems for all kinds of equipment in a wide variety of market segments, from the smallest excavator to the largest trucks and industrial applications. The application of our high-end systems leads to decreased wear and tear of critical components resulting in extended lifetime, less downtime and reduced repair and maintenance costs. In short: higher productivity and lower operational costs. As maintenance technicians no longer have to climb on or crawl under the equipment, Groeneveld-BEKA's automatic lubrication systems also contribute to safety.

For optimal greasing in all circumstances Groeneveld-BEKA also offers the right type of grease for every application and every system. This is your guarantee for many years of trouble-free operation of your system and perfect lubrication of your valuable equipment.

## Fluid Control

Groeneveld-BEKA's fluid management systems reduce daily maintenance and minimize the risk of unexpected downtime by controlling engine oil levels or removing contamination. Next to the oil management systems, Groeneveld-BEKA also offers systems which easily convey hydraulic power from fixed to moving points.

## Safety Support Systems

For many years, Groeneveld-BEKA supplies safety support systems for a wide range of applications. Speedlimiters as well as obstacle detection and camera systems by Groeneveld-BEKA increase safety in many segments from road transport to construction, port, terminal and internal transport.

## The World of Lubrication

Groeneveld-BEKA is a global enterprise with a worldwide coverage. In many countries, the company is also represented by independent distributors and dealers – all just as driven as our own organisation to offer added value to the customer's company.

With decades of experience providing reliability services to a range of industries, Groeneveld-BEKA offers complete automated maintenance solutions for all your needs. Groeneveld-BEKA's reliability products maintain your equipment, helping you increase uptime and improve profitability.

Visit the Groeneveld-BEKA website for contact details of our subsidiaries, distributors and service dealers.



## Less maintenance, improved efficiency and lower costs

In today's demanding industrial environment it is critical that machines generate an acceptable level of profit. Whether you are an owner, operator or a plant manager, one of the most cost effective ways of achieving this objective is by employing the use of fully automatic lubrication systems.

Groeneveld-BEKA's automatic lubrication systems have been proven to extend bearing life compared with manual greasing, dramatically cutting the cost of bearing replacements, reducing downtime and improving efficiency and safety.

### The benefits

The benefits of automatic lubrication are clear: better greasing of critical components, no time wasted on manual lubrication and the certainty that the equipment will always be greased independent of weather conditions, time schedules or operators. All resulting in significant cost savings.

#### Reduced man-hours required to lubricate.

- Improved availability of personnel for technical activities.
- Reduced lubricant spillage that occurs with manual lubrication.

#### Higher equipment productivity

Reduced equipment downtime by ca. 15% resulting from:

- Lubrication taking place during normal machine operation.
- Better and uniform greasing of all critical components because bearings and pins and bushings are in motion when lubrication takes place, resulting in less wear and tear of machinery.

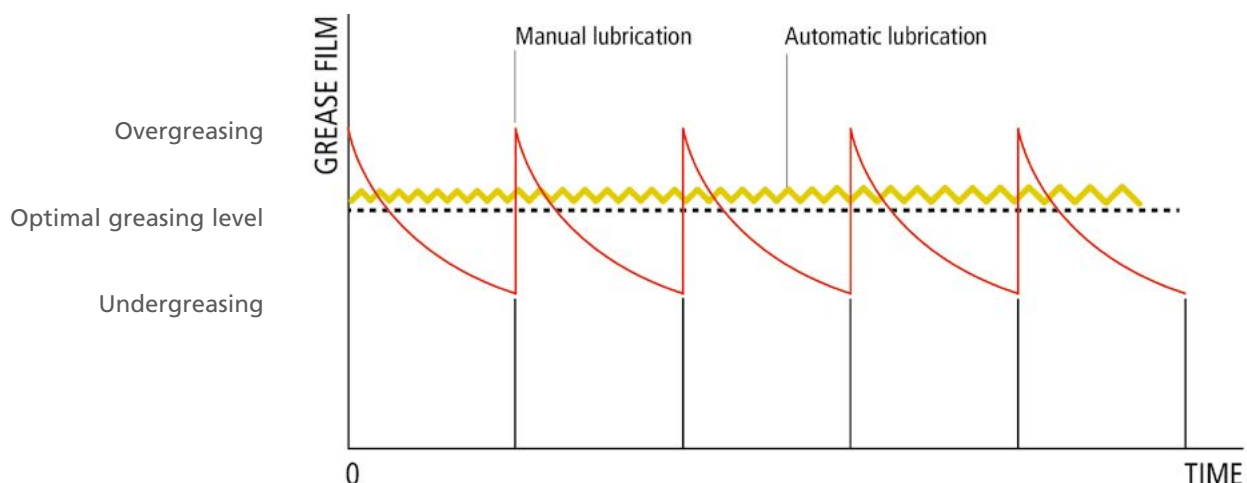
#### Decreased maintenance

- With manual lubrication, grease will follow the path of least resistance due to the fact that greasing has to take place under static conditions. So, the grease is not equally distributed around the lubrication point. Automatic greasing avoids this, as lubrication will take place during operation, reducing wear of critical components.
- Reduced replacement rate of components and bearings up to 50%.
- Decreased machine labour costs by ~ 50%.

#### Improved safety

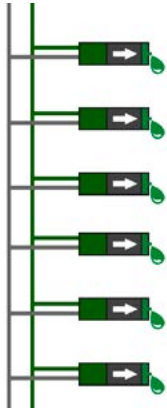
- No climbing on and around machinery or inaccessible areas.

## Effectiveness of Automatic Lubrication





## Dual line systems



A dual line parallel system is similar to the single line parallel system in that it uses pressure to cycle adjustable valves to dispense measured shots of lubricant. It has 2 main supply lines which are alternatively used as pressure / vent lines.

The advantage of a dual line system is that it can handle hundreds of lubrication points from a single pump station over longer line lengths using significantly smaller tubing or lines.

Groenevelds Twin dual line automatic lubrication systems are used on the most demanding applications all over the world.

## Dual line systems for all kinds of applications



Wheeled loaders



Articulated dump trucks



Rigid dump trucks



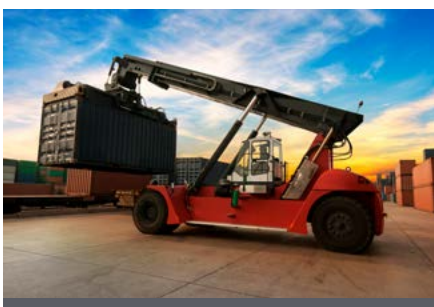
Excavators



Dozers & Graders



Forage harvesters & Combines



Reachstackers & Telehandlers



Terminal tractors



Gantry cranes

# Groeneveld Twin

## When only the very best will do



## Groeneveld Twin

Unique product features make the Twin the best solution for larger machines that are often used under extreme conditions. The system works under relatively low pressure, which means that the structure – and therefore the quality – of the grease is preserved.

The dual-line system with its patented metering units ensures that all lubrication points are always optimally lubricated. This is made possible due to precise metering and lubrication intervals, also in case of extremely low or high ambient temperatures and large distances between pump and lubrication points. In addition, it is easy to expand the system to detachable equipment pieces. This makes the system extremely suitable for larger machines such as large wheel loaders and dump trucks, but also for spreaders and heavy haulage trailers.

- Grease output and grease delivery independently of ambient temperature and grease viscosity
- Thanks to the relatively low work pressure, the quality of the grease is preserved
- Modern pump with real-time clock, memory, CAN-Bus connection and follower plate
- High quality metering units and distribution blocks
- Standard with in-cab display
- Available with reservoir volumes ranging from 2 to 200 litres
- Easy to programme, install and extend
- The filling coupling with filter prevents contamination during filling
- Easily extended to grippers, excavation buckets and other equipment pieces through quick couplers
- Suitable for biodegradable grease

### System overview



#### Follower plate

The follower plate ensures that all the grease in the reservoir is used. This means that the reservoir wall remains clean, allowing you to check the grease level visually. Ageing of the grease as a result of oxidation is also prevented.

#### Reservoir

Twin is available with reservoir volumes of 3, 4, 6 and 8 litres.

#### Filler coupling with filter

The filling coupling with grease filter prevents contamination of the grease during filling.

#### Pump housing

The pump is made of hard anodised aluminium and nylon reinforced - containing the control unit, memory database and minimum level indicator.

### Twin XL & Twin barrel pump

Specifically for larger applications, the Groeneveld range includes the Twin XL with an extra large reservoir of 20 litres. An automatic lubrication system with a higher grease delivery and an extra large reservoir, made of sturdy and coated material.

For machines and vehicles with an extremely high grease demand, such as mining equipment, Groeneveld supplies a barrel pump with reservoir volumes from 40 to 200 litres.

The major benefit will be that the user rarely needs to refill the reservoir.

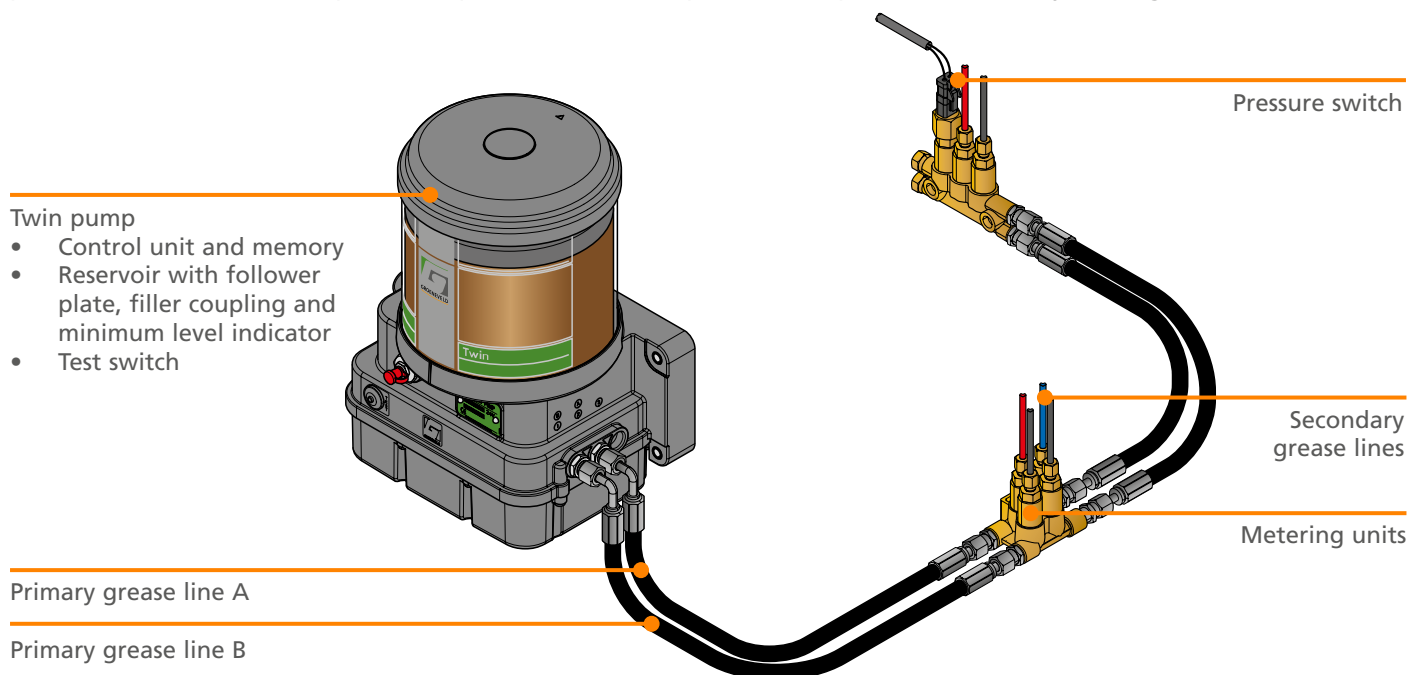


Twin XL



## Working principle

A Twin system consists of a pump with grease reservoir, a main line network to the distribution blocks with metering units and a secondary line network to the lubrication points. The grease is pumped to the distribution blocks via a double main line network. The metering units supply the exact right amount of grease to each of the lubrication points. The pump switches off once the pressure in all metering units is at least 100 bar. As a result, always the right amount of grease is provided at each lubrication point, independent of counter-pressure, temperature or viscosity of the grease.



## Twin In-cab display

In order to check the status of the system, the driver or operator does not have to leave the cabin. The in-cab display will show system messages in the cabin. This will allow an easy and fast diagnosis of the system, as well as remote assistance.





Technical information | Twin pump

Pump type	Electric piston pump
No. of outputs	1
Maximim number or lubrication points	200*
Grease delivery Twin	12 cc/min.
Grease delivery Twin XL	20 cc/min.
Grease delivery Twin barrel pump	60 cc/min.
Maximum operating pressure	250 bar (3625 psi)
Grease class	NLGI-2
Temperature range	-20 up to +70 °C (-4 up to 158 °F)
Supply voltage	12 or 24 Vdc
Protection class	IP67 (for pump unit)
Regulations / EMC	Automotive directive 72/245/EC, as last amended by directive 2006/28/EC. Earth Moving Machinery standard; ISO 13766

*\*Depending on system resistance, grease delivery and tubing length*

Technical information | Twin display

Supply voltage	9 - 32 Vdc
Maximum operating current	220 mA
Temperature range	-25 up to +70 °C (-13 up to 158 °F)
Protection class	IP54
Regulations / EMC	Off road ISO 13766-2006 Road transport 2004/104/EC Industrial equipment 2004/108/EC



## **Dual line distribution blocks & metering units**



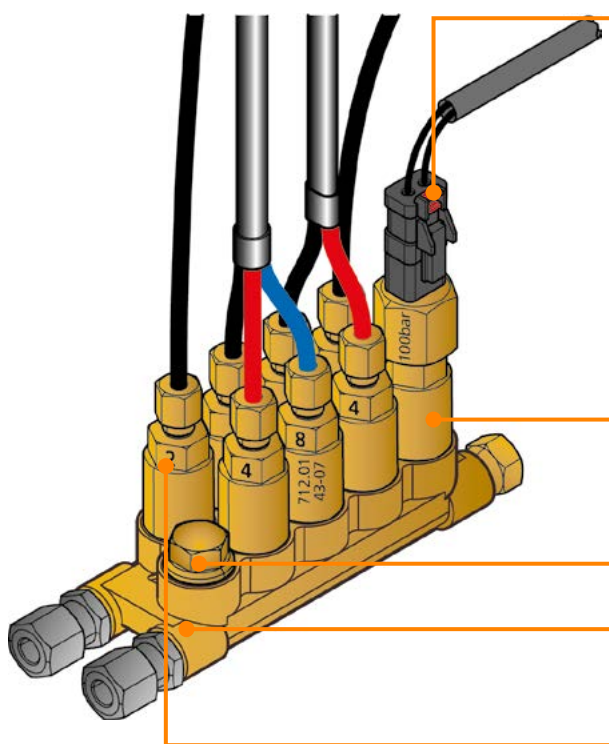
## Dual line distribution blocks & metering units

Various types of distribution blocks and metering units are available for the Groeneveld-BEKA dual line systems. Each grease point can receive the correct dose of grease per greasing cycle by a careful choice of the type of metering unit, which all have a different grease output.

Dual line distribution blocks are built by combining a distribution block with different metering units. Unused ports on the distribution block are sealed with a blind plug. A pressure switch can also be mounted into one of the ports. The metering units deliver the lubricant under pressure via secondary lines directly to the lubrication points.

A distribution block with metering units forms an closed structure and can therefore be fitted in a moist or dirty environment without problems. Both distribution blocks and metering units are available in brass and stainless steel. Brass is always used as standard. When it is known that part of the machine will be operating in an aggressive environment (e.g. salt, fertiliser, unslaked lime, acids, etc.) it is recommended to use stainless steel for that part of the lubrication installation.

### System overview



#### Pressure switch

The pressure switch notifies the control unit that sufficient pressure has been built up during the pumping phase and stops the pump. When the required pressure is not reached, the pumping phase is only ended after reaching the set maximum pumping time.

Preferably the pressure switch is mounted on the distribution block, located the farthest from the pump. This is done to be sure that the required grease pressure of 100 bar also reaches the last distribution block. When for practical considerations the switch is placed somewhere in the middle or at the beginning of the greasing system, a switch with a higher switch-pressure is applied. Pressure switches are delivered with switch-pressures of 100, 125, 150 or 175 bar.

#### Metering unit

The various metering units are distinguished from each other using numbers. Metering units are available from 0.025 up to 4.000 cc/cycle. The metering units are available in brass or stainless steel.

#### Blind plug

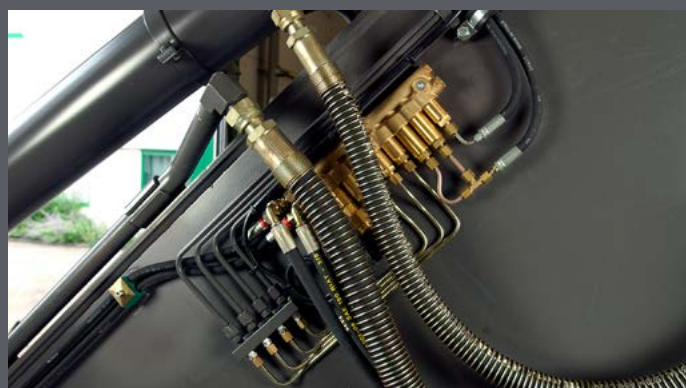
#### Distribution block

The distribution blocks are deliverable with 2, 3, 4, 5, 6, 7, 8, 9, 12, 14, 18, 20, 21 or 22 ports (exits).

#### Metering unit number

### Secondary lines

The lines create the connection between the metering units and the lubrication points. From flexible hoses to very strong steel lines. Groeneveld-BEKA has the correct line for any application.



### Kits

For the most common applications, Groeneveld-BEKA supplies ready-made kits. These kits contain all necessary components for installation. This allows Groeneveld-BEKA to offer an expert and quick solution for each machine.





## Types of distribution blocks

Groeneveld-BEKA offers different types of distribution blocks:

- Flat distribution blocks, with the metering units in one line made out of brass or stainless steel
- Distribution blocks with threaded studs, fitted with a double row of metering units made out of brass or stainless steel



Flat distribution blocks



Distribution blocks with threaded stud

## Type of metering units

The metering units are available with different grease outputs and are distinguished from each other using numbers. If the largest dosing rate does not deliver sufficient grease to a grease point then it is possible to connect metering units together.

Metering unit	cc per cycle
0	0.025 cc
1	0.050 cc
2	0.100 cc
3	0.150 cc
4	0.200 cc
5	0.250 cc
6	0.300 cc
7	0.350 cc
8	0.400 cc
8.5	0.700 cc
9	1.000 cc
10	2.000 cc
11	4.000 cc







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