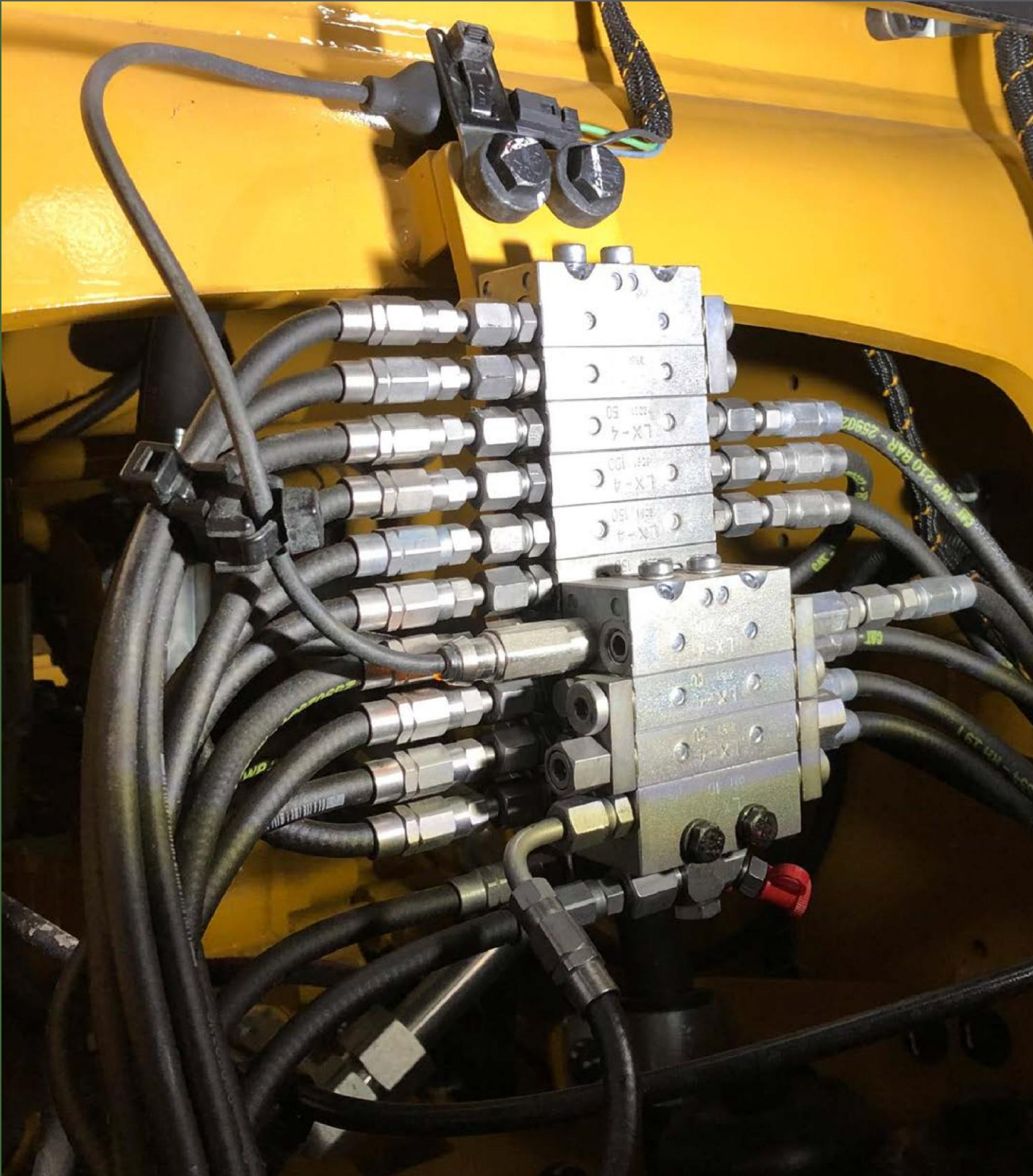


Progressive Systems

Wide range of unique solutions



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.

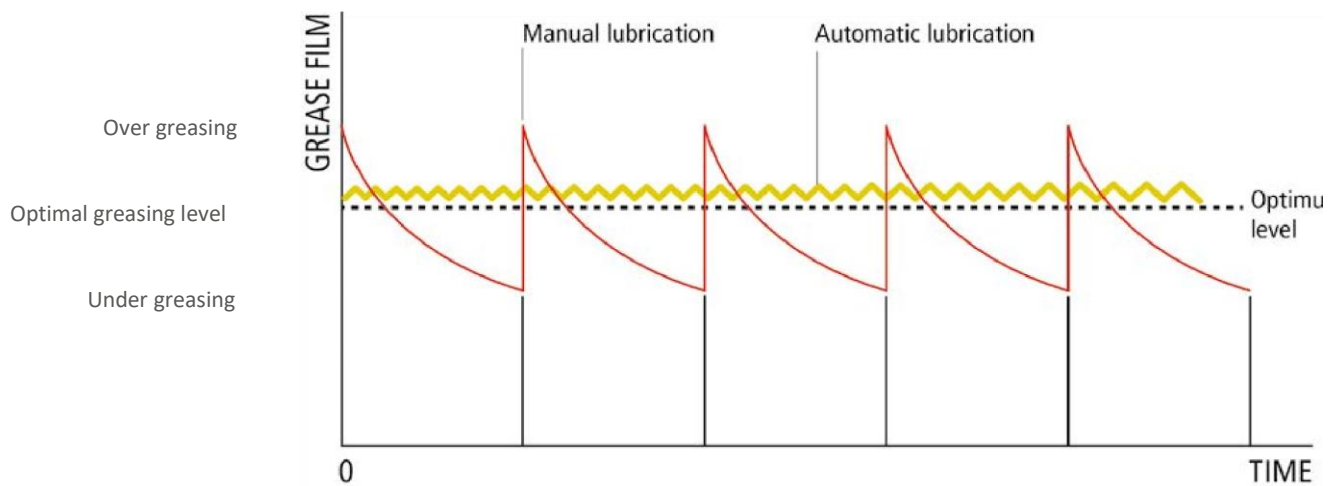
Decreased maintenance

- 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

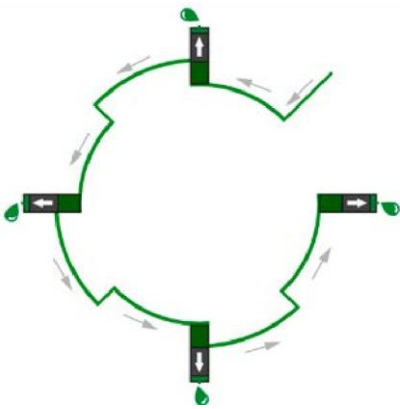
- No climbing on and around machinery or inaccessible areas.

Effectiveness of Automatic Lubrication



Progressive systems

A progressive system uses lubricant flow to cycle individual metering valves and valve assemblies. The valves consist of dispensing pistons moving back and forth in a specific bore. Each piston depends on flow from the previous piston to shift and displace lubricant. This ensures that each lubrication point is supplied with the correct and defined amount of grease.



Progressive systems for all kinds of applications



Wheeled loaders



Articulated dump trucks



Rigid dump trucks



Excavators



Dozers & Graders



Forage harvesters & Combines



Agricultural machines



Reachstackers



Attachments

Progressive lubrication systems

Electric actuated pumps



BEKAMAX PICO

The PICO system combines power and flexibility in perfect conditions with a compact design. The PICO system is the unique combination of progressive- and multi line technology.

The basic version of the PICO pump supplies lubricant through the progressive outlets to the lube points via one or more progressive distributors. In addition up to 8 lubrication points can be supplied directly via the multi line principle. If necessary the system can be enlarged by a second progressive cycle.

- Very compact design for applications with little number of lubrication points
- Unique combination of two lubrication systems:
- Progressive- and multi line technology
- Suitable for all common lubricants from NLGI-000 up to NLGI-2 • Flexible extension possibilities

System overview



Reservoir

The 1,2 litre reservoir is available with agitator blade or follower plate. The system with a follower plate can be installed in each direction, also upside down.

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.

Multi line outputs

The PICO has got 8 multi line outputs for different pump elements.

Progressive outputs

The PICO has got 2 progressive outputs for different pump elements.

Filling zerk

The pump can be filled with a standard filling gun. The filling zerk can be replaced by a filling connection to refill using a filling pump.

Control unit

The PICO can be delivered with an integrated control unit with:

- 3 control functions: time, stroke or revolutions
- Electronic monitoring of grease level, pump function, distributor function, line rupture, lubricant feeding
- Selection of operating conditions: easy, medium or heavy
- Integrated data logger with diagnosis module DiSys

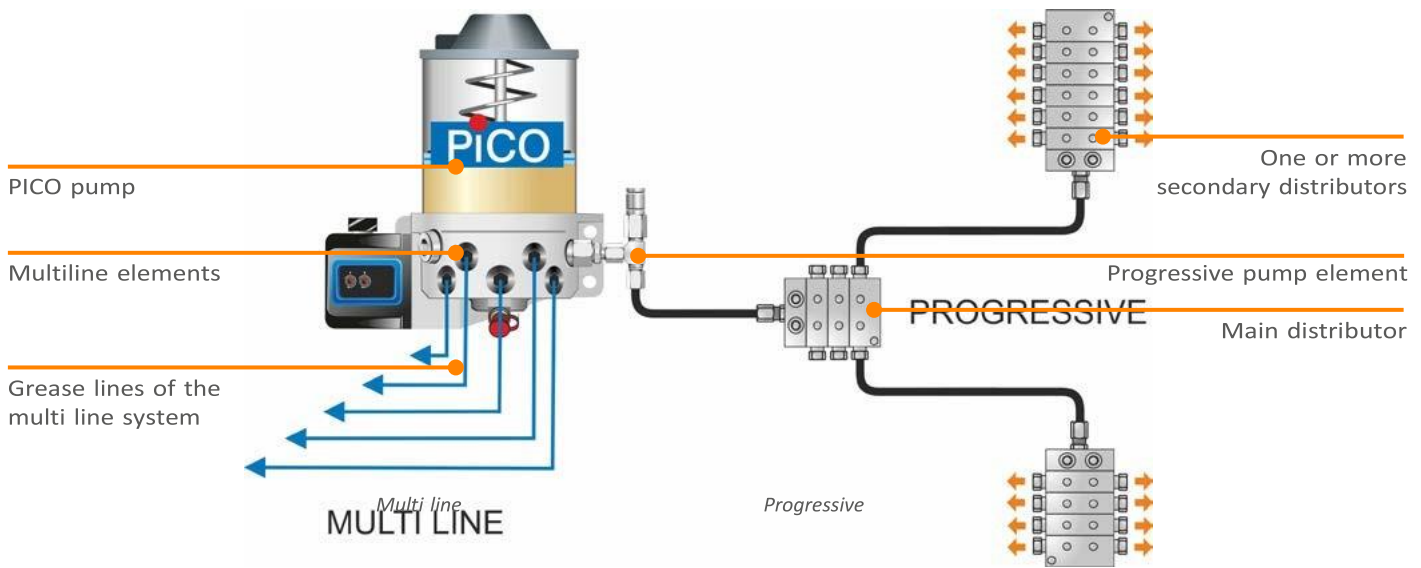
The protective housing is equipped with a bayonet or Hirschmann plug-type connection.

Pump elements

Two different construction types of pump elements can be installed into the device, depending on for which lubrication system or for which lubrication system combination the device is used.

System	Pump elements		Metering volume
Multi line	PE 5		0.005 cc/stroke
	PE 10		0.010 cc/stroke
	PE 15		0.015 cc/stroke
	PE 25		0.025 cc/stroke
	PE 50		0.050 cc/stroke
Progressive	PE 120 F	with/without pressure limiting valve	0.120 cc/stroke
	PE 120 FV		0.04 up to max. 0.12 cc/stroke (adjustable)

When the pump is activated, grease is pumped through the pump elements. The pump elements transfer the grease to main and secondary progressive distributors. The multi line elements transfer the grease directly to the lubrication points.



Technical information

Pump type	Electric
Supply voltage	12 or 24V
No. of outlets	Max. 10, 2 progressive and 8 multi line
Maximum operating pressure	200 bar (2900 psi) at multi line system 280 bar (4000 psi) at progressive system
Delivery volume	Max. 0.12 cc per stroke/outlet
Reservoir capacity	1,2 litre
Grease class	Greases up to NLGI-2
Temperature range	-20 up to +70 °C / (-4 up to 158 °F)
Protection class	IP65

BEKAMAX EP-1

The EP-1 is an electrically actuated pump with up to 3 lubrication outlets. The EP-1 can deliver commercial lubricants from NLGI-000 up to NLGI-2 at a working pressure of maximum 280 bar. Therefore, this system is the ultimate solution for different applications in on road, construction, agriculture and port equipment.

- A versatile solution for most mobile and stationary applications
- Suitable for all common lubricants
- Springless pump elements with desmodromic drive for highest reliability

System overview



Level monitor

The EP-1 can be equipped with an electronic grease level controller to control the minimum grease level.

Reservoir

The EP-1 reservoir is made of transparent plastic and contains an agitator blade. The agitator blade enables a visual check of the lubricant volume in the reservoir.

EP-1 is available with different reservoir capacities.

Pressure relief valve

Pump element

The EP-1 has up to a maximum of 3 lubricant outlets. A separate pump element is required for each outlet. Three pump elements with different flow rates are available, as well as a flow-adjustable pump element.

Filling zerk

The pump can be filled with a standard filling gun. The filling zerk can be replaced by a filler coupling.

Control unit

The EP-1 series differ in control type. EP-1 can be controlled externally or with an integrated control unit with:

- 3 control functions: time, stroke or revolutions
- Electronic monitoring of grease level, pump function, distributor function, line rupture, lubricant feeding
- Selection of operating conditions: easy, medium or heavy
- Integrated data logger with diagnosis module DiSys

Pump elements

Three pump elements with different flow rates are available, as well as a flow-adjustable pump element. All pump elements are marked either with a groove or with a notch for a better differentiation.



PE 60 PLV
0.06 cc/stroke



PE 120 PLV
0.12 cc/stroke



PE 120 V PLV
Max. 0.12 cc/stroke
Adjustable output

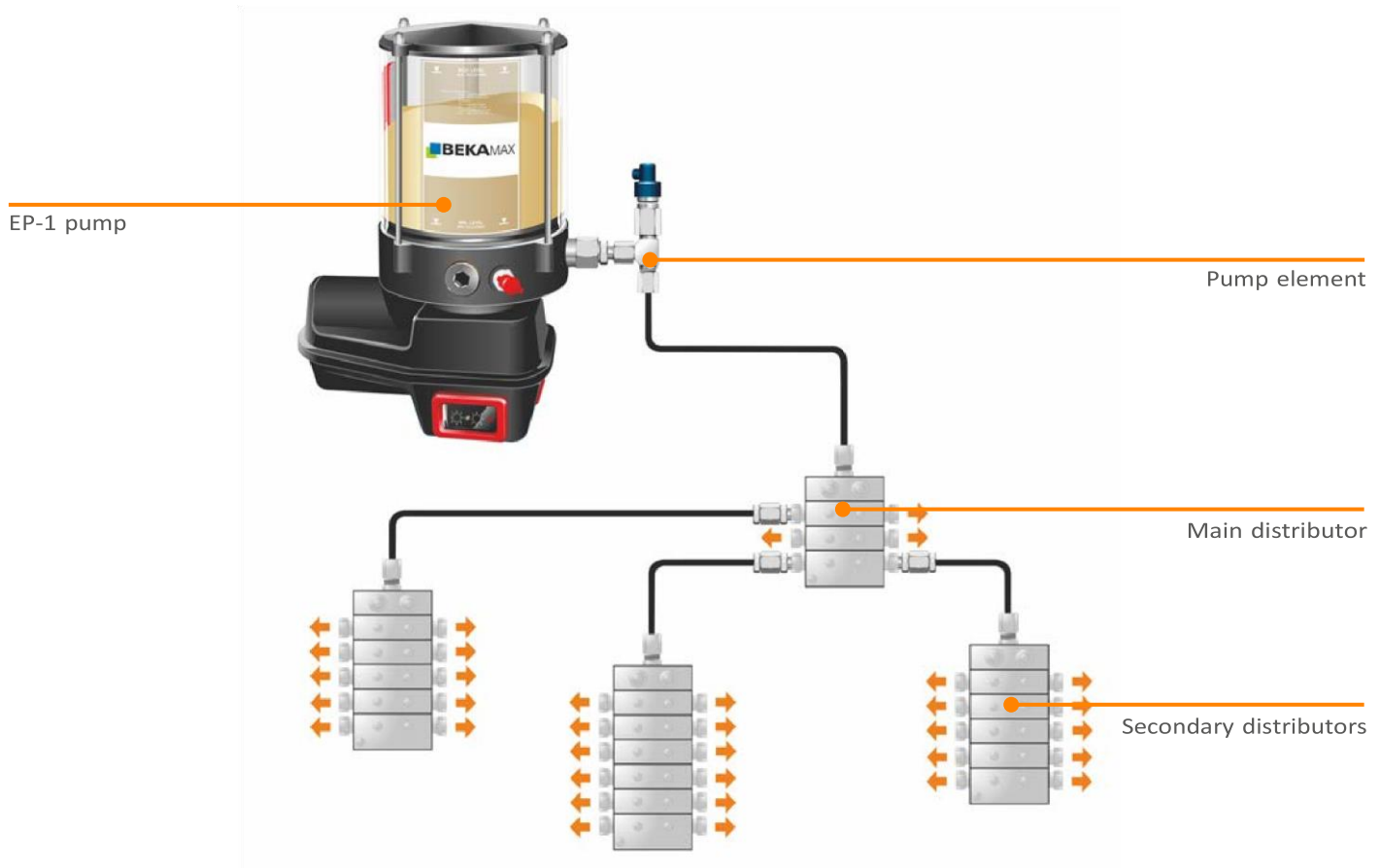


PE 170 PLV
0.17 cc/stroke

Pressure: Max. 350 bar

Pressure limiting valve: adjusted to 280 bar

When the pump is activated, grease is pumped through the pump elements. The pump elements transfer the grease to the main and secondary progressive distributors.



Technical information

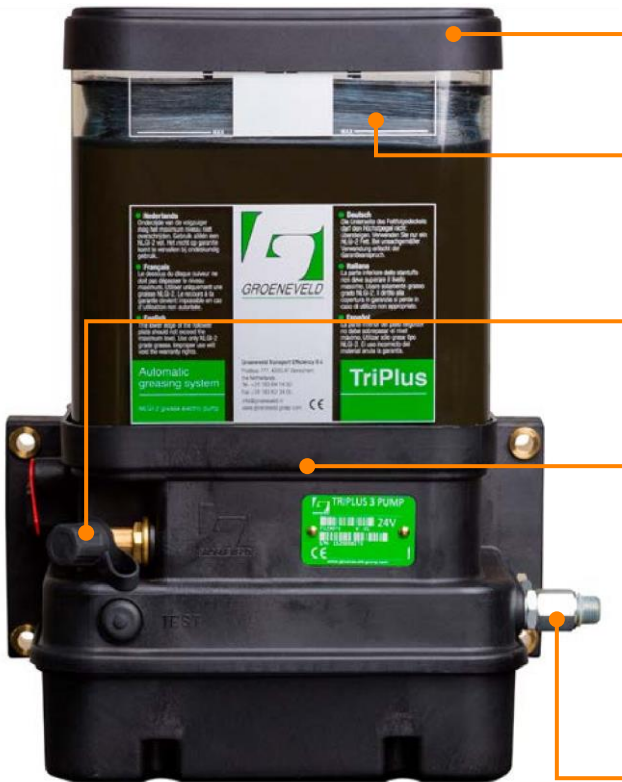
Pump type	Electric
Supply voltage	12 or 24V
No. of outlets	Max. 3
Maximum operating pressure	350 bar (5100 psi)
Pressure limiting valve	Adjusted to max. 280 bar (4000 psi)
Number of revolutions	15 min ⁻¹
Reservoir capacity	1.9, 2.5, 4, 8, 12 and 16 litre
Grease class	Greases up to NLGI-2
Temperature range	-20 up to +70 °C (-4 up to 158 °F)
Protection class	IP5K9K

Groeneveld TriPlus

The Groeneveld TriPlus is a unique progressive lubrication system that offers three circuits that can be operated independently. It is the ultimate solution for machines that have different components requiring different amounts of lubrication. This prevents unnecessary lubrication of components that are not moving.

- Three lubrication circuits that can be operated independently
- Grease metering regardless of the ambient temperature
- Optimal grease metering per lubrication point
- Follower plate for visual checking of the grease level and to prevention of ageing of the grease as a result of oxidation • Filling coupling with filter prevents contamination during refilling
- Provided with in-cab check light

System overview



Reservoir

TriPlus is available with reservoir volumes of 1,5, 3, 4, 6 and 8 litres. The 6 and 8 litre pumps are equipped with a round reservoir.

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.

Filler coupling with filter

The filling coupling with grease filter prevents contamination during filling. To be able to fill the reservoir using a special filling pump, a special filler coupling can be installed.

Pump housing with integrated control unit

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

The controller is the core of the TriPlus. This electronic controller, with a real-time clock and memory, ensures that each lubrication circuit receives the exact amount of grease that has been programmed. These settings can always be adjusted to changing working conditions.

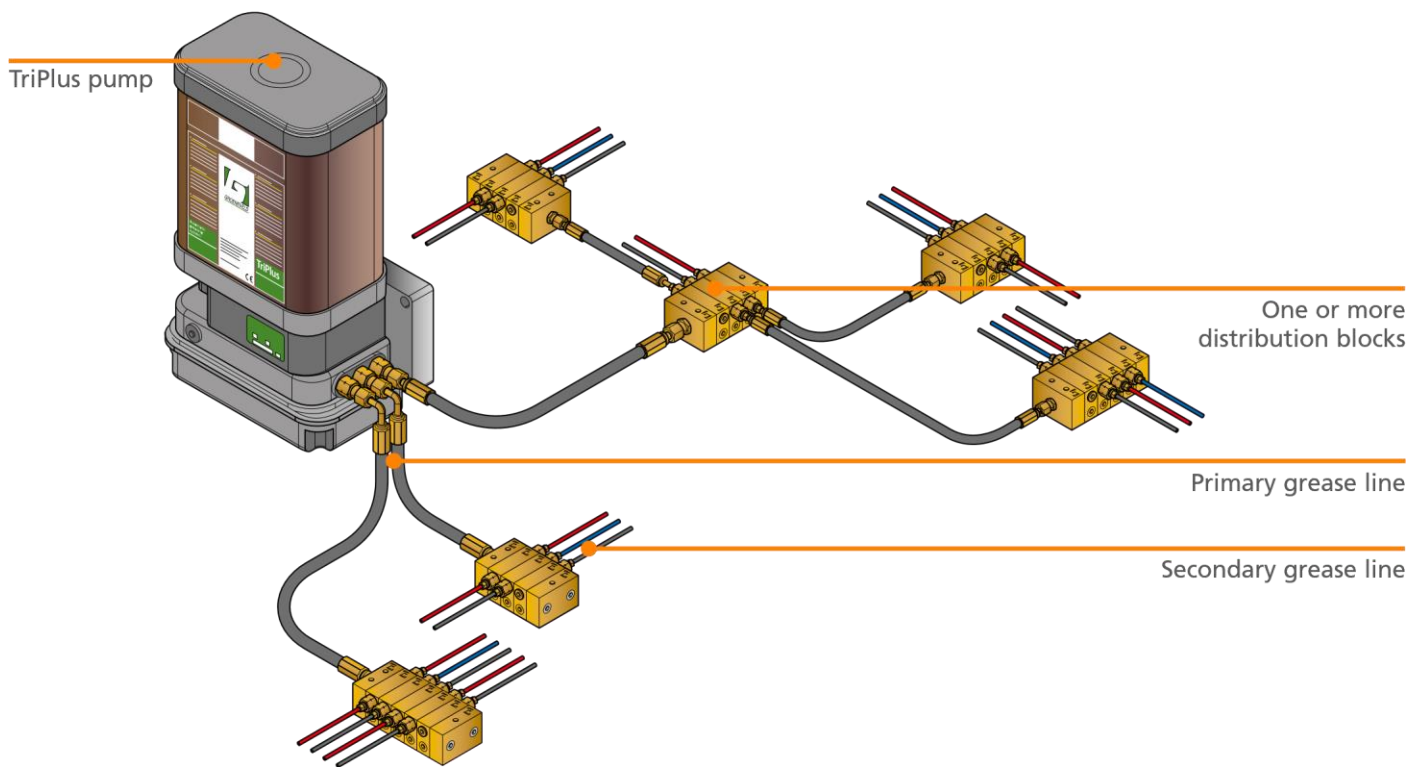
Outlets

The TriPlus can be delivered with up to 3 separate grease outlets with independent programming.

When the pump is activated, grease is pumped into the pump elements. The progressive elements transfer the grease to the progressive distribution block via the primary grease line. Then it's being transferred to additional blocks or to the lubrication points via secondary grease lines.

If the pump features more than 1 grease output port, one or 2 shuttle valves are installed in the pump. By placing the shuttle valves in a certain position the control unit controls which output is used to transfer the grease.



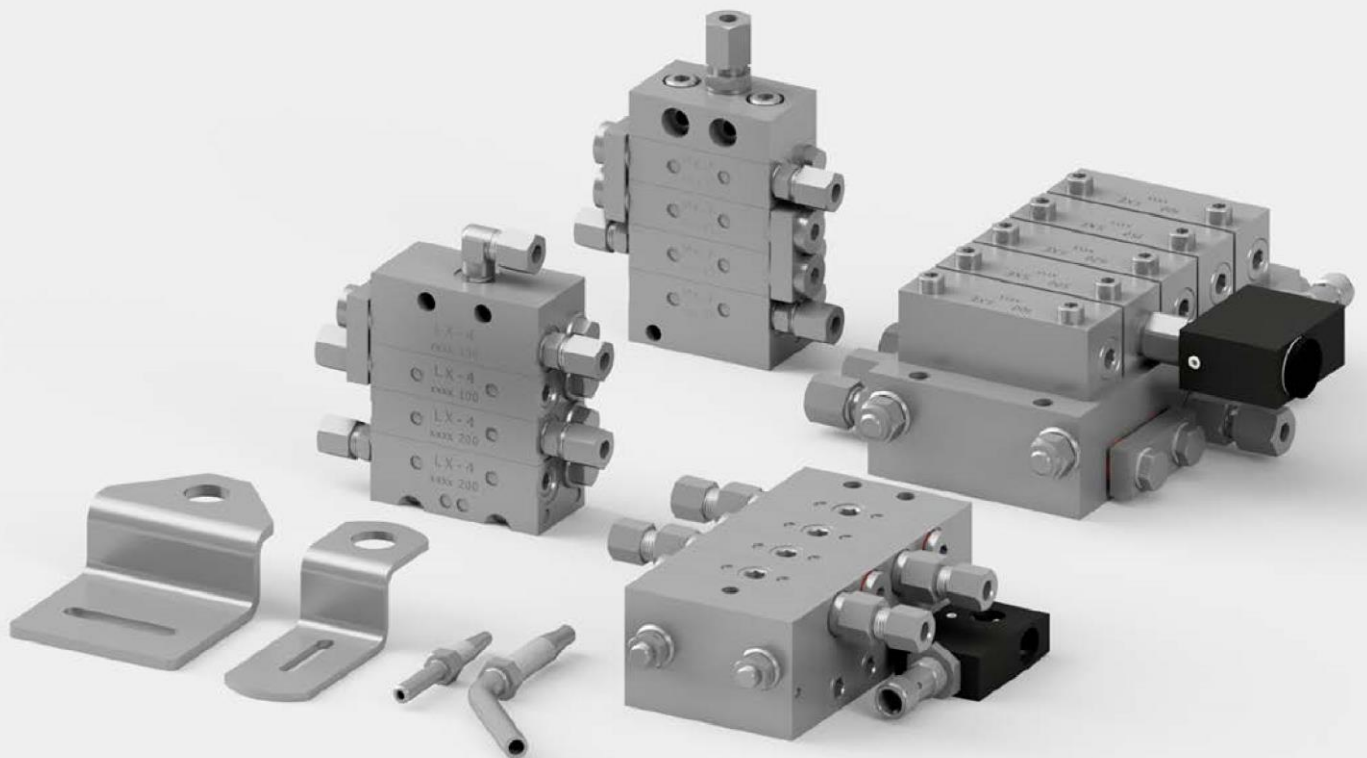


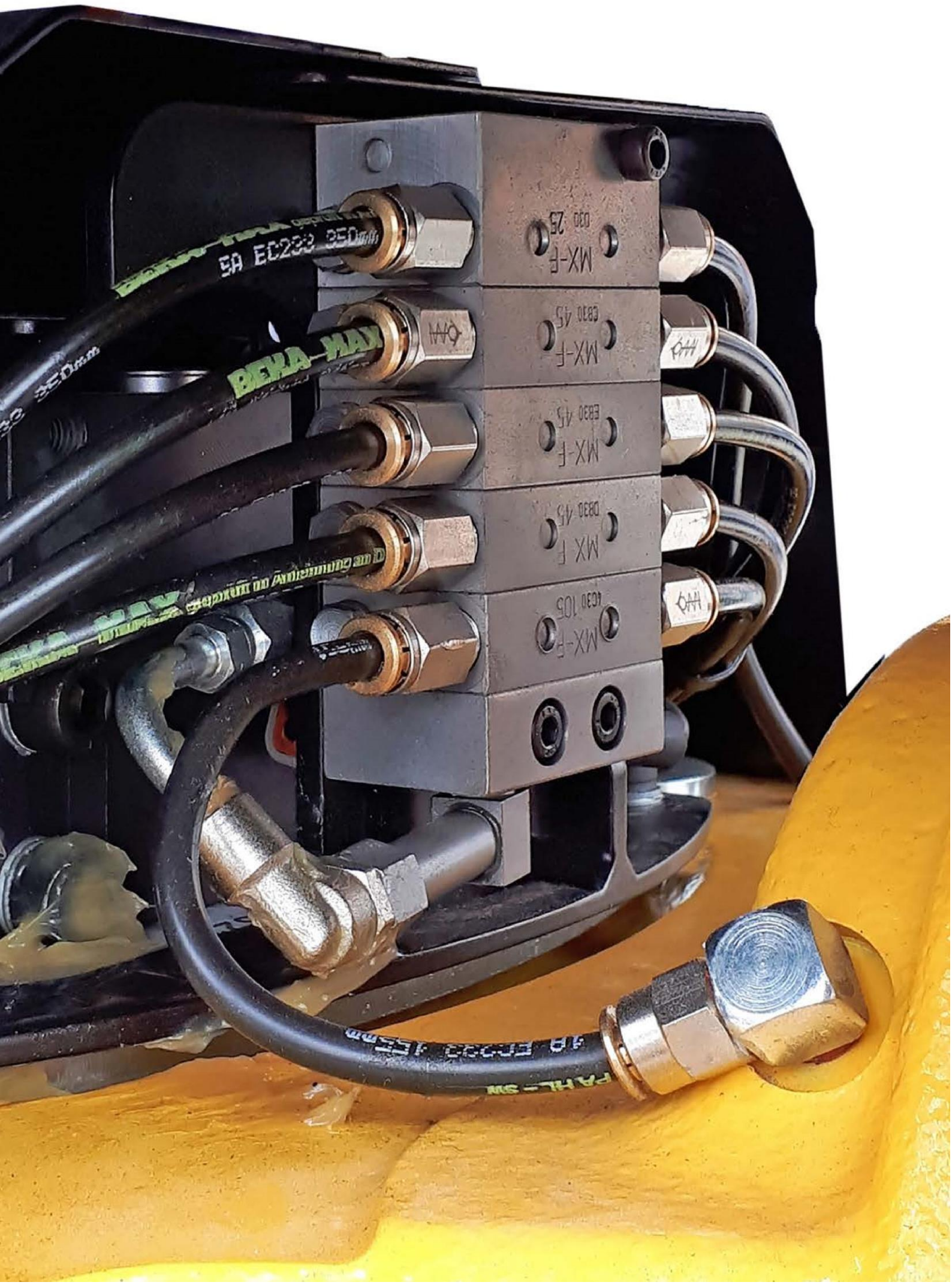
Technical information

Pump type	Electric
Supply voltage	12 or 24 Vdc
No. of outlets	Max. 3
Output	2.5 cc/min. or 0.1 cc/revolution
Maximum operating pressure	250 bar (3625 psi)
Reservoir capacity	1.5, 3, 4, 6 or 8 litre
Grease class	NLGI-2
Temperature range	-20 up to +85 °C (-4 up to 185 °F)
Protection class	IP67



Progressive distributors





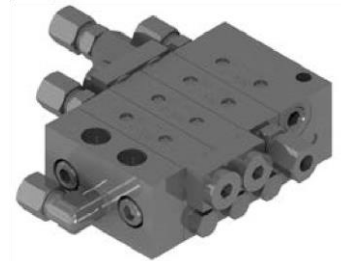
BEKA Progressive distributors for oil and grease

The BEKA progressive distributors are built in modular disc design. Therefore the distributors can be extended or shortened depending on the number of lubrication points. Because of the disk construction, there is the possibility to form individual distributors with different metering elements and different metering volumes.

BEKA MX-F

The MX-F distributors are used in the mobile range, in onroad and offroad vehicles, agricultural and construction machinery etc. These distributors are made of steel with a zinc-nickel coating.

Type element	Output per outlet	Output per element
MX-F 25	0.025 cc	0.05 cc
MX-F 45	0.045 cc	0.09 cc
MX-F 75	0.075 cc	0.15 cc
MX-F 105	0.105 cc	0.21 cc
No. of metering elements	Min. 3, max. 12 Excluding start and end element	



BEKA LX-4

The LX-4 distributors are the alternative for the MX-F with a high metering flexibility and accuracy. They are made of steel with a zinc-nickel coating.

Type element	Output per outlet	Output per element
LX-4 50	0.05 cc	0.10 cc
LX-4 100	0.10 cc	0.20 cc
LX-4 150	0.15 cc	0.30 cc
LX-4 200	0.20 cc	0.40 cc
No. of metering elements	Min. 3, max. 10 Excluding start and end element	



BEKA MX-I

The MX-I distributors are especially suitable for the food industry and aggressive environments. These distributors are made of stainless steel with the highest material quality, 1.4404.

Type element	Output per outlet	Output per element
MX-I 45	0.045 cc	0.90 cc
MX-I 75	0.075 cc	0.15 cc
MX-I 105	0.105 cc	0.21 cc
No. of metering elements	Min. 3, max. 8 Excluding start and end element	

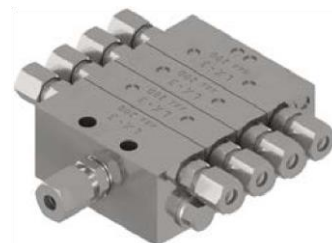


BEKA LX-3

The LX-3 distributors are perfectly suitable for the beverage and packaging industry. These distributors are made of stainless steel with the highest material quality, 1.4404.

Progressive distributors

Type element	Output per outlet	Output per element
LX-3	0.20 cc	0.40 cc
No. of metering elements	Min. 3, max. 10 Excluding start and end element	



BEKA SX-1

The SX-1 is a typical main distributor for industrial applications. They are available with integrated non-return-valve. These distributors are made of steel with a zinc-nickel coating.

Type element	Output per outlet	Output per element
SX-1 05	0.068 cc	0.136 cc
SX-1 10	0.105 cc	0.210 cc
SX-1 15	0.150 cc	0.300 cc
SX-1 20	0.210 cc	0.420 cc
SX-1 25	0.275 cc	0.550 cc
SX-1 35	0.350 cc	0.700 cc
SX-1 45	0.430 cc	0.860 cc
No. of metering elements	Min. 3, max. 10 Excluding start and end element	



BEKA SX-2 / SX3

The SX-2 and SX-3 combine compact dimensions with a high volume flow.

The SX-2 distributors are made of steel with a zinc-nickel coating. The SX-3 distributors are made of stainless steel with the highest material quality, 1.4404. Therefore they are especially suitable for the food industry and in aggressive environments.

Type element	Output per outlet	Output per element
SX-2 (3) 07	0.075 cc	0.150 cc
SX-2 (3) 11	0.117 cc	0.234 cc
SX-2 (3) 17	0.170 cc	0.340 cc
SX-2 (3) 23	0.230 cc	0.460 cc
SX-2 (3) 30	0.300 cc	0.600 cc
SX-2 (3) 38	0.380 cc	0.760 cc
SX-2 (3) 47	0.470 cc	0.940 cc
No. of metering elements	Min. 3, max. 10 Excluding start and end element	
Revolutions SX-2	Max. 180 revolutions/min.	
Revolutions SX-3	Max. 60 revolutions/min.	



BEKA SX-5

The SX-5 distributors stand out because of their heavy duty design and their large connection threads. They are available with integrated non-return-valve. They are especially suitable for the mining industry.

Type element	Output per outlet	Output per element
075 SX-5	0.075 cc	0.150 cc
117 SX-5	0.117 cc	0.234 cc
170 SX-5	0.170 cc	0.340 cc
230 SX-5	0.230 cc	0.460 cc
300 SX-5	0.300 cc	0.600 cc
380 SX-5	0.380 cc	0.760 cc
470 SX-5	0.470 cc	0.940 cc



No. of metering elements	Min. 3, max. 10 Excluding start and end element
--------------------------	--

BEKA UX

The UX distributors have their outlets positioned upward, making them easily detachable when swivel joints are used at the pipe lines. They are made of steel with a zinc-nickel coating.

Type element	Output per outlet	Output per element
UX 1000	1.13 cc	2.26 cc
UX 1500	1.54 cc	3.08 cc
UX 2000	2.00 cc	4.00 cc
No. of metering elements	Min. 3, max. 10 Excluding start and end element	



BEKA SXE-2 / SXE-2R / SXE-3

The SXE distributor-range is designed for the use as main distributor for lubrication systems at construction machinery. Within this range the use of dummy elements is possible, which can be replaced by metering elements if necessary without disassembling the whole distributor and lines. The SXE-distributors are made of steel with a zinc-nickel coating.

Type element	Output per outlet	Output per element
000 SXE-2/3	Dummy element	
100 SXE-2 (SXE-2/3)	0.10 cc	0.20 cc
150 SXE-2 (SXE-2/3)	0.15 cc	0.30 cc
220 SXE-2 (SXE-2/3)	0.22 cc	0.44 cc
300 SXE-2 (SXE-2/3)	0.30 cc	0.60 cc
400 SXE-2 (SXE-2/3)	0.40 cc	0.80 cc
500 SXE-2 (SXE-2/3)	0.50 cc	1.00 cc
620 SXE-2 (SXE-2/3)	0.62 cc	1.24 cc
760 SXE-2 (SXE-2/3)	0.76 cc	1.52 cc
No. of metering elements	Min. 3, max. 10 Excluding start and end element	
SXE-2R	With integrated return-to-tank channels and connections	
SXE-3	Suitable for larger line diameter	



BEKA SXD

The SXD distributors are also designed for the use as main distributor, but due to the connections of the outlets facing downwards they are perfectly suitable for installation into a dust and impact protected control cabinet. The use of dummy elements is possible, which can be replaced by metering elements if necessary.

The SXD-distributors are made of steel with a zinc-nickel coating.

Type element	Output per outlet	Output per element
SXD M000	Dummy element	
SXD M100	0.10 cc	0.20 cc
SXD M150	0.15 cc	0.30 cc
SXD M220	0.22 cc	0.44 cc
SXD M300	0.30 cc	0.60 cc
SXD M400	0.40 cc	0.80 cc
SXD M500	0.50 cc	1.00 cc
SXD M620	0.62 cc	1.24 cc
SXD M760	0.76 cc	1.52 cc
No. of metering elements	Min. 3, max. 10 Excluding start and end element	



Progressive distributors

BEKA SXW-1

The progressive distributors in sandwich construction consist of a connecting plate and several metering elements. The elements are connected to the connecting plate and can be exchanged individually or completely with the base plate. The use of dummy elements is possible, which can be replaced by metering elements if necessary.

The SXW-range is especially suitable for oil circulating systems. The metering elements are made of coated steel, with a connection plate made of aluminium, which reduces the weight of the distributor.



Type element	Output per outlet	Output per element
000 SXW-1	Dummy element	
100 SXW-1	0.10 cc	0.20 cc
150 SXW-1	0.15 cc	0.30 cc
220 SXW-1	0.22 cc	0.44 cc
300 SXW-1	0.30 cc	0.60 cc
400 SXW-1	0.40 cc	0.80 cc
500 SXW-1	0.50 cc	1.00 cc
630 SXW-1	0.63 cc	1.26 cc
750 SXW-1	0.75 cc	1.50 cc
900 SXW-1	0.90 cc	1.80 cc
No. of metering elements	Min. 3, max. 10	

BEKA SXW-2

The SXW-2 distributors are especially developed for oil lubricating systems in the automotive industry.

Type element	Output per outlet	Output per element
000 SXW-2	Dummy element	
900 SXW-2	0.90 cc	1.80 cc
1800 SXW-2	1.80 cc	3.60 cc
2700 SXW-2	2.70 cc	5.40 cc
3700 SXW-2	3.70 cc	7.40 cc
No. of metering elements	Min. 3, max. 10	

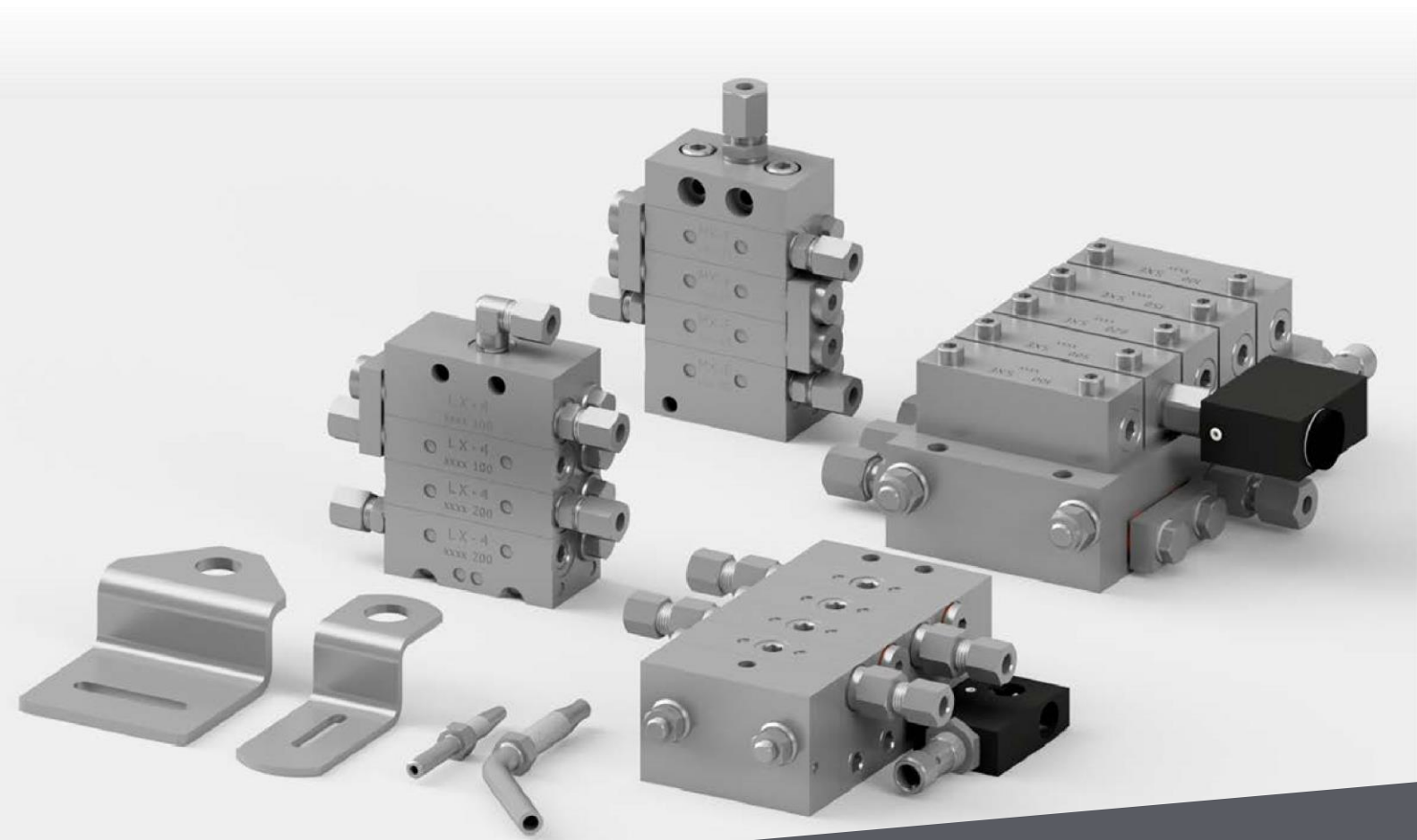


Zinc-nickel coating, the surface for rough conditions

Zinc-nickel coating does not only considerably increase the corrosion resistance but is also characterized by highest environmental compatibility and a high-quality appearance.

Surfaces coated with zinc-nickel prove to have a significantly higher resistance against corrosion than previous solutions with A3C. As this zinc-nickel coating offers so many advantages, Groeneveld-BEKA offers all relevant components and parts like distributors, fittings, pump elements etc. with a zinc-nickel coating.

- Excellent corrosion resistance
- Free of hexavalent chromium
- Significantly longer service life compared to conventional electroplating method
- White rust only occurs as a slight grey coating
- The zinc-nickel coating complies with all European requirements



Corrosion resistance (red rust) > 720h salt spray test

