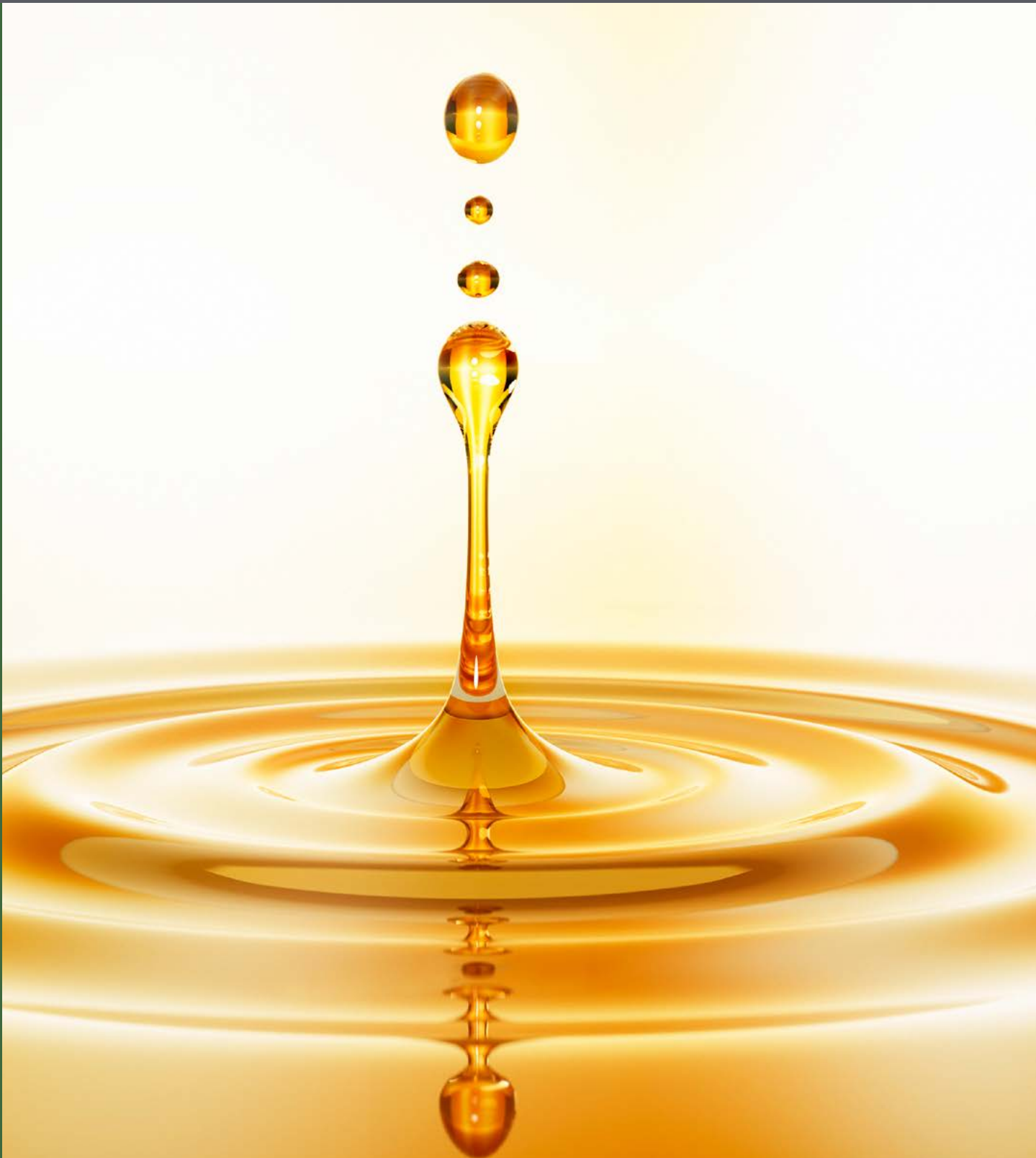


# Fluid Control Systems

Enhancing performance



## 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 life 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 operates in more than 40 countries worldwide and is represented by a growing number of independent distributors in many countries around the globe.

Groeneveld-BEKA products are supplied for ex-factory installs to leading manufacturers of trucks, trailers, buses, wind turbines, industrial applications, 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 kind 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 life time, less downtime and reduced repair and maintenance costs. In short: higher productivity and lower operational costs. As operators 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 has 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 a fixed point to a moving point.

### 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.



## Less maintenance, improved efficiency and lower costs

Maintaining a clean and optimal oil level at all times improves engine efficiency, minimises emissions and provides substantial cost savings to the operator. Trying to do this manually relies on vigilance and discipline from the driver and the maintenance staff.

Groeneveld-BEKA's systems have been proven to extend oil and engine life, cutting the cost of component replacements, reducing vehicle downtime and improving efficiency and safety.

## Trends & Developments



24 hour, 365 days a year operation



Vehicles and machines experience intense operational pressure



Companies strive for maximum reliability and utilization



Increase brand mix within fleets and technical diversity



Safety risks with hybrid high voltage applications



Time constraints on daily maintenance



Oil management has become a key role



Different guidelines on oil level checks per manufacturer

## Wide range of fluid control systems

In general Groeneveld-BEKA offers three types of fluid control systems for different applications.

### Oil level management



The Groeneveld Oilmaster monitors the oil level in the engine and, if necessary, supplies a measured pre-set volume of oil from its own reservoir.

### Oil filtration



The Groeneveld Filtakleen range of oil filters have been developed to filter engine and hydraulic oils, efficient at removing solid particles and water.

### Transferring oil



The Groeneveld Tecreel range of self-retracting hydraulic hose reels are designed to provide an efficient means of transferring hydraulic power from a fixed to a moving point.



# Fluid Control systems for all kind of applications

Whether you are an owner, operator or a fleet manager, one of the most cost effective ways of looking after your oil is by employing the use of oil replenishment and filtration systems. The fluid control systems from Groeneveld-BEKA are designed to manage and care for these requirements, the oil condition in engines and hydraulic equipment in a diverse range of applications.



Trucks



Truck mounted cranes



Refuse trucks



Buses



Reach stackers



Automated guided vehicles



Dozers



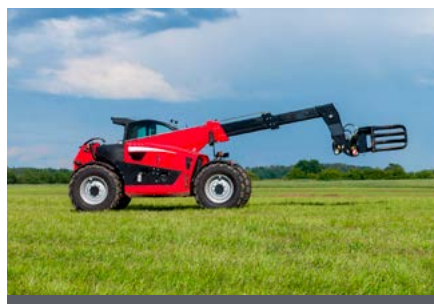
Excavators



Wheel loaders



Forklifts



Telehandlers



Generator sets

# Groeneveld Oilmaster

## Always the right oil level



## Groeneveld Oilmaster

With the Oilmaster, daily oil level checks and topping-up engine oil are no longer required. Oilmaster automatically checks the oil level according to an engine specific protocol and tops-up the oil from the integrated reservoir when needed. As a result the engine oil is always exactly at the right level. Not too low, but certainly not too high either. Oilmaster saves oil, time and costs, whilst reducing vehicles environmental impact.

- Manual oil level checks and filling oil are history - pure time saving
- Always the optimum oil level and the right oil specification
- No engine damage as a result of a too low oil level
- Less unscheduled downtime for repairs and maintenance
- Less risk of damaging the exhaust gas aftertreatment system
- Decreased oil consumption
- Avoiding increased fuel consumption as a result of overfilling
- Less oil needed at an oil change and less oil waste
- Lower costs
- Care for the environment

### Always the right oil level

Oilmaster, the advanced oil management system, ensures that the engine oil is always at the right level. Not too low, which can cause serious engine damage and also not too high, which can lead to excessive oil consumption, oil leakages or blown-out seals, increased fuel consumption and even damaged exhaust gas after treatment systems. As the oil is topped-up from the integrated tank, it also reduces the risk of operators adding oil of the wrong specification.

Oilmaster guarantees maintenance employees and management can minimise the risks of major repair and standstill as a result of damage to engines. This is comfort by security! Oilmaster provides increased business security, maximum availability of the equipment and consequently a short cost-recovery period.

### System overview

#### Control unit

The control unit controls and monitors all actions performed by the Oilmaster system.

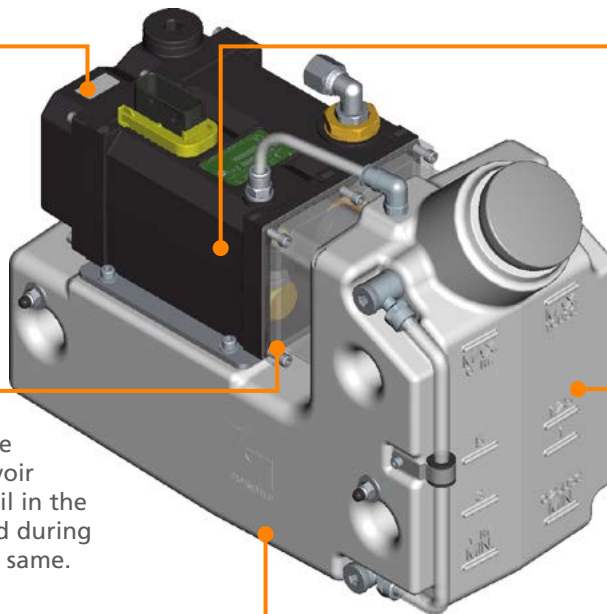
When during a measurement the sump level sensor detects a valid low level in the engine sump, the control unit starts a pump cycle.

#### Calibration tank

During one pump cycle the whole contents of the calibration reservoir (0.5 litres) will be added to the oil in the engine. The quantity of oil added during a single pump cycle is always the same.

#### Additional options:

- Can-BUS interface
- Inclination sensor
- Visual main-tank level indicator
- USB diagnosis connector



#### Tilt sensor

The tilt sensor ensures that the Oilmaster will only measure the oil level at the moment the engine is levelled.

It also measures the oil level only after an adequate period for oil level stabilisation.

#### Main reservoir

The Groeneveld Oilmaster is available in 6, 12 and 19 litre versions. Reservoirs can be adapted to special OEM requirements.

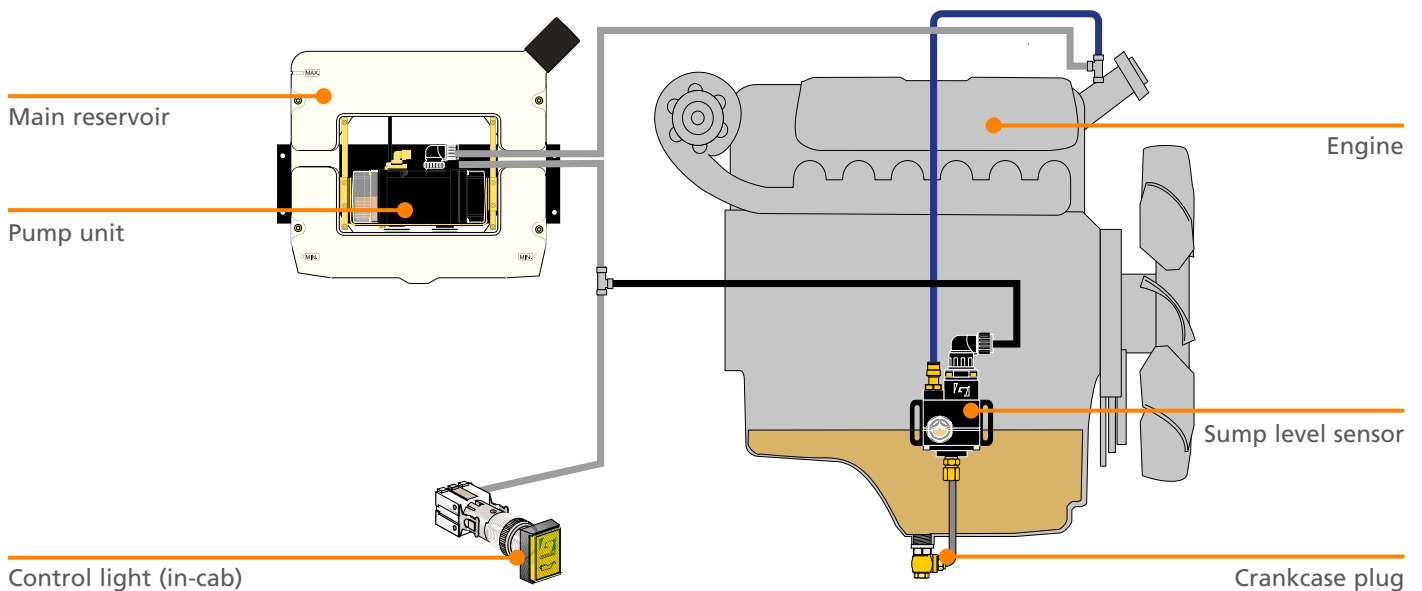
For the most demanding applications a heavy duty Oilmaster with a solid 15 litre aluminum tank is available.



## Working principle

The basic principle of Oilmaster consist of a two-step system. Oilmaster measures the oil level in the sump with a highly accurate level sensor, according to the protocol defined by the engine manufacturer. When needed, oil is pumped out of the tank and transferred into the filling chamber in amounts of 0.5 litre each time. When the filling chamber is full, the pumping is stopped and only then the carter will be filled automatically - safe, automatic and reliable.

Many manufacturers and end users have built in Oilmaster as a reliable instrument for many years. By using the Oilmaster, optimum oil management is achieved for buses, trucks, off-road applications, port equipment and stationary engines. Oilmaster is an essential supplement in remaining compliant with ever stricter emission requirements.





## System specifications

Reservoir capacity	Supply voltage	Setting (adjustable)	Remarks
4 litres	12 Vdc / 24 Vdc	3 hours	Requires additional tank
6 litres	12 Vdc / 24 Vdc	1 hour / 3 hours	
12 litres	12 Vdc / 24 Vdc	1 hour / 3 hours	
15 litres	12 Vdc / 24 Vdc	1 hour / 3 hours	
19 litres	24 Vdc	1 hour / 3 hours	

## Basic information

Temperature range	-25 °C up to +80 °C
Power consumption pump motor 12 Vdc*	4 A
Power consumption pump motor 24 Vdc*	2 A
Protection class	IP67 (for pump unit)
Type approval in accordance with the following directives	ECE-R10 (Rev. 4) EN 50498 (2010)

\*Nominal at 20 °C and 15W40 oil

## Applications

The Oilmaster can be used for a wide variety of applications. It is suitable for mobile applications like excavators, dump trucks and wheel loaders. But also for stationary equipment like gensets.



Transport



Bus & Coach



Construction



Port Equipment



# Groeneveld Filtakleen

Keeps oil in perfect condition



## Groeneveld Filtakleen

The Filtakleen is an ultra-fine bypass filtration system suitable for use on a wide range of equipment. It provides the best possible filtration protection against system wear, oil degradation and corrosion. Working in conjunction with the equipments full flow filter, the Filtakleen by-pass filter removes any particles in the oil likely to cause system damage.

The Filtakleen typically filters all the oil in the system several times an hour, so the system continuously receives analytically clean oil.

- Enhances oil performance
- Improves reliability
- Ultra fine particle removal to ISO 17/15/12 - NAS6
- Prevents corrosion by removing 100% of water from oil
- Prevents system wear
- Prevents acidity in oil

### Significantly extending oil life

The by-pass filter is designed to be used in conjunction with the main in-line-filter. The system continuously filters a percentage of the oil (typically 10 %) in the circuit which means it is able to provides additional filtration to a much finer tolerance than the in-line filter. This greatly prolongs the life of both the oil and the main filter itself.

The filter housing is manufactured as a one piece aluminium anodised body, which is powder coated. Making it a durable solution for all kind of environments. The lid is secured by a single high tensile bolt which makes lid removal and filter changing quick and easy. The lid houses a quad ring seal, giving completely leak proof sealing.

The filter cartridge is made from a cellulose fibre based tissue of pure pulp, around a cardboard core. The cartridge is housed in a nylon stocking with an impressed brass ring to facilitate cartridge removal. The filter housing is fitted using an adjustable mounting bracket, which offers the installer a wide range of filter positions and fixing points.

The filter is capable of filtering all types of oils with a viscosity range of 9 - 220 cSt. It is also suitable for use with other mediums such as bio fuels and dielectric fluid.

### Working principle

Once installed, Filtakleen's unique filtration technology removes all damaging wear particles normally missed by the main filter, removing these at source immediately reduces the risk of malfunctioning major internal engine parts. Filtakleen removes particles to 4 micron absolute and 1 micron partial - but it does not remove engine additives as these are sub micron size.

Oil enters the filter via the inlet point and passes up through the core of the filter. The oil then percolates slowly down through the filter medium, through the outlet and is returned to the system.

Systems for hydraulic oils will have a pressure reducing manifold fitted to the bottom of the filter body. This reduces the high pressures of a hydraulic system to the operating pressure of the filter. The manifold incorporates a pressure relief valve which is factory set at 4.45 bar (65 psi). The manifold has a test point for the attachment of fluid monitoring equipment. A pressure gauge is available as an option.

Engine oil systems have no need for the manifold as they operate at much lower pressures. The standard operating pressure of the filter is approximately 5 bar (72.52 psi).

## Applications

The Filtakleen can be used for a wide variety of applications. It is suitable for mobile applications like excavators, dump trucks and wheel loaders. But also for stationary equipment like recycling machines or gensets.

Groeneveld-BEKA offers a by-pass filtration system for both hydraulic and engine oil.



Transport



Earthmoving

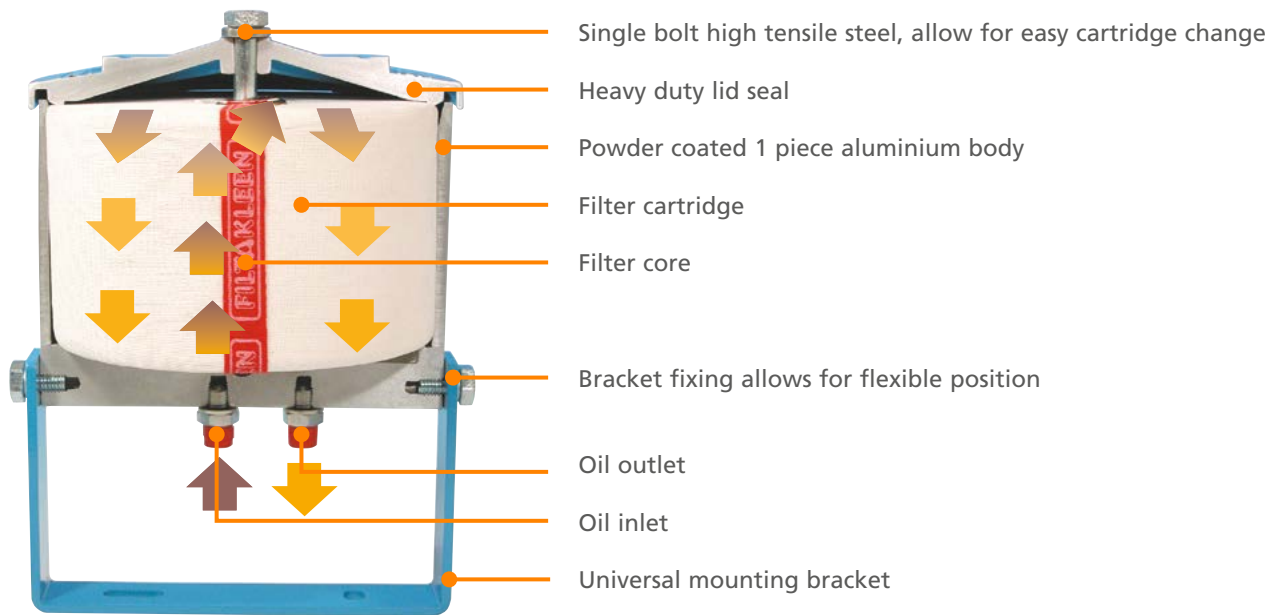


Port equipment

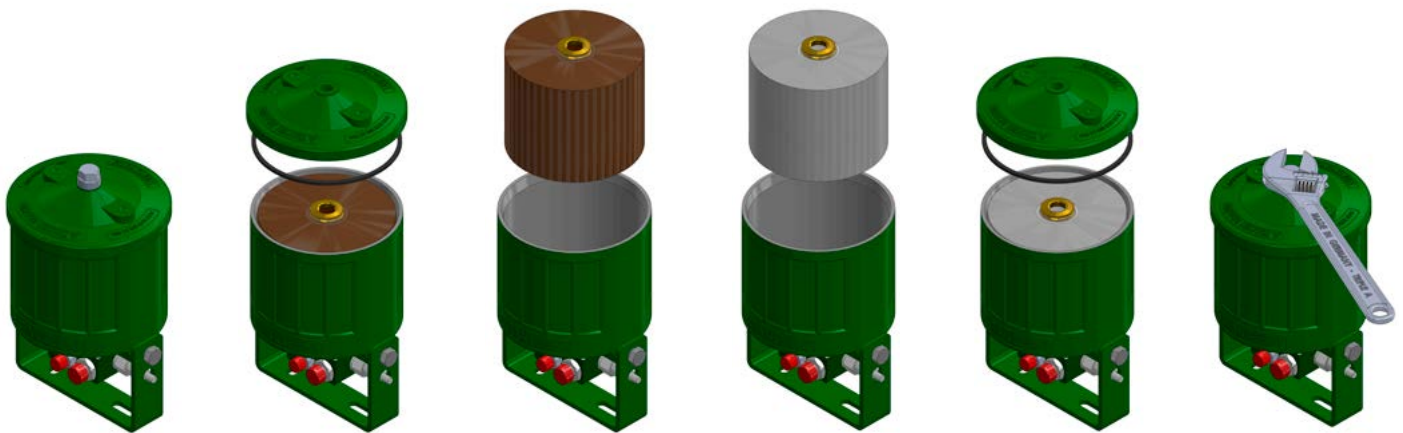


Industry & Recycling

## System overview



## Maintenance



Changing the filter element is a quick and easy job. Incorporating a ball valve into the inlet side of the circuit, means the filter can be isolated. The retaining bolt is unscrewed the lid taken off, the old filter removed and replaced with the new one. A simple no-mess job that takes a couple of minutes.

Recommended filter change frequency is 500 hours or quarterly. For filters installed on a system with used oil initial changes should be more frequent.





## System specifications

The correct size filter for the application should be confirmed by referring to the application table below. The filter kit comprises a filter assembly including mounting bracket, filter cartridge, and a range of fittings.

The system is designed to be installed with 1/4" inlet hose, and 3/8" outlet hose, and fittings to suit this size hose, plus connections into the filter are provided. With hydraulic systems a ball valve and pressure reducing manifold are included.

## Application

Product	Engines				Hydraulics	
	Bantam	Light	Heavy	Maxi	Heavy	Maxi
Sump/Tank capacity	8 litre	14 litre	36 litre	72 litre	900 litre	2000 litre
Flow rate	1.5 l/min	3 l/min	4.5 l/min	6 l/min	4.5 l/min	6 l/min
Inlet pressure	4.45 bar (65 psi)	4.45 bar (65 psi)	4.45 bar (65 psi)	4.45 bar (65 psi)	350 bar (5000 psi)	350 bar (5000 psi)
Internal pressure	4.45 bar (65 psi)	4.45 bar (65 psi)	4.45 bar (65 psi)	4.45 bar (65 psi)	4.45 bar (65 psi)	4.45 bar (65 psi)
Max oil temp.*	79 °C	79 °C	79 °C	79 °C	79 °C	79 °C
Viscosity range	9-220 cSt	9-220 cSt	9-220 cSt	9-220 cSt	9-220 cSt	9-220 cSt

\*Recommended maximum operating temperature. Filter can operate at higher temperatures but filter life may be affected

## Cartridges

Product	Engines				Hydraulics	
	Bantam	Light	Heavy	Maxi	Heavy	Maxi
Height	78 mm	114 mm	114 mm	114 mm	114 mm	114 mm
Diameter	102 mm	102 mm	145 mm	190 mm	145 mm	190 mm
Filter length	102 mm	114 mm	272 mm	460 mm	272 mm	460 mm
Surface area	80,000 cm <sup>2</sup>	130,000 cm <sup>2</sup>	490,000 cm <sup>2</sup>	524,000 cm <sup>2</sup>	490,000 cm <sup>2</sup>	524,000 cm <sup>2</sup>



# Groeneveld Tecreel

Self retracting hydraulic hose reels



## Groeneveld Tecreel

The Tecreel range of self-retracting hose reels provides an efficient way of conveying hydraulic power from fixed to moving points on cranes, truck mounted cranes, telehandlers, lift trucks and container handling equipment. An integral coil spring ensures that the hoses remain constant under tension.

Reels are available as 2 port, 4 port and multi function models; each complemented by a choice of 2 or 4 port swivels providing 180° of free hose movement.

Tecreel eliminates slack or trailing hydraulic hoses where continuous variation of hose length is required, while transferring hydraulic oil to moving, rotating and swivelling parts.

The main benefits at a glance:

- Robust all steel construction
- Epoxy powder coated for increased wear resistance
- Reliable operation and maintenance free
- Available as reel only or with hoses

### Efficiently conveying hydraulic power

Tecreel is a non-locking, spring retractable hydraulic hose reel assembly, designed for use where movements occur requiring continuous variations in hose length. The Tecreel automatically rewinds the surplus hose under constant spring tension.

The Tecreel is suitable for almost all situations in which hydraulic power needs to be transferred from a fixed point to a moving point. Applications include forklifts, counter balance trucks, reach stackers, cranes with hydraulically controlled attachments, truck mounted cranes, telehandlers, container cranes and above ground mining applications.

### System overview

#### Powder coated

Tecreel hosereels are supplied with red or orange powdercoat as a standard. Other colours are available upon request. Marine grade reels with additional corrosion protection are also available upon request.

#### Shaft inlet

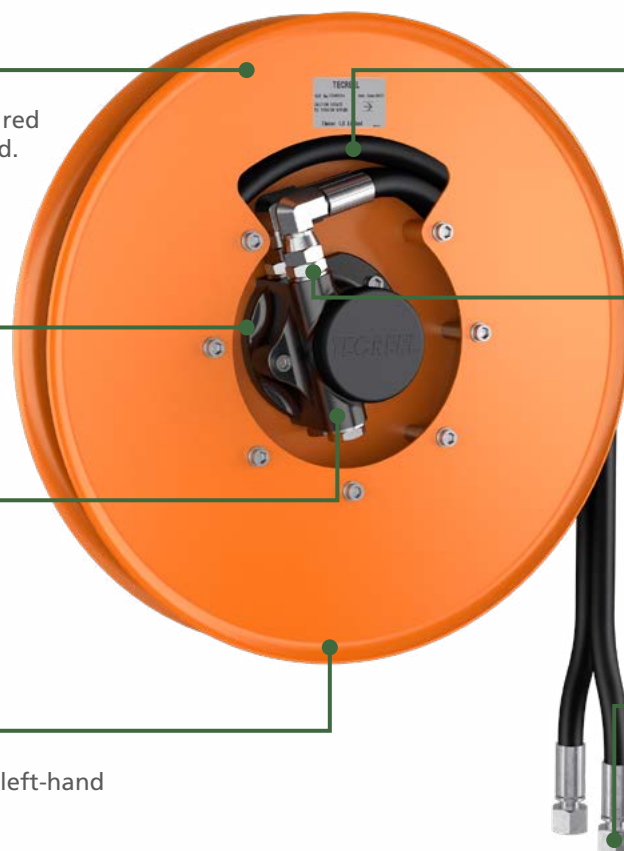
There are various shaft inlet adaptors available.

#### Oilways

There are two separate oilways running through the hub & shaft assembly to allow oil to flow into the hub. They are separated by rotary seals.

#### Left-hand or right-hand mounting

All models can be supplied in both left-hand or right-hand mounting.



#### Hoses

Tecreel is available with and without hoses. Hoses are available in different hose bores and various hose lengths.

#### Connection ports

The hose connection ports on hosereel hub are 3/8" BSP. Adaptors fitted as standard are 3/8" male to 3/8" male.

Standard hose fitting is 3/8" BSP female compact 90° elbow. Other adaptors for different hose fittings are available on request.

#### Hose free-end fittings

Free ends of hose connected to attachment to be actuated.

Groeneveld-BEKA delivers three different types of hoses in six different sizes with a reel diameter from 31.8 cm up to 60 cm. All models can be supplied in both left-hand or right-hand mounting, in various diameters, hose bore and pull-off lengths.

### Type 375 twin port



- Max. operating pressure 300 bar
- Twin bore 1/4", 5/16", 3/8" or 1/2" siamese hose with various end fittings
- Inlet Ports 3/8" BSP
- Hose length: 2.7 to 11 meter
- Temp. range: -30 °C to +60 °C

### 4-port



- Max. operating pressure 210 bar
- Twin bore 1/4" or 5/16" Siamese hose with various end fittings
- Inlet Ports 1/4" BSP
- Hose length: 3.5 to 6 meter
- Temp. range: -30 °C to +60 °C

### Multi-function electro-hydraulic



- Max. operating pressure 300 bar
- Available with 2 hoses 3/8" or 5/16" and 6 wires
- Inlet Ports 3/8" BSP
- Max. voltage 80V, max. 4.5A
- Hose length: 2.7 to 9.3 meter
- Temp. range: -30 °C to +60 °C

All versions are available as reel only or with hoses. If supplied with hose fitted, SAE100R7 hose is supplied as standard. Other type of hoses are available upon request.

## Swivels

Swivels are used to connect Tecreel hoses to moving parts. They allow a full 180° movement repeated and are predominantly used on vertical applications like forklift masts. Groeneveld-BEKA offers two types of swivels, a 2-port and a 4-port, both available with various adapters fitted in the inlet and outlet ports.

### 2 port swivel



- Suitable for use with Type 375, Type 4 and Multifunction reels
- Available with or without check valves
- Max. pressure with check valves: 210 bar

### 4 port swivel



- Suitable for use with 4 port Tecreels
- Provides 4-in-line connection with hose outlet at 180° to each other
- Comes with check valves

## Applications

The Tecreel can be used for a wide variety of applications. It is most suitable for cranes, truck mounted cranes, telehandlers, lift trucks and container handling equipment.



Cranes



Truck mounted cranes



Lift trucks



Container handling equipment

## System specifications

	Reel diameter [Ø mm]	Max. length [1/4"]	Max. pull-off [1/4"]	Max. length [5/16"]	Max. pull-off [5/16"]	Max. length [3/8"]	Max. pull-off [3/8"]	Max. length [1/2"]	Max. pull-off [1/2"]
Type 375	318	3,0 m	2,3 m	2,5 m	1,9 m	2,2 m	1,5 m	1,4 m	0,8 m
Type 375	380	5,2 m	4,5 m	4,5 m	3,9 m	4,2 m	3,6 m	3,3 m	2,6 m
Type 375	457	8,9 m	8,0 m	8,0 m	6,9 m	6,9 m	6,3 m	5,8 m	5,1 m
Type 375	457	9,5 m	8,8 m	8,5 m	7,8 m	7,3 m	6,6 m	6,4 m	5,7 m
Type 375	530	12,5 m	11,0 m	11,5 m	11,0 m	10,3 m	9,6 m	8,0 m	7,2 m

	Reel diameter [Ø mm]	Max. length [1/4"]	Max. pull-off [1/4"]	Max. length [5/16"]	Max. pull-off [5/16"]	Max. length [3/8"]	Max. pull-off [3/8"]	Max. length [1/2"]	Max. pull-off [1/2"]
Type 375+	318	3,5 m	3,0 m	3,0 m	2,5 m	3,0 m	2,5 m	2,5 m	1,9 m
Type 375+	380	6,0 m	5,5 m	5,2 m	4,5 m	4,5 m	3,5 m	3,5 m	2,7 m
Type 375+	457	8,6 m	6,8 m	7,6 m	6,6 m	8,0 m	7,0 m	5,8 m	5,2 m
Type 375+	457	9,5 m	8,8 m	8,5 m	7,8 m	7,3 m	6,6 m	6,4 m	5,7 m
Type 375+	530	12,5 m	11,0 m	11,5 m	11,0 m	10,3 m	9,6 m	8,0 m	7,2 m
Type 375+	600	17,7 m	16,1 m	16,7 m	16,0 m	13,8 m	13,0 m	11,3 m	10,6 m

	Reel diameter [Ø mm]	Max. length [1/4"]	Max. pull-off [1/4"]	Max. length [5/16"]	Max. pull-off [5/16"]	Max. length [3/8"]	Max. pull-off [3/8"]
4-port	318	4,4 m	3,8 m	3,8 m	3,2 m	3,2 m	2,4 m
4-port	380	6,7 m	6,1 m	5,9 m	5,3 m	5,2 m	4,6 m
4-port	457	10,5 m	8,1 m	9,4 m	7,9 m	7,6 m	7,0 m

	Reel diameter [Ø mm]	Max. length [5/16"]	Max. pull-off [5/16"]	Electric cable length	Max. length [3/8"]	Max. pull-off [3/8"]	Electric cable length
Multifunction	318	3,8 m	3,2 m	4,1 m	3,2 m	2,4 m	3,3 m
Multifunction	380	5,9 m	5,3 m	6,2 m	5,2 m	4,6 m	5,5 m
Multifunction	457	9,4 m	7,9 m	9,9 m	7,6 m	7,0 m	7,9 m