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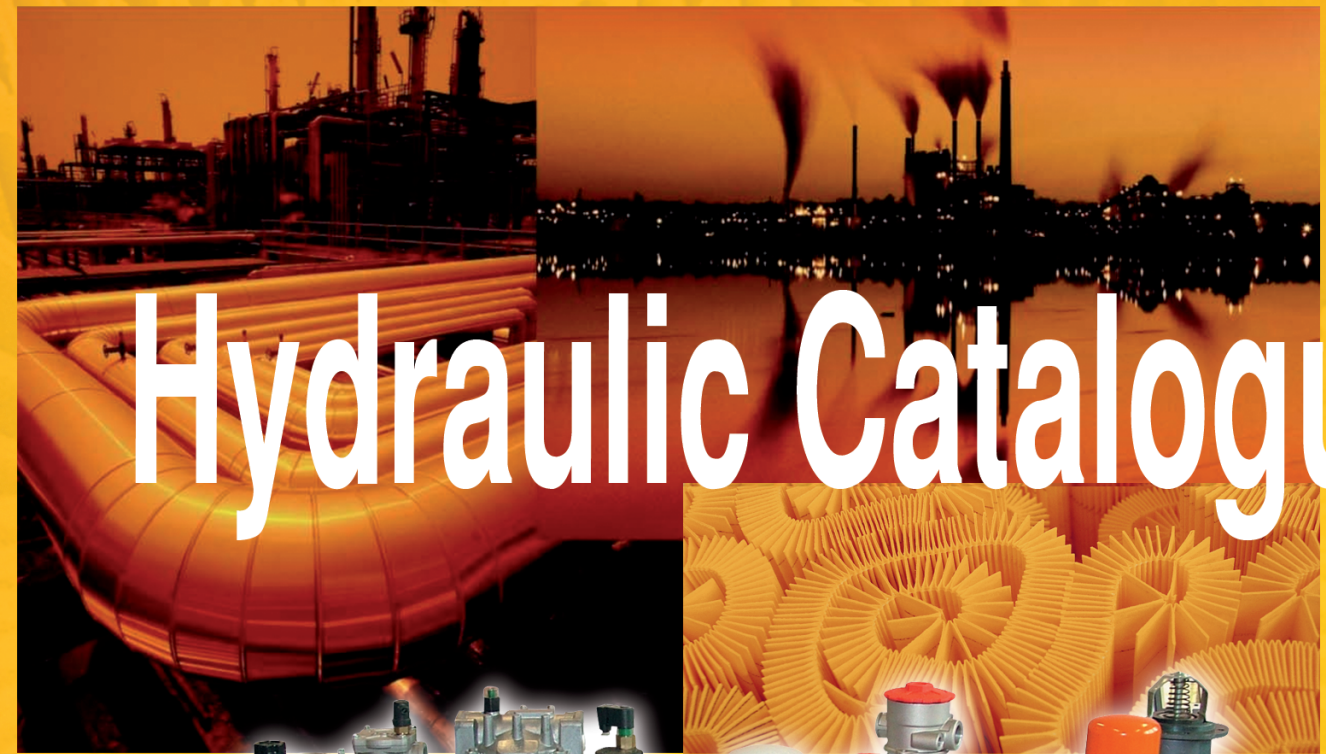
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Accessoires for Engine Applications



# Hydraulic Catalogue



## Hydraulic Filters & Accessories for Engine Applications

Filtration Solutions that lower your  
cost of ownership through clean oil

Catalogue Number F116023 / June, 2008.

For more information, contact:



Donaldson filters are built to provide the best protection for your engine - even in the most demanding operating environments.



# Donaldson Hydraulic Filters & Accessories

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# Global Resources For Filtration Solutions

... a Cleaner World for Industry

Donaldson Company Inc., headquartered in Minneapolis (USA), is a leading worldwide designer and manufacturer of filtration systems and replacement parts. Founded in 1915, Donaldson strives to be the technology leader in every market we serve and to provide the best overall value to our customers.

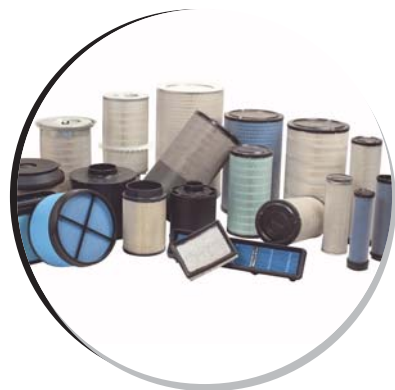
Donaldson Europe was established in Belgium in 1966. 40 years later, Donaldson Europe has approximately 50 operations doing business in excess of 18 countries throughout Europe, the Middle East and Africa.

Donaldson Engine Systems & Technologies offers: Intake air filtration systems and accessories; Hydraulic filtration systems and accessories; Lube, fuel, coolant and crankcase filtration;

Exhaust and emission control systems, Accessories and a Full line of replacement air, lube, fuel, coolant and hydraulic filter elements.

Our products carry the Donaldson brand or that of our OEM partners and are available through an international dealer/distributor network.

Following brands already rely on Donaldson as their filtration partner: Agco, Bobcat, Case New Holland, Caterpillar, Claas, DAF, Daimler Chrysler, Dana, Deutz, Dynapac, Evobus, Ford Otosan, Fiat-Kobelco, Freightliner, Furukawa, Gima, Hitachi, Hyster, Iveco, JCB, John Deere, Jungheinrich Boss, Komatsu, Landini, Liebherr, Linde, Lombardini, M.A.N, Manitou, Massey Ferguson, McCormick, Merlo, MTU, Renault Agriculture, Renault Trucks, Same, Scania, Sauer Danfoss, Terex, Toyota, Volvo, ...





# About Donaldson

# Historical Highlights

**...in every feature of every product, backed by a long tradition of innovation.**



*Corporate Headquarters  
in Minneapolis, Minnesota USA*



*European Headquarters  
in Leuven, Belgium*

**1910's** Working for the Bull Tractor Company, Frank Donaldson rigs up his first air cleaner, “The Twister,” from eider cloth and a tin can. Donaldson Engineering Company is founded in 1915 in St. Paul, Minnesota, USA.

**1930's** The company develops and sells its new, patented, oil-washed air cleaner to Ford, Caterpillar and John Deere. Despite the major financial depression in the U.S., Donaldson continues to increase sales and expands its facilities.

**1950's** Donaldson Company, Inc. goes public in 1955 and sales reach \$7.8 million. The company revolutionizes the industry with the introduction of the first ever dry-type air cleaner for diesel engines, and begins operations in the United Kingdom.

**1960's** Overseas operations expand with the opening of subsidiaries in Japan, Belgium, Australia, South Africa, France, and Brazil.

**1970's** Donaldson develops high-efficiency hydraulic filters and the company diversifies into fluid, particle and acoustics technology. The company acquires Torit Corp., a manufacturer of industrial air pollution control equipment. In 1979, Donaldson stock begins trading on the New York Stock Exchange under the symbol DCI.

**1980's** Donaldson enters the exploding computer market and creates an Industrial Group to focus on in-plant hydraulic filtration and dust collection, gas turbine air filtration, disk drives, and other non-diesel markets. The company sets new standards for air filtration efficiency with the introduction of nanofiber technology, brand named Ultra-Web.

**1990's** Donaldson expands and diversifies into new product and geographic markets with its powerful technology, strong customer access, and broad global reach.

**1992** Acquisition of Italian Filter manufacturer FBO becoming Donaldson Italia srl.

**21st Century** Donaldson continues to expand its technological expertise with further advancements in nanofiber media technology, improved synthetic medias and PTFE medias, and more acquisitions.



# Donaldson Italy

# Capabilities

**...in every feature of every product, backed by a long tradition of innovation.**

## **Leader in Designing and Manufacturing Liquid Filters**

Donaldson Italia srl was established in 1992, when DCI bought the existing Italian filter manufacturing company FBO, specialized in hydraulic filtration (industrial & mobile). The company grew during the last 12 years, passing from 50 up to 140 employees.

Over the years, Donaldson Italia srl was and is able to develop new synthetic media, spin-ons, high pressure filters. This mainly thanks to the synergy with DCI and by supplying a huge number of OEM's. One of our main characteristics is the big flexibility and the capacity to develop customized products.



*Donaldson Italia srl plant in Ostiglia, Mantova (Italy).*

As all Donaldson factories, Donaldson Italia srl achieved the quality certification according to ISO 9001/2, ISO 14000 and ISO 16889 as well as quality certification of our major OEM customers.

## **DISRL Manufacturing means Quality Production**

Most of the filters production processes are automated, enabling us the possibilities to build filters faster and with greater precision. The plant of Ostiglia, with its 10000m<sup>2</sup>, has a daily production capability of 4000-8000 Duramax hydraulic spin-ons, 3000-5000 hydraulic cartridges, 1000 hydraulic filter assies, 4000 low pressure spin-on filters and liquid filters.

Beginning of August 2005 the production facility even doubled with a new liquid lab, engineering and sales offices.





# Donaldson Italy

# Capabilities

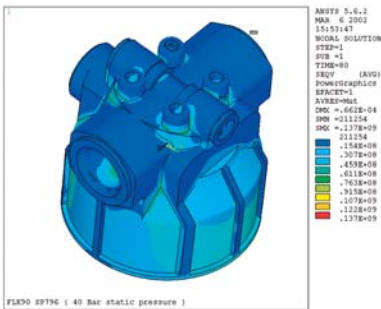
...in every feature of every product, backed by a long tradition of innovation.

## Engineering means High Technology Products Design

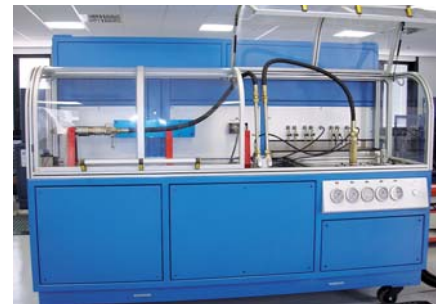


With the multipass test bench we have the possibilities to analyse a filter or media efficiency and capacity.

The pressure flow bench is one of our benches with which we can analyse the filter strength to flow fatigue.



Donaldson Italia srl is supported by European expertise for CAE (Computer Aided Engineering) systems for static and dynamic FEM analysis on heads, bowls...



Lab & Testing for Extreme Field Condition Simulation  
Vibration/Variable Flow Bench.



# Hydraulic

# Filtration Systems

## ... and Accessories

Donaldson develops, manufactures and markets a full line of hydraulic filters for the protection of machinery and components in hundreds of applications on heavy duty-mobile equipment. When you need high-, medium- or low pressure filters, filter housings, filter heads, replacement cartridges, spin-ons (e.g. Duramax™) or hydraulic accessories, turn to Donaldson. We also offer a broad line of replacement filter elements.



Donaldson heavy-duty high-pressure filters sit behind pumps and other prime movers to protect critical hydraulic components such as cylinders, motors and valves. All contain our Synteq® synthetic filter media, specially developed by Donaldson for high efficiency liquid filtration. Working pressures range from 140 to 420 bar and static pressures from 310 to 830 bar.



Donaldson Duramax®, well-known as the highest rated medium pressure filters available, are most often used in return-line positions. As spin-ons, they are particularly well-suited for duplex circuits. Donaldson Synteq® and cellulose media are available. Duramax working pressures range from 25 to 70 bar and static pressures from 55 to 140 bar.



Low pressure filters are the most commonly used type of filters in hydraulic circuits, used most often as return line filters in applications with working pressures up to 10 bar and static pressure up to 20 bar.



An expanded line of Accessories for hydraulic lines and reservoirs is also available! Finish off your hydraulic circuit with filter service indicators, pressure gauges, test point assemblies, valves, flanges, reservoir level gauges, sight glasses, a variety of tank and filler breathers, caps vents, plugs, strainers, diffusers, magnets and more.



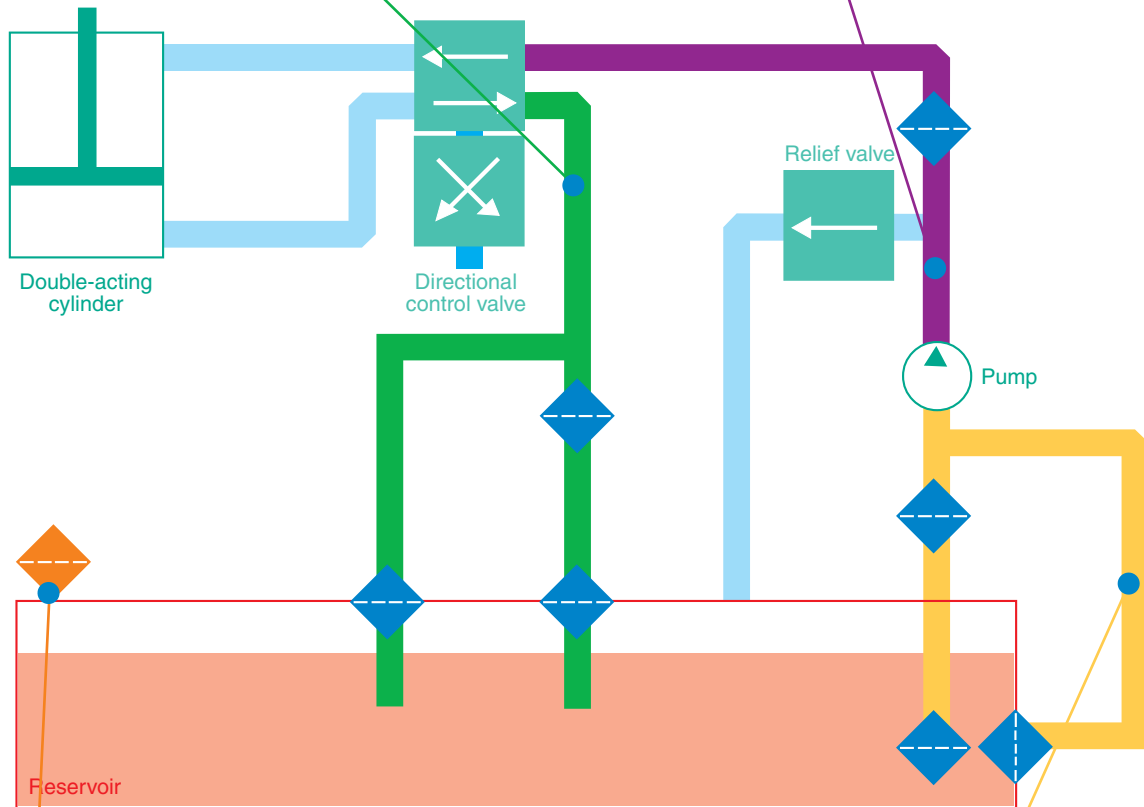
Donaldson is proud to offer a broad selection of Hydraulic replacement cartridges and spin-ons. Choose from our many different filter media to find exactly the right filter to help you meet the cleanliness requirements for your hydraulic system.



Hydraulic

# Product Overview

...in every feature of every product, backed by a long tradition of innovation.

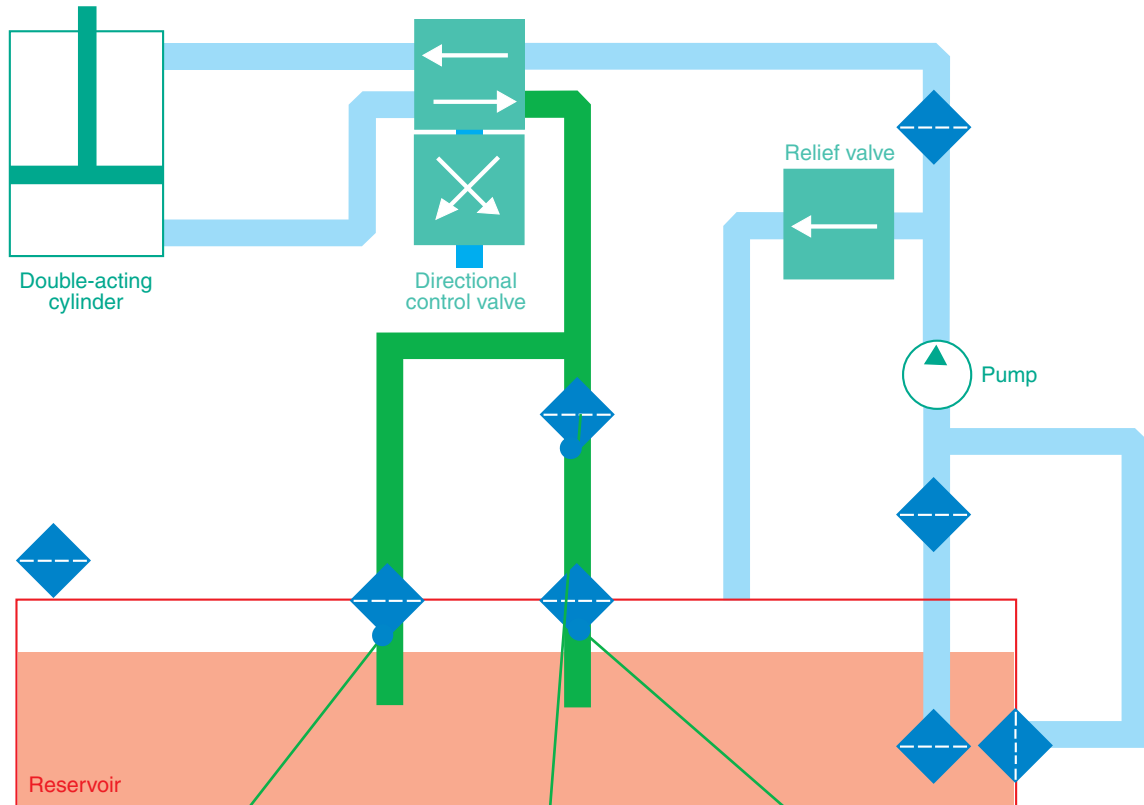






# Product Overview

## Return Line Filters



**RETURN & SUCTION  
IN TANK FILTERS**



**IN-LINE RETURN LINE  
FILTERS**



**IN TANK RETURN  
FILTERS**



# Product Overview

...in every feature of every product, backed by a long tradition of innovation.

## Return Line Filters

---

### In Tank Return Filters

- **FIK - FIO SERIE** p. 50 - 59
- **FIK - FIOT SERIE**

Flow Rate: From 10 to 800 lpm  
Efficiency Range: From 10 to 90 micron  
Media Material: Synthetic fiber, cellulose and wire mesh  
Max. Operating Pressure: 10 bar  
Ports Connections: Gas and SAE flange  
Service Indicators: Visual and electrical



- **FIK - FIO / FIOT, 4 HOLES FLANGE** p. 54 - p. 59



- **FIK - FIS SERIE** p. 61 - 64

Flow Rate: From 10 to 150 lpm  
Efficiency Range: From 10 to 90 micron  
Media Material: Synthetic fiber, cellulose and wire mesh  
Max. Operating Pressure: 10 bar  
Service Indicators: Visual and electrical



- **REPLACEMENT ELEMENTS FOR PXX-FCRS SERIE** p. 65 - 68



- **FHK - FIR SERIE (STATIONARY APPLICATION)** p. 69 - 72

Flow Rate: From 15 to 500 lpm  
Efficiency Range: From 10 to 90 micron  
Media Material: Synthetic fiber, cellulose and wire mesh  
Max. Operating Pressure: 10 bar  
Service Indicators: Visual and electrical



- **REPLACEMENT ELEMENTS FOR FDK-FIRDA SERIE (STATIONARY APPLICATION)** p. 73 - 78



# Product Overview

...in every feature of every product, backed by a long tradition of innovation.

## Return Line Filters

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### Return & Suction In Tank Filters

#### • SRK - COMBO 120 SERIE p. 80 - 94

Flow Rate: 120 lpm, emergency suction flow rate 60 lpm  
Efficiency: 10 micron absolute.  
Emergency suction element 125 micron  
Media Material: Synthetic fiber, emergency suction element wire mesh  
Max. Operating Pressure: 10 bar  
Service Indicators: Visual and electrical



#### • SRK - COMBO 200 SERIE p. 95 - 100

Flow Rate: Return 200 lpm, emergency suction flow rate 70 lpm  
Efficiency:  $\beta_{11(c)} > 200$  ;  $\beta_{13(c)} > 1000$   
By-pass strainer 125 micron  
Emergency suction element 125 micron  
Media Material: Synthetic fiber, By-pass strainer wire mesh.  
Emergency suction element wire mesh  
Max. Operating Pressure: 10 bar  
Service Indicators: Visual and electrical



## Return Line Filters

---

### In-Line Return Filters

#### • REPLACEMENT ELEMENTS FOR FLK-FL & FLK-FLV SERIE p. 103 - 106



#### • FLK - FLS SERIE p. 107 - 112

Flow Rate: From 30 to 200 lpm  
Efficiency Range: From 10 to 90 micron  
Media Material: Synthetic fiber, cellulose and wire mesh  
Max. Operating Pressure: 30 bar  
Ports Connections: Gas and SAE flange  
Service Indicators: Visual and electrical



#### • FBK - FRCA SERIE p. 113 - 117

Flow Rate: From 40 to 400 lpm  
Efficiency Range: From 10 to 60 micron  
Media Material: Synthetic fiber, cellulose and wire mesh  
Max. Operating Pressure: 10 bar  
Ports Connections: Gas and SAE Flange  
Service Indicators: Visual and electrical

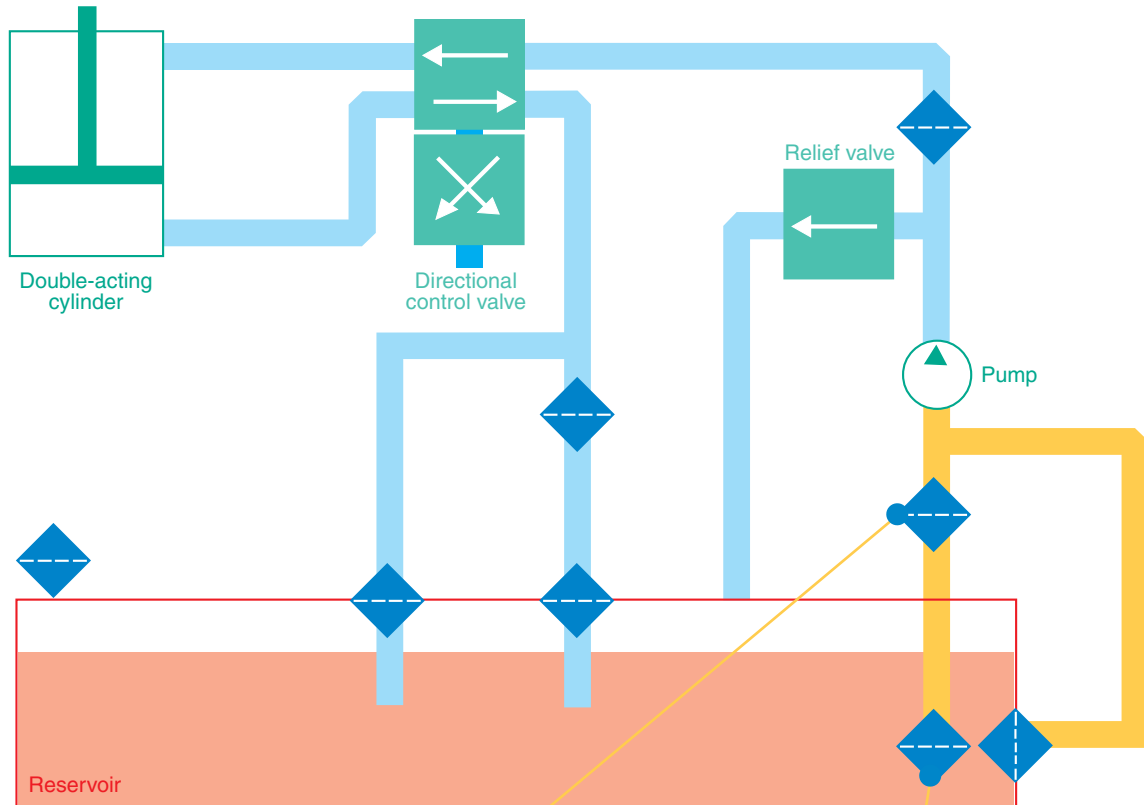






# Product Overview

## Suction Filters



SUCTION FILTERS



IN-LINE SUCTION FILTERS



IN TANK SUCTION FILTERS



# Product Overview

...in every feature of every product, backed by a long tradition of innovation.

## Suction Filters

---

### In Tank Suction Filters

- **PXX - FIOA SERIE**

p. 123 - 126

Flow Rate:

From 5 to 400 lpm

Efficiency Range:

From 30 to 250 micron

Media Material:

Cellulose and metal wire mesh



- **FHK - FIR SERIE**

p. 127 - 129

Flow Rate:

From 8 to 250 lpm

Efficiency Range:

From 10 to 90 micron

Media Material:

Synthetic fiber, cellulose and metal wire mesh



- **REPLACEMENT ELEMENTS FOR FDK-FIRDA SERIE (STATIONARY APPLICATION)**



...in every feature of every product, backed by a long tradition of innovation.

## Suction Filters

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### In-Line Suction Filters

#### • FLK-FLA SERIE

p. 137 - 141

Flow Rate: From 10 to 300 lpm  
Efficiency Range: From 10 to 90 micron  
Media Material: Synthetic fiber, cellulose and metal wire mesh  
Ports Connections: Gas and SAE Flange  
Service Indicators: Visual and electrical



#### • PXX-FAL SERIE

p. 143 - 145

Max Operating Pressure: 4 bar  
Flow Rate: From 25 to 100 lpm  
Efficiency Range: 160 micron  
Media Material: Metal wire mesh  
Ports Connections: To be clamped



#### • FKB-FACA SERIE

p. 147 - 151

Flow Rate: From 15 to 200 lpm  
Efficiency Range: From 10 to 60 micron  
Media Material: Synthetic fiber, cellulose and metal wire mesh  
Ports Connections: Gas and SAE Flange  
Service Indicators: Visual and electrical



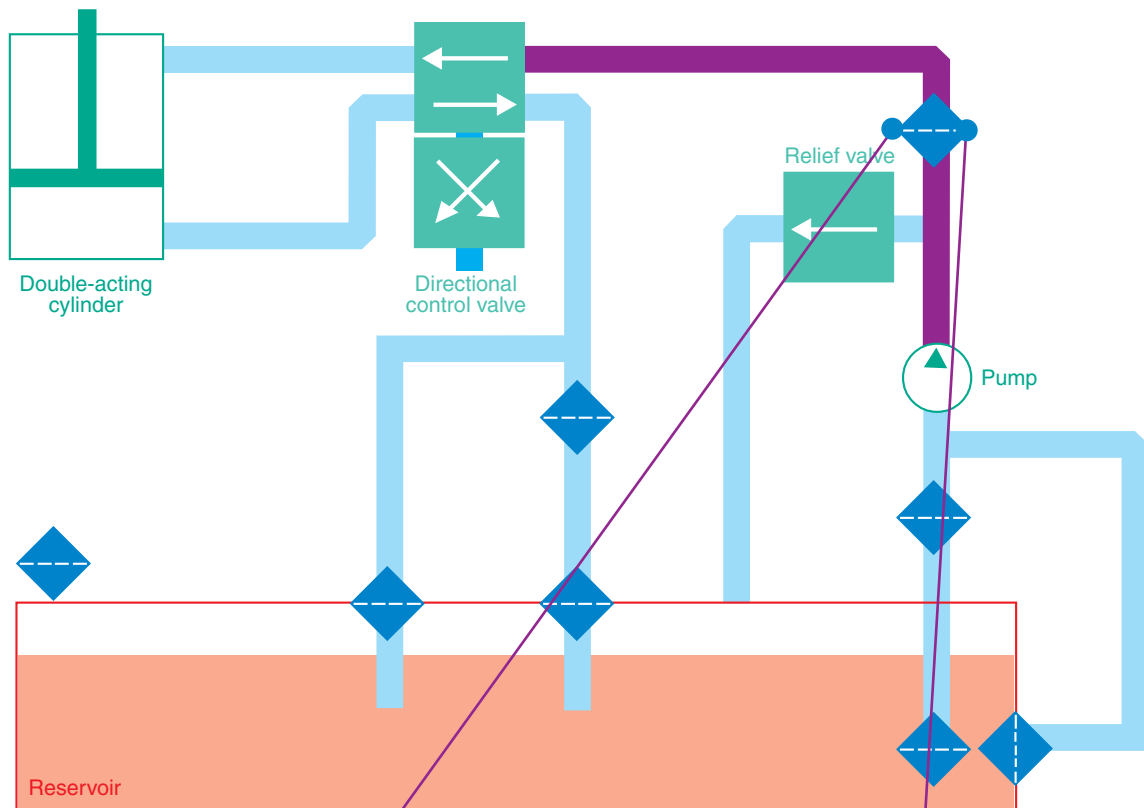




*Hydraulic*

# Product Overview

## In Line Filters



IN-LINE FILTERS



**MEDIUM PRESSURE FILTERS**



**HIGH PRESSURE FILTERS**

# Product Overview

...in every feature of every product, backed by a long tradition of innovation.

## In-Line Filters

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### Medium Pressure Filters

#### • FMK - FM SERIE

p. 157 - 160

Flow Rate:	From 40 to 80 lpm
Efficiency Range:	From 5 to 60 micron
Media Material:	Synthetic fiber, cellulose and wire mesh
Max. Operating Pressure:	120 bar
Service Indicators:	Visual and electrical



#### • HMK 04 - DURAMAX SERIE

p. 161 - 164

Flow Rate:	From 100 to 140 lpm
Efficiency Range:	From 5 to 40 micron
Media Material:	Synthetic fiber and cellulose
Max. Operating Pressure:	34.5 bar
Service Indicators:	Visual and electrical



#### • HMK 05 - DURAMAX SERIE

p. 165 - 168

Flow Rate:	From 160 to 200 lpm
Efficiency Range:	From 5 to 40 micron
Media Material:	Synthetic fiber and cellulose
Max. Operating Pressure:	24 bar
Service Indicators:	Visual and electrical





...in every feature of every product, backed by a long tradition of innovation.

## In-Line Filters

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### High Pressure Filters

#### • FPK 02 & 04 - AP 220 SERIE p. 171 - 174

Flow Rate: From 30 to 450 lpm  
Efficiency Range: From 5 to 25 micron  
Media Material: Synthetic fiber  
Max. Operating Pressure: 420 bar  
Service Indicators: Visual and electrical



#### • FPK 02 - AP 280 SERIE p. 175 - 178

Flow Rate: From 20 to 90 lpm  
Efficiency Range: From 5 to 25 micron  
Media Material: Synthetic fiber  
Max. Operating Pressure: 420 bar  
Service Indicators: Visual and electrical



#### • FPK 03 & 04 - AP 420 SERIE p. 179 - 182

Flow Rate: From 40 to 400 lpm  
Efficiency Range: From 5 to 25 micron  
Media Material: Synthetic fiber  
Max. Operating Pressure: 420 bar  
Ports Connections: Gas and SAE Flange  
Service Indicators: Visual and electrical



#### • FCK - LC SERIE p. 183 - 185

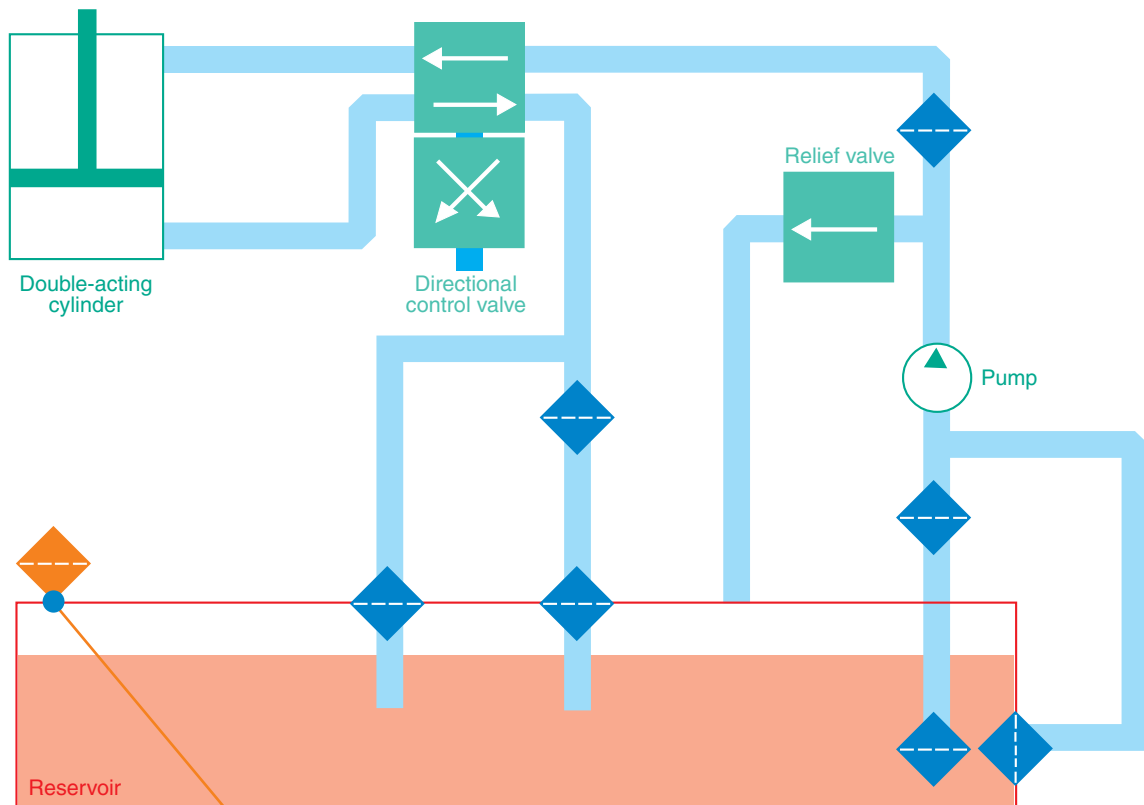
Flow Rate: From 2 to 20 lpm  
Efficiency Range: From 5 to 60 micron  
Media Material: Synthetic fiber and wire mesh  
Max. Operating Pressure: 420 bar





# Product Overview

## Accessories



## ACCESSORIES



# Product Overview

...in every feature of every product, backed by a long tradition of innovation.

## Accessories

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### Breather Filler Caps

- **PXX-TCO SERIE** p. 190

Flow Rate: From 270 to 500 lpm  
Efficiency: 10 and 40 micron  
Available with pressure relief valve



- **PXX-TCA SERIE** p. 191

Aluminium cap with anti-vandalism blocking system.  
Available with pressure relief valve



## Accessories

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### Tank Breathers

- **PXX-FS SERIE** p. 194

Flow Rate: From 200 to 1500 lpm  
Efficiency: 10, 40 and 60 micron



- **PXX-FFCA SERIE** p. 195

Flow Rate: From 1200 to 3600 lpm  
Efficiency: 10 and 30 micron



## Accessories

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### Vertical Oil Level Gauges

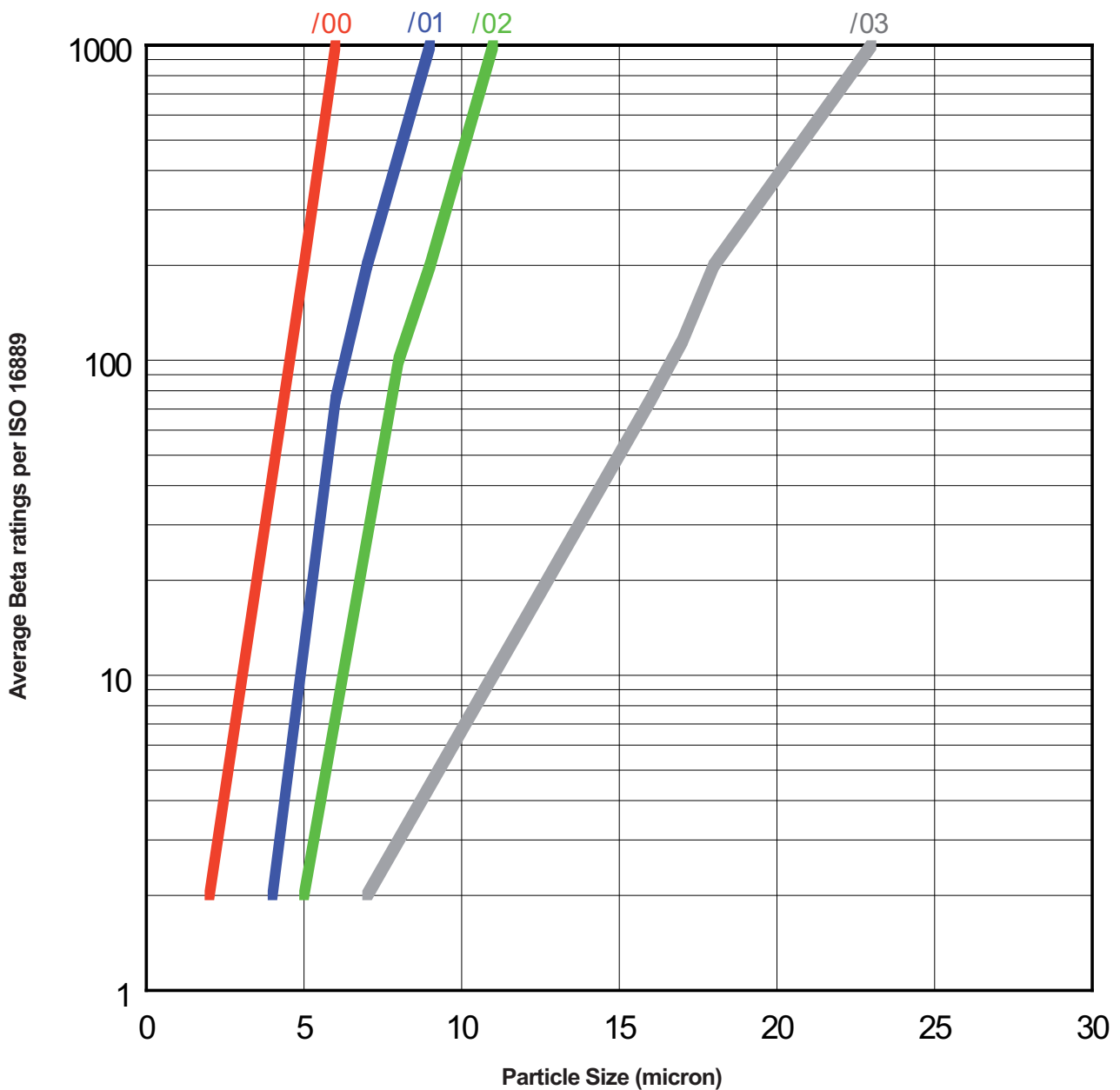
- **PXX-LVO SERIE** p. 198

Max Operating Pressure: 1 bar  
LVO SERIE without thermometer  
LVOT SERIE with thermometer



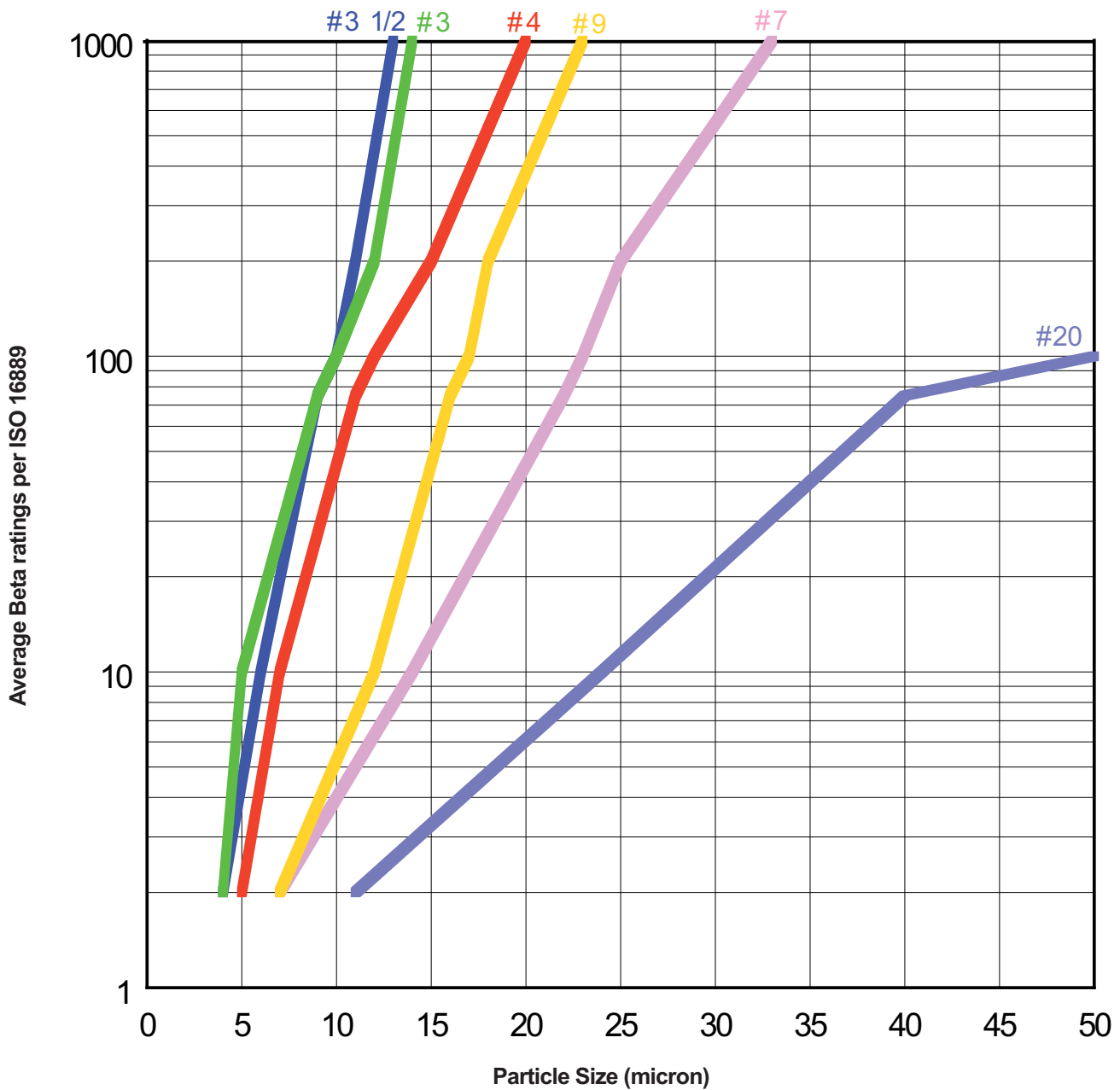
# Filtration Efficiency Ratings

Synthetic Filter Media Efficiency Curves



# Filtration Efficiency Ratings

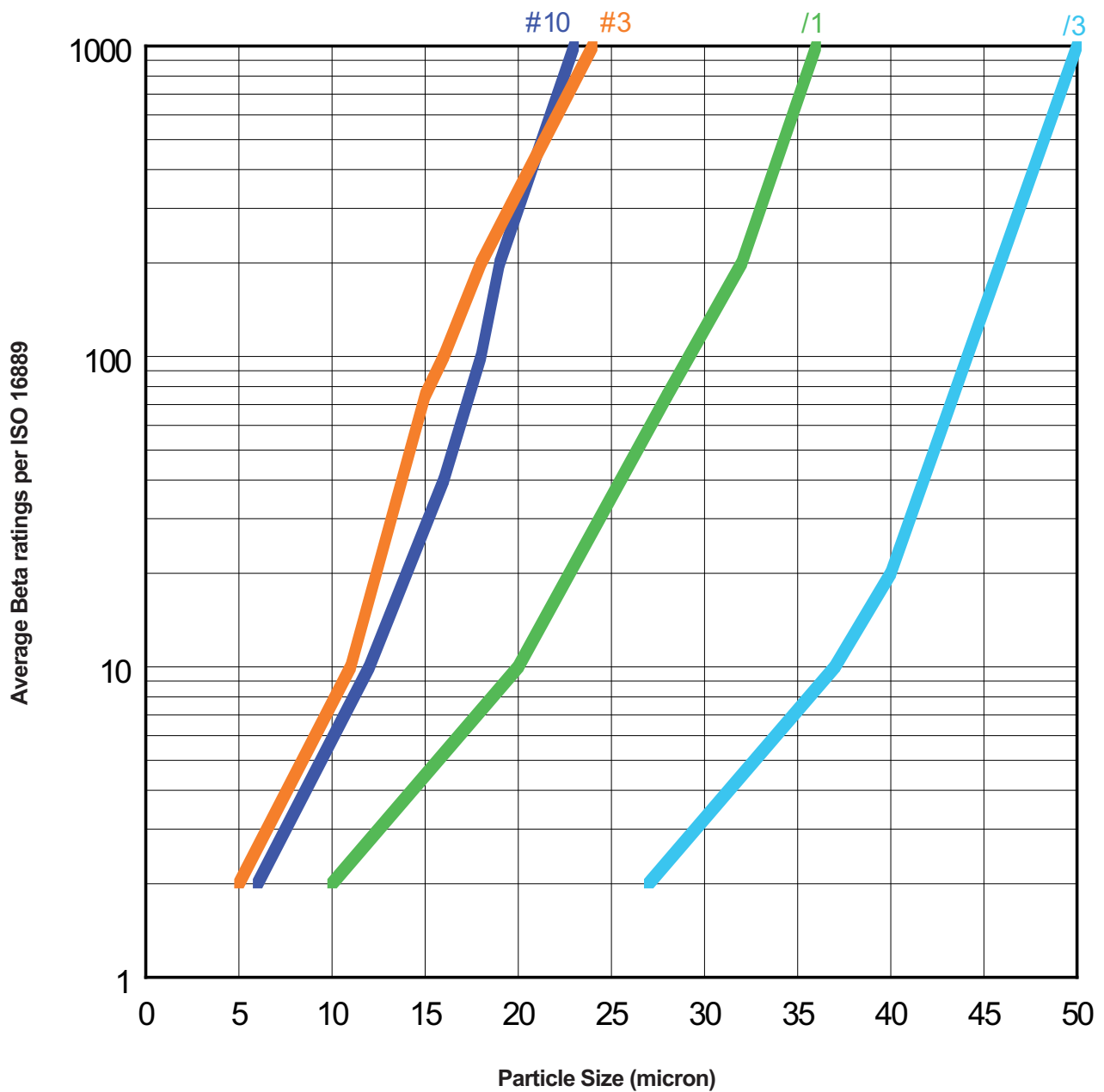
Synthetic Filter Media Efficiency Curves





# Filtration Efficiency Ratings

Cellulose Filter Media Efficiency Curves



# Filtration Efficiency Ratings

Per ISO 16889 Test Standards

Media Number	FORMER Rating Beta $\times$ = 2 / 75 Per ISO 4572	NEW Rating Beta $\times$ (c) = 200 Per ISO 16889	NEW Rating Beta $\times$ (c) = 1000 Per ISO 16889
<b>Donaldson Synteq® Synthetic Media</b>			
# 3	4 / 15	12 $\mu$ m (c)	14 $\mu$ m (c)
# 3 1/2	4 / 15	11 $\mu$ m (c)	13 $\mu$ m (c)
# 4	5 / 16	15 $\mu$ m (c)	20 $\mu$ m (c)
# 7	7 / 22	25 $\mu$ m (c)	33 $\mu$ m (c)
# 9	7 / 22	18 $\mu$ m (c)	23 $\mu$ m (c)
# 20	20 / 40	> 50 $\mu$ m (c)	> 50 $\mu$ m (c)
/00	<2 / 3	5 $\mu$ m (c)	6 $\mu$ m (c)
/01	<2 / 5	7 $\mu$ m (c)	8 $\mu$ m (c)
/02	2 / 8	9 $\mu$ m (c)	11 $\mu$ m (c)
/03	7 / 22	18 $\mu$ m (c)	23 $\mu$ m (c)
<b>Donaldson Cellulose Media</b>			
# 3	4 / 16	18 $\mu$ m (c)	24 $\mu$ m (c)
# 10	10 / 25	19 $\mu$ m (c)	23 $\mu$ m (c)
/1	10 / 30	32 $\mu$ m (c)	36 $\mu$ m (c)
/3	25 / 45	46 $\mu$ m (c)	> 50 $\mu$ m (c)

# Hydraulic

## Guide to Selecting the Right Filter Media

### STEP 1:

Using the form below, circle the number in each category that best describes your hydraulic application.

### STEP 2:

Add the numbers from each category to get your TOTAL score.

### STEP 3:

Using the filter media table at bottom of page, find the suggested Donaldson media number for your application.

## 1 APPLICATION QUESTIONS

### Environment

OPTIMAL	Clean areas & labs.....	0
↑	General machine shops, lifts.....	1
	Mobile plants.....	2
↓	Foundries, drilling, mining underground, die cast shops.....	3
HOSTILE		

### Component Sensitivity

#### Sensitivity of components to contamination

HIGH	Hi-performance servo valves.....	8
↑	Industrial servo valves.....	6
	Piston pumps, proportional valves.....	4
↓	Vane pumps, spool valves.....	3
LOW	Gear pumps, manual & industrial valves.....	2

### Economic Liabilities (Components)

#### The cost of component replacement

HIGH	Large piston pumps, high torque motors.....	5
↑	Cylinders, servo valves, piston pumps.....	3
	Valves, subplate industrial.....	2
↓	Manual valves, gear pumps.....	1
LOW		

### Economic Liabilities (Operational)

#### The cost of downtime

HIGH	Steel mill, plastic injection.....	5
↑	High volume production plant.....	3
	Mobile installations.....	2
↓	Equipment not critical to production.....	1
LOW		

### Safety Liabilities

HIGH	Failure would cause severe damage to equipment, danger to personnel.....	3
↑	Failure likely to cause hazards.....	1
↓	Some hydraulic component test rigs.....	0
LOW		

### Life Expectancy

#### Service life required for components

HIGH	0-1000 hours.....	0
↑	1000-5000 hours.....	1
	5000-10000 hours.....	2
↓	10000-20000 hours.....	3
LOW	20000+ hours.....	5

### Pressure

#### Operating & Duty Cycle

LIGHT	Continuous operation at rated pressure or lower
↑	Medium pressure changes up to rated pressure
	Zero to full pressure, cyclic flow
↓	Zero to full pressure with transients at high frequency
SEVERE	

Pressure	LIGHT	MED	HEAVY	SEVERE
0-70 bar 1-1000 psi	1	3	3	4
70-150 bar 1000-2200 psi	1	3	4	5
150-250 bar 2200-3600 psi	2	3	4	6
250-350 bar 3600-5000 psi	3	5	6	7
350+ bar 5000+ psi	4	6	7	8

### 2

## TOTALS

ENVIRONMENT.....	_____
COMPONENT SENSITIVITY.....	_____
COMPONENT LIABILITIES.....	_____
OPERATIONAL LIABILITIES.....	_____
SAFETY LIABILITIES.....	_____
PRESSURE.....	_____
LIFE EXPECTANCY.....	_____

Your Total Score:

### 3

## MEDIA

### If Your Score is:

### Donaldson Advises:

22+.....	/ 00 MEDIA
17+.....	/ 01 MEDIA
15+.....	/ 02 MEDIA
10+.....	#9, / 03 MEDIA
9+.....	#20, / 3 MEDIA



# Hydraulic

# Technical Reference Guide *“The Blue Pages”*

Donaldson provides this technical reference as a short course in Hydraulic Filtration, for those who want to gain a better understanding of fluid power filtration.

In applications at factories all over the world, we too often see hydraulic circuits that don't include proper fluid filtration, or include it as an after-thought. Good filtration needs to be an integral part of the hydraulic circuit to ensure the long life and proper operation of the pumps, valves and motors.

**This guide is offered to aid in choosing the filter that will help you achieve the ideal cleanliness levels and longest life for your critical components.**

## Symbols Used

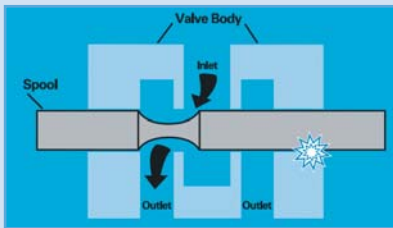
$\beta$	Beta Ratio
cSt	Centistokes
$\Delta P$	Pressure Drop or Differential Pressure
ISO	International Standards Organization
$\mu\text{m}$	Micron or micrometer
ppm	Parts per million
SSU SUS	Saybolt Seconds Universal

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## Hydraulic Components Need Protection

Fluid power circuits are designed in all shapes and sizes, both simple and complex in design, and they all need protection from damaging contamination. Abrasive particles enter the system and, if unfiltered, damage sensitive components like pumps, valves and motors. It is the job of the hydraulic filter to remove these particles from the oil flow to help prevent premature component wear and system failure. As the sophistication of hydraulic systems increases, the need for reliable filtration protection becomes ever more critical.

## How Contamination Damages Precision Parts



This cutaway view of a simple hydraulic valve illustrates how particles damage components. In normal operation,

the spool slides back and forth in the valve body, diverting oil to one side of the valve or the other. If a particle lodges between the spool and valve body, it will erode small flakes from the metal surfaces. As these flakes are moved back and forth by the action of the spool, they can roll into a burr that jams the spool and disables the valve.



## Component Damage

Looking down the barrel of an hydraulic cylinder, we can see the scratches along the inside surface. Don't cut costs by eliminating hydraulic filters! It could cost you more in the long run in major component repairs!

## Types of Contaminant

Many different types of contamination may be present in hydraulic fluid, causing various problems. Some are:

- ✓ Particulate (dust, dirt, sand, rust, fibers, elastomers, paint chips)
- ✓ Wear metals, silicon, and excessive additives (aluminum, chromium copper, iron, lead, tin, silicon, sodium, zinc, barium, phosphorous)
- ✓ Water
- ✓ Sealant (Teflon tape, pastes)
- ✓ Sludge, oxidation, and other corrosion products
- ✓ Acids and other chemicals
- ✓ Biological, microbes (in high water based fluids)

## Typical Factors in Component Life

Studies show that most (typically 70%) of hydraulic component replacement is necessary because of surface degradation, and most of that is due to mechanical wear.

Proper filtration of hydraulic fluids can lengthen component life.

### 70% Surface Degradation

70% mechanical wear from:

- abrasion
- fatigue
- adhesion

30% corrosion

15% Accidents

15% Obsolescence

## Where Contamination Comes From

There are surprising number of different sources of system contamination in hydraulic filtration.

### New Hydraulic Fluid

Adding new fluid can be a source; even though it's fresh from the drum, new hydraulic fluid isn't clean. (It may look clean, but, remember, the human eye can only see a particle the size of about 40µm.) Oil out of shipping containers is usually contaminated to a level above what is acceptable for most hydraulic systems: typically, new fluid has a cleanliness level about the same as ISO Code 21/19 (see page 39), and water content is typically 200 to 300 ppm. Never assume your oil is clean until it has been filtered.

### Built-in

Built-in contamination, also called primary contamination, is caused during the manufacture, assembly and testing of hydraulic components. Metal filings, small burrs, pieces of teflon tape, sand and other contaminants are routinely found in initial clean up filtration of newly manufactured systems.

### Ingressed

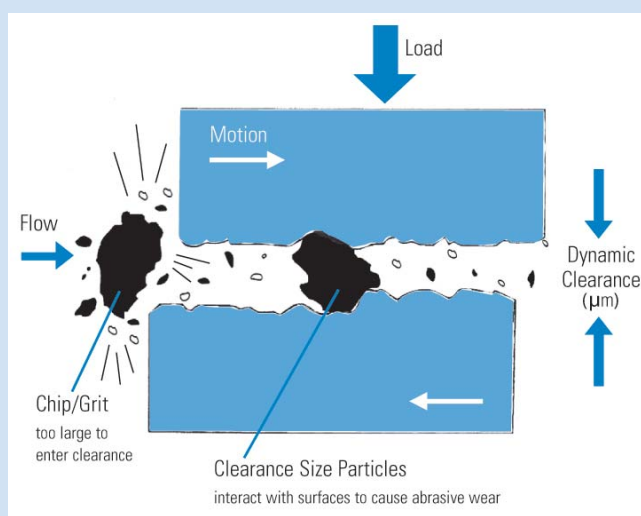
Ingressed or external contamination comes from the environment surrounding the system. Dirt can enter the hydraulic fluid supply through leaking seals, reservoir breather caps, and worn cylinder rod seals. Ingressed moisture, particularly, can cause long-term problems. As a hot system cools at night, cool moisture-laden air can be drawn into the reservoir; as the air condenses, water is released into the reservoir. Water in excess of 0.5% by volume in a hydrocarbon-based fluid accelerates the formation of acids, sludge and oxidation that can attack internal components, cause rust, and adversely affect lubrication properties. The severity of ingress and type of contaminant are dictated by the applications and environment.

### Induced

Maintenance procedures can introduce contamination into the system. Opening the system allows airborne particles to enter. Leaving the system open during operation provides continuous ambient particle ingress. Keep your system closed as much as possible.

## In-Operation

The major source of contamination are the pump & actuators, the hydraulic cylinder, or the hydraulic motor. Wear-generated contaminants are a hazard during normal hydraulic system operation. The circuit actually generates additional particles as the fluid comes into contact with the precision machined surfaces of valves, motors and pumps. Contaminant levels can keep doubling with every new particle generated. The result can be catastrophic if these contaminants are not properly filtered out of the system.



## Rubber & Elastomers

Due to temperature, time, and high-velocity fluid streams, rubber compounds and elastomers degrade — thus releasing particulates into the fluid. This may be from hoses, accumulator bladders, seals, or other elastomer products.

## High Water Based Fluids

The water in HWBF tends to support biological growth and generate organic contamination and microbes.

## Replacement of Failed Components

Failure to thoroughly clean fluid conductor lines after replacing a failed hydraulic pump will cause premature catastrophic failure.

Donaldson recommends frequent oil sampling to ensure proper contamination control. Sample test points should be close to hydraulic pumps and at other key locations that provide safe, reliable access to the fluid while under full system pressure.

## Fluid Conditioning

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Fluid Conditioning is the term for the overall conditioning of the fluid in the hydraulic system, and encompasses particulate removal via filters along with other various methods for removing silt, air, water, heat, acid, sludge or chemicals.

### Particulate Removal

Is usually done with mechanical filters. A well designed reservoir that allows settling will also help in keeping particulates out of the mainstream fluid. For ferrous particulates and rust, reservoir magnets or strainer band magnets can also be used. Other methods such as centrifuging or electrostatic filtration units can also be used, particularly in continuous batch processing.

### Removal of Silt

Silt, defined as very fine particulate under 5µm in size, requires very fine filtration or “oil polishing.”

### Air Removal

Getting air out of the system is best done by adding 100 mesh screen in the reservoir, approximately 30° from horizontal to coalesce entrained air and allow larger bubbles to rise to the surface when reservoir velocities are low.

### Water Removal

This requires special water removal filters, referred to as absorbent or inactive. In systems with large quantities of water, a vacuum dehydration system may be necessary.

### Chemical Removal

Removal of acids, sludge, gums, varnishes, soaps, oxidation products and other chemicals generally requires an adsorbent (active) filter with Fuller Earth, active type clays, charcoal, or activated alumina.

### Heat Removal

Removing heat is important to maintain viscosity and prevent fluid breakdown. Usually performed with heat exchangers, including air-to-oil and water-to-oil types, finned coolers, or refrigerated units.

### Heat Addition

Added heat is used for cold temperature start-up to get fluid viscosities within operational limits. Use heaters, immersion or in-line.



## Proper Filter Application

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When selecting a filter or replacement element, it's important to first answer some basic questions about your application. Where will the filter be used? What is the required cleanliness level (ISO code) of your system? What type of oil are you filtering? Are there specific problems that need to be addressed?

It's also important to think about the viscosity of the fluid in your system. In some machinery lubrication applications, for example, the oil is very thick and has a tougher time passing through the layer of media fibers. Heating techniques and the addition of polymers can make the liquid less viscous and therefore easier to filter. Another option is to install a filter with larger media surface area or low pressure filters, that can accommodate more viscous fluids.

Next, think about duty cycle and flow issues. Working components such as cylinders often create wide variations in flow - also called pulsating flow - that can be problematic for filters with higher efficiency ratings. On the other hand, dedicated off-line filtration (also called "kidney loop") produces a very consistent flow, so it makes sense to use a more efficient filter.

Filters used in applications with steady, continuous operation at lower pressures will last longer than filters that must endure cycles of high pressure pulsating flow. Generally, the lower the micron rating of a filter, the more often it needs to be changed since it is trapping more particles.

Finally, it's wise to ask yourself, "How much is my equipment worth?" Calculate how much it would cost to replace the equipment in your system, in case of component failure, and make sure those areas are well protected with proper filtration. (For example, high performance servo valves are very sensitive, costly components that need to be protected with finer filtration media.)

Minimizing maintenance costs through good contamination control practices requires proper filter application based on the specific contamination problems. Good contamination control means cost-effective filtration. When looking for a filter, first assess the needs of your system and any problem areas.

### System Characteristics to Consider When Specifying Filtration

- 1) Oil Viscosity
- 2) Flow
- 3) Pressure
- 4) What Components will be protected by the filter
- 5) Cleanliness level required (expressed in ISO code)
- 6) Type of oil/fluid
- 7) Environment (the system, the surrounding conditions, etc.)
- 8) Duty cycle
- 9) Operating Temperature

## Fluid Properties

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**Lubricity** The property of the fluid that keeps friction low and maintains an adequate film between moving parts.

**Viscosity** The thickness of the fluid as measured by resistance to flow. The fluid must be thin enough to flow freely, heavy enough to prevent wear and leakage. Hydraulic fluids thicken when they cool and thin out as they heat up. Because some hydraulic systems work under wide temperature extremes, viscosity can be an important factor.

**Viscosity Index (VI)** The rate of viscosity changes with temperature: the higher the index, the more stable the viscosity as temperature varies. VI can sometimes be improved by additives, usually polymers.

**Rust Resistance** Rust inhibiting chemicals in hydraulic fluids help overcome the effects of moisture from condensation.

**Oxidation Resistance** Oxidation inhibitors delay the sludgy/acidic effects of air, heat, and contamination in the system.

**Foaming Resistance** Although control of foaming depends largely on reservoir design, anti-foaming additives in the fluid also help.

## Types of Hydraulic Fluid

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There are many kinds of fluids used for power, but they can basically be called petroleum-based fluids, biodegradable fluids, and fire-resistant fluids. A brief description of some of the types in each category are listed below.

### Petroleum Based (Hydrocarbon)

These are the most commonly used fluids in hydraulic systems. Their major advantages are low cost, good lubricity, relatively low/non-toxicity, and common availability. This type of fluid is not just plain oil; rather, it is a special formulation with additives that make it suitable for hydraulic systems. Mostly, the additives inhibit or prevent rust, oxidation, foam and wear.

#### Variations:

- ✓ Straight oils: same as petroleum-based oil but without the additives.
- ✓ Automatic transmission fluids (ATF): excellent low temperature viscosity and very high VI.
- ✓ Military hydraulic fluids (ie: MIL-H-5606 & MIL-H-83282): also called 'red oil' because of the color. Low viscosity, good for cold temperature operations, but may have to be modified for pumps.

### Fire Resistant Fluids

There are two types of fire-resistant fluids commonly used in hydraulic applications: Phosphate Esters and High Water Based Fluids (HWBF). Although generally not as viscous at cold temperatures as petroleum-based fluids, they are fire resistant due to their high content of noncombustible material. Very useful in overcoming the likelihood of fire caused by a broken hydraulic line spraying petroleum fluid into a pit of molten metal, onto a hot manifold, into a heat-treating furnace, or other ignition source.

### Some types of HWBF:

- ✓ Oil-in-water emulsions : typically 95% water and 5% oil, with the oil droplets dispersed throughout the water. Provide some fire resistance, but due to oil content, other fluids are superior.
  - ✓ Water-in-oil emulsions (invert emulsion) : typically 40% water and 60% oil, with the water dispersed in the oil. Provide some fire resistance, but due to oil content, other fluids are superior.
  - ✓ Water-glycol : typically 40% water and 60% glycol. Excellent fire resistance. Since glycol is an antifreeze, water-glycol can be used at lower temperatures.
- NOTE: HWBF may require reduced pressure rating of pumps and other components.
- ✓ Phosphate Ester : Somewhat fire resistant and good in higher temperature operations. Aggressive fluids that attack elastomers, paints and plastics. Special seals required (EPR, Butyl rubber, or Viton™). Note that synthetic fluids are typically phosphate esters, chlorinated hydrocarbons or a blend with good lubrication characteristics but usually with low viscosity index. As with straight phosphate esters, use special seals, paints and plastics.

### Biodegradable

With increasing concern about the environmental impact of hydraulic system leaks and spills, biodegradable fluids are receiving expanded usage, particularly in Europe. There are two types of common biodegradable hydraulic fluids: (1) vegetable-based oils, such as sunflower or grapeseed oils, and (2) synthetic oils like diesters, etc. Generally, systems using biodegradable fluids are derated for maximum and minimum temperatures. Users who replace standard hydraulic oils with biodegradable oils must check with filtration component manufacturers to confirm that the fluid and components are compatible.

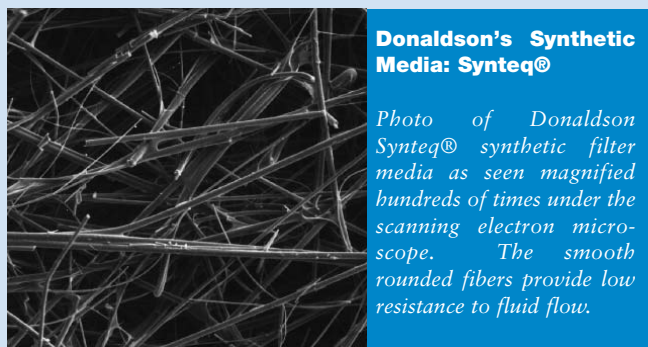
### Basic Hydraulic Filtration Principles

#### Filter Media

Media is a term used to describe any material used to filter particles out of a fluid flow stream. There are four basic types used to remove contamination in hydraulic applications:

##### A. Synthetic Media

Synthetic fibers are man-made, smooth and rounded to provide the least resistance to flow. Their consistent shape allows us to control the fiber size and distribution pattern throughout the media mat to create the smoothest, least inhibited fluid flow.



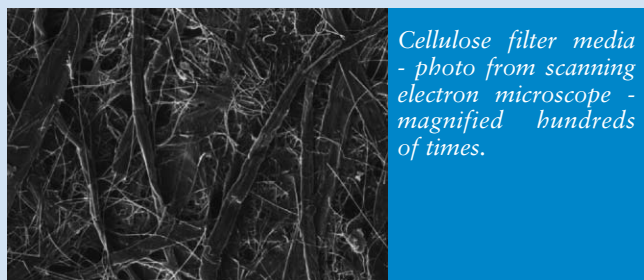
Consistency of fiber shape allows the maximum amount of contaminant-catching surface area and specific pore size control. The result is media with predictable filtration efficiencies at removing specified contaminants (i.g., 4 $\mu$ m) and maximum dirt holding capacity.

The low resistance of synthetic media to fluid flow makes it ideal for synthetic fluids, water glycols, water/oil emulsions, HWCF, and petroleum-based fluids.

##### B. Cellulose Media

Cellulose fibers are actually wood chips, microscopic in size and held together by resin. As you see in the photo below, the fibers are irregular in both shape and size.

Cellulose often has lower beta ratings, which means there are smaller pores in the media. Smaller media pores cause more flow resistance, in turn causing higher pressure drop.



While cellulose provides effective filtration for a wide variety of petroleum-base fluids, in certain applications it results in poor filtration performance as compared to synthetic media.

##### C. Water Removal Media

This is media formulated with desiccants and resins to remove moisture and condensation from petroleum-based fluids. (For concentration of water greater than half of 1 percent (0.05%) in the hydraulic oil, we recommend you use a vacuum dehydrator unit.)

##### D. Wire-Mesh Media

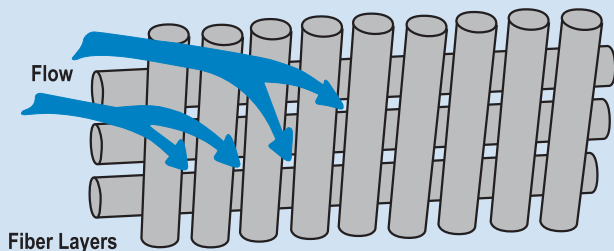
Wire-mesh media consists of stainless steel, epoxy-coated wire mesh available in 4 mesh sizes:

- 30, 60, 90, 160,  $\mu$ m filtration

Typically wire-mesh filters will be applied to catch very large, harsh particulate that would rip up a normal filter. You may also find this media useful as a coarse filter in viscous fluid applications.

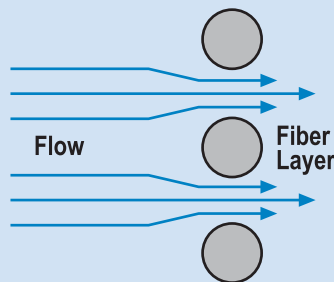
## How Filter Media Functions In a Filtration System

The job of the media is to capture particles and allow the fluid to flow through. For fluid to pass through, the media must have holes or channels to direct the fluid flow and allow it to pass. That's why filter media is a porous mat of fibers that alters the fluid flow stream by causing fluid to twist, turn and accelerate during passage



The fluid changes direction as it comes into contact with the media fibers, as illustrated above. As the fluid flows through the media, it changes direction continuously as it works its way through the maze of media fibers. As it works its way through the depths of the layers of fibers, the fluid becomes cleaner and cleaner. Generally, the thicker the media, the greater the dirt-holding capacity it has.

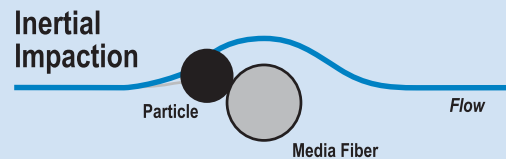
Looking at a cross-section view of the fibers, we can see how the flowstream is accelerated as it flows into the spaces between the fibers.



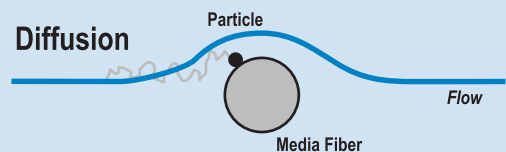
## How Filter Media Collects Particles

There are four basic ways media captures particles.

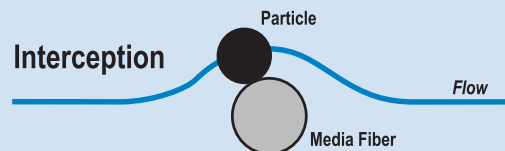
The first, called **inertia**, works on large, heavy particles suspended in the flow stream. These particles are heavier than the fluid surrounding them. As the fluid changes direction to enter the fiber space, the particle continues in a straight line and collides with the media fibers where it is trapped and held.



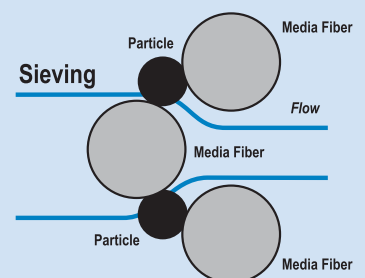
The second way media can capture particles is by **diffusion**. Diffusion works on the smallest particles. Small particles are not held in place by the viscous fluid and diffuse within the flow stream. As the particles traverse the flow stream, they collide with the fiber and are collected.



The third method of particle entrapment is called **interception**. Direct interception works on particles in the mid-range size that are not quite large enough to have inertia and not small enough to diffuse within the flow stream. These mid-sized particles follow the flow stream as it bends through the fiber spaces. Particles are intercepted or captured when they touch a fiber.



The fourth method of capture is called **sieving** and is the most common mechanism in hydraulic filtration. As shown at right, this is when the particle is too large to fit between the fiber spaces.





## Hydraulic Filtration Pressure Drop

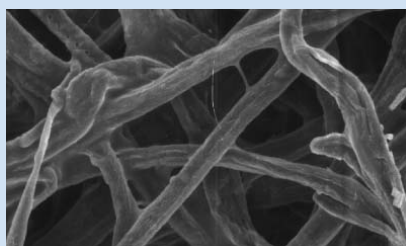
The difference between the inlet pressure and the outlet pressure is called pressure drop or differential pressure. It's symbolized by  $\Delta P$ .  $\Delta P$  is an irrecoverable loss of total pressure caused by the filter, and is mostly due to frictional drag on the fibers in the media.

$\Delta P$  may increase as the particulate rating or efficiency of the filter (as expressed by its beta ratio) gets better.  $\Delta P$  also increases as the filter is being loaded with contaminant.

### Four Major Factors Contribute to Pressure Drop

#### 1. Filter Media

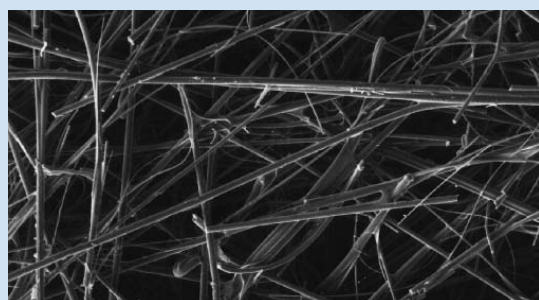
Media is, of course, the main factor influencing pressure drop; indeed, it causes pressure drop. That's why having a low-friction, high-flowing media is so



*Natural Fiber Cellulose media, as seen under the scanning electron microscope.*

important. The natural cellulose or paper fibers (shown at left) typically used in filtration are large, rough, and as irregular as nature made them.

Donaldson developed a synthetic media with smooth, rounded fibers, consistently shaped so that we can control the fiber size and distribution pattern throughout the media mat, and still allow the smoothest, least inhibited fluid flow. Our synthetic media is named Synteq®.



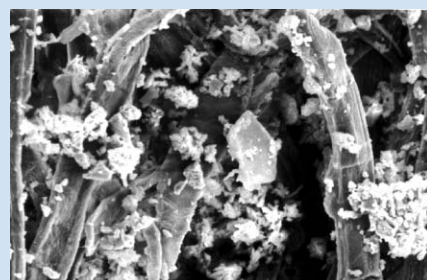
*Donaldson's synthetic Synteq® filter media - photo from scanning electron microscope - magnified hundreds of times.*

Synteq® fibers offer the least amount of resistance to fluid passing through the media. Consistency of fiber shape allows the maximum amount of contaminant-catching surface area and specific pore size control. The result is media with predictable filtration efficiencies at removing specified contaminants (i.g., 4 $\mu$ m) and maximum dirt holding capacity.

Natural cellulose fibers are larger than synthetic fibers and jagged in shape, so controlling size of the pores in the media mat is difficult and there is less open volume. In most applications this results in higher  $\Delta P$  as compared to synthetic filters. Higher beta ratings mean there are smaller pores in the media; smaller media pores cause more flow resistance, in turn causing higher pressure drop.

#### 2. Dirt, Contaminant

As dirt gets caught in the media, it eventually begins to build up and fill the pore openings. As the pore openings shrink, the differential pressure (pressure drop) increases. This is called restriction. This photo from our scanning electronic microscope shows actual dirt particles building up in the media pores.



Excessive dirt in the media can cause dirt migration or even filter failure. Dirt migration occurs when the restriction is so great that the differential pressure pushes dirt deeper into the media and, eventually, through the media and back into the system. Filter failure occurs when the restriction becomes so high that the filter cartridge collapses (outside-in flow) or bursts (inside-out flow) to relieve the upstream pressure.

To avoid such catastrophe, use of a filter service indicator and filter bypass is recommended. It measures the pressure drop across the filter, then signals when the filter is 'full' and needs to be changed.

#### 3. Flow

Higher flows create higher pressure drop. With fast moving fluid, there will be more friction causing higher pressure drop across the media.

## 4. Fluid Viscosity

Measured in centistokes (cSt) or Saybolt Seconds Universal (SSU or SUS), fluid viscosity is the resistance of a fluid to flow. As fluid viscosity increases, the cSt rating increases. Higher fluid viscosities also mean higher pressure drop because the thicker oil has a tougher time passing through the layer of media fibers. Cold start fluid is a good example of highly viscous fluid.

Filter media, amount of contamination, the flow rate, and fluid viscosity are all factors in the

importance of sizing the filter for the system requirements. Filters that are too small won't be able to handle the system flow rate and will create excessive pressure drop from the start. The results could be filter operation in the bypass mode, filter failure, component malfunction, or catastrophic system failures. Filters that are too large for the system can be too costly. Oversized filters require more system oil and higher cost replacement elements. Optimal sizing is best.

## Physical Characteristics of Elements

There are two main differences in filter elements. The first is the design of the **filter element itself**, and the second is the type of **media** that is used in such elements.

Filter elements have some attributes that are immediately obvious to the casual observer, such as height, inside diameter, outside diameter, media concentration, type of liner, seal design, and the way the media and components are glued or potted together.

- **Liners** must be structurally sturdy to withstand pressure variance, yet open enough to allow good flow.
- **Top seal design** must be leak-free, with a gasket or sealing device that ensures a good seal throughout the life of the filter. Standard seals are made of BunaN material, which is fine for most applications. However, if the filtered fluid is diester or phosphate ester fluid, you'll need a seal made of a fluoroelastomer such as Viton.
- **Media potting** is key since it holds the media in place at each end. Not only should the potting be fully around the ends of the media to prevent leaks, it should also be of a material that can withstand the application. For instance, epoxy potting should be used in elements that must perform in higher temperature environments, phosphate ester fluids and some high water based fluids.
- **Inside** the element, the filter media can vary in thickness, pleat depth and pleat concentration.

For example, Donaldson hydraulic filters are generally equipped with either white ("Synteq" our synthetic material) or natural brown (paper or cellulose material) media. It is important to note that media colors vary according to each manufacturer - it should not be assumed that any white-colored media is made of synthetic material.

Some of the most important characteristics of a filter element (structure, fiber diameter, volume solidity, basis weight, thickness, layering) can only be detected under a microscope.



### Damaged Equipment

*Damage happens when key filtration points are ignored! The pistons in this pump are severely damaged from contamination in the oil.*

## Combining the ISO Rating and Filter Performance Ratings

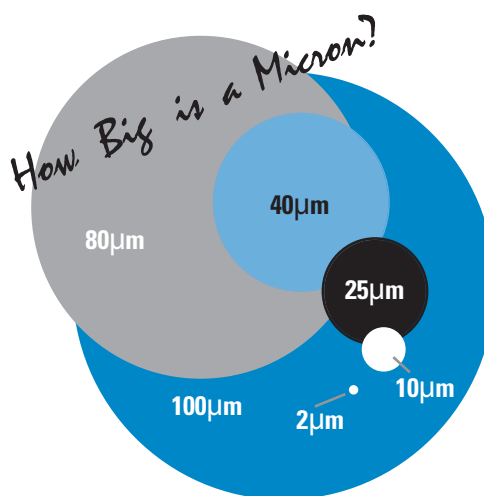
While filter manufacturers publish beta ratings for filter media to describe efficiency performance levels, a direct connection between the beta rating scale and the ISO rating scale cannot be made.

The solution is monitoring filter media performance at removing particles in the 4 $\mu$ m, 6 $\mu$ m, and 14 $\mu$ m ranges. Oil analysis and field monitoring are the only ways to get these measurements. Combine data from several tests to form a range of performance. Remember, actual filter performance will vary between applications.

Donaldson media efficiency performance levels are derived from the ISO 16889 test standard with NIST-certified on-line automatic particle counters and ISO medium test dust. The Donaldson media efficiency performance levels shown are based on test averages under steady flow conditions. Actual performance levels may vary by application, viscosity, flow variance and contamination differences. Contact Donaldson or your Donaldson distributor for specific application calculations.

## Micron Sizes of Familiar Particles

Grain of table salt	100 $\mu$ m
Human hair	80 $\mu$ m
Lower limit of visibility	40 $\mu$ m
White blood cell	25 $\mu$ m
Talcum powder	10 $\mu$ m
Red blood cell	8 $\mu$ m
Bacteria	2 $\mu$ m
Silt	<5 $\mu$ m



## Typical ISO Cleanliness

Here are some typical ISO cleanliness recommendations from component manufacturers. (These are guidelines; always check the ratings specified by the manufacturer of your specific components.)



### Disaster Strikes

When filters are not a main component of the hydraulic circuit, disaster awaits! Here, piston rings were eaten away by contaminants.

# Hydraulic Technical Reference Guidee

## Typical ISO cleanliness

Manufacturer's ISO contamination levels are based on controlling the particle counts of 4µm, 6µm and 14µm particles in hydraulic system oil. This level is

identified by measuring the number of particles 4µm and greater, 6µm and greater, and 14µm and greater in one milliliter of the system hydraulic oil sample.

### ISO 4406 Contamination Code

This correlates to the numbers in the boxes along the right side of the graph on the next page.

#### Range of number of particles per milliliter:

Code	More Than	Up to & Including	Code	More Than	Up to & Including
24	80,000	160,000	14	80	160
23	40,000	80,000	13	40	80
22	20,000	40,000	12	20	40
21	10,000	20,000	11	10	20
20	5,000	10,000	10	5	10
19	2,500	5,000	9	2.5	5
18	1,300	2,500	8	1.3	2.5
17	640	1,300	7	.64	1.3
16	320	640	6	.32	.64
15	160	320			

ISO 4406:1999 Code	System type	Suggested Efficiency ISO 16889	Suggested Media (closer)
15/13/10	servo-valves for pressure >20MPa, laboratory & aerospace	$\beta_{2(c)} \geq 200$	/00
16/14/11	high perf. & high press. long life components, i.e. small gearbox	$\beta_{2(c)} \geq 200$ $\beta_{5(c)} \geq 200$	/00 /01
17/15/12	i.e. servo-valves, general power transmission gearbox	$\beta_{7(c)} \geq 200$	/01
18/16/13	high quality reliable, general purpose mach., vane & piston pumps, prop. valves, large gearbox	$\beta_{7(c)} \geq 200$ $\beta_{10(c)} \geq 200$	/01 /02
19/17/14	gear pumps	$\beta_{10(c)} \geq 200$ $\beta_{12(c)} \geq 200$	/02 #3 #3 1/2
20/18/15	mobile equipment, medium pressure i.e. motors, valves & control	$\beta_{12(c)} \geq 200$ $\beta_{15(c)} \geq 200$	#3 #3 1/2
21/19/16	low-medium pressure systems, heavy industry, cylinders, steering unit (load sens.)	$\beta_{15(c)} \geq 200$ $\beta_{20(c)} \geq 200$	#4 /03
22/20/17	low pressure systems	$\beta_{25(c)} \geq 200$	/03 #9
23/21/18	low pressure systems with large clearance	$\beta_{25(c)} \geq 200$ $\beta_{10(c)} \geq 2$	#9 /1 #10
26/24/20	low pressure systems with large clearance	$\beta_{40(c)} \geq 200$ $\beta_{23(c)} \geq 2$	/3 #20



## Filter Efficiency Standards

### Understanding the Beta Rating System

This information is provided as an aid to understanding fluid filter efficiency terminology based on current ISO, ANSI and NFPA test standards. It is not proprietary and may be reproduced or distributed in any manner for educational purposes.

#### What is Beta Ratio?

Beta ratio (symbolized by  $\beta$ ) is a formula used to calculate the filtration efficiency of a particular fluid filter using base data obtained from multi-pass testing.

In a multi-pass test, fluid is continuously injected with a uniform amount of contaminant (i.e., ISO medium test dust), then pumped through the filter unit being tested. Filter efficiency is determined by monitoring oil contamination levels upstream and downstream of the test filter at specific times. An automatic particle counter is used to determine the contamination level. Through this process an upstream to downstream particle count ratio is developed, known as the beta ratio.

The formula used to calculate the beta ratio is:

$$\text{Beta ratio}_{(x)} = \frac{\text{particle count in upstream oil}}{\text{particle count in downstream oil}}$$

where (x) is a given particle size

Indicates that testing was done with APC's calibrated with NIST fluid

$$\beta_{10(c)} = 1000$$

1000 times more particles upstream than downstream that are 10  $\mu\text{m}$  and larger

### Why the Efficiency Rating Test Standard was Updated

The International Industry Standard (ISO) for multi-pass testing provides a common testing format for filter manufacturers to rate filter performance. This standardization gives you the ability to reliably compare published filter ratings among different brands of filters.

ISO test standards were updated in 1999 to reflect the improved technology available in particle counters and other test equipment. The newer particle counters provide more precise counting and greater detail—reflecting a truer indication of filter performance.

The National Fluid Power Association (NFPA), the National Institute of Standards & Technology (NIST), and industry volunteers, including several engineers from Donaldson, helped revise the ISO standard. ISO 16889 has been in force since late 1999 and ISO 4572 is officially discontinued.

#### Better Test Dust

The old test dust (AC fine test dust or ACFTD) was “ball milled,” which produced dust particles of varying size and shape. Particle distribution was often different from batch to batch. The accuracy of ACFTD distribution and previous APC calibration procedure was questioned by industry, due to lack of traceability and certification. ACFTD hasn't been produced since 1992.

Now, the new test dust (ISO medium test dust) is “jet milled” to produce consistent particle size, shape, and distribution from batch to batch. See dust size comparison chart below.

#### Liquid Automatic Particle Counters (APC's)

In the old test standard (ISO 4572), fluid samples obtained in bottles and off-line particle counting were allowed. Now, in the updated standard (ISO 16889), on-line, laser-based automatic particle counters, especially made for measuring liquids, are required and bottle counting methods are disallowed, as illustrated on next page.



# Hydraulic Technical Reference Guide

The old particle counter calibration was based on only 1 dimension of an irregularly-shaped particle (the longest cord). Today, the particle counter calibration is based on equivalent spherical area of an irregularly-shaped particle.

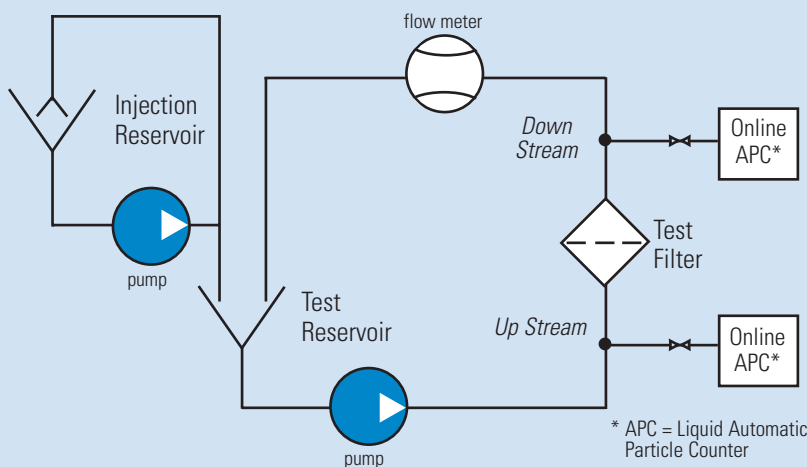
NIST provides calibration suspension, which is certified with X number of particles at a certain size. This is verified by NIST. The new way to list beta ratios includes a subscript (c) to indicate NIST certified test suspension and assures you of traceability and repeatability.

Overall, you can have strong confidence in filter ratings resulting from tests per ISO 16889, as they are highly accurate. As always, keep in mind that beta ratings are laboratory measurements under steady flow conditions with artificial contaminants — the real proof of the performance is how clean the filter keeps the fluids in the application. A good oil analysis program that checks the cleanliness of the oil periodically will verify that the proper filters are being used.

## Test Dust Size Comparisons

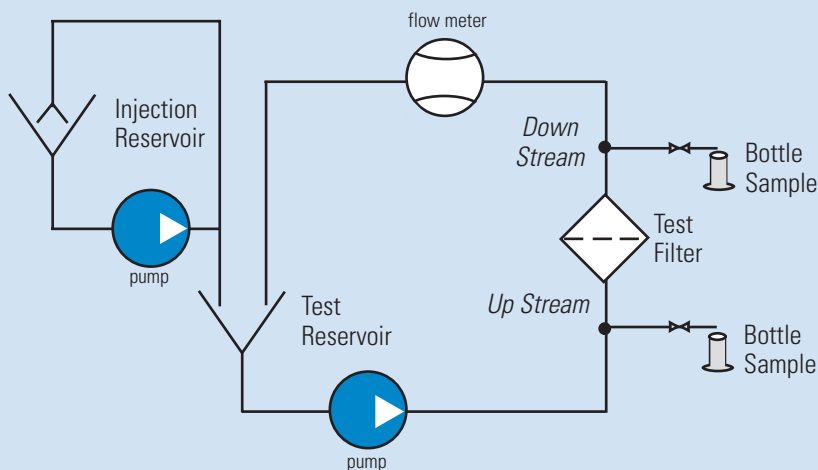
ACFTD calibrated size ( $\mu\text{m}$ ) per ISO 4402 corresponds to a NIST-calibrated size [ $\mu\text{m}(c)$ ] per ISO 11171

<b>ACFTD</b>	<b>0.8</b>	<b>1</b>	<b>2</b>	<b>2.7</b>	<b>3</b>	<b>4.3</b>	<b>5</b>	<b>7</b>	<b>10</b>	<b>12</b>	<b>15</b>	<b>15.5</b>	<b>20</b>	<b>25</b>	<b>30</b>	<b>40</b>	<b>50</b>
<b>NIST</b>	<b>4</b>	<b>4.2</b>	<b>4.6</b>	<b>5</b>	<b>5.1</b>	<b>6</b>	<b>6.4</b>	<b>7.7</b>	<b>9.8</b>	<b>11.3</b>	<b>13.6</b>	<b>14</b>	<b>17.5</b>	<b>21.2</b>	<b>24.9</b>	<b>31.7</b>	<b>38.2</b>



## ISO 16889

- In-Line Liquid Automatic Particle Counters (APC) are now required for proper testing.
- APC calibration follows ISO 11171 procedures
- ISO 11171 uses NIST (National Institute of Standards & Technology) certified calibration fluid



## ISO 4572

(Discontinued)

- Either bottle samples or APC's were allowed.
- APC calibration followed ISO4402 ACFTD (Discontinued)

## Cleanliness Level Correlation Table

Conversion of cleanliness specifications to filter performance is not an exact science because the contamination level in a hydraulic system is a function of the ingress and generation rate as well as the filter performance.

### Factors That Affect Cleanliness Levels in a Hydraulic System

- ✓ Abrasive wear in space between adjacent moving surfaces of components.
- ✓ Erosive wear at component edges or direction changes where there is high fluid velocity.
- ✓ Fatigue wear by particles trapped between moving surfaces.

### Identification of the Most Sensitive Component

- ✓ Required cleanliness level is dominated by the component with smallest clearances and/or highest loading on the lubricating film.
- ✓ Best source for determining this level is the specification published by the component manufacturer.
- ✓ Higher pressures reduce component life, unless contamination level is decreased accordingly.
- ✓ Operating at half the rated pressure of component will increase its life by more than four times.
- ✓ Percent of operating time at maximum pressure depends on individual machines and application.

ISO Code Level	Particles Per Milliliter	ISO FTD* Gravimetric	Mil Std 1236A	NAS 1638	SAE
	>10 microns	Level (mg/l)	(1967)	(1964)	(1963)
26/23	140,000	1000			
25/23	85,000		1000		
25/20	14,000	100	700		
21/18	4,500			12	
20/18	2,400		500		
20/17	2,300			11	
20/17	1,400	10			
19/16	1,200		10		
18/15	580			9	6
17/14	280		300	8	5
16/13	140	1		7	4
15/12	70			6	3
14/12	40		200		
14/11	35			5	2
13/10	14	0.1		4	1
12/9	9			3	0
11/8	5			2	
10/8	3		100		
10/7	2.3			1	
10/6	1.4	0.01			
9/6	1.2			0	
8/5	0.6			0	
7/5	0.3		50		
6/3	0.14	0.001			
5/2	0.04		25		
2/8	0.01		10		

\* SAE Fine Test Dust --- ISO approved test and calibration contaminant. Source: Milwaukee School of Engineering Seminar, Contamination & Filtration of Hydraulic Systems

## Compatibility of Donaldson Filter Media with Hydraulic Fluids

While Donaldson has developed many formulations of media, they can be divided into two broad categories: natural fibers, usually cellulose, and synthetic or man-made fibers.

Fluid to be Filtered	Recommended Media
<b>Petroleum-based</b>	<b>Synteq Cellulose</b>
<b>Phosphate Ester Diester</b>	<b>Synteq</b>
<b>Water Glycol</b>	<b>Synteq</b>
<b>Water-Oil Emulsion</b>	<b>Synteq</b>
<b>Biodegradable Fluid</b>	<b>Synteq</b>
<b>HWCF (high water content fluids)</b>	<b>Synteq</b>
<b>Coarse Filtration</b>	<b>Wire Mesh</b>

### A Note on Seals

- ✓ Filters with seals made of BunaN are appropriate for most applications involving petroleum oil and some high water content fluids. Filters with seals made of Viton® or Fluorel® (both fluoroelastomers) are required when using diesters, phosphate ester fluids. Donaldson offers both types. (Viton® is a registered trademark of DuPont Dow Elastomers, and Fluorel® is a registered trademark of 3M Company.)
- ✓ In Donaldson filters with fluorocarbon elastomer seals, epoxy potting is used to accommodate higher temperature environments and for compatibility with fluids such as phosphate ester and high water based fluids. The plastisol (heat cured) and urethane (self curing) potting materials used in other filters perform well with petroleum-based fluids.



### Piston Pump Damage

*The severe score marks on the piston slippers leave no question about why good hydraulic filtration is important.*

*Mobile*

# Hydraulic Circuits

## Applications



Skidsteer



Skidsteer



Combine



Tractor



Paving machine



Backhoe



Donaldson.  
*Filtration Solutions*

# RETURN LINE FILTERS







Donaldson®  
*Filtration Solutions*

# IN TANK RETURN FILTERS



# FIK-FIO

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Return line filters,  
up to 10 bar

# FIK-FIOT

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Return line filters with filler cap,  
up to 10 bar



## Technical Data

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- Operating pressure at 1000 kPa (10 bar).
- Static pressure testing at 1500 kPa (15 bar).
- Operating temperature -20 +100°C.
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO 3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1 or flanged per SAE J 518 - 3000 PSI.

## Filter Elements

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- Wire mesh with 60-90 micron.
- Synteq® synthetic media with 10-25 micron.
- Cellulose media with 10-30 micron, reinforced with wire mesh.
- By-pass valve setting 150 kPa (1,5 bar) per ISO 3968.
- Collapse resistance 1000 kPa (10 bar) per ISO 2941.
- Replacement element includes spring and O-ring seal.

# FIK-FIO

## Return line filters



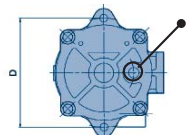
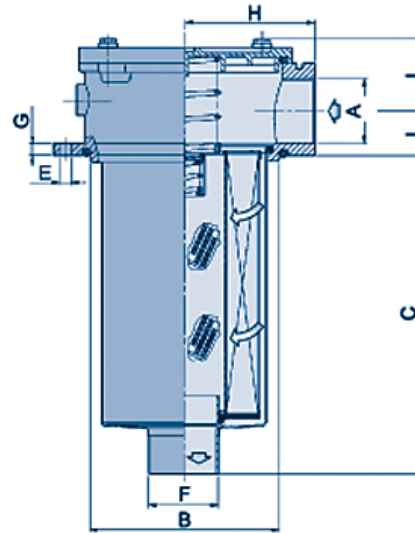
### Specifications

FLOW l/min	/9		/6		FLOW l/min	/3		/1		FLOW l/min	/03		/02	
	WIRE MESH MEDIA					CELLULOSE MEDIA					SYNTHETIC MEDIA			
	TYPE	ELEMENT	TYPE	ELEMENT		$\beta_{40(c)}=1000$		$\beta_{36(c)}=1000$			$\beta_{23(c)}=1000$		$\beta_{11(c)}=1000$	
20	K030207 FIO 20 K030329 FIO 20 P	P171500 CR 30	K030212 FIO 20/6 K030332 FIO 20/6 P	P171505 CR 30/6	15	K030211 FIO 20/3 K030331 FIO 20/3 P	P171504 CR 30/3	K030210 FIO 20/1 K030379 FIO 20/1 P	P171503 CR 30/1	10	P171502 CR 30/03	K030208 FIO 20/02 K030378 FIO 20/02 P	P171501 CR 30/02	
30	K030213 FIO 30 K030333 FIO 30 P	P171500 CR 30	K030218 FIO 30/6 K030337 FIO 30/6 P	P171505 CR 30/6	20	K030217 FIO 30/3 K030336 FIO 30/3 P	P171504 CR 30/3	K030216 FIO 30/1 K030335 FIO 30/1 P	P171503 CR 30/1	15	P171502 CR 30/03	K030214 FIO 30/02 K030334 FIO 30/02 P	P171501 CR 30/02	
50	K040506 FIO 50 K040868 FIO 50 P	P171518 CR 50	K040511 FIO 50/6 K040867 FIO 50/6 P	P171523 CR 50/6	35	K040510 FIO 50/3 K040866 FIO 50/3 P	P171522 CR 50/3	K040509 FIO 50/1 K040865 FIO 50/1 P	P171521 CR 50/1	30	P171520 CR 50/03	K040507 FIO 50/02 K040971 FIO 50/02 P	P171519 CR 50/02	
60	K040512 FIO 60 K040873 FIO 60 P	P171524 CR 60	K040517 FIO 60/6 K040872 FIO 60/6 P	P171529 CR 60/6	40	K040516 FIO 60/3 K040871 FIO 60/3 P	P171528 CR 60/3	K040515 FIO 60/1 K040870 FIO 60/1 P	P171527 CR 60/1	35	P171526 CR 60/03	K040513 FIO 60/02 K040869 FIO 60/02 P	P171525 CR 60/02	
80	K040518 FIO 80 K040878 FIO 80 P	P171530 CR 100	K040523 FIO 80/6 K040877 FIO 80/6 P	P171535 CR 100/6	55	K040522 FIO 80/3 K040876 FIO 80/3 P	P171534 CR 100/3	K040521 FIO 80/1 K040875 FIO 80/1 P	P171533 CR 100/1	50	P171532 CR 100/03	K040519 FIO 80/02 K040985 FIO 80/02 P	P171531 CR 100/02	
100	K040500 FIO 100 K040884 FIO 100 P	P171530 CR 100	K040505 FIO 100/6 K040883 FIO 100/6 P	P171535 CR 100/6	65	K040504 FIO 100/3 K040882 FIO 100/3 P	P171534 CR 100/3	K040503 FIO 100/1 K040880 FIO 100/1 P	P171533 CR 100/1	60	P171532 CR 100/03	K040501 FIO 100/02 K040879 FIO 100/02 P	P171531 CR 100/02	
150	K051109 FIO 150 K051238 FIO 150 P	P171536 CR 180	K051114 FIO 150/6 K051237 FIO 150/6 P	P171541 CR 180/6	100	K051113 FIO 150/3 K051236 FIO 150/3 P	P171540 CR 180/3	K051112 FIO 150/1 K051235 FIO 150/1 P	P171539 CR 180/1	90	P171538 CR 180/03	K051110 FIO 150/02 K051233 FIO 150/02 P	P171537 CR 180/02	
180	K051115 FIO 180 K051242 FIO 180 P	P171536 CR 180	K051120 FIO 180/6 K051241 FIO 180/6 P	P171541 CR 180/6	120	K051119 FIO 180/3 K051229 FIO 180/3 P	P171540 CR 180/3	K051118 FIO 180/1 K051232 FIO 180/1 P	P171539 CR 180/1	110	P171538 CR 180/03	K051116 FIO 180/02 K051239 FIO 180/02 P	P171537 CR 180/02	
200	K070003 FIO 200 K070280 FIO 200 P	P171542 CR 201	K070008 FIO 200/6 K070285 FIO 200/6 P	P171547 CR 201/6	140	K070007 FIO 200/3 K070284 FIO 200/3 P	P171546 CR 201/3	K070006 FIO 200/1 K070283 FIO 200/1 P	P171545 CR 201/1	130	P171544 CR 201/03	K070004 FIO 200/02 K070281 FIO 200/02 P	P171543 CR 201/02	
250	K070009 FIO 250 K070286 FIO 250 P	P171548 CR 250	K070014 FIO 250/6 K070290 FIO 250/6 P	P171553 CR 250/6	160	K070013 FIO 250/3 K070289 FIO 250/3 P	P171552 CR 250/3	K070012 FIO 250/1 K070288 FIO 250/1 P	P171551 CR 250/1	140	P171550 CR 250/03	K070010 FIO 250/02 K070355 FIO 250/02 P	P171549 CR 250/02	
330	K070015 FIO 325 K070192 FIO 325 P	P171554 CR 325	K070020 FIO 325/6 K070295 FIO 325/6 P	P171559 CR 325/6	200	K070019 FIO 325/3 K070294 FIO 325/3 P	P171558 CR 325/3	K070018 FIO 325/1 K070293 FIO 325/1 P	P171557 CR 325/1	180	P171556 CR 325/03	K070016 FIO 325/02 K070356 FIO 325/02 P	P171555 CR 325/02	
330	K070021 FIO 330 K070296 FIO 330 P	P171560 CR 330	K070026 FIO 330/6 K070301 FIO 330/6 P	P171565 CR 330/6	200	K070025 FIO 330/3 K070300 FIO 330/3 P	P171564 CR 330/3	K070024 FIO 330/1 K070299 FIO 330/1 P	P171563 CR 330/1	180	P171562 CR 330/03	K070022 FIO 330/02 K070297 FIO 330/02 P	P171561 CR 330/02	
500	K070027 FIO 500 K070302 FIO 500 P	P171566 CR 500	K070032 FIO 500/6 K070307 FIO 500/6 P	P171571 CR 500/6	400	K070031 FIO 500/3 K070306 FIO 500/3 P	P171570 CR 500/3	K070030 FIO 500/1 K070305 FIO 500/1 P	P171569 CR 500/1	350	P171568 CR 500/03	K070028 FIO 500/02 K070303 FIO 500/02 P	P171567 CR 500/02	
600	K070033 FIO 600 K070308 FIO 600 P	P171572 CR 600	K070038 FIO 600/6 K070311 FIO 600/6 P	P171577 CR 600/6	500	K070037 FIO 600/3 K070310 FIO 600/3 P	P171576 CR 600/3	K070036 FIO 600/1 K070309 FIO 600/1 P	P171575 CR 600/1	400	P171574 CR 600/03	K070034 FIO 600/02 K070277 FIO 600/02 P	P171573 CR 600/02	
600	K070045 FIOF 600 K070358 FIOF 600 P	P171572 CR 600	K070050 FIOF 600/6 K070357 FIOF 600/6 P	P171577 CR 600/6	500	K070049 FIOF 600/3 K070318 FIOF 600/3 P	P171576 CR 600/3	K070048 FIOF 600/1 K070317 FIOF 600/1 P	P171575 CR 600/1	400	P171574 CR 600/03	K070046 FIOF 600/02 K070364 FIOF 600/02 P	P171573 CR 600/02	
800	K070039 FIO 800 K070359 FIO 800 P	P171578 CR 800	K070044 FIO 800/6 K070316 FIO 800/6 P	P171583 CR 800/6	600	K070043 FIO 800/3 K070315 FIO 800/3 P	P171582 CR 800/3	K070042 FIO 800/1 K070314 FIO 800/1 P	P171581 CR 800/1	500	P171580 CR 800/03	K070040 FIO 800/02 K070312 FIO 800/02 P	P171579 CR 800/02	
800	K070051 FIOF 800 K070303 FIOF 800 P	P171578 CR 800	K070056 FIOF 800/6 K070362 FIOF 800/6 P	P171583 CR 800/6	600	K070055 FIOF 800/3 K070321 FIOF 800/3 P	P171582 CR 800/3	K070054 FIOF 800/1 K070320 FIOF 800/1 P	P171581 CR 800/1	500	P171580 CR 800/03	K070052 FIOF 800/02 K070360 FIOF 800/02 P	P171579 CR 800/02	

IN BLUE, FILTER ASSIES WITH PREDISPOSITION SERIE FIK-FIO

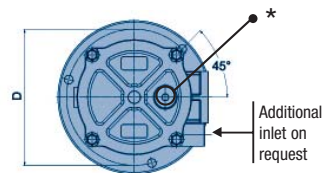


DIMENSIONS ASSY (mm)											DIMENSIONS ELEMENT (mm)		
A	B	C	D	E	F	G	H	I	L	Kg.	M	N	O
G 3/8	67	78	90	6,4	25	9	49	30	22	0,5	26	52	67
G 1/2	67	78	90	6,4	25	9	49	30	22	0,5	26	52	67
G 1/2	90	100	115	8,4	28	10	66	43	28	0,8	29	70	75
G 3/4	90	100	115	8,4	28	10	66	43	28	0,8	29	70	82
G3/4	90	145	115	8,4	28	10	66	43	28	0,9	29	70	128
G 1	90	145	115	8,4	28	10	66	43	28	0,9	29	70	128
G 1	131	230	175	10,5	40	10	95	53	35	2,5	41	95	203
G 1 1/4	131	230	175	10,5	40	10	95	53	35	2,5	41	95	203
G 1 1/4	131	280	175	10,5	40	10	95	53	35	2,8	41	95	250
G 1 1/2	175	167	220	10,5	50	11	119	65	41	3,7	52	140	136
G 1 1/2	175	238	220	10,5	50	11	119	65	41	4,3	52	140	203
G 1 1/2	175	238	220	10,5	63,5	11	119	65	41	4,3	65	140	203
G 2	175	238	220	10,5	63,5	11	119	65	41	4,5	65	140	203
G 2	175	293	220	10,5	63,5	11	119	65	41	5	65	140	250
FLANGE SAE 2	174	289	220	10,5	63,5	11	126	58	48,5	5,2	65	140	250
G 2	175	441	220	10,5	63,5	11	119	65	41	6	165	140	400
FLANGE SAE 2	174	437	220	10,5	63,5	11	126	58	48,5	6,2	65	140	400

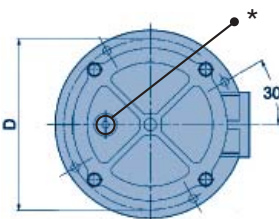


\* Plugged predisposition for models "P"

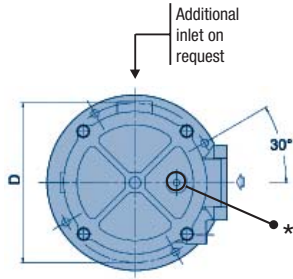
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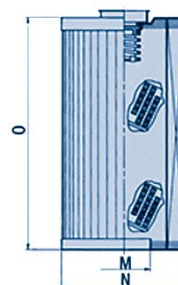
SIZE 150-180-200



SIZE 250-330-500-600-800



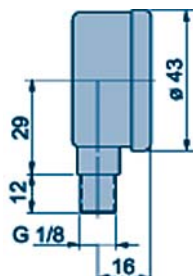
SIZE 330-600-800



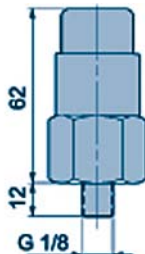
### IMPORTANT NOTES:

- 1) To foresee hole diameter on top of the tank to be  $\phi B + 2\text{mm}$
- 2) To maintain the filter outlet (ref.  $\phi F$ ) well below the oil level to avoid foam formation.

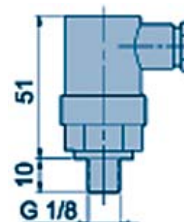
## Service Indicators



**PRESSURE GAUGE**  
**P171953** (500.01)  
 Scale: -100÷500 kPa (-1÷5 bar)

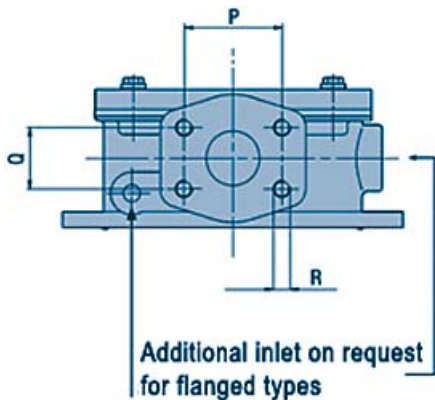


**VISUAL PRESSURE GAUGE INDICATOR**  
**P171958** (503.01)  
 Setting: 120 kPa (1,2 bar)



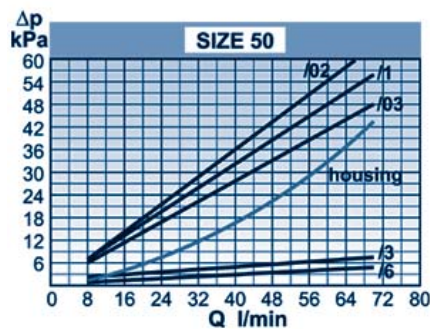
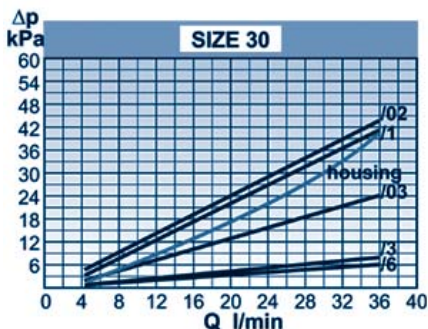
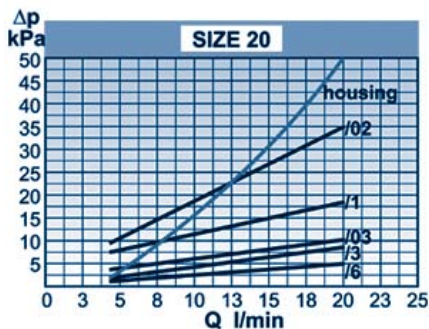
**ELECTRICAL PRESSURE SWITCH INDICATOR**  
**P171966** (504.01) N.O. contacts  
**P173104** (504.05) N.C. contacts  
 Setting: 120 kPa (1,2 bar)  
 Max. values: 48 VAC - 30 DCV - 0,5 A res - 0,2 A. ind  
 Protection class: IP 65  
 Cable clamp: PG 7

## SAE Flanges 300

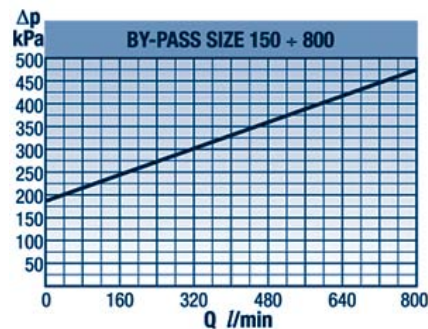
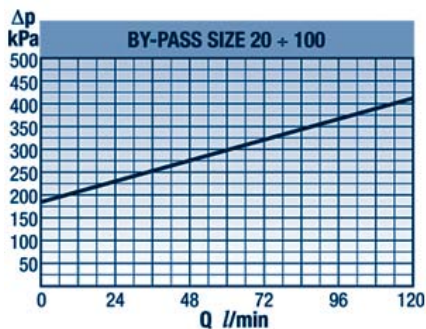
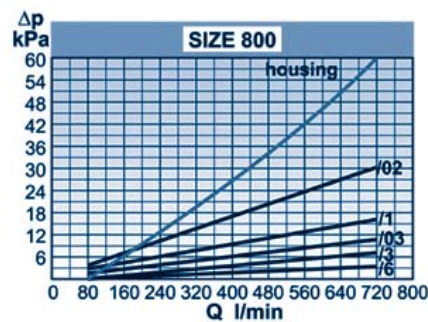
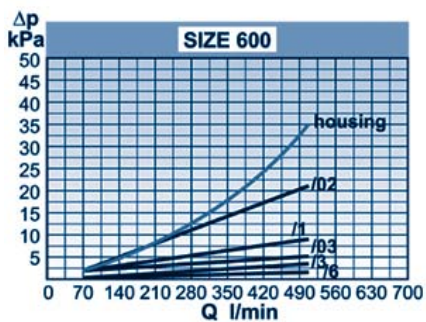
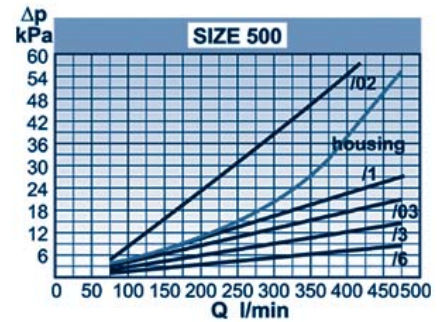
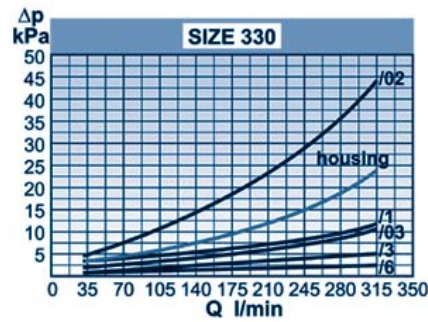
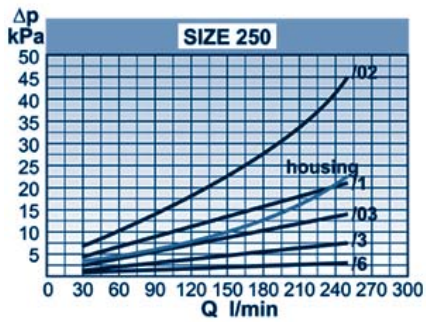
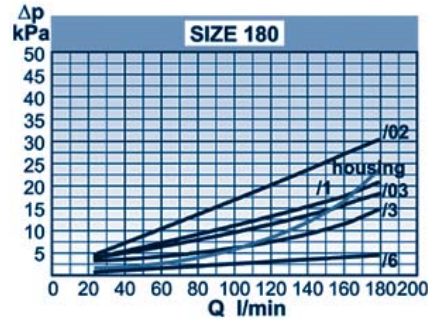
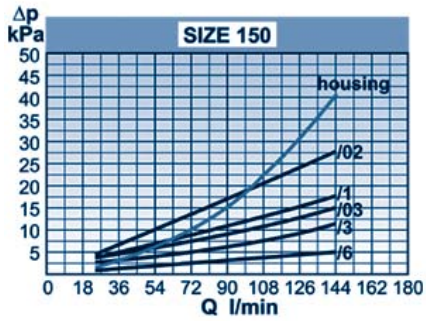
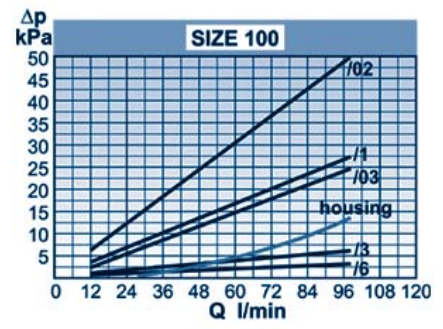
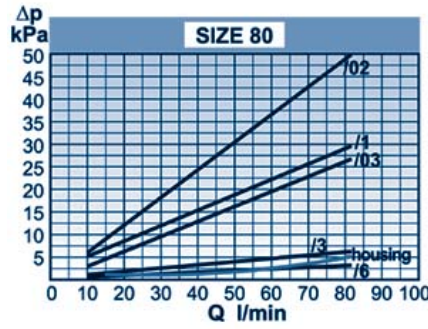
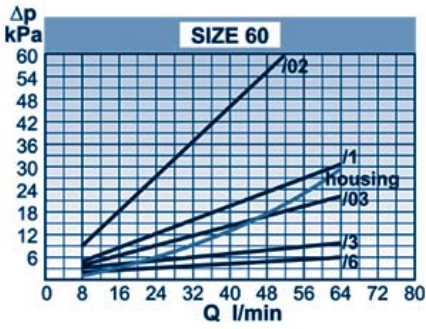


FLANGE SAE J518 3000 PSI	P	Q	R
1 1/2	69,8	35,8	M12
2	77,8	42,9	M12

## Performance Curves







# FIK-FIO, 4 HOLES FLANGES

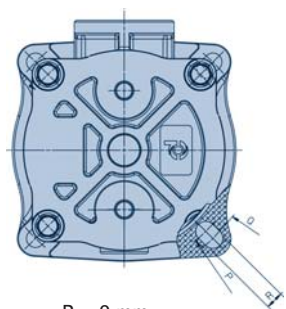
Return line filters

## Specifications

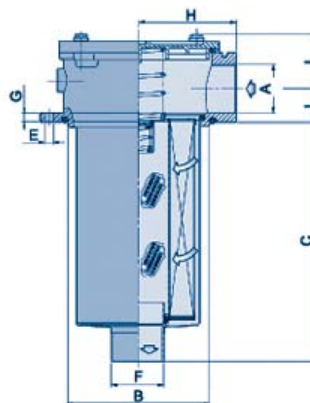


FLOW l/min	/9		/6		FLOW l/min	/3		/1		FLOW l/min	/03		/02	
	WIRE MESH MEDIA					CELLULOSE MEDIA					SYNTHETIC MEDIA			
	TYPE	ELEMENT	TYPE	ELEMENT		TYPE	ELEMENT	TYPE	ELEMENT		TYPE	ELEMENT	TYPE	ELEMENT
110	K041560	P171530 CR 100	K041561	P171535 CR 100/6	65	K041562	P171534 CR 100/3	K041563	P171533 CR 100/1	60	K041564	P171532 CR 100/03	K041565	P171531 CR 100/02
	FIO 110/9		FIO 110/6			FIO 110/3		FIO 110/1			FIO 110/03		FIO 110/02	
	K041536		K041537			K041538		K041539			K041540		K041541	
	FIO 110/9 P		FIO 110/6 P		FIO 110/3 P		FIO 110/1 P		FIO 110/1 P		FIO 110/03 P		FIO 110/02 P	
140	K041566	P171831 CR 150	K041567	P171834 CR 150/6	100	K041568	P171837 CR 150/3	K041569	P171840 CR 150/1	90	K041570	P171843 CR 150/03	K041571	P171846 CR 150/02
	FIO 140/9		FIO 140/6			FIO 140/3		FIO 140/1			FIO 140/03		FIO 140/02	
	K041542		K041543			K041544		K041545			K041546		K041547	
	FIO 140/9 P		FIO 140/6 P		FIO 140/3 P		FIO 140/1 P		FIO 140/1 P		FIO 140/03 P		FIO 14/02 P	

IN BLUE, FILTER ASSIES WITH PREDISPOSITION SERIE FIK-FIO, 4 HOLES FLANGE

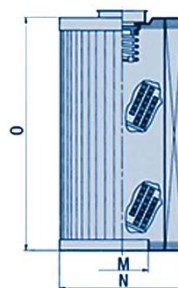


R = 9 mm  
Q =  $\varnothing$  126 mm  
P =  $\varnothing$  115 mm



DIMENSIONS ASSY (mm)										
A	B	C	D	E	F	G	H	I	L	Kg.
G 1	90	145	115	8,4	28	10	66	43	28	0,9
G 1	90	235	115	8,4	28	10	66	43	28	0,9

DIMENSIONS ELEMENT (mm)		
M	N	O
29	70	128
42	70	210







## Specifications

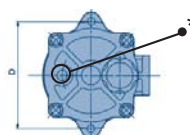
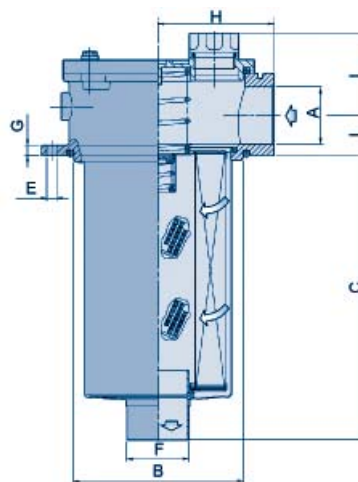
FLOW l/min	/9				/6				FLOW l/min	/3				/1				FLOW l/min	/03				/02																																																																																																																																																																																																																																							
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	TYPE	ELEMENT	TYPE	ELEMENT	TYPE	ELEMENT	TYPE	ELEMENT		TYPE	ELEMENT	TYPE	ELEMENT	TYPE	ELEMENT	TYPE	ELEMENT		TYPE	ELEMENT	TYPE	ELEMENT	TYPE	ELEMENT	TYPE	ELEMENT	TYPE	ELEMENT																																																																																																																																																																																																																																		
									$\beta_{40(c)}=1000$								$\beta_{38(c)}=1000$																$\beta_{23(c)}=1000$								$\beta_{31(c)}=1000$																																																																																																																																																																																																																					
20	K030225 FIOT 20 K030341 FIOT 20 P	P171500 CR 30	K030230 FIOT 20/6 K030394 FIOT 20/6 P	P171505 CR 30/6	15	K030229 FIOT 20/3 K030342 FIOT 20/3 P	P171504 CR 30/3	K030228 FIOT 20/1 K030389 FIOT 20/1 P	P171503 CR 30/1	10	K030227 FIOT 20/03 K030388 FIOT 20/03 P	P171502 CR 30/03	K030226 FIOT 20/02 K030387 FIOT 20/02 P	P171501 CR 30/02	30	K030231 FIOT 30 K030343 FIOT 30 P	P171500 CR 30	K030236 FIOT 30/6 K030346 FIOT 30/6 P	P171505 CR 30/6	20	K030235 FIOT 30/3 K030345 FIOT 30/3 P	P171504 CR 30/3	K030234 FIOT 30/1 K030344 FIOT 30/1 P	P171503 CR 30/1	15	K030233 FIOT 30/03 K030396 FIOT 30/03 P	P171502 CR 30/03	K030232 FIOT 30/02 K030395 FIOT 30/02 P	P171501 CR 30/02	50	K040536 FIOT 50 K040892 FIOT 50 P	P171518 CR 50	K040541 FIOT 50/6 K040895 FIOT 50/6 P	P171523 CR 50/6	35	K040540 FIOT 50/3 K040894 FIOT 50/3 P	P171522 CR 50/3	K040539 FIOT 50/1 K040893 FIOT 50/1 P	P171521 CR 50/1	30	K040538 FIOT 50/03 K040994 FIOT 50/03 P	P171520 CR 50/03	K040537 FIOT 50/02 K040993 FIOT 50/02 P	P171519 CR 50/02	60	K040542 FIOT 60 K040896 FIOT 60 P	P171524 CR 60	K040547 FIOT 60/6 K040900 FIOT 60/6 P	P171529 CR 60/6	40	K040546 FIOT 60/3 K040899 FIOT 60/3 P	P171528 CR 60/3	K040545 FIOT 60/1 K040898 FIOT 60/1 P	P171527 CR 60/1	35	K040544 FIOT 60/03 K040897 FIOT 60/03 P	P171526 CR 60/03	K040543 FIOT 60/02 K041008 FIOT 60/02 P	P171525 CR 60/02	80	K040548 FIOT 80 K040901 FIOT 80 P	P171530 CR 100	K040553 FIOT 80/6 K040904 FIOT 80/6 P	P171535 CR 100/6	55	K040552 FIOT 80/3 K040903 FIOT 80/3 P	P171534 CR 100/3	K040551 FIOT 80/1 K040902 FIOT 80/1 P	P171533 CR 100/1	50	K040550 FIOT 80/03 K041017 FIOT 80/03 P	P171532 CR 100/03	K040549 FIOT 80/02 K041016 FIOT 80/02 P	P171531 CR 100/02	100	K040530 FIOT 100 K040888 FIOT 100 P	P171530 CR 100	K040535 FIOT 100/6 K040891 FIOT 100/6 P	P171535 CR 100/6	65	K040534 FIOT 100/3 K040890 FIOT 100/3 P	P171534 CR 100/3	K040533 FIOT 100/1 K040864 FIOT 100/1 P	P171533 CR 100/1	60	K040532 FIOT 80/03 K041023 FIOT 100/03 P	P171532 CR 100/03	K040531 FIOT 100/02 K040889 FIOT 100/02 P	P171531 CR 100/02	150	K051121 FIOT 150 K051243 FIOT 150 P	P171536 CR 180	K051127 FIOT 150/6 K051247 FIOT 150/6 P	P171541 CR 180/6	100	K051126 FIOT 150/3 K051246 FIOT 150/3 P	P171540 CR 180/3	K051125 FIOT 150/1 K051245 FIOT 150/1 P	P171539 CR 180/1	90	K051124 FIOT 150/03 K051244 FIOT 150/03 P	P171538 CR 180/03	K051123 FIOT 150/02 K041029 FIOT 150/02 P	P171537 CR 180/02	180	K051128 FIOT 180 K051248 FIOT 180 P	P171536 CR 180	K051133 FIOT 180/6 K051250 FIOT 180/6 P	P171541 CR 180/6	120	K051132 FIOT 180/3 K051227 FIOT 180/3 P	P171540 CR 180/3	K051131 FIOT 180/1 K051231 FIOT 180/1 P	P171539 CR 180/1	110	K051130 FIOT 180/03 K051263 FIOT 180/03 P	P171538 CR 180/03	K051129 FIOT 180/02 K051249 FIOT 180/02 P	P171537 CR 180/02	200	K070057 FIOT 200 K070458 FIOT 200 P	P171542 CR 201	K070062 FIOT 200/6 K070461 FIOT 200/6 P	P171547 CR 201/6	140	K070061 FIOT 200/3 K070460 FIOT 200/3 P	P171546 CR 201/3	K070060 FIOT 200/1 K070322 FIOT 200/1 P	P171545 CR 201/1	130	K070059 FIOT 200/03 K070319 FIOT 200/03 P	P171544 CR 201/03	K070058 FIOT 200/02 K070459 FIOT 200/02 P	P171543 CR 201/02	250	K070063 FIOT 250 K070462 FIOT 250 P	P171548 CR 250	K070068 FIOT 250/6 K070325 FIOT 250/6 P	P171553 CR 250/6	160	K070067 FIOT 250/3 K070324 FIOT 250/3 P	P171552 CR 250/3	K070066 FIOT 250/1 K070323 FIOT 250/1 P	P171551 CR 250/1	140	K070065 FIOT 250/03 K070464 FIOT 250/03 P	P171550 CR 250/03	K070064 FIOT 250/02 K070463 FIOT 250/02 P	P171549 CR 250/02	330	K070069 FIOT 325 K070465 FIOT 325 P	P171554 CR 325	K070074 FIOT 325/6 K070330 FIOT 325/6 P	P171559 CR 325/6	200	K070073 FIOT 325/3 K070329 FIOT 325/3 P	P171558 CR 325/3	K070072 FIOT 325/1 K070328 FIOT 325/1 P	P171557 CR 325/1	180	K070071 FIOT 325/03 K070327 FIOT 325/03 P	P171556 CR 325/03	K070070 FIOT 325/02 K070326 FIOT 325/02 P	P171555 CR 325/02	330	K070075 FIOT 330 K070365 FIOT 330 P	P171560 CR 330	K070080 FIOT 330/6 K070335 FIOT 330/6 P	P171565 CR 330/6	200	K070079 FIOT 330/3 K070334 FIOT 330/3 P	P171564 CR 330/3	K070078 FIOT 330/1 K070333 FIOT 330/1 P	P171563 CR 330/1	180	K070077 FIOT 330/03 K070332 FIOT 330/03 P	P171562 CR 330/03	K070076 FIOT 330/02 K070331 FIOT 330/02 P	P171561 CR 330/02	500	K070081 FIOT 500 K070366 FIOT 500 P	P171566 CR 500	K070086 FIOT 500/6 K070339 FIOT 500/6 P	P171571 CR 500/6	400	K070085 FIOT 500/3 K070338 FIOT 500/3 P	P171570 CR 500/3	K070084 FIOT 500/1 K070337 FIOT 500/1 P	P171569 CR 500/1	350	K070083 FIOT 500/03 K070367 FIOT 500/03 P	P171568 CR 500/03	K070082 FIOT 500/02 K070336 FIOT 500/02 P	P171567 CR 500/02	600	K070087 FIOT 600 K070343 FIOT 600 P	P171572 CR 600	K070092 FIOT 600/6 K070454 FIOT 600/6 P	P171577 CR 600/6	500	K070091 FIOT 600/3 K070342 FIOT 600/3 P	P171576 CR 600/3	K070090 FIOT 600/1 K070341 FIOT 600/1 P	P171575 CR 600/1	400	K070089 FIOT 600/03 K070389 FIOT 600/03 P	P171574 CR 600/03	K070088 FIOT 600/02 K070340 FIOT 600/02 P	P171573 CR 600/02	600	K070099 FIOTF 600 K070466 FIOTF 600 P	P171572 CR 600	K070104 FIOTF 600/6 K070345 FIOTF 600/6 P	P171577 CR 600/6	500	K070103 FIOTF 600/3 K070344 FIOTF 600/3 P	P171576 CR 600/3	K070102 FIOTF 600/1 K070469 FIOTF 600/1 P	P171575 CR 600/1	400	K070101 FIOTF 600/03 K070468 FIOTF 600/03 P	P171574 CR 600/03	K070100 FIOTF 600/02 K070467 FIOTF 600/02 P	P171573 CR 600/02	800	K070093 FIOT 800 K070455 FIOT 800 P	P171578 CR 800	K070098 FIOT 800/6 K070457 FIOT 800/6 P	P171583 CR 800/6	600	K070097 FIOT 800/3 K070348 FIOT 800/3 P	P171582 CR 800/3	K070096 FIOT 800/1 K070347 FIOT 800/1 P	P171581 CR 800/1	500	K070095 FIOT 800/03 K070456 FIOT 800/03 P	P171580 CR 800/03	K070094 FIOT 800/02 K070346 FIOT 800/02 P	P171579 CR 800/02	800	K070105 FIOTF 800 K070470 FIOTF 800 P	P171578 CR 800	K070110 FIOTF 800/6 K070478 FIOTF 800/6 P	P171583 CR 800/6	600	K070109 FIOTF 800/3 K070742 FIOTF 800/3 P	P171582 CR 800/3	K070108 FIOTF 800/1 K070350 FIOTF 800/1 P	P171581 CR 800/1	500	K070107 FIOTF 800/03 K070471 FIOTF 800/03 P	P171580 CR 800/03	K070106 FIOTF 800/02 K070349 FIOTF 800/02 P	P171579 CR 800/02
150	K051121 FIOT 150 K051243 FIOT 150 P	P171536 CR 180	K051127 FIOT 150/6 K051247 FIOT 150/6 P	P171541 CR 180/6	100	K051126 FIOT 150/3 K051246 FIOT 150/3 P	P171540 CR 180/3	K051125 FIOT 150/1 K051245 FIOT 150/1 P	P171539 CR 180/1	90	K051124 FIOT 150/03 K051244 FIOT 150/03 P	P171538 CR 180/03	K051123 FIOT 150/02 K041029 FIOT 150/02 P	P171537 CR 180/02	180	K051128 FIOT 180 K051248 FIOT 180 P	P171536 CR 180	K051133 FIOT 180/6 K051250 FIOT 180/6 P	P171541 CR 180/6	120	K051132 FIOT 180/3 K051227 FIOT 180/3 P	P171540 CR 180/3	K051131 FIOT 180/1 K051231 FIOT 180/1 P	P171539 CR 180/1	110	K051130 FIOT 180/03 K051263 FIOT 180/03 P	P171538 CR 180/03	K051129 FIOT 180/02 K051249 FIOT 180/02 P	P171537 CR 180/02	200	K070057 FIOT 200 K070458 FIOT 200 P	P171542 CR 201	K070062 FIOT 200/6 K070461 FIOT 200/6 P	P171547 CR 201/6	140	K070061 FIOT 200/3 K070460 FIOT 200/3 P	P171546 CR 201/3	K070060 FIOT 200/1 K070322 FIOT 200/1 P	P171545 CR 201/1	130	K070059 FIOT 200/03 K070319 FIOT 200/03 P	P171544 CR 201/03	K070058 FIOT 200/02 K070459 FIOT 200/02 P	P171543 CR 201/02	250	K070063 FIOT 250 K070462 FIOT 250 P	P171548 CR 250	K070068 FIOT 250/6 K070325 FIOT 250/6 P	P171553 CR 250/6	160	K070067 FIOT 250/3 K070324 FIOT 250/3 P	P171552 CR 250/3	K070066 FIOT 250/1 K070323 FIOT 250/1 P	P171551 CR 250/1	140	K070065 FIOT 250/03 K070464 FIOT 250/03 P	P171550 CR 250/03	K070064 FIOT 250/02 K070463 FIOT 250/02 P	P171549 CR 250/02	330	K070069 FIOT 325 K070465 FIOT 325 P	P171554 CR 325	K070074 FIOT 325/6 K070330 FIOT 325/6 P	P171559 CR 325/6	200	K070073 FIOT 325/3 K070329 FIOT 325/3 P	P171558 CR 325/3	K070072 FIOT 325/1 K070328 FIOT 325/1 P	P171557 CR 325/1	180	K070071 FIOT 325/03 K070327 FIOT 325/03 P	P171556 CR 325/03	K070070 FIOT 325/02 K070326 FIOT 325/02 P	P171555 CR 325/02	330	K070075 FIOT 330 K070365 FIOT 330 P	P171560 CR 330	K070080 FIOT 330/6 K070335 FIOT 330/6 P	P171565 CR 330/6	200	K070079 FIOT 330/3 K070334 FIOT 330/3 P	P171564 CR 330/3	K070078 FIOT 330/1 K070333 FIOT 330/1 P	P171563 CR 330/1	180	K070077 FIOT 330/03 K070332 FIOT 330/03 P	P171562 CR 330/03	K070076 FIOT 330/02 K070331 FIOT 330/02 P	P171561 CR 330/02	500	K070081 FIOT 500 K070366 FIOT 500 P	P171566 CR 500	K070086 FIOT 500/6 K070339 FIOT 500/6 P	P171571 CR 500/6	400	K070085 FIOT 500/3 K070338 FIOT 500/3 P	P171570 CR 500/3	K070084 FIOT 500/1 K070337 FIOT 500/1 P	P171569 CR 500/1	350	K070083 FIOT 500/03 K070367 FIOT 500/03 P	P171568 CR 500/03	K070082 FIOT 500/02 K070336 FIOT 500/02 P	P171567 CR 500/02	600	K070087 FIOT 600 K070343 FIOT 600 P	P171572 CR 600	K070092 FIOT 600/6 K070454 FIOT 600/6 P	P171577 CR 600/6	500	K070091 FIOT 600/3 K070342 FIOT 600/3 P	P171576 CR 600/3	K070090 FIOT 600/1 K070341 FIOT 600/1 P	P171575 CR 600/1	400	K070089 FIOT 600/03 K070389 FIOT 600/03 P	P171574 CR 600/03	K070088 FIOT 600/02 K070340 FIOT 600/02 P	P171573 CR 600/02	600	K070099 FIOTF 600 K070466 FIOTF 600 P	P171572 CR 600	K070104 FIOTF 600/6 K070345 FIOTF 600/6 P	P171577 CR 600/6	500	K070103 FIOTF 600/3 K070344 FIOTF 600/3 P	P171576 CR 600/3	K070102 FIOTF 600/1 K070469 FIOTF 600/1 P	P171575 CR 600/1	400	K070101 FIOTF 600/03 K070468 FIOTF 600/03 P	P171574 CR 600/03	K070100 FIOTF 600/02 K070467 FIOTF 600/02 P	P171573 CR 600/02	800	K070093 FIOT 800 K070455 FIOT 800 P	P171578 CR 800	K070098 FIOT 800/6 K070457 FIOT 800/6 P	P171583 CR 800/6	600	K070097 FIOT 800/3 K070348 FIOT 800/3 P	P171582 CR 800/3	K070096 FIOT 800/1 K070347 FIOT 800/1 P	P171581 CR 800/1	500	K070095 FIOT 800/03 K070456 FIOT 800/03 P	P171580 CR 800/03	K070094 FIOT 800/02 K070346 FIOT 800/02 P	P171579 CR 800/02	800	K070105 FIOTF 800 K070470 FIOTF 800 P	P171578 CR 800	K070110 FIOTF 800/6 K070478 FIOTF 800/6 P	P171583 CR 800/6	600	K070109 FIOTF 800/3 K070742 FIOTF 800/3 P	P171582 CR 800/3	K070108 FIOTF 800/1 K070350 FIOTF 800/1 P	P171581 CR 800/1	500	K070107 FIOTF 800/03 K070471 FIOTF 800/03 P	P171580 CR 800/03	K070106 FIOTF 800/02 K070349 FIOTF 800/02 P	P171579 CR 800/02																																																																																										
250	K070063 FIOT 250 K070462 FIOT 250 P	P171548 CR 250	K070068 FIOT 250/6 K070325 FIOT 250/6 P	P171553 CR 250/6	160	K070067 FIOT 250/3 K070324 FIOT 250/3 P	P171552 CR 250/3	K070066 FIOT 250/1 K070323 FIOT 250/1 P	P171551 CR 250/1	140	K070065 FIOT 250/03 K070464 FIOT 250/03 P	P171550 CR 250/03	K070064 FIOT 250/02 K070463 FIOT 250/02 P	P171549 CR 250/02	330	K070069 FIOT 325 K070465 FIOT 325 P	P171554 CR 325	K070074 FIOT 325/6 K070330 FIOT 325/6 P	P171559 CR 325/6	200	K070073 FIOT 325/3 K070329 FIOT 325/3 P	P171558 CR 325/3	K070072 FIOT 325/1 K070328 FIOT 325/1 P	P171557 CR 325/1	180	K070071 FIOT 325/03 K070327 FIOT 325/03 P	P171556 CR 325/03	K070070 FIOT 325/02 K070326 FIOT 325/02 P	P171555 CR 325/02	330	K070075 FIOT 330 K070365 FIOT 330 P	P171560 CR 330	K070080 FIOT 330/6 K070335 FIOT 330/6 P	P171565 CR 330/6	200	K070079 FIOT 330/3 K070334 FIOT 330/3 P	P171564 CR 330/3	K070078 FIOT 330/1 K070333 FIOT 330/1 P	P171563 CR 330/1	180	K070077 FIOT 330/03 K070332 FIOT 330/03 P	P171562 CR 330/03	K070076 FIOT 330/02 K070331 FIOT 330/02 P	P171561 CR 330/02	500	K070081 FIOT 500 K070366 FIOT 500 P	P171566 CR 500	K070086 FIOT 500/6 K070339 FIOT 500/6 P	P171571 CR 500/6	400	K070085 FIOT 500/3 K070338 FIOT 500/3 P	P171570 CR 500/3	K070084 FIOT 500/1 K070337 FIOT 500/1 P	P171569 CR 500/1	350	K070083 FIOT 500/03 K070367 FIOT 500/03 P	P171568 CR 500/03	K070082 FIOT 500/02 K070336 FIOT 500/02 P	P171567 CR 500/02	600	K070087 FIOT 600 K070343 FIOT 600 P	P171572 CR 600	K070092 FIOT 600/6 K070454 FIOT 600/6 P	P171577 CR 600/6	500	K070091 FIOT 600/3 K070342 FIOT 600/3 P	P171576 CR 600/3	K070090 FIOT 600/1 K070341 FIOT 600/1 P	P171575 CR 600/1	400	K070089 FIOT 600/03 K070389 FIOT 600/03 P	P171574 CR 600/03	K070088 FIOT 600/02 K070340 FIOT 600/02 P	P171573 CR 600/02	600	K070099 FIOTF 600 K070466 FIOTF 600 P	P171572 CR 600	K070104 FIOTF 600/6 K070345 FIOTF 600/6 P	P171577 CR 600/6	500	K070103 FIOTF 600/3 K070344 FIOTF 600/3 P	P171576 CR 600/3	K070102 FIOTF 600/1 K070469 FIOTF 600/1 P	P171575 CR 600/1	400	K070101 FIOTF 600/03 K070468 FIOTF 600/03 P	P171574 CR 600/03	K070100 FIOTF 600/02 K070467 FIOTF 600/02 P	P171573 CR 600/02	800	K070093 FIOT 800 K070455 FIOT 800 P	P171578 CR 800	K070098 FIOT 800/6 K070457 FIOT 800/6 P	P171583 CR 800/6	600	K070097 FIOT 800/3 K070348 FIOT 800/3 P	P171582 CR 800/3	K070096 FIOT 800/1 K070347 FIOT 800/1 P	P171581 CR 800/1	500	K070095 FIOT 800/03 K070456 FIOT 800/03 P	P171580 CR 800/03	K070094 FIOT 800/02 K070346 FIOT 800/02 P	P171579 CR 800/02	800	K070105 FIOTF 800 K070470 FIOTF 800 P	P171578 CR 800	K070110 FIOTF 800/6 K070478 FIOTF 800/6 P	P171583 CR 800/6	600	K070109 FIOTF 800/3 K070742 FIOTF 800/3 P	P171582 CR 800/3	K070108 FIOTF 800/1 K070350 FIOTF 800/1 P	P171581 CR 800/1	500	K070107 FIOTF 800/03 K070471 FIOTF 800/03 P	P171580 CR 800/03	K070106 FIOTF 800/02 K070349 FIOTF 800/02 P	P171579 CR 800/02																																																																																																																																							
500	K070081 FIOT 500 K070366 FIOT 500 P	P171566 CR 500	K070086 FIOT 500/6 K070339 FIOT 500/6 P	P171571 CR 500/6	400	K070085 FIOT 500/3 K070338 FIOT 500/3 P	P171570 CR 500/3	K070084 FIOT 500/1 K070337 FIOT 500/1 P	P171569 CR 500/1	350	K070083 FIOT 500/03 K070367 FIOT 500/03 P	P171568 CR 500/03	K070082 FIOT 500/02 K070336 FIOT 500/02 P	P171567 CR 500/02	600	K070087 FIOT 600 K070343 FIOT 600 P	P171572 CR 600	K070092 FIOT 600/6 K070454 FIOT 600/6 P	P171577 CR 600/6	500	K070091 FIOT 600/3 K070342 FIOT 600/3 P	P171576 CR 600/3	K070090 FIOT 600/1 K070341 FIOT 600/1 P	P171575 CR 600/1	400	K070089 FIOT 600/03 K070389 FIOT 600/03 P	P171574 CR 600/03	K070088 FIOT 600/02 K070340 FIOT 600/02 P	P171573 CR 600/02	600	K070099 FIOTF 600 K070466 FIOTF 600 P	P171572 CR 600	K070104 FIOTF 600/6 K070345 FIOTF 600/6 P	P171577 CR 600/6	500	K070103 FIOTF 600/3 K070344 FIOTF 600/3 P	P171576 CR 600/3	K070102 FIOTF 600/1 K070469 FIOTF 600/1 P	P171575 CR 600/1	400	K070101 FIOTF 600/03 K070468 FIOTF 600/03 P	P171574 CR 600/03	K070100 FIOTF 600/02 K070467 FIOTF 600/02 P	P171573 CR 600/02	800	K070093 FIOT 800 K070455 FIOT 800 P	P171578 CR 800	K070098 FIOT 800/6 K070457 FIOT 800/6 P	P171583 CR 800/6	600	K070097 FIOT 800/3 K070348 FIOT 800/3 P	P171582 CR 800/3	K070096 FIOT 800/1 K070347 FIOT 800/1 P	P171581 CR 800/1	500	K070095 FIOT 800/03 K070456 FIOT 800/03 P	P171580 CR 800/03	K070094 FIOT 800/02 K070346 FIOT 800/02 P	P171579 CR 800/02	800	K070105 FIOTF 800 K070470 FIOTF 800 P	P171578 CR 800	K070110 FIOTF 800/6 K070478 FIOTF 800/6 P	P171583 CR 800/6	600	K070109 FIOTF 800/3 K070742 FIOTF 800/3 P	P171582 CR 800/3	K070108 FIOTF 800/1 K070350 FIOTF 800/1 P	P171581 CR 800/1	500	K070107 FIOTF 800/03 K070471 FIOTF 800/03 P	P171580 CR 800/03	K070106 FIOTF 800/02 K070349 FIOTF 800/02 P	P171579 CR 800/02																																																																																																																																																																																				
600	K070099 FIOTF 600 K070466 FIOTF 600 P	P171572 CR 600	K070104 FIOTF 600/6 K070345 FIOTF 600/6 P	P171577 CR 600/6	500	K070103 FIOTF 600/3 K070344 FIOTF 600/3 P	P171576 CR 600/3	K070102 FIOTF 600/1 K070469 FIOTF 600/1 P	P171575 CR 600/1	400	K070101 FIOTF 600/03 K070468 FIOTF 600/03 P	P171574 CR 600/03	K070100 FIOTF 600/02 K070467 FIOTF 600/02 P	P171573 CR 600/02	800	K070093 FIOT 800 K070455 FIOT 800 P	P171578 CR 800	K070098 FIOT 800/6 K070457 FIOT 800/6 P	P171583 CR 800/6	600	K070097 FIOT 800/3 K070348 FIOT 800/3 P	P171582 CR 800/3	K070096 FIOT 800/1 K070347 FIOT 800/1 P	P171581 CR 800/1	500	K070095 FIOT 800/03 K070456 FIOT 800/03 P	P171580 CR 800/03	K070094 FIOT 800/02 K070346 FIOT 800/02 P	P171579 CR 800/02	800	K070105 FIOTF 800 K070470 FIOTF 800 P	P171578 CR 800	K070110 FIOTF 800/6 K070478 FIOTF 800/6 P	P171583 CR 800/6	600	K070109 FIOTF 800/3 K070742 FIOTF 800/3 P	P171582 CR 800/3	K070108 FIOTF 800/1 K070350 FIOTF 800/1 P	P171581 CR 800/1	500	K070107 FIOTF 800/03 K070471 FIOTF 800/03 P	P171580 CR 800/03	K070106 FIOTF 800/02 K070349 FIOTF 800/02 P	P171579 CR 800/02																																																																																																																																																																																																																		
800	K070105 FIOTF 800 K070470 FIOTF 800 P	P171578 CR 800	K070110 FIOTF 800/6 K070478 FIOTF 800/6 P	P171583 CR 800/6	600	K070109 FIOTF 800/3 K070742 FIOTF 800/3 P	P171582 CR 800/3	K070108 FIOTF 800/1 K070350 FIOTF 800/1 P	P171581 CR 800/1	500	K070107 FIOTF 800/03 K070471 FIOTF 800/03 P	P171580 CR 800/03	K070106 FIOTF 800/02 K070349 FIOTF 800/02 P	P171579 CR 800/02																																																																																																																																																																																																																																																

IN BLUE FILTERS ASSY WITH PREDISPOSITION SERIE FIK-FIOT



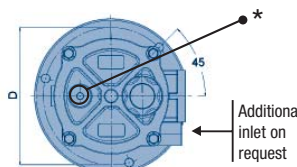
### Specifications

DIMENSIONS ASSY (mm)											DIMENSIONS ELEMENT (mm)		
A	B	C	D	E	F	G	H	I	L	Kg.	M	N	O
G 3/8	67	78	90	6,4	25	9	49	30	22	0,5	26	52	67
G 1/2	67	78	90	6,4	25	9	49	30	22	0,5	26	52	67
G 1/2	90	100	115	8,4	28	10	66	43	28	0,8	29	70	75
G 3/4	90	100	115	8,4	28	10	66	43	28	0,8	29	70	82
G3/4	90	145	115	8,4	28	10	66	43	28	0,9	29	70	128
G 1	90	145	115	8,4	28	10	66	43	28	0,9	29	70	128
G 1	131	230	175	10,5	40	10	95	53	35	2,5	41	95	203
G 1 1/4	131	230	175	10,5	40	10	95	53	35	2,5	41	95	203
G 1 1/4	131	280	175	10,5	40	10	95	53	35	2,8	41	95	250
G 1 1/2	175	167	220	10,5	50	11	119	65	41	3,7	52	140	136
G 1 1/2	175	238	220	10,5	50	11	119	65	41	4,3	52	140	203
G 1 1/2	175	238	220	10,5	63,5	11	119	65	41	4,3	65	140	203
G 2	175	238	220	10,5	63,5	11	119	65	41	4,5	65	140	203
G 2	175	293	220	10,5	63,5	11	119	65	41	5	65	140	250
FLANGE SAE 2	174	289	220	10,5	63,5	11	126	58	48,5	5,2	65	140	250
G 2	175	441	220	10,5	63,5	11	119	65	41	6	165	140	400
FLANGE SAE 2	174	437	220	10,5	63,5	11	126	58	48,5	6,2	65	140	400



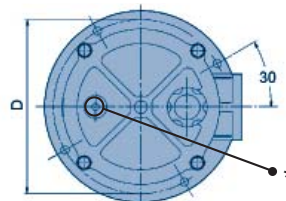
SIZE 20-100

\* Plugged predisposition for models "P"



SIZE 150-200

Additional inlet on request



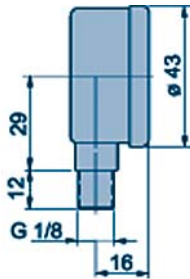
SIZE 250-800

**IMPORTANT NOTES:**

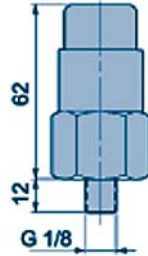
- 1) To foresee hole diameter on top of the tank to be  $\phi B + 2mm$
- 2) To maintain the filter outlet (ref.  $\phi F$ ) well below the oil level to avoid foam formation.



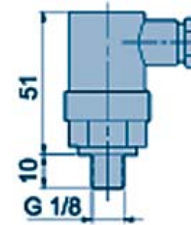
## Service Indicators



**PRESSURE GAUGE**  
**P171953** (500.01)  
 Scale: -100÷500 kPa (-1÷5 bar)

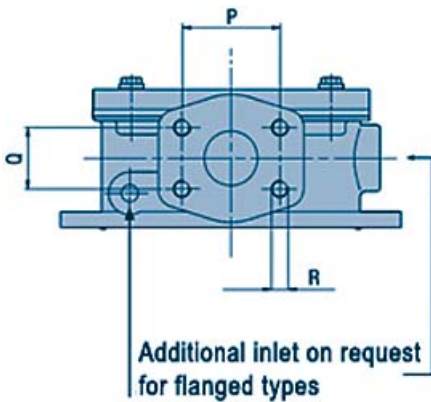


**VISUAL PRESSURE GAUGE INDICATOR**  
**P171958** (503.01)  
 Setting: 120 kPa (1,2 bar)



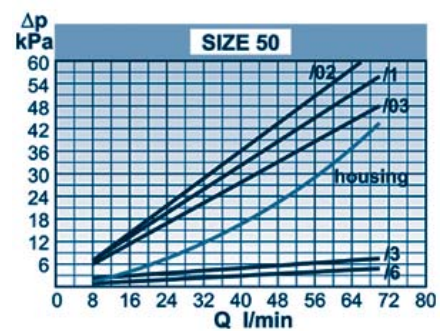
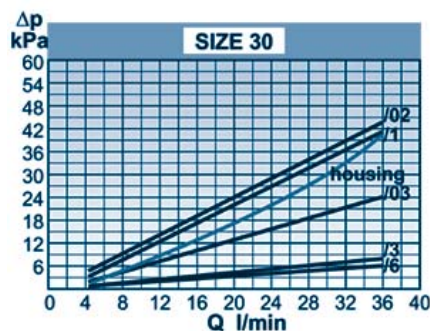
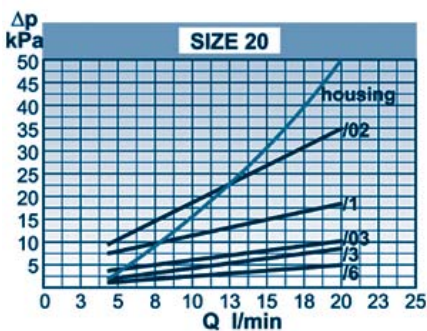
**ELECTRICAL PRESSURE SWITCH INDICATOR**  
**P171966** (504.01) N.O. contacts  
**P173104** (504.05) N.C. contacts  
 Setting: 120 kPa (1,2 bar)  
 Max. values: 48 VAC - 30 DCV - 0,5 A res - 0,2 A. ind  
 Protection class: IP 65  
 Cable clamp: PG 7

## SAE Flanges 300



FLANGE SAE J518 3000 PSI	P	Q	R
1 1/2	69,8	35,8	M12
2	77,8	42,9	M12

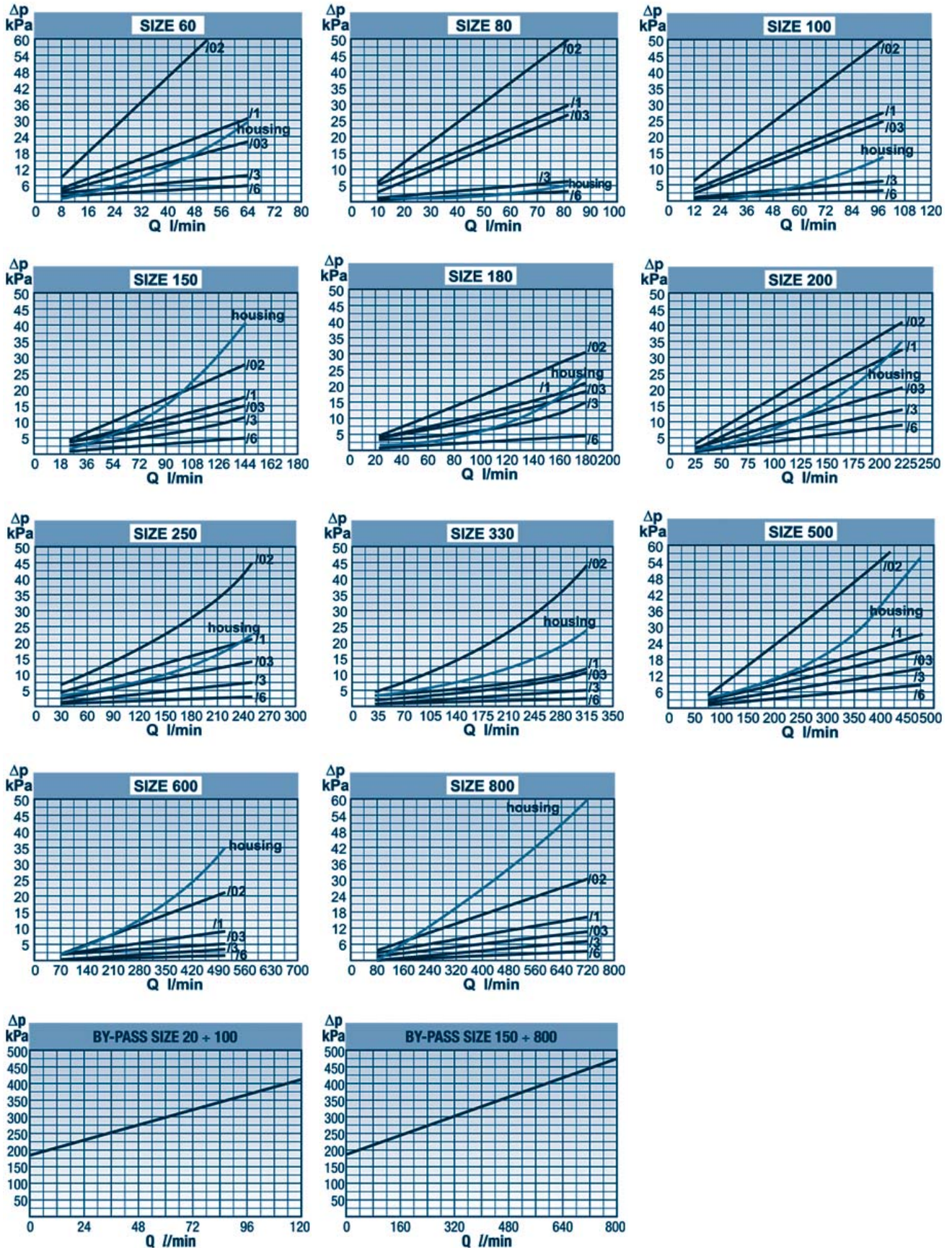
## Performance Curves





# FIK-FIOT

## Return line filters

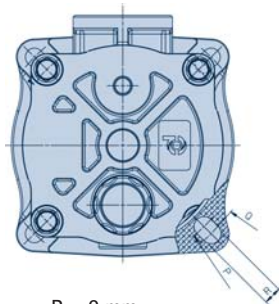


## Specifications

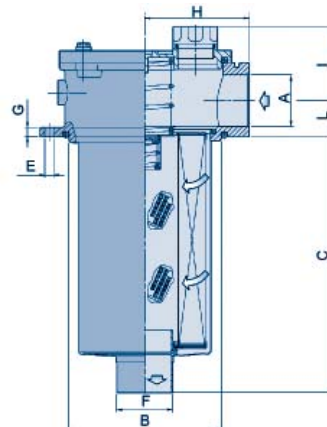


FLOW l/min	/9		/6		FLOW l/min	/3		/1		FLOW l/min	/03		/02	
	WIRE MESH MEDIA					CELLULOSE MEDIA					SYNTHETIC MEDIA			
	TYPE	ELEMENT	TYPE	ELEMENT		$\beta_{s0(c)}=1000$		$\beta_{38(c)}=1000$			$\beta_{23(c)}=1000$		$\beta_{11(c)}=1000$	
						TYPE	ELEMENT	TYPE	ELEMENT		TYPE	ELEMENT	TYPE	ELEMENT
110	K041572 FIOT 110/9 K041548 FIOT 110/9 P	P171530 CR 100	K041573 FIOT 110/6 K041549 FIOT 110/6 P	P171535 CR 100/6	65	K041522 FIOT 110/3 K041550 FIOT 110/3 P	P171534 CR 100/3	K041575 FIOT 110/1 K041551 FIOT 110/1 P	P171533 CR 100/1	60	K041567 FIOT 110/03 K041552 FIOT 110/03 P	P171532 CR 100/03	K041577 FIOT 110/02 K041553 FIOT 110/02 P	P171531 CR 100/02
140	K041578 FIOT 140/9 K041554 FIOT 140/9 P	P171831 CR 150	K041579 FIOT 140/6 K041555 FIOT 140/6 P	P171834 CR 150/6	100	K041580 FIOT 140/3 K041556 FIOT 140/3 P	P171837 CR 150/3	K041581 FIOT 140/1 K041557 FIOT 140/1 P	P171840 CR 150/1	90	K041582 FIOT 140/03 K041558 FIOT 140/03 P	P171843 CR 150/03	K041583 FIOT 140/02 K041559 FIOT 14/02 P	P171846 CR 150/02

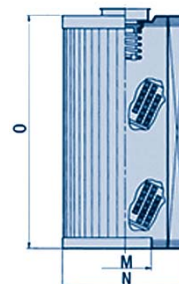
IN BLUE FILTERS ASSY WITH PREDISPOSITION SERIE FIK-FIOT, 4 HOLES FLANGE



R = 9 mm  
Q =  $\varnothing$  126 mm  
P =  $\varnothing$  115 mm



DIMENSIONS ASSY (mm)											DIMENSIONS ELEMENT (mm)		
A	B	C	D	E	F	G	H	I	L	Kg.	M	N	O
G 1	90	145	115	8,4	28	10	66	60	28	0,9	29	70	128
G 1	90	235	115	8,4	28	10	66	60	28	0,9	42	70	210







# FIK-FIS

Return line filters  
with service cover and breather,  
up to 10 bar



## Technical Data

- Operating pressure at 1000 kPa (10 bar).
- Static pressure testing at 1500 kPa (15 bar).
- Operating temperature -20 +100°C.
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO 3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1

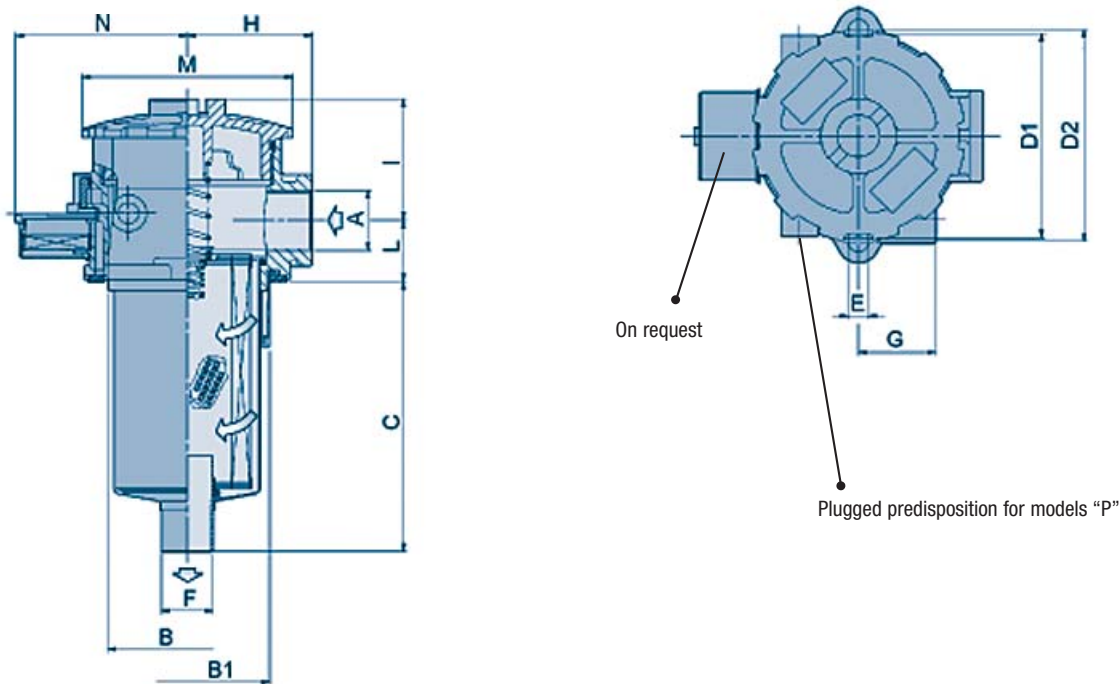
## Filter Elements

- Wire mesh with 60-90 micron.
- Synteq® synthetic media with 10-25 micron.
- Cellulose media with 10-30 micron, reinforced with wire mesh.
- By-pass valve setting 150 kPa (1,5 bar) per ISO 3968.
- Collapse resistance 1000 kPa (10 bar) per ISO 2941.
- Replacement element includes spring and O-ring seal.

# FIK-FIS

Return line filters  
with service cover and breather

## Specifications



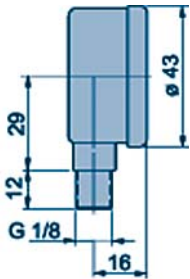
### IMPORTANT NOTES:

- 1) To foresee hole diameter on top of the tank to be  $\phi B + 2\text{mm}$
- 2) To maintain the filter outlet (ref.  $\phi F$ ) well below the oil level to avoid foam formation.

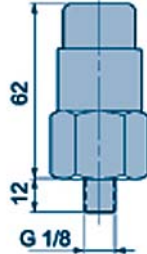
FLOW l/min	/9		/6		FLOW l/min	/3		/1		FLOW l/min	/03		/02	
	TYPE	ELEMENT	TYPE	ELEMENT		ELEMENT	TYPE	ELEMENT	TYPE		ELEMENT	TYPE	ELEMENT	TYPE
20	K030304 FIS 20	P171829 CR 20	K030306 FIS 20/6	P171832 CR 20/6	15	P171835 CR 20/3	K030310 FIS 20/1	P171838 CR 20/1	10	K030312 FIS 20/03	P171841 CR 20/03	K030314 FIS 20/02	P171844 CR 20/02	
	K030524 FIS 20 P		K030529 FIS 20/6 P				K030527 FIS 20/1 P			K030526 FIS 20/03 P				
40	K030305 FIS 40	P171830 CR 40	K030307 FIS 40/6	P171833 CR 40/6	30	P171836 CR 40/3	K030311 FIS 40/1	P171839 CR 40/1	25	K030313 FIS 40/03	P171842 CR 40/03	K030315 FIS 40/02	P171845 CR 40/02	
	K030530 FIS 40 P		K030535 FIS 40/6 P				K030533 FIS 40/1 P			K030532 FIS 40/03 P				
60	K040758 FIS 60	P171524 CR 60	K040761 FIS 60/6	P171529 CR 60/6	40	P171528 CR 60/3	K040767 FIS 60/1	P171527 CR 60/1	35	K040770 FIS 60/03	P171526 CR 60/03	K040773 FIS 60/02	P171525 CR 60/02	
	K041337 FIS 60 P		K041342 FIS 60/6 P				K041340 FIS 60/1 P			K041339 FIS 60/03 P				
100	K040759 FIS 100	P171530 CR 100	K040762 FIS 100/6	P171535 CR 100/6	65	P171534 CR 100/3	K040768 FIS 100/1	P171533 CR 100/1	60	K040771 FIS 100/03	P171532 CR 100/03	K040774 FIS 100/02	P171531 CR 100/02	
	K041319 FIS 100 P		K041329 FIS 100/6 P				K041322 FIS 100/1 P			K041321 FIS 100/03 P				
150	K040760 FIS 150	P171831 CR 150	K040763 FIS 150/6	P171834 CR 150/6	120	P171837 CR 150/3	K040769 FIS 150/1	P171840 CR 150/1	110	K040772 FIS 150/03	P171843 CR 150/03	K040775 FIS 150/02	P171846 CR 150/02	
	K041330 FIS 150 P		K041336 FIS 150/6 P				K041334 FIS 150/1 P			K041332 FIS 150/03 P				

IN BLUE FILTERS ASSY WITH PREDISPOSITION SERIE FIK-FIS

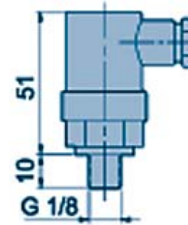
## Service Indicators



**PRESSURE GAUGE**  
**P171953** (500.01)  
 Scale: -100÷500 kPa (-1÷5 bar)



**VISUAL PRESSURE GAUGE INDICATOR**  
**P171958** (503.01)  
 Setting: 120 kPa (1,2 bar)



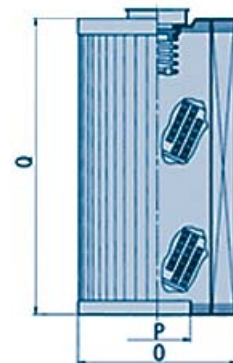
**ELECTRICAL PRESSURE SWITCH INDICATOR**  
**P171966** (504.01) N.O. contacts  
**P173104** (504.05) N.C. contacts  
 Setting: 120 kPa (1,2 bar)  
 Max. values: 48 VAC - 30 DCV - 0,5 A res - 0,2 A. ind  
 Protection class: IP 65  
 Cable clamp: PG 7

## Air Breather Accessories

SIZE	NON-PRESSURISED BREATHER	
	10 micron	40 micron
20-40	P173330	P173076
	SF 20/1	SF 20/4
60-100-150	P172434	P172432
	SF 100/1	SF 100/4

DIMENSIONS ASSY (mm)														
A	B	B1	C	D1	D2	E	F	G	H	I	L	M	N	Kg.
G 3/8	60	-	114	84	88	10	20	-	48	48	21	74	60	0,4
G 1/2	60	-	180	84	88	10	20	-	48	48	21	74	60	0,6
G 3/4	86	90	104	112	116	11	28	42	68	65	32	116	86	1,0
G 1	86	90	150	112	116	11	28	42	68	65	32	116	86	1,2
G 1 1/4	86	90	235	112	116	11	40	42	68	65	32	116	86	1,4

DIMENSIONS ELEMENT (mm)		
O	P	Q
43	22	97
43	22	162
70	29	82
70	29	128
70	42	210

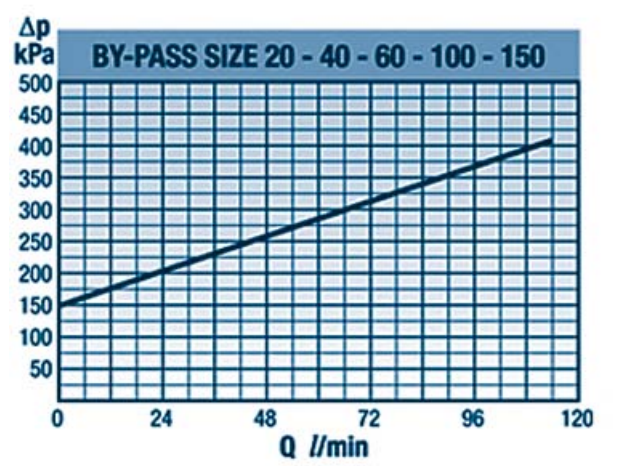
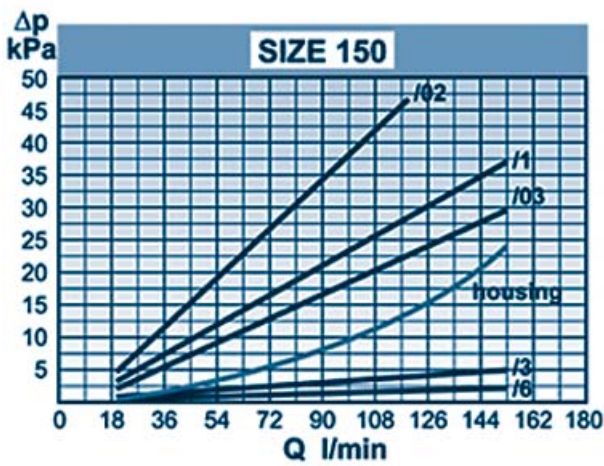
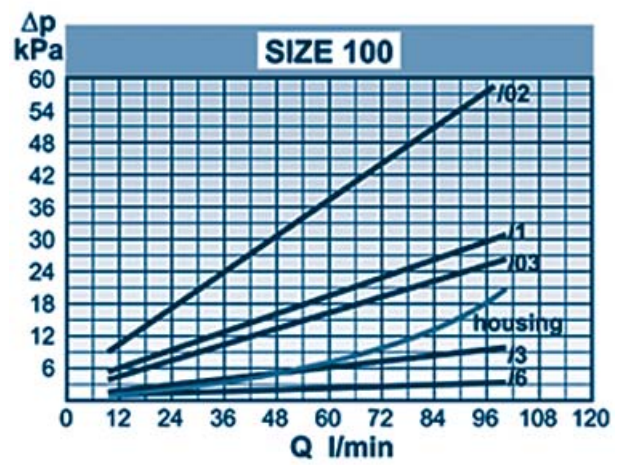
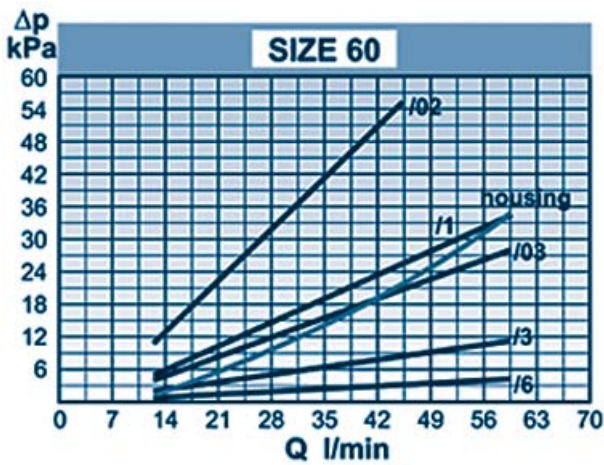
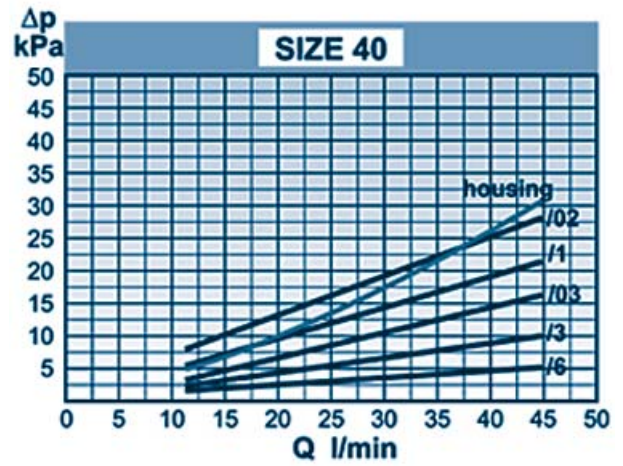
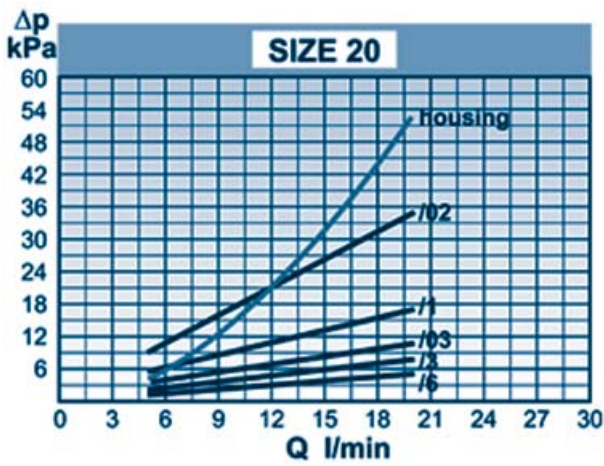




# FIK-FIS

Return line filters  
with service cover and breather

## Performance Curves





# *Replacement elements for PXX-FCRS Serie*

---

Return insert filters with flow passing through the element in an “inside-to-outside” direction



## **Filter Elements**

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- Wire mesh with 60-90 micron.
- Synteq® synthetic media with 10-25 micron.
- Cellulose media with 10-30 micron, reinforced with wire mesh.
- Burst resistance 1000 kPa (10 bar) per ISO 2941.



# Replacement elements for PXX-FCRS Serie

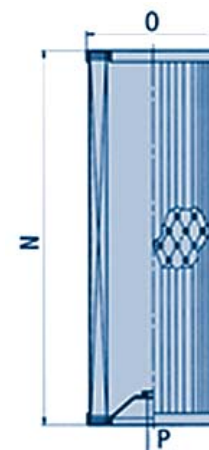
Return insert filters with flow passing through the element in an “inside-to-outside” direction

## Specifications

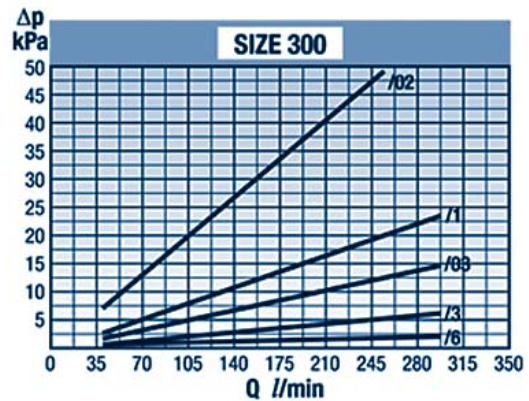
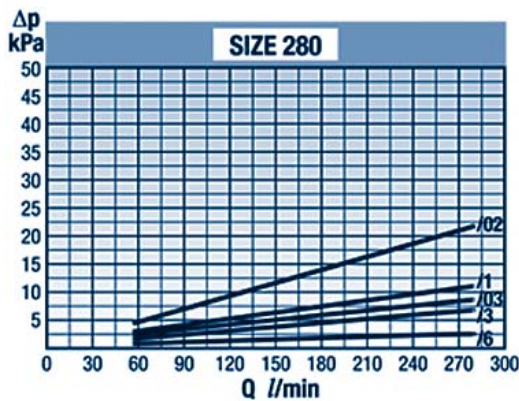
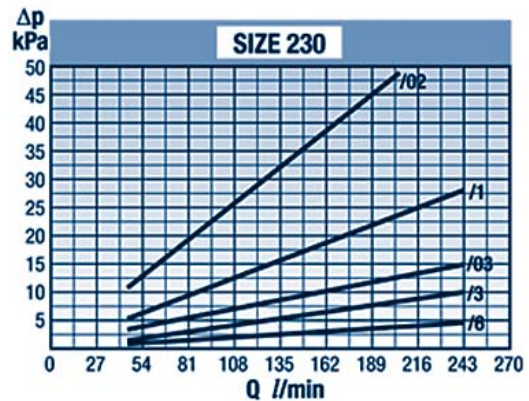
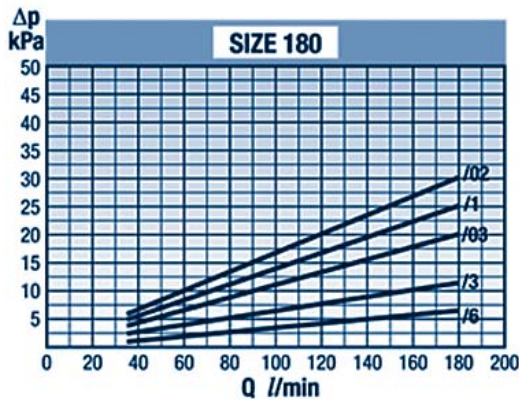
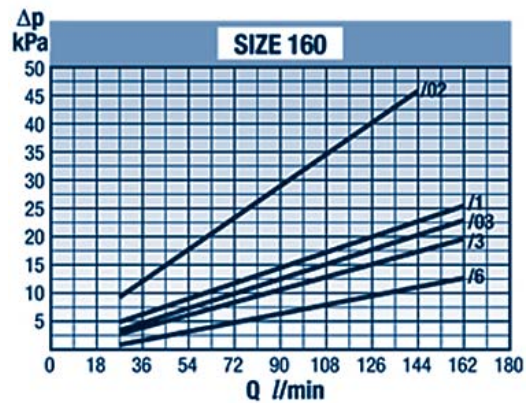
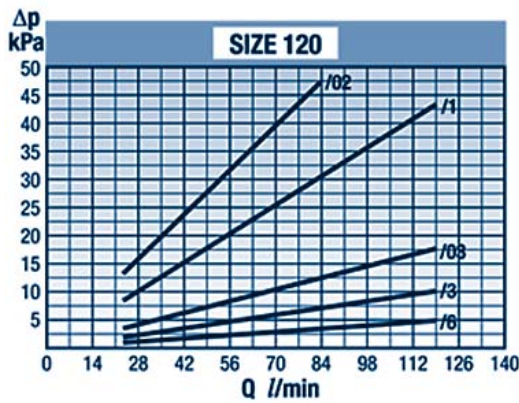
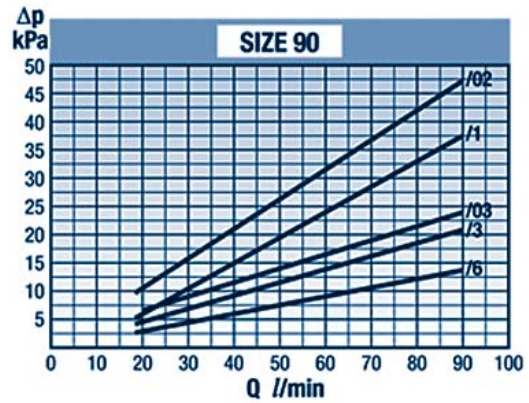
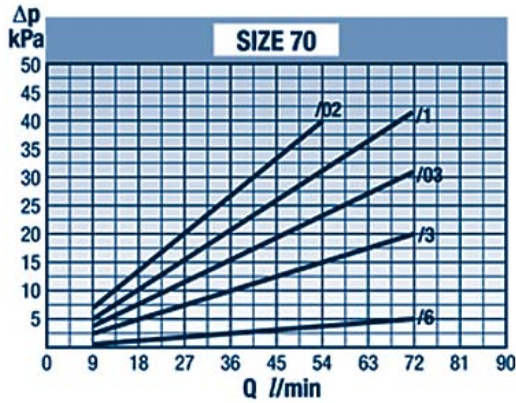
FLOW l/min	/6	FLOW l/min	/3		FLOW l/min	/1		FLOW l/min	/03		/02		DIMENSIONS ELEMENT (mm)		
	WIRE MESH MEDIA		CELLULOSE MEDIA			SYNTHETIC MEDIA			ELEMENT	ELEMENT	ELEMENT	ELEMENT	N	O	P
70	P171794 CRS 70/6	50	P171801 CRS 70/3	P171808 CRS 70/1	40	P171815 CRS 70/03	P171822 CRS 70/02	106	71,5	8					
90	P171795 CRS 90/6	65	P171802 CRS 90/3	P171809 CRS 90/1	55	P171816 CRS 90/03	P171823 CRS 90/02	150	71,5	8					
120	P171796 CRS 120/6	90	P171803 CRS 120/3	P171810 CRS 120/1	70	P171817 CRS 120/03	P171824 CRS 120/02	200	71,5	8					
160	P171797 CRS 160/6	120	P171804 CRS 160/3	P171811 CRS 160/1	100	P171818 CRS 160/03	P171825 CRS 160/02	300	71,5	8					
180	P171798 CRS 180/6	140	P171805 CRS 180/3	P171812 CRS 180/1	110	P171819 CRS 180/03	P171826 CRS 180/02	190	106	10					
230	P171799 CRS 230/6	180	P171806 CRS 230/3	P171813 CRS 230/1	140	P171820 CRS 230/03	P171827 CRS 230/02	260	106	10					
280	P171800 CRS 280/6	230	P171807 CRS 280/3	P171814 CRS 280/1	180	P171821 CRS 280/03	P171828 CRS 280/02	465	106	10					
300	P173053 CRS 300/6	250	P173052 CRS 300/3	P172460 CRS 300/1	200	P172462 CRS 300/03	P172461 CRS 300/02	211	126	10					
390	P173056 CRS 390/6	340	P173055 CRS 390/3	P172463 CRS 390/1	300	P172465 CRS 390/03	P172464 CRS 390/02	290	126	10					
430	P173100 CRS 430/6	380	P173099 CRS 430/3	P173098 CRS 430/1	340	P173097 CRS 430/03	P173096 CRS 430/02	390	126	10					
490	P173059 CRS 490/6	440	P173058 CRS 490/3	P172466 CRS 490/1	400	P172468 CRS 490/03	P172467 CRS 490/02	480	126	10					



PXX-FCRS SERIE



## Performance Curves

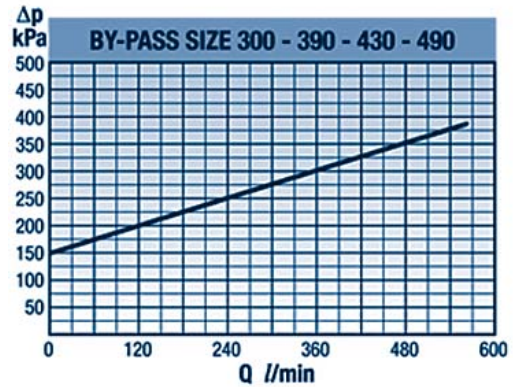
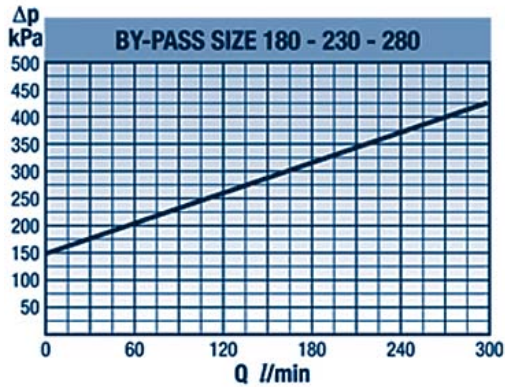
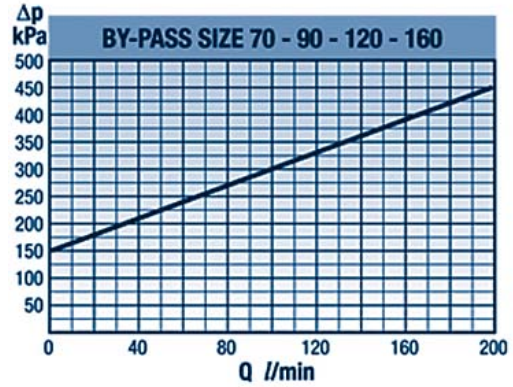
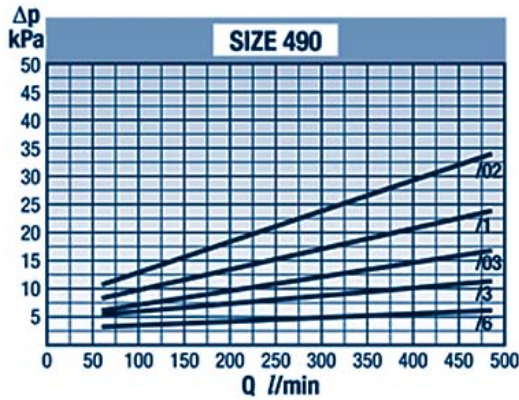
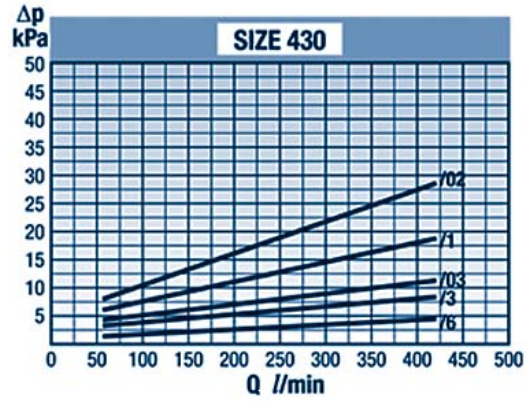
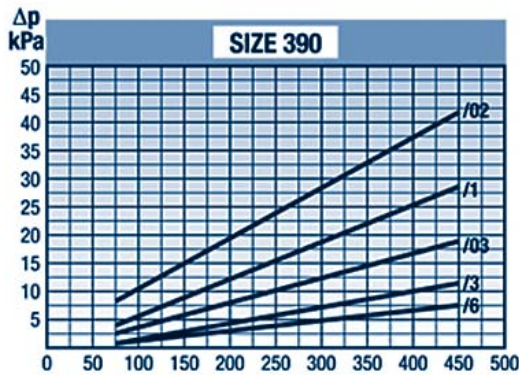




# Replacement elements for PXX-FCRS Serie

Return insert filters with flow passing through the element in an “inside-to-outside” direction

## Performance Curves





# FHK-FIR

In tank return filters for stationary application,  
with in tank connections



## Technical Data

- Operating pressure at 1000 kPa (10 bar).
- Static pressure testing at 1500 kPa (15 bar).
- By-pass valve setting 150 kPa (1,5 bar) per ISO 3968.
- Operating temperature -20 +100°C.
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1.

## Filter Elements

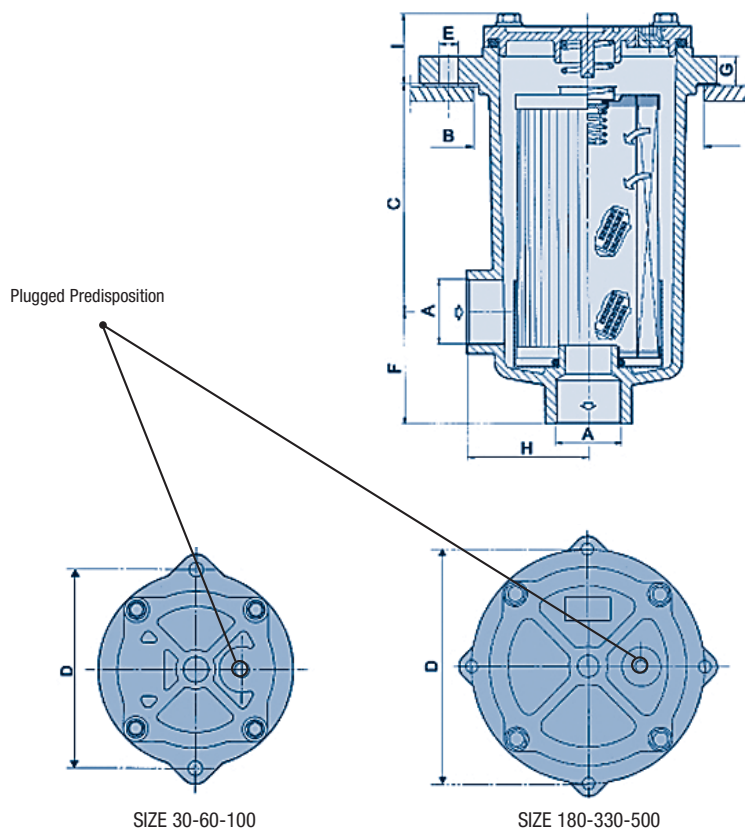
- Wire mesh 60-90 micron.
- Synteq® synthetic media with 10-25 micron.
- Cellulose media with 10-30 micron, reinforced with wire mesh.
- Collapse resistance 1000 kPa (10 bar) per ISO 2941.
- Replacement element includes spring and O-ring seal.



# FHK-FIR

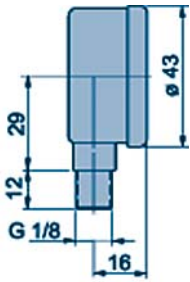
In tank return filters for stationary application,  
with in tank connections

## Specifications

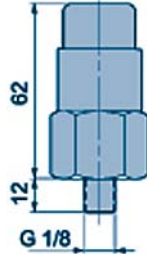


FLOW l/min	/9		/6	FLOW l/min	/3		/1	FLOW l/min	/03		/02	
	WIRE MESH MEDIA				CELLULOSE MEDIA				SYNTHETIC MEDIA			
	TYPE	ELEMENT	ELEMENT		$\beta_{50(c)}=1000$		$\beta_{38(c)}=1000$		$\beta_{23(c)}=1000$		$\beta_{11(e)}=1000$	
30	K035009 FIR 30	P171500 CR 30	P171505 CR 30/6	20	K030245 FIR 30/3	P171504 CR 30/3	K030244 FIR 30/1	P171503 CR 30/1	15	P171502 CR 30/03	K035010 FIR 30/02	P171501 CR 30/02
60	K040560 FIR 60	P171524 CR 60	P171529 CR 60/6	40	K040564 FIR 60/3	P171528 CR 60/3	K040563 FIR 60/1	P171527 CR 60/1	35	P171526 CR 60/03	K040561 FIR 60/02	P171525 CR 60/02
100	K040566 FIR 100	P171530 CR 100	P171535 CR 100/6	65	K040570 FIR 100/3	P171534 CR 100/3	K040569 FIR 100/1	P171533 CR 100/1	60	P171532 CR 100/03	K040567 FIR 100/02	P171531 CR 100/02
180	K051134 FIR 180	P171536 CR 180	P171541 CR 180/6	120	K051138 FIR 180/3	P171540 CR 180/3	K051137 FIR 180/1	P171539 CR 180/1	110	P171538 CR 180/03	K051135 FIR 180/02	P171537 CR 180/02
500	K070117 FIR 500	P171566 CR 500	P171571 CR 500/6	400	K070121 FIR 500/3	P171570 CR 500/3	K070120 FIR 500/1	P171569 CR 500/1	350	P171568 CR 500/03	K070118 FIR 500/02	P171567 CR 500/02

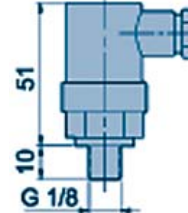
### Service Indicators



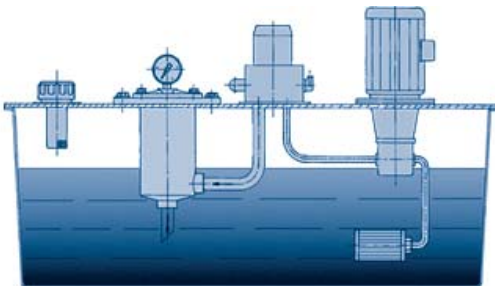
**PRESSURE GAUGE**  
**P171953** (500.01)  
 Scale: -100÷500 kPa (-1÷5 bar)



**VISUAL PRESSURE GAUGE INDICATOR**  
**P171958** (503.01)  
 Setting: 120 kPa (1,2 bar)



**ELECTRICAL PRESSURE SWITCH INDICATOR**  
**P171966** (504.01) N.O. contacts  
**P173104** (504.05) N.C. contacts  
 Setting: 120 kPa (1,2 bar)  
 Max. values: 48 VAC - 30 DCV - 0,5 A res - 0,2 A. ind  
 Protection class: IP 65  
 Cable clamp: PG 7



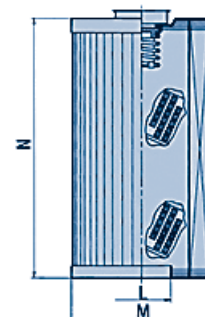
Return line filter location

**IMPORTANT NOTES:**

- 1) To foresee hole diameter on top of the tank to be  $\phi B + 2\text{mm}$
- 2) To maintain the filter outlet (ref.  $\phi F$ ) well below the oil level to avoid foam formation.

DIMENSIONS ASSY (mm)									
A	B	C	D	E	F	G	H	I	Kg.
G 1/2	88	61	100	7	40	11	49	29	0,8
G 3/4	110	68	126	9	52	14	59	36	1,3
G 1	110	110	126	9	54	14	59	36	1,5
G 1 1/4	156	176	175	9	63	18	83	48	3,0
G 2	204	168	220	9	78	20	108	53	5,5

DIMENSIONS ELEMENT (mm)		
L	M	N
26	52	67
29	70	82
29	70	128
41	95	203
65	140	203

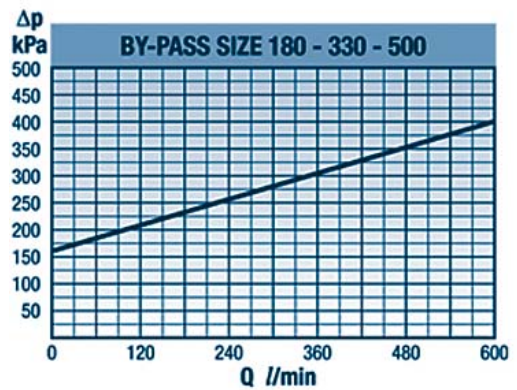
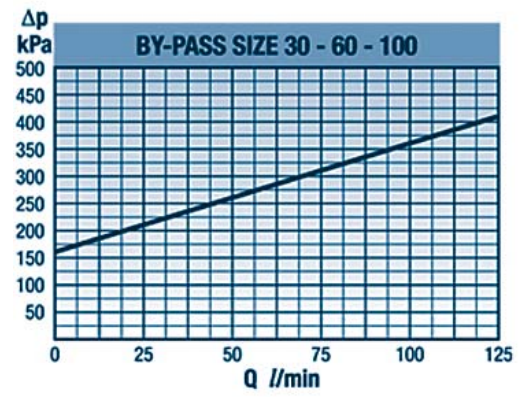
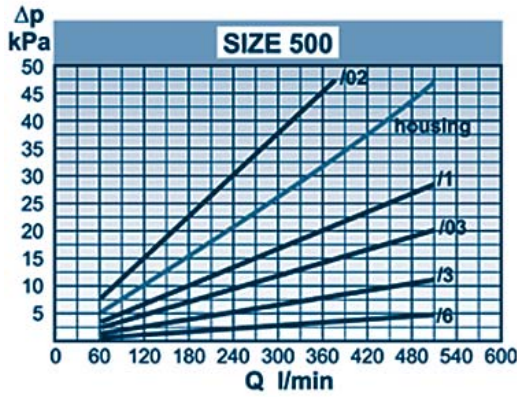
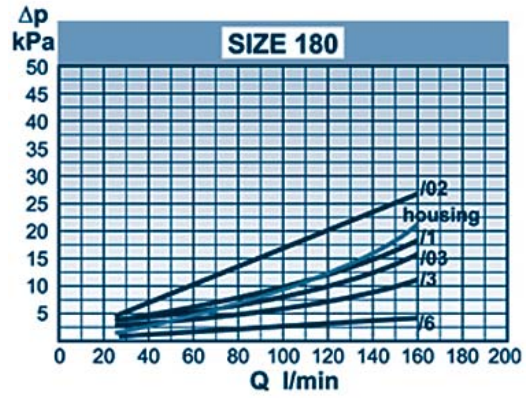
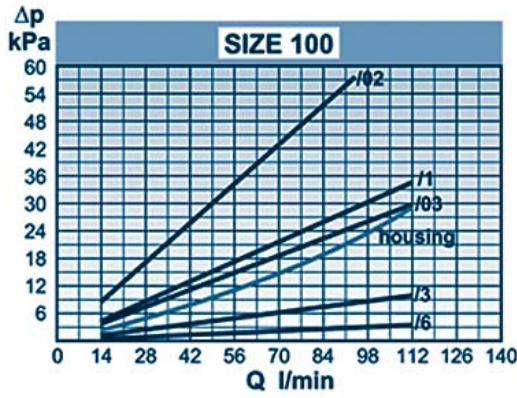
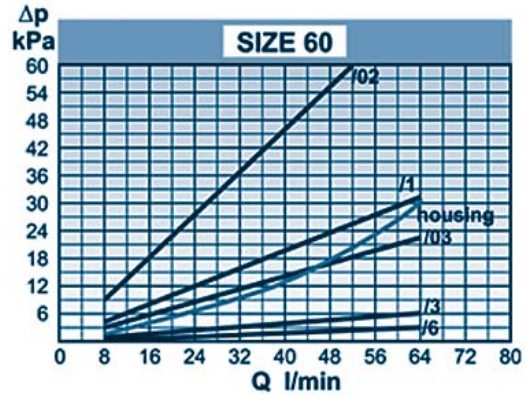
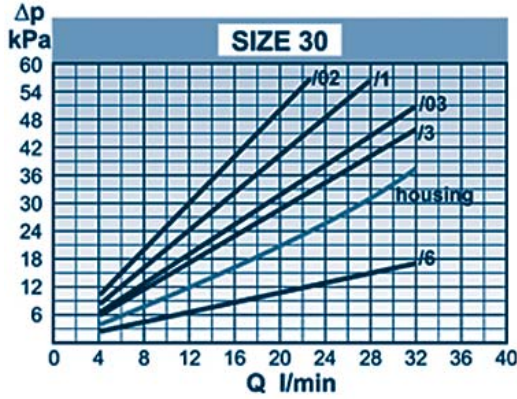


# FHK-FIR

In tank return filters for stationary application,  
with in tank connections



## Performance Curves





# *Replacement elements for FDK-FIRDA Serie*

---

In tank return filters for stationary application,  
with double inlet connection



## **Filter Elements**

---

- Wire mesh 60-90 micron.
- Synteq® synthetic media with 10-25 micron.
- Cellulose media with 10-30 micron, reinforced with wire mesh.
- Collapse resistance 1000 kPa (10 bar) per ISO 2941.

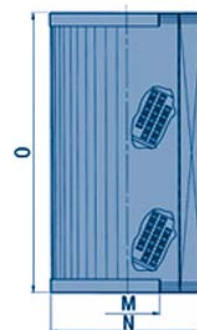


# Replacement elements for FDK-FIRDA Serie

In tank return filters for stationary application,  
with double inlet connection

## Specifications

FLOW l/min	/9		/6		FLOW l/min	/3		/1		FLOW l/min	/02		DIMENSIONS ELEMENT (mm)		
	WIRE MESH MEDIA					CELLULOSE MEDIA					SYNTHETIC MEDIA				
	ELEMENT	ELEMENT	ELEMENT	ELEMENT		ELEMENT	ELEMENT	ELEMENT	ELEMENT		ELEMENT	ELEMENT	M	N	O
30	P171643 C 25	P171649 C 25/6	20	P171647 C 25/3	P171646 C 25/1	15	P171644 C 25/02	26/29	50	70					
60	P171650 C 40	P171656 C 40/6	40	P171654 C 40/3	P171653 C 40/1	30	P171651 C 40/02	35	70	85					
120	P171657 C 100	P171663 C 100/6	80	P171661 C 100/3	P171660 C 100/1	60	P171658 C 100/02	35	70	130					
300	P171664 C 250	P171670 C 250/6	200	P171668 C 250/3	P171667 C 250/1	180	P171665 C 250/02	52	100	210					
600	P171671 C 630	P171677 C 630/6	400	P171675 C 630/3	P171674 C 630/1	350	P171672 C 630/02	76	137	250					

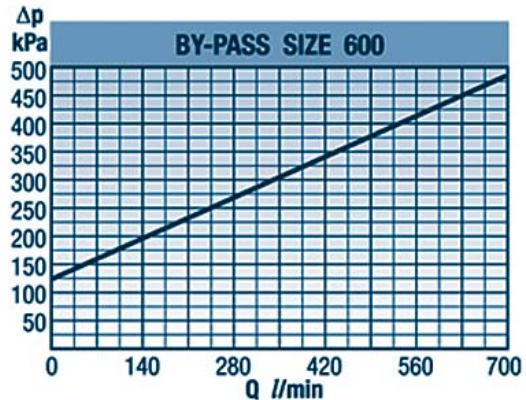
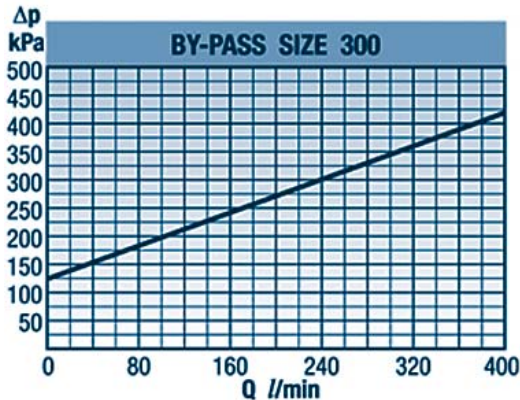
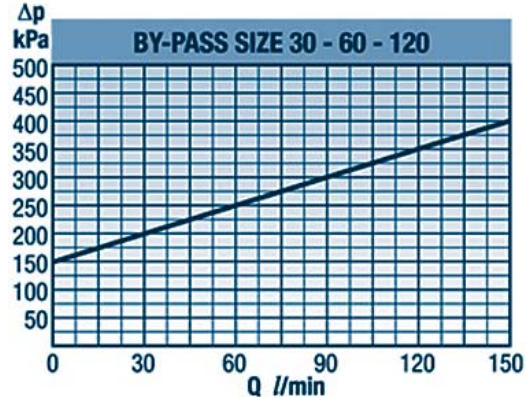
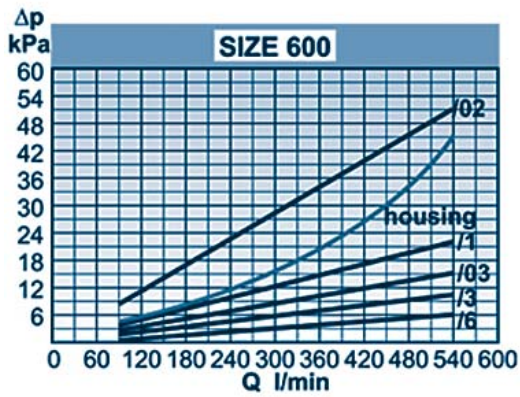
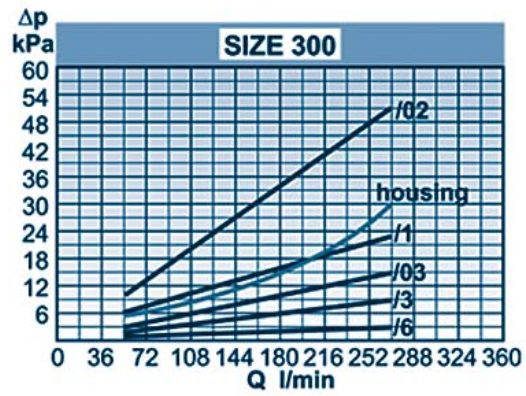
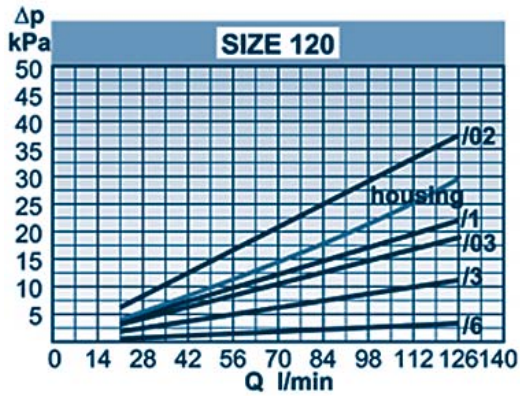
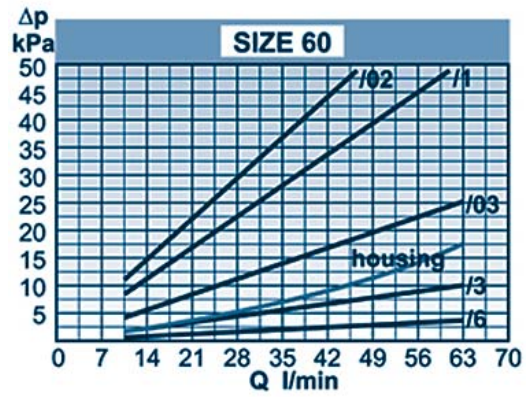
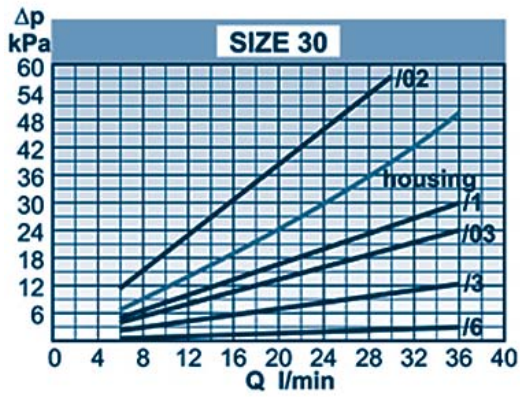


FDK-FIRDA SERIE

# Replacement elements for FDK-FIRDA Serie

In tank return filters for stationary application,  
with double inlet connection

## Performance Curves







Donaldson®  
*Filtration Solutions*

# RETURN & SUCTION IN TANK FILTERS





# SRK-COMBO

## Return & Suction In Tank Filters

### Design

The design - which became feasible thanks to the use of highly engineered plastic parts - is very compact and unique with regard to the valves arrangement and the specific element interface. Two different heads are available: one with inlet-outlet on the same side and one with inlet and outlet on the same axis. It has an easy to service housing for clean oil service. Patents were applied and granted.



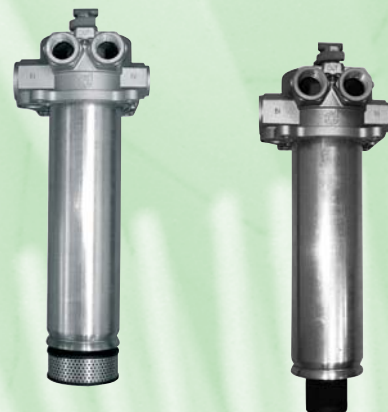
### Function

In the inlet comes oil from the return line which goes back to the reservoir. The outlet (in the diecasted body) provides clean, pressurized oil for several uses (mainly for charge pump of hydrostatic transmission).



### Application

The Combo filter is typically used on mobile equipment operating with hybrid hydraulic systems like hydrostatic transmissions (with close circuit) and service systems (open circuit).





# Combo 120 Series

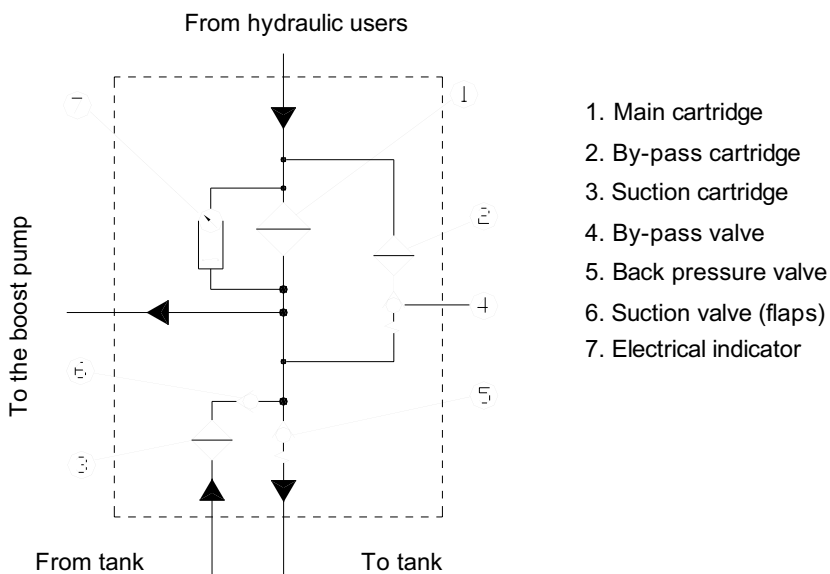
RETURN & SUCTION  
IN TANK FILTERS

Predisposition position options	With Emergency Suction		Without Emergency Suction	
	Same axis ports  Additional G3/8 port on request	Same side ports	Same axis ports  Additional G3/8 port on request	Same side ports
Electrical Clogging Indicator	<b>K041511</b> 	<b>K041595</b> 	<b>K041301</b> 	<b>K041610</b> 
Main element	P763652		P762421	
Suction element	P763643		Not Present	

### Features

- Modular and compact design.
- Replaceable components: main cartridge with by-pass strainer integrated and unscrewing suction strainer.
- Electrical differential indicator (P165194) is standard / also possibility to have the head without electrical differential indicator.
- Visual differential indicator and extension kit (X770576 = K041511 + extension) are optional.
- Filtration efficiency according to ISO 16889:  $\beta_{11 \mu m(c)} = 200$  ;  $\beta_{13 \mu m(c)} = 1000$ .
- Back pressure valve setting: 0,5 bar / By-pass valve setting: 2,5 bar.
- Inlet ports size: G1 + G3/8 (optional) / Outlet port size: G3/4.
- Max. flow rate: 120 l/min. / Maximum working pressure: 10 bar.
- Burst pressure: 15 bar. / Retained capacity: 25 gr. / Housing diameter: 80 mm.
- Emergency filtered suction from the tank.
- By-pass filtered and pressurized.
- No cavitation risk for the pump.
- Flow direction: standard (outside-inside).
- Emergency suction flow rate: 60 l/min.
- Number of fitting holes: 2 / Fitting holes diameter: 11 mm.
- Wheelbase diameter of fitting holes: 115 mm.

### Scheme





# K041511

Small Combo with emergency suction and by-pass filtration.

Same axis ports head / Optional extension

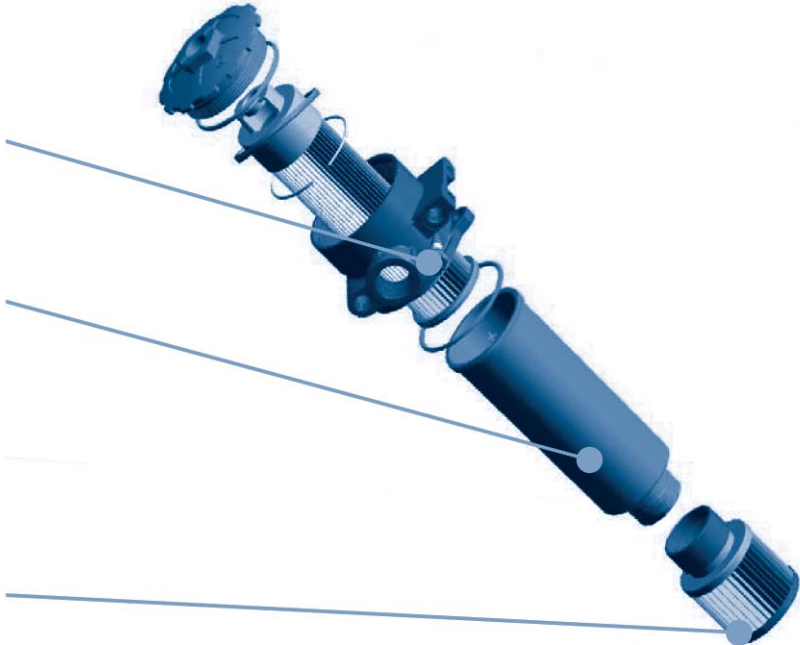
RETURN & SUCTION  
IN TANK FILTERS

## Model

Electrical differential indicator is standard. (Visual indicator is optional).

Filtered bypass inside the bowl

Emergency Suction Cartridge with backpressure valve



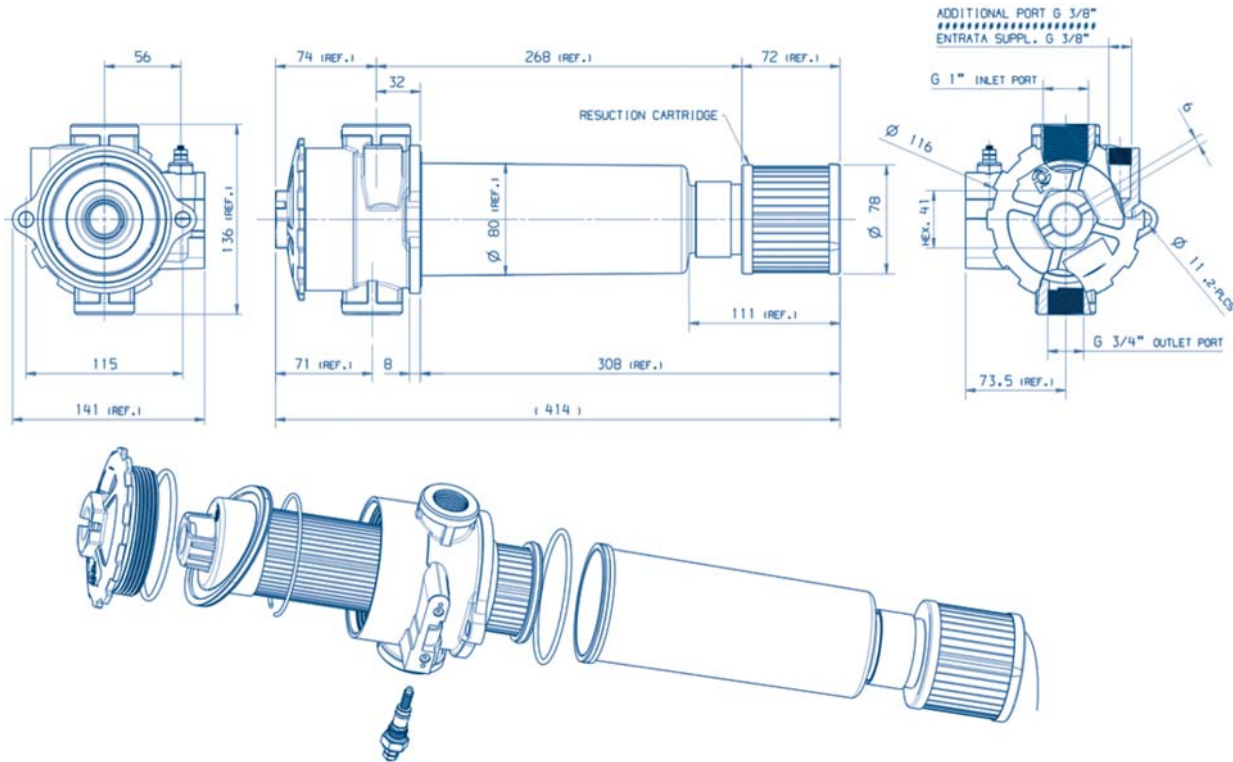
## Pictures



Extension kit is optional  
(X770576 = K041511 + extension)

Small Combo with emergency suction  
and by-pass filtration.  
Same axis ports head / Optional extension

**Dimensions Drawing**



RETURN & SUCTION  
IN TANK FILTERS

**Note**

Minimum oil level in the tank must be sufficient to cover completely the emergency suction cartridge; ref. 115 mm from the end of cartridge.

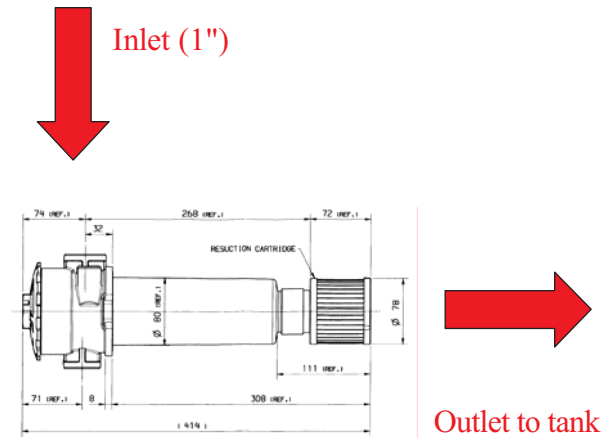
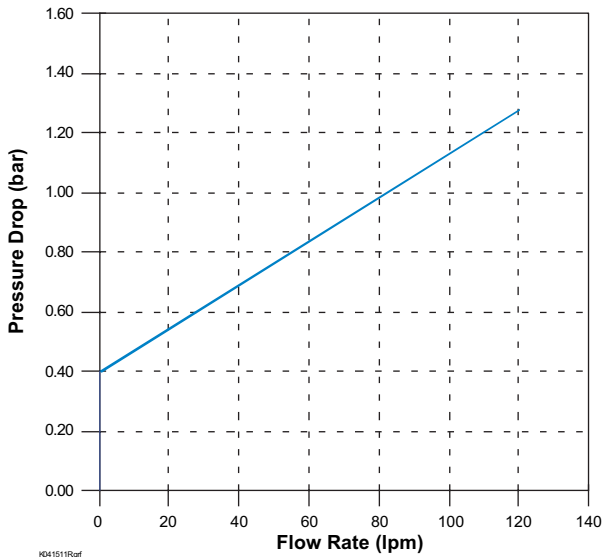
# K041511

Small Combo with emergency suction and by-pass filtration.

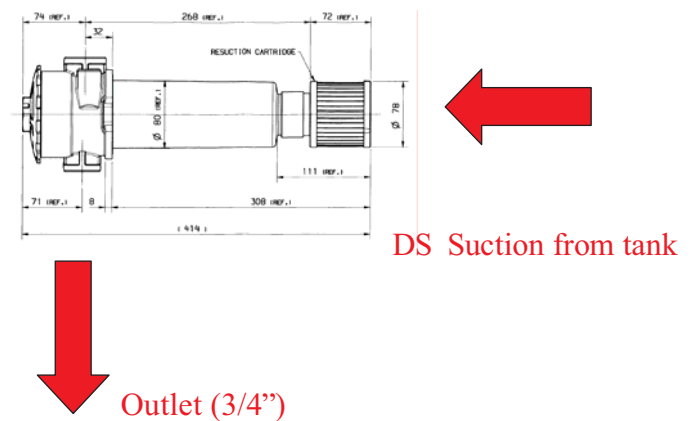
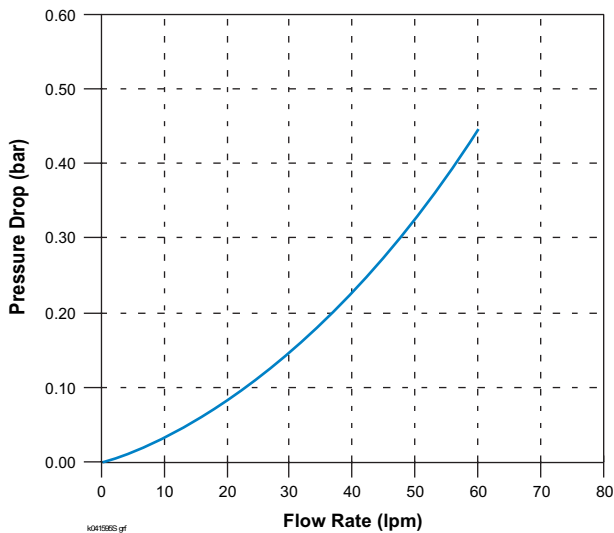
Same axis ports head / Optional extension

## Pressure Drop Test per ISO3968 (32cSt)

*Combo "Same axis ports" – Return to tank*



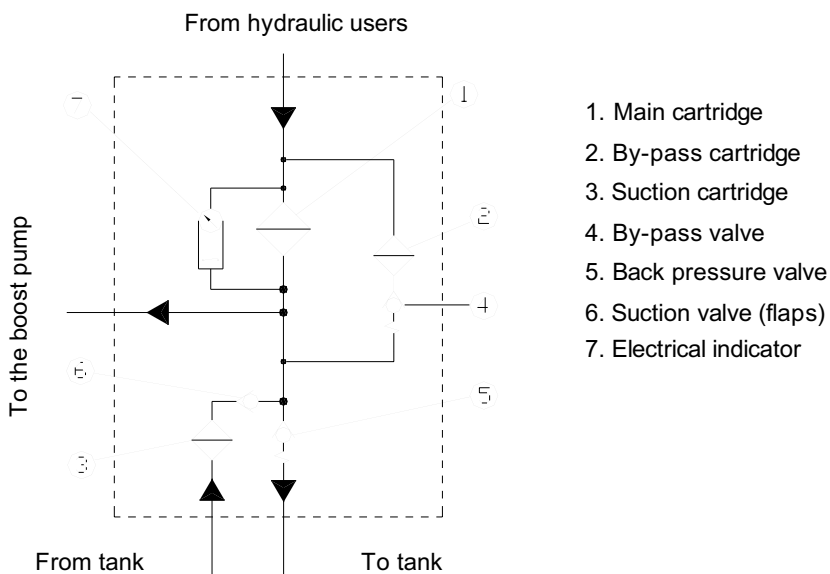
*Combo "Same axis ports" - Suction*



### Features

- Modular and compact design.
- Replaceable components: main cartridge with by-pass strainer integrated and unscrewing suction strainer.
- Electrical differential indicator (P164745) is standard / also possibility to have the head without electrical differential indicator.
- Extension kit is optional.
- Filtration efficiency according to ISO 16889:  $\beta_{11(e)} = 200$  ;  $\beta_{13(e)} = 1000$ .
- Back pressure valve setting: 0,5 bar / By-pass valve setting: 2,5 bar.
- Inlet ports size: G1 / Outlet port size: G3/4.
- Max. flow rate: 120 l/min. / Maximum working pressure: 10 bar.
- Burst pressure: 15 bar. / Retained capacity: 25 gr. / Housing diameter: 80 mm.
- Emergency filtered suction from the tank.
- By-pass filtered and pressurized.
- No cavitation risk for the pump.
- Flow direction: standard (outside-inside).
- Emergency suction flow rate: 60 l/min.
- Number of fitting holes: 2 / Fitting holes diameter: 11 mm.
- Wheelbase diameter of fitting holes: 115 mm.

### Scheme





# K041595

Small Combo with emergency suction and by-pass filtration.

Same side ports head / Optional extension

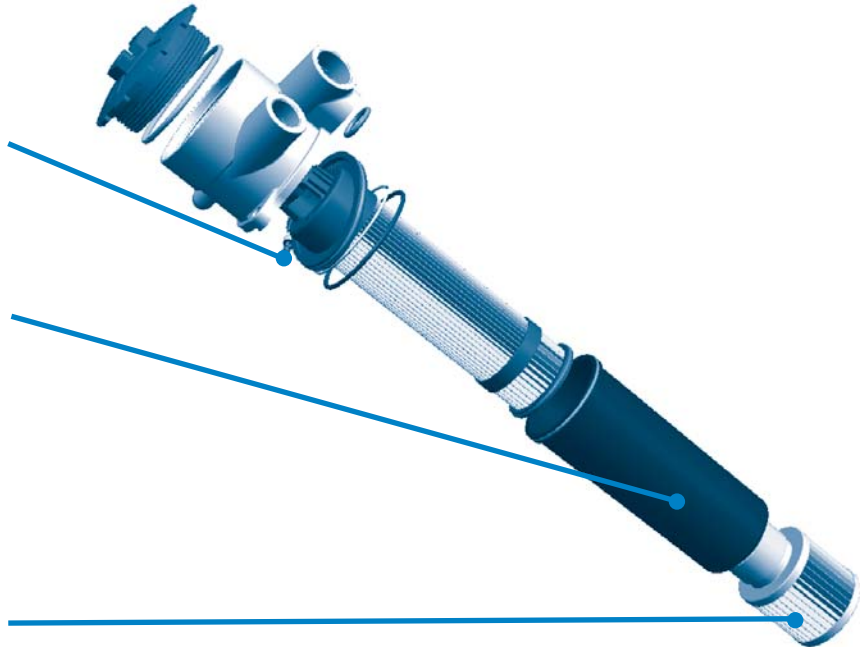
## Model

---

Electrical differential indicator is standard. (Visual indicator is optional).

Filtered bypass inside the bowl

Emergency Suction Cartridge with backpressure valve



## Picture

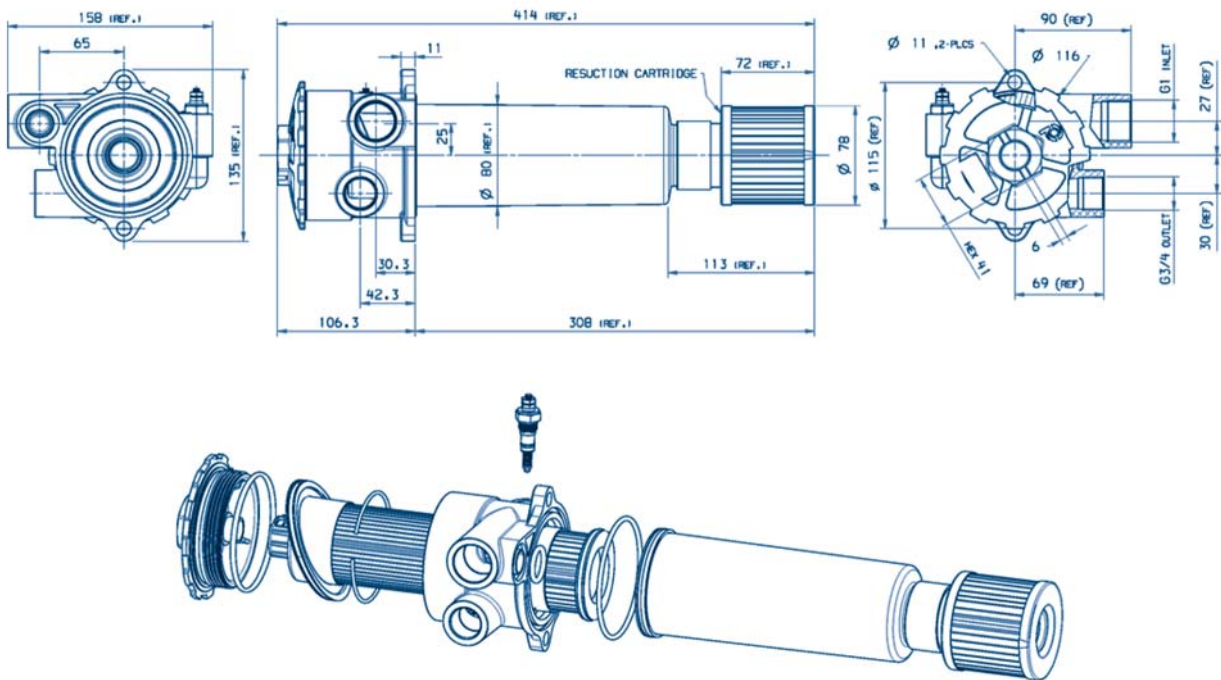
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Extension kit is optional (X770576)

Small Combo with emergency suction  
and by-pass filtration.  
Same side ports head / Optional extension

**Dimensions Drawing**



RETURN & SUCTION  
IN TANK FILTERS

**Note**

Minimum oil level in the tank must be sufficient to cover completely the emergency suction cartridge; ref. 115 mm from the end of cartridge.

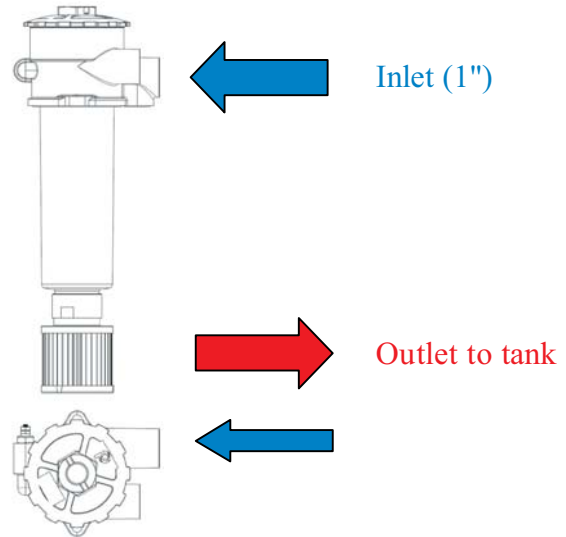
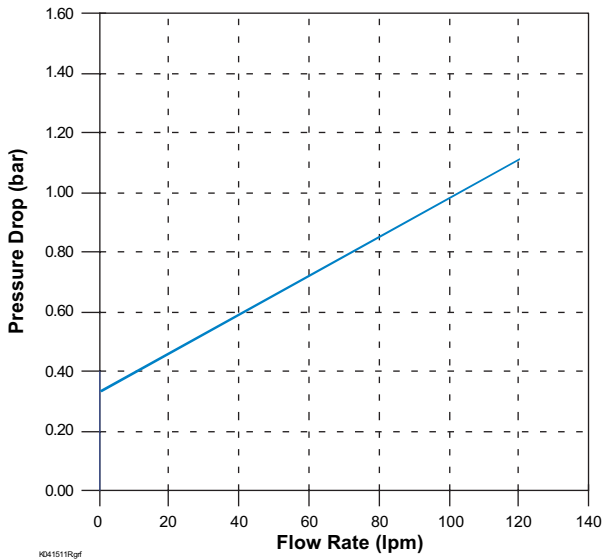
# K041595

Small Combo with emergency suction and by-pass filtration.

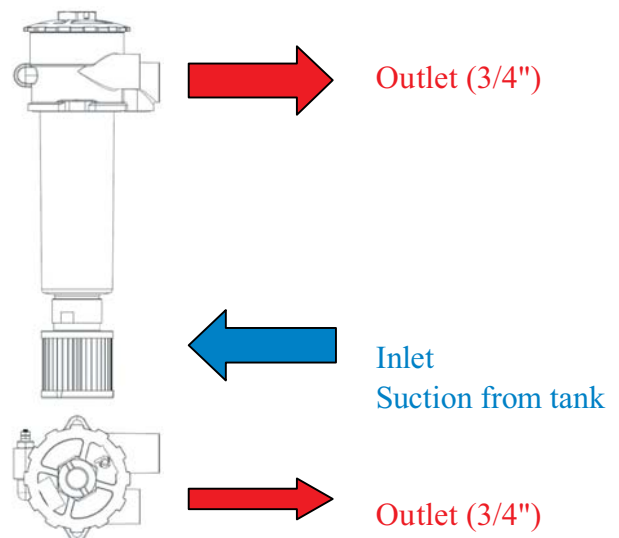
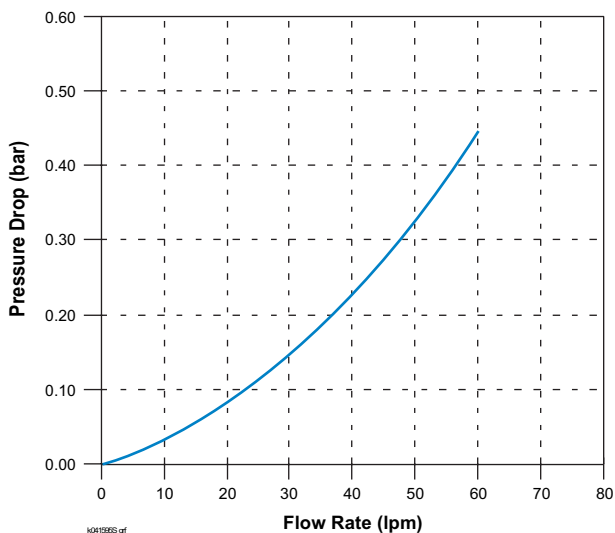
Same side ports head / Optional extension

## Pressure Drop Test per ISO3968 (32cSt)

*Combo "Same side ports" – Return to tank*



*Combo "Same side ports" - Suction*



## Features

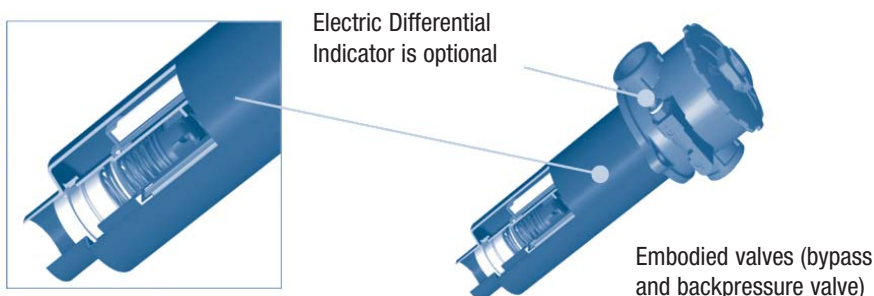
- Modular and compact design.
- Embodied valves available, possibility to fit low cost differential pressure indicator, serviceable filler cap with clean service.
- Improved pump feeding hydraulic transmission during cold starts.
- Simple interface with the tank: one unique installation hole.
- Outlet with always clean, filtered oilflow to the pressurized (0.5 bar)
- Suction side (boost pump of hydrostatic transmissions).
- Bypass setting: 2,5 bar.
- No loose parts.
- Flow range up to 120 l/min.
- Low pressure drop and high capacity.



## Important

The suction port always gets clean oil. When the element becomes clogged, oil that reaches the suction port is gradually reduced, so the use of an electrical clogging indicator (P165194) is recommended. Return flow must always be higher than suction flow.

## Model



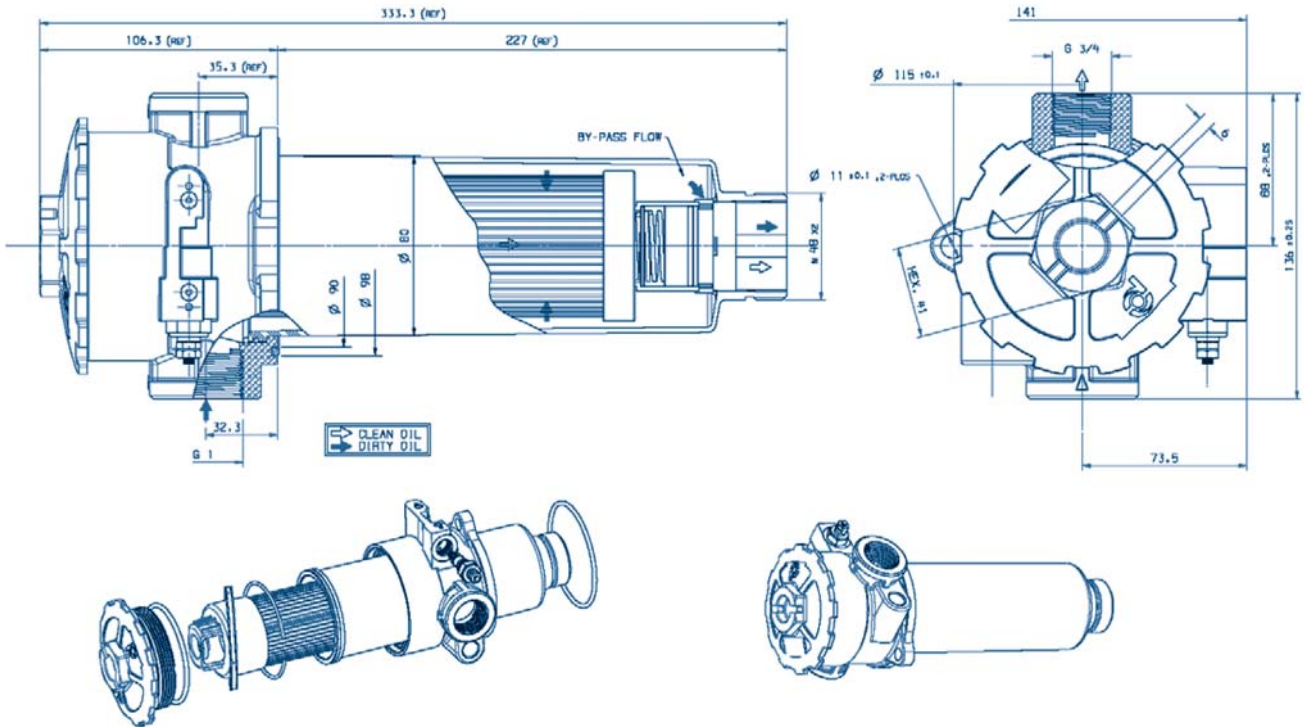


# K041301

Small Combo without emergency suction  
and by-pass filtration  
Same axis ports head

RETURN & SUCTION  
IN TANK FILTERS

## Dimensions

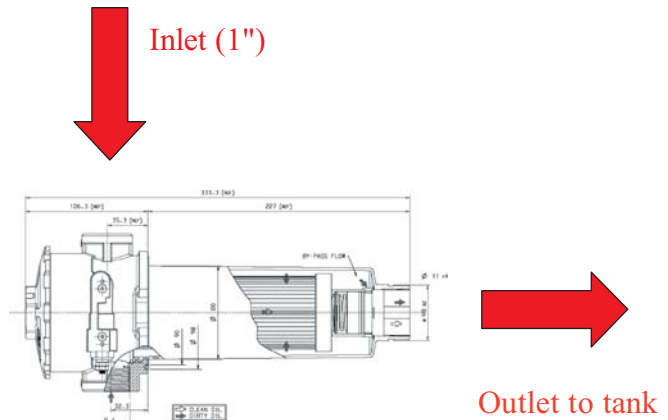
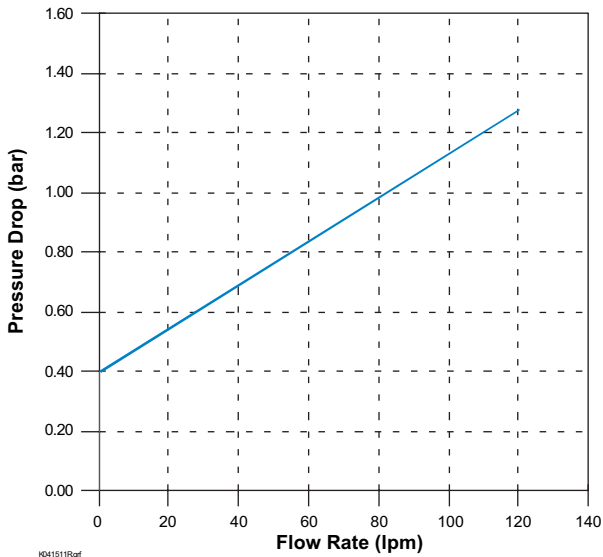


## Note

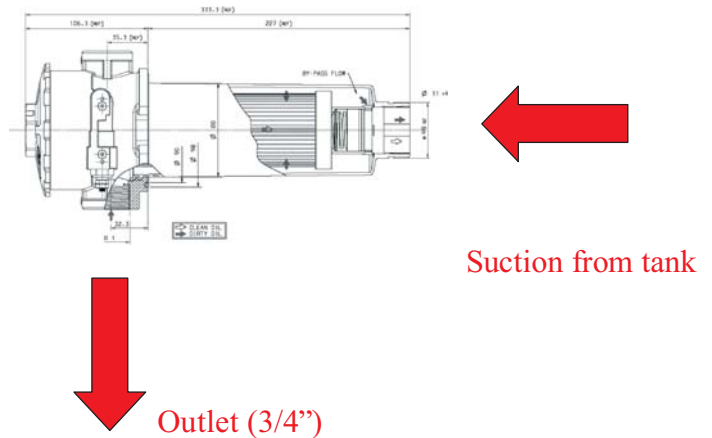
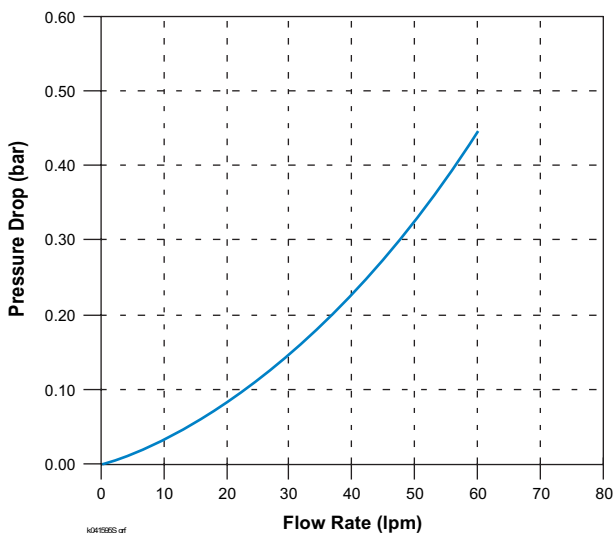
Minimum oil level in the tank must be almost 50 mm above the housing end.

**Pressure Drop Test per ISO3968 (32cSt)**

*Combo “Same axis ports” – Return to tank*



*Combo “Same axis ports” - Suction*



# K041610

Small Combo without emergency suction  
and by-pass filtration  
Same side ports head

## Features

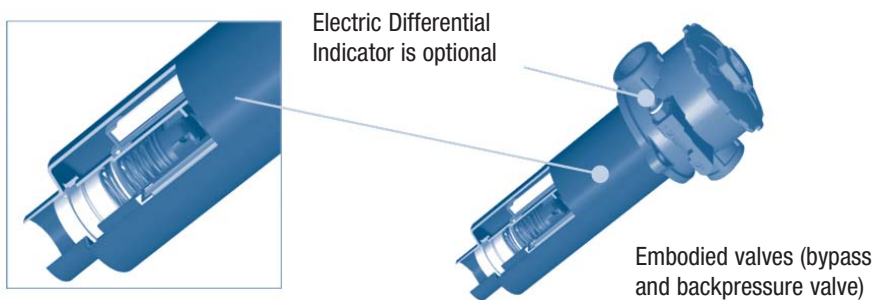
- Modular and compact design.
- Embodied valves available, possibility to fit low cost differential pressure indicator, serviceable filler cap with clean service.
- Improved pump feeding hydraulic transmission during cold starts.
- Simple interface with the tank: one unique installation hole.
- Outlet with always clean, filtered oilflow to the pressurized (0.5 bar) suction side (boost pump of hydrostatic transmissions).
- Bypass setting: 2,5 bar.
- No loose parts.
- Flow range up to 120 l/min.
- Low pressure drop and high capacity.



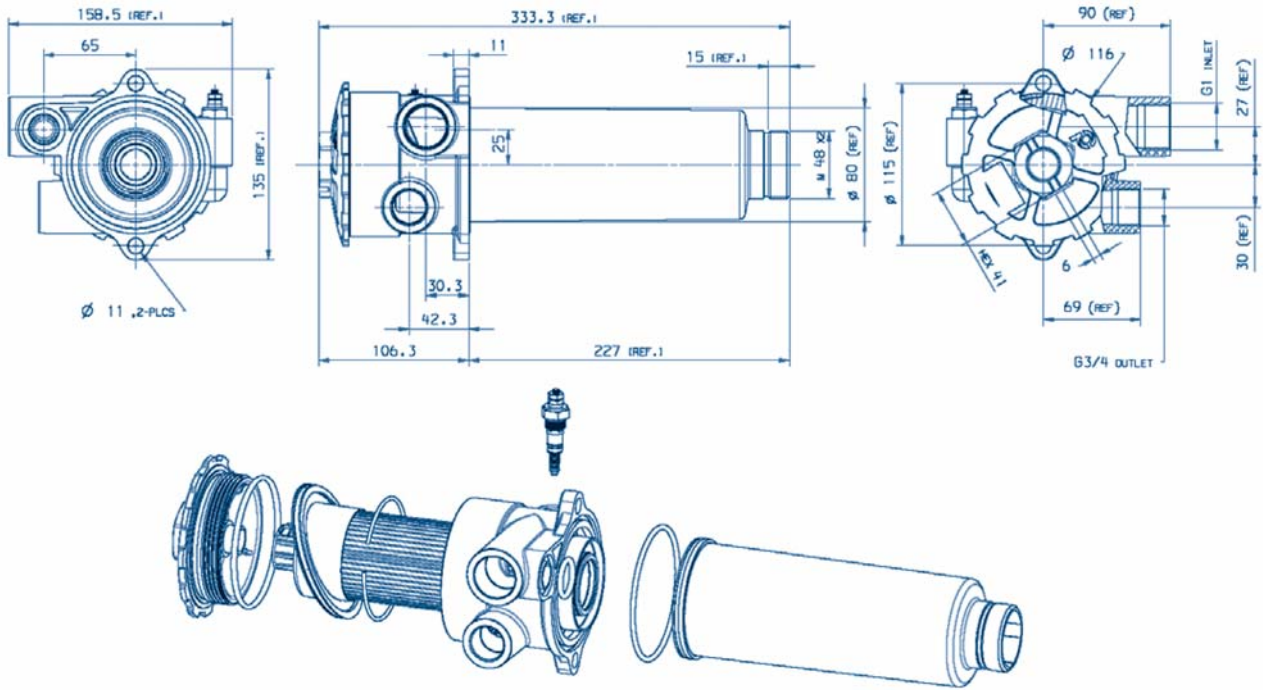
## Important

The suction port always gets clean oil. When the element becomes clogged, oil that reaches the suction port is gradually reduced, so the use of an electrical clogging indicator (P164745) is recommended. Return flow must always be higher than suction flow.

## Model



## Dimensions



## Note

Minimum oil level in the tank must be almost 50 mm above the housing end.

## Indicators

P165194  
 P164745



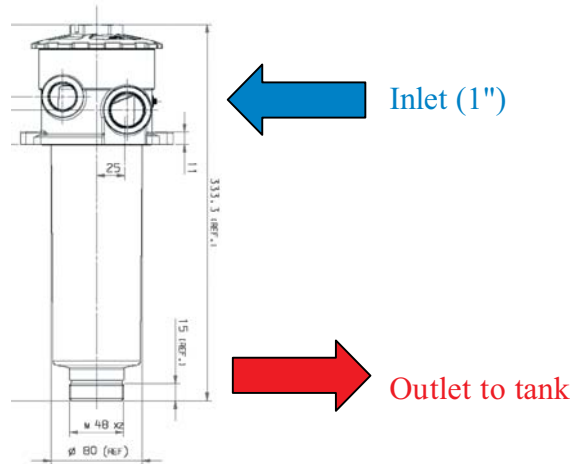
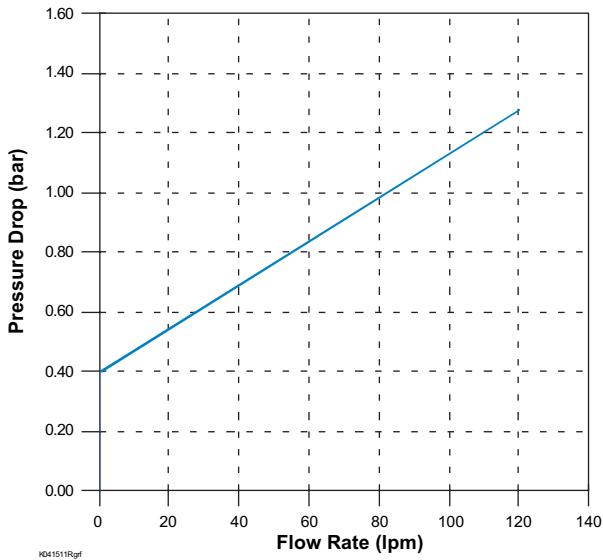
# K041610

Combo without emergency suction  
and by-pass filtration  
Same side ports head

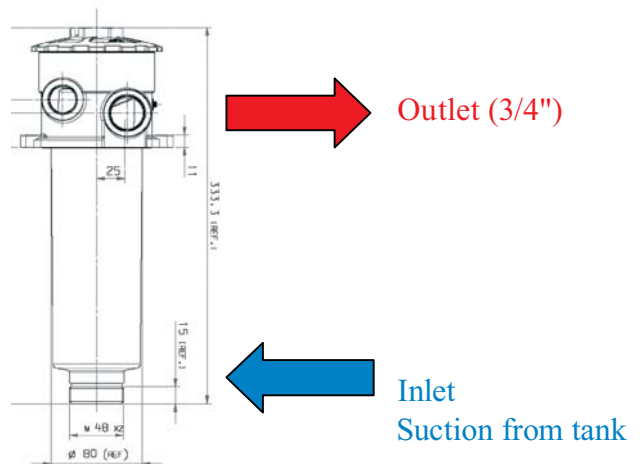
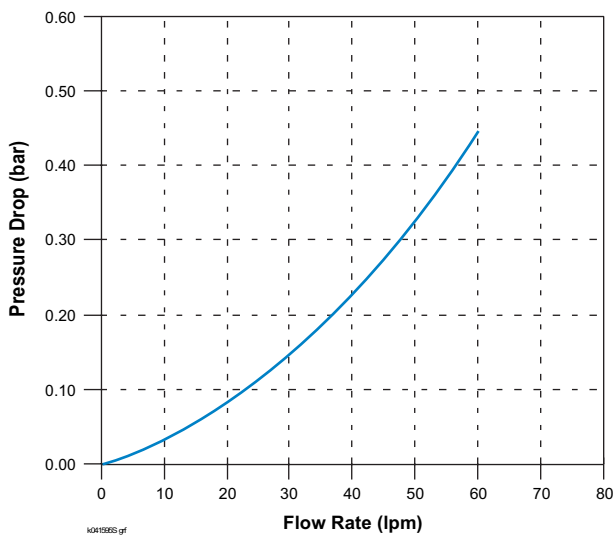
RETURN & SUCTION  
IN TANK FILTERS

## Pressure Drop Test per ISO3968 (32cSt)



Combo "Same side ports" – Return to tank

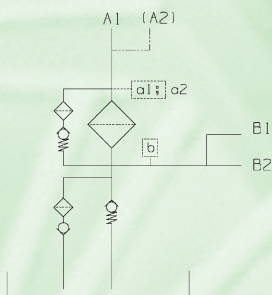


Combo "Same side ports" - Suction

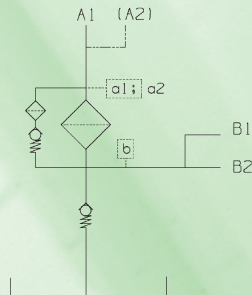


# Combo 200 Series

Predisposition position options  (No indicator fitted)	With Emergency Suction		Without Emergency Suction	
	Without optional inlet port G1	With optional inlet port G1	Without optional inlet port G1	With optional inlet port G1
None predisposition	<b>K041535</b>	<b>K041596</b>	<b>K041528</b>	<b>K041597</b>
RETURN LINE PREDISPOSITION				
a1	<b>K041598</b>	<b>K041599</b>	<b>K041600</b>	<b>K041601</b>
a2	<b>K041602</b>	<b>K041603</b>	<b>K041604</b>	<b>K041605</b>
SUCTION LINE PREDISPOSITION				
b	<b>K041606</b>	<b>K041607</b>	<b>K041608</b>	<b>K041609</b>
				
Main element	P764198		P764198	
Suction element	P764183		Not present	



With emergency suction



Without emergency suction

New partnumbers according to:

- With or without emergency suction
- Indicator positions
- Optional inlet port

# COMBO 200 Series

## Big Combo, with or without Emergency Suction

### Technical Data

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- Two filter versions with and without emergency suction from the tank.
- By-pass flow always filtered.
- By-pass flow always pressurized.
- Operating Pressure at 1000 kPa (10bar).
- Flow Rate: return 200 l/min.
- Emergency suction flow rate till 70 lpm from the tank.
- Back Pressure valve setting 50kPa (0,5 bar).
- By-pass valve setting 250 kPa (2,5 bar).
- Operating Temperature -20 - +100 °C.
- Compatibility with hydraulic fluids per ISO 2943.
- Interchangeable with various return and suction filters.
- Flow direction through the element from inside to outside.

### Filter Elements

---

#### Main Element

- Synthetic Fiber
- Efficiency Per ISO 16889:  $\beta_{11}(c) > 200$  ;  $\beta_{13}(c) > 1000$
- Dust capacity per ISO 16889 at final Delta P 350 kPa typical value 70g
- By pass strainer integrated into the main element 125 micron wire mesh
- Unique interface with filter assembly

#### Suction Element

(only on version with emergency suction)

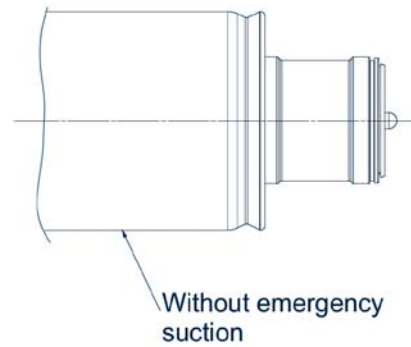
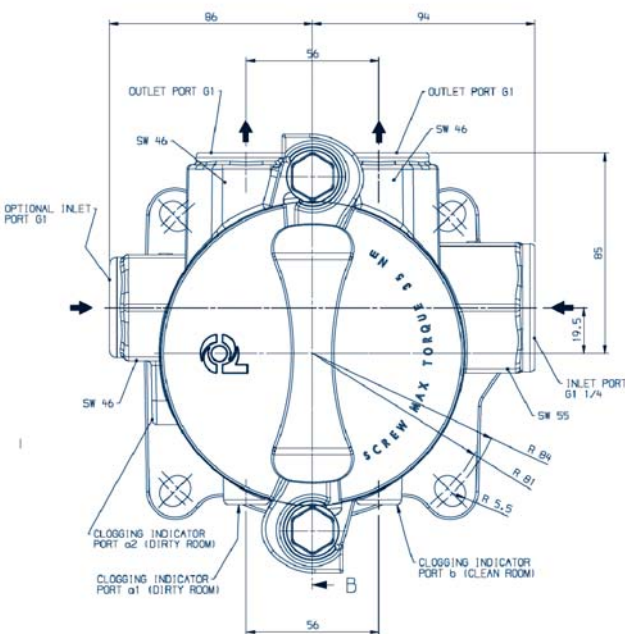
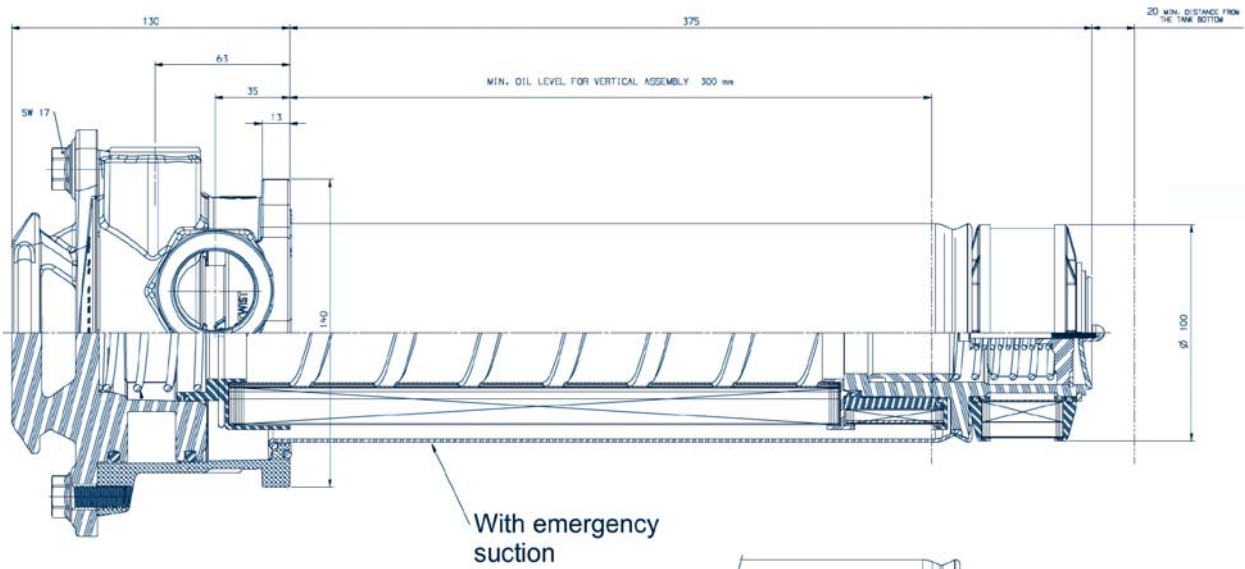
- 125 micron wire mesh

### Service Indicator

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Visual and electrical indicator available on request

**Dimensions Drawing**



RETURN & SUCTION  
IN TANK FILTERS

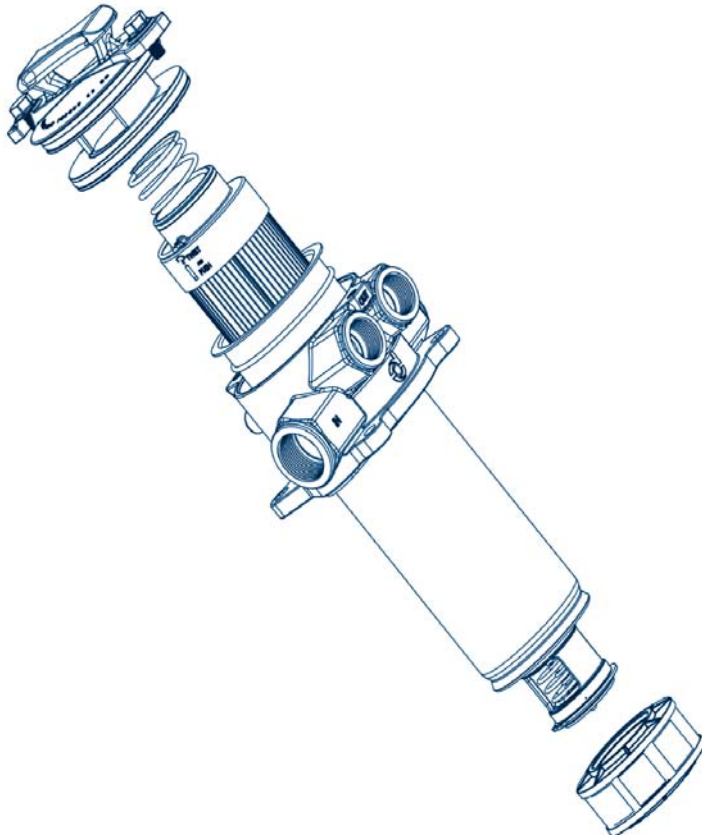


# COMBO 200 Series

Big Combo,  
with or without Emergency Suction

## Model

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The two versions with and without emergency suction have the same body but different housings. Thus any retrofit from one version to the other is not possible.

## Note

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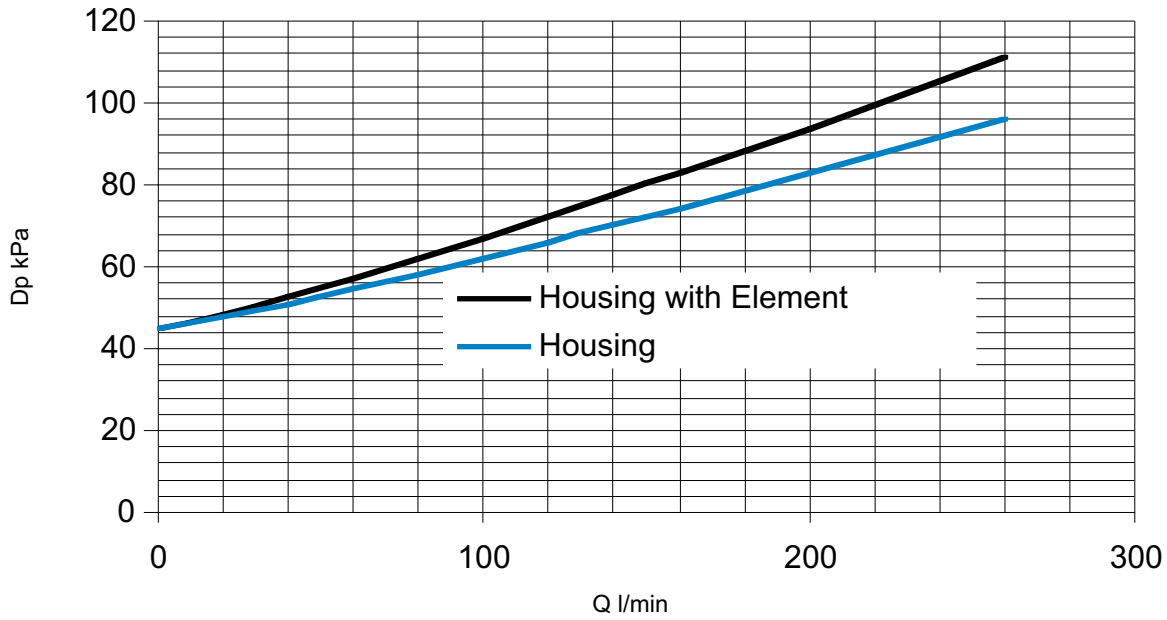
### With Emergency Suction:

Note: Minimum oil level in the tank must be sufficient to cover completely the emergency suction cartridge.

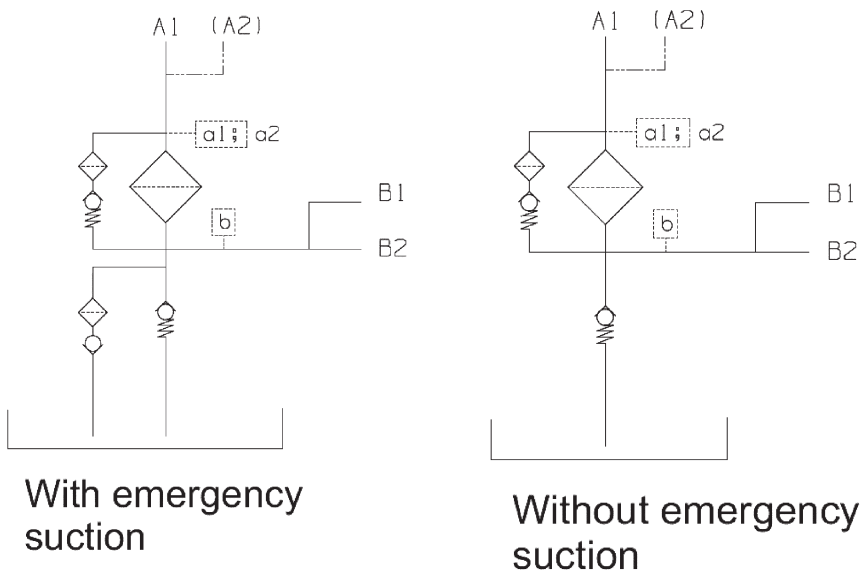
### Without Emergency Suction:

Note: Minimum oil level in the tank must be almost 50 mm above the housing end.

## Performance curves



## Functional Scheme



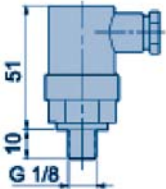
# COMBO 200 Series

Big Combo,  
with or without Emergency Suction

## Service Indicators

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### For positions a1 and a2: Electrical Switch Indicator



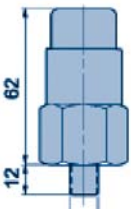
#### P764431

Normally open contacts  
Setting: 250kPa (2,5 bar)  
Max values: 30DCV - 0,5A res. - 0,2 A ind.  
Protection class IP65  
Cable clam: PG7

#### P764613

Normally closed contacts  
Setting: 250kPa (2,5 bar)  
Max values: 30DCV - 0,5A res. - 0,2 A ind.  
Protection class IP65  
Cable clam: PG7

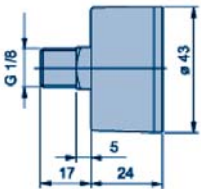
### For positions A1 and A2: Visual Pressure Gauge Indicator



#### P764612

Setting 250 kPa (2,5 bar)

### For position B: Vacuum Gauge



#### P171954

Scale: -100~300kPa (-1~3 bar)



Donaldson®  
*Filtration Solutions*

# IN-LINE RETURN FILTERS





# *Replacement elements for FLK-FL & FLK-FLV Serie*

In-line return filters with take apart element,  
up to 20 bar



IN-LINE  
RETURN FILTERS

## **Filter Elements**

- Wire mesh 60-90 micron.
- Synteq® synthetic media with 10-25 micron reinforced with wire mesh
- Cellulose media with 10-30 micron, reinforced with wire mesh.
- Burst resistance 1000 kPa (10 bar) per ISO 2941.



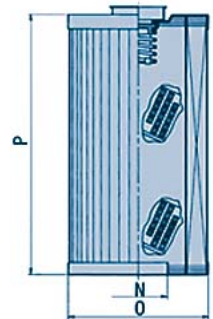
FLK-FL & FLK-FLV SERIE

# Replacement elements for FL Serie

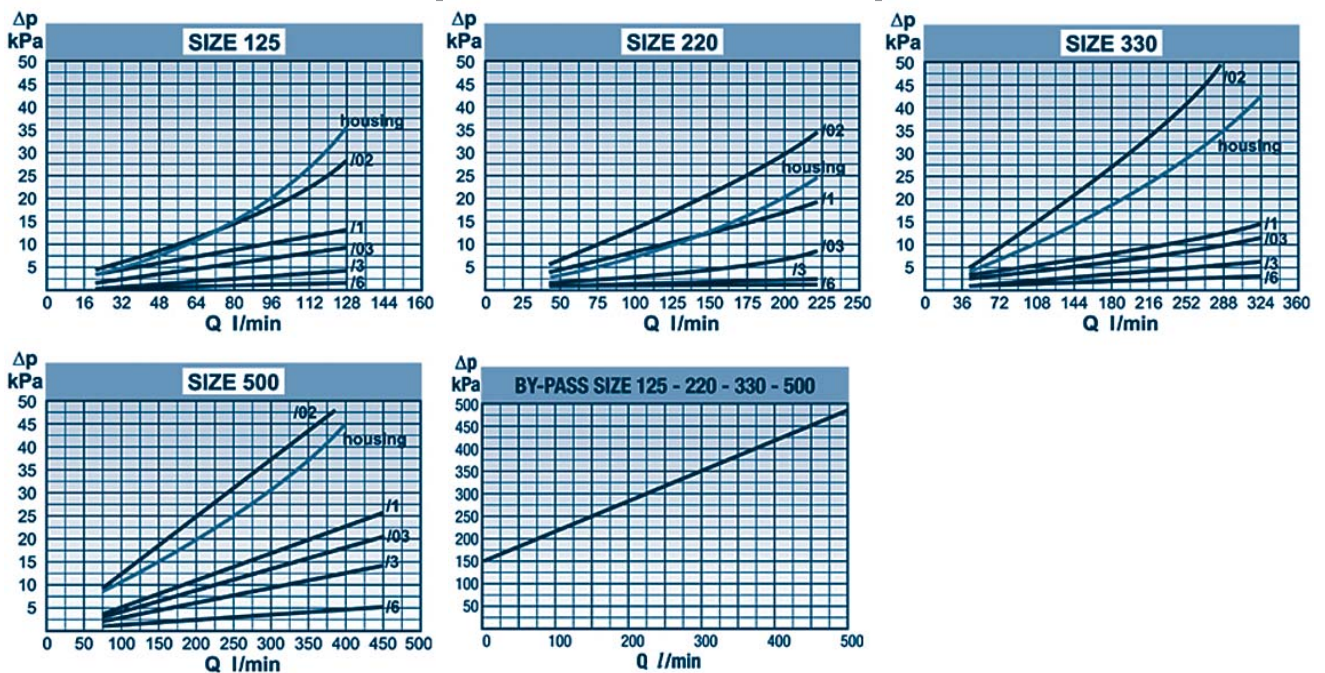
In-line return filters with take apart element

## Specifications

FLOW l/min	/9		/6		FLOW l/min	/3		/1		FLOW l/min	/03		/02		DIMENSIONS ELEMENT (mm)		
	WIRE MESH MEDIA					CELLULOSE MEDIA					SYNTHETIC MEDIA				N	O	P
	ELEMENT	ELEMENT				ELEMENT	ELEMENT				ELEMENT	ELEMENT					
125	P171584 CR 125	P171589 CR 125/6			80	P171588 CR 125/3	P171587 CR 125/1			70	P171586 CR 125/03	P171585 CR 125/02			41	95	169
220	P171590 CR 220	P171595 CR 220/6			150	P171594 CR 220/3	P171593 CR 220/1			130	P171592 CR 220/03	P171591 CR 220/02			65	140	136
330	P171560 CR 330	P171565 CR 330/6			220	P171564 CR 330/3	P171563 CR 330/1			180	P171562 CR 330/03	P171561 CR 330/02			65	140	203
500	P171566 CR 500	P171571 CR 500/6			400	P171570 CR 500/3	P171569 CR 500/1			350	P171568 CR 500/03	P171567 CR 500/02			65	140	203



## Performance curves





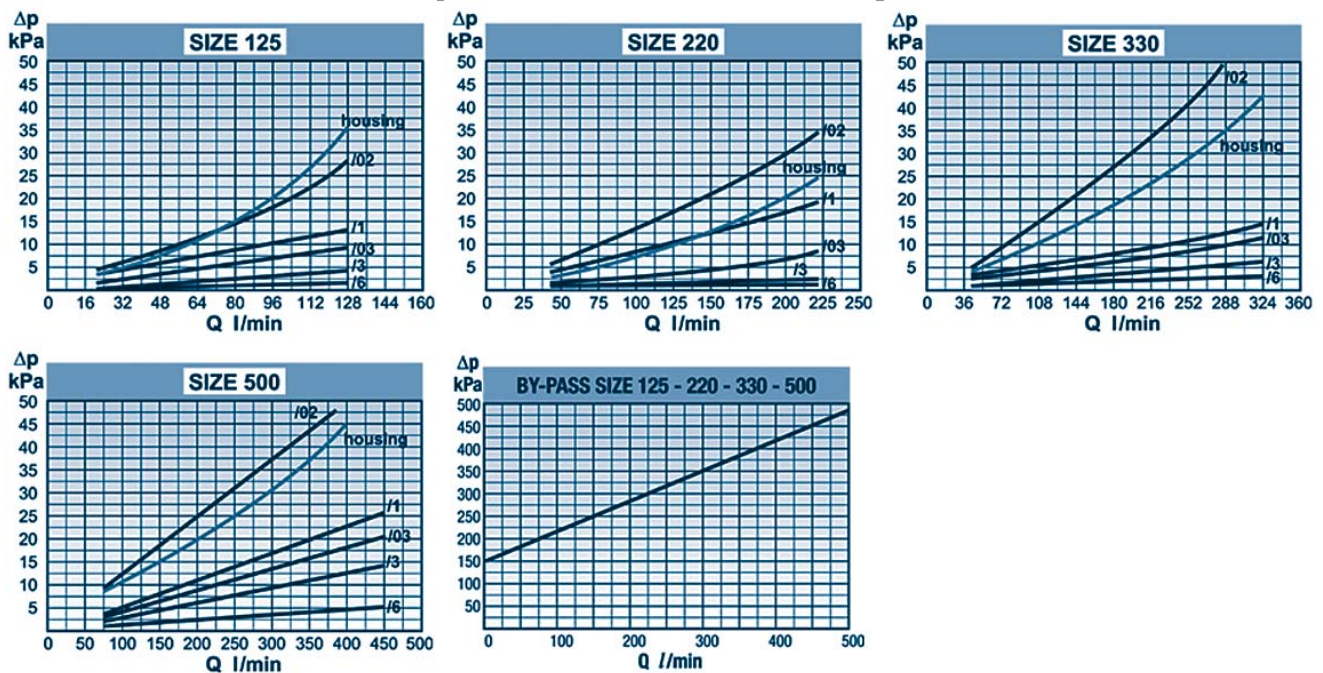
### Specifications

FLOW l/min	/6		/3		/1		DIMENSIONS ELEMENT (mm)		
	WIRE MESH MEDIA		CELLULOSE MEDIA						
	ELEMENT		$\beta_{50(c)}=1000$		$\beta_{36(c)}=1000$		N	O	P
125	P171589 CR 125/6		P171588 CR 125/3		P171587 CR 12/1		41	95	169
220	P171595 CR 220/6		P171594 CR 220/3		P171593 CR 220/1		65	140	169
330	P171565 CR 330/6		P171564 CR 330/3		P171563 CR 330/1		65	140	203
500	P171571 CR 500/6		P171570 CR 500/3		P171596 CR 500/1		65	140	203



IN-LINE  
RETURN FILTERS

### Performance curves







# FLK-FLS

In-line return filters with take apart element,  
up to 30 bar



IN-LINE  
RETURN FILTERS

## Technical Data

- Operating pressure at 3000 kPa (30 bar).
- Static pressure testing at 4500 kPa (45 bar).
- By-pass valve setting 150 kPa (1,5 bar) per ISO 3968.
- Operating temperature -20 +100°C.
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO 3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1 or flanged per SAE J 518 - 3000PSI.

## Filter Elements

- Wire mesh 60-90 micron.
- Synteq® synthetic media with 10-25 micron.
- Cellulose media with 10-30 micron, reinforced with wire mesh.
- Collapse resistance 1000 kPa (10 bar) per ISO 2941.

# FLK-FLS

## In-line return filters with take apart element

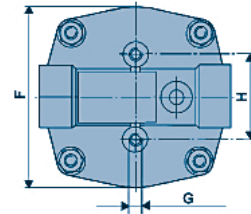
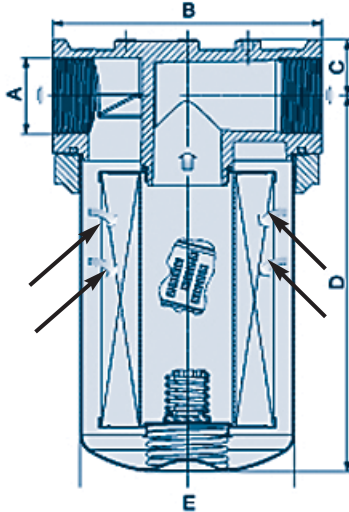
## Specifications

IN-LINE  
RETURN FILTERS

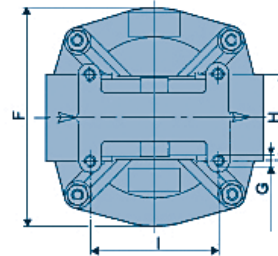
	/9				/6				/3				/1				/03				/02																																																																																																			
	WIRE MESH MEDIA								CELLULOSE MEDIA								SYNTHETIC MEDIA																																																																																																							
									$\beta_{50(c)}=1000$				$\beta_{36(c)}=1000$				$\beta_{23(c)}=1000$				$\beta_{11(c)}=1000$																																																																																																			
FLOW l/min	TYPE	ELEMENT	TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT	TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT	TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT	TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT	TYPE	ELEMENT																																																																																																
WITHOUT FLANGE	40	K030259 FLS 50 K030372 FLS 50 P	P171518 CR 50	K030264 FLS 50/6 K030325 FLS 50/6 P	P171523 CR 50/6	35	K030263 FLS 50/3 K030376 FLS 50/3 P	P171522 CR 50/3	K030262 FLS 50/1 K030375 FLS 50/1 P	P171521 CR 50/1	30	K030261 FLS 50/03 K030374 FLS 50/03 P	P171520 CR 50/03	K030260 FLS 50/02 K030373 FLS 50/02 P	P171519 CR 50/02	80	K030271 FLS 100 K030365 FLS 100 P	P171530 CR 100	K030276 FLS 100/6 K030371 FLS 100/6 P	P171535 CR 100/6	65	K030275 FLS 100/3 K030326 FLS 100/3 P	P171534 CR 100/3	K030274 FLS 100/1 K030368 FLS 100/1 P	P171533 CR 100/1	60	K030273 FLS 100/03 K030367 FLS 100/03 P	P171532 CR 100/03	K030272 FLS 100/02 K030366 FLS 100/02 P	P171531 CR 100/02	130	K040596 FLS 150 K040948 FLS 150 P	P171584 CR 125	K040601 FLS 150/6 K040953 FLS 150/6 P	P171589 CR 125/6	110	K040600 FLS 150/3 K040952 FLS 150/3 P	P171588 CR 125/3	K040599 FLS 150/1 K040951 FLS 150/1 P	P171587 CR 125/1	90	K040598 FLS 150/03 K040950 FLS 150/03 P	P171586 CR 125/03	K040597 FLS 150/02 K040949 FLS 150/02 P	P171585 CR 125/02	180	K040608 FLS 180 K040954 FLS 180 P	P171536 CR 180	K040613 FLS 180/6 K040959 FLS 180/6 P	P171541 CR 180/6	130	K040612 FLS 180/3 K040958 FLS 180/3 P	P171540 CR 180/3	K040611 FLS 180/1 K040957 FLS 180/1 P	P171539 CR 180/1	110	K040610 FLS 180/03 K040956 FLS 180/03 P	P171538 CR 180/03	K040609 FLS 180/02 K040955 FLS 180/02 P	P171537 CR 180/02	200	K040620 FLS 200 K040960 FLS 200 P	P171596 CL 200	K040963 FLS 200/6 K040963 FLS 200/6 P	P171601 CL 200/6	140	K040624 FLS 200/3 K040962 FLS 200/3 P	P171600 CL 200/3	K040623 FLS 200/1 K040961 FLS 200/1 P	P171599 CL 200/1	120	K040622 FLS 200/03 K041125 FLS 200/03 P	P171598 CL 200/03	K040621 FLS 200/02 K041124 FLS 200/02 P	P171597 CL 220/02	250	K070159 FLS 250 K070560 FLS 250 P	P171590 CR 220	K070164 FLS 250/6 K070419 FLS 250/6 P	P171595 CR 220/6	160	K070163 FLS 250/3 K070418 FLS 250/3 P	P171594 CR 220/3	K070162 FLS 250/1 K070417 FLS 250/1 P	P171593 CR 220/1	140	K070161 FLS 250/03 K070559 FLS 250/03 P	P171592 CR 220/03	K070160 FLS 250/02 K070558 FLS 250/02 P	P171591 CR 220/02	330	K070171 FLS 330 K070420 FLS 330 P	P171560 CR 330	K070176 FLS 330/6 K070425 FLS 330/6 P	P171565 CR 330/6	220	K070175 FLS 330/3 K070424 FLS 330/3 P	P171564 CR 330/3	K070174 FLS 330/1 K070423 FLS 330/1 P	P171563 CR 330/1	180	K070173 FLS 330/03 K070422 FLS 330/03 P	P171562 CR 330/03	K070172 FLS 330/02 K070421 FLS 330/02 P	P171561 CR 330/02	500	K070183 FLS 500 K070426 FLS 500 P	P171566 CR 500	K070188 FLS 500/6 K070431 FLS 500/6 P	P171571 CR 500/6	400	K070187 FLS 500/3 K070430 FLS 500/3 P	P171570 CR 500/3	K070186 FLS 500/1 K070429 FLS 500/1 P	P171569 CR 500/1	350	K070185 FLS 500/03 K070428 FLS 500/03 P	P171568 CR 500/03	K070184 FLS 500/02 K070427 FLS 500/02 P	P171567 CR 500/02
	WITH FLANGE	250	K070195 FLSF 250 K070432 FLSF 250 P	P171590 CR 220	K070200 FLSF 250/6 K070433 FLSF 250/6 P	P171595 CR 220/6	160	K070199 FLSF 250/3 K070564 FLSF 250/3 P	P171594 CR 220/3	K070198 FLSF 250/1 K070563 FLSF 250/1 P	P171593 CR 220/1	140	K070197 FLSF 250/03 K070562 FLSF 250/03 P	P171592 CR 220/03	K070196 FLSF 250/02 K070561 FLSF 250/02 P	P171591 CR 220/02	330	K070207 FLSF 330 K070569 FLSF 330 P	P171560 CR 330	K070212 FLSF 330/6 K070568 FLSF 330/6 P	P171565 CR 330/6	220	K070211 FLSF 330/3 K070434 FLSF 330/3 P	P171564 CR 330/3	K070210 FLSF 330/1 K070567 FLSF 330/1 P	P171563 CR 330/1	180	K070209 FLSF 330/03 K070566 FLSF 330/03 P	P171562 CR 330/03	K070208 FLSF 330/02 K070565 FLSF 330/02 P	P171561 CR 330/02	500	K070219 FLSF 500 K070571 FLSF 500 P	P171566 CR 500	K070224 FLSF 500/6 K070439 FLSF 500/6 P	P171571 CR 500/6	400	K070223 FLSF 500/3 K070438 FLSF 500/3 P	P171570 CR 500/3	K070222 FLSF 500/1 K070437 FLSF 500/1 P	P171569 CR 500/1	350	K070221 FLSF 500/03 K070436 FLSF 500/03 P	P171568 CR 500/03	K070220 FLSF 500/02 K070435 FLSF 500/02 P	P171567 CR 500/02	600	K070231 FLSF 800 K070440 FLSF 800 P	P171578 CR 800	K070236 FLSF 800/6 K070445 FLSF 800/6 P	P171583 CR 800/6	500	K070235 FLSF 800/3 K070444 FLSF 800/3 P	P171582 CR 800/3	K070234 FLSF 800/1 K070443 FLSF 800/1 P	P171581 CR 800/1	400	K070233 FLSF 800/03 K070442 FLSF 800/03 P	P171580 CR 800/03	K070232 FLSF 800/02 K070441 FLSF 800/02 P	P171579 CR 800/02																																																											

IN BLUE FILTERS ASSY WITH PREDISPOSITION SERIE FLK-FLS  
WHEN THE FILTER ASSY HAVE PREDISPOSITION  
IT IS NECESSARY TO MOUNT THE INDICATOR (SEE PAGE 110)

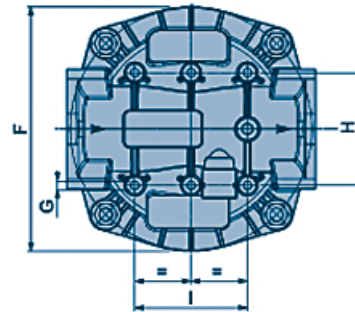
## Specifications



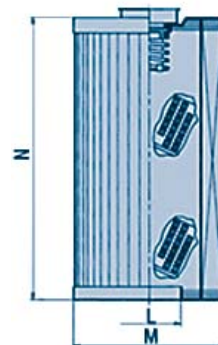
SIZE 40-80-130-180



SIZE 200



SIZE 250-330-500-600



DIMENSIONS ASSY (mm)										DIMENSIONS ELEMENT (mm)		
A	B	C	D	E	F	G	H	I	Kg.	L	M	N
G 1/2	120	21	139	90	116	M8	54	-	1.5	29	70	75
G 3/4	120	24	193	90	116	M8	54	-	1.8	29	70	128
G 1	140	31	250	110	135	M8	68	-	2.8	41	95	169
G 1 1/4	140	31	284	110	135	M8	68	-	3.0	41	95	203
G 1 1/4	152	30	237	124	152	M8	60	90	2.9	46	112	180
G 1 1/2	212	44	224	170	208	M8	96	96	6.0	65	140	136
G 1 1/2	212	44	294	170	208	M8	96	96	6.2	65	140	203
G 2	212	44	294	170	208	M8	96	96	7.2	65	140	203
FLANGE SAE 1 1/2	212	44	224	170	208	M8	96	96	6.0	65	140	136
FLANGE SAE 1 1/2	212	44	294	170	208	M8	96	96	6.2	65	140	203
FLANGE SAE 2	212	44	294	170	208	M8	96	96	7.2	65	140	203
FLANGE SAE 2	212	44	505	170	208	M8	96	96	9.5	65	140	400



# FLK-FLS

In-line return filters  
with take apart element

## Service Indicators

IN-LINE  
RETURN FILTERS



### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR

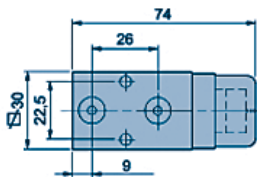
**P171961** (501.02)

**P171963** (501.04) with thermostat 30°C

Setting: 140 kPa (1,4 bar)

Max. values: 30 ACV - 30 DCV - 0,5 A res. and ind.

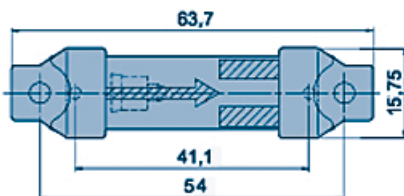
Protection class: IP 65 - Cable clamp: PG 11



### VISUAL DIFFERENTIAL PRESSURE INDICATOR

**P171950** (502.04)

Setting: 140 kPa (1,4 bar)

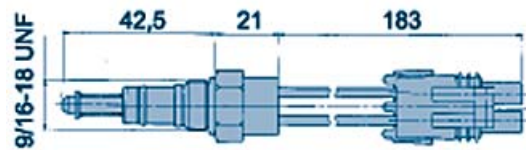


### VISUAL DIFFERENTIAL PRESSURE INDICATOR

**P162696** (506.05)

Setting: 140 kPa (1,4 bar)

ONLY FOR SIZES 250-330-500-600



### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR 2-WIRES, PACKARD CONNECTOR

**P171143** N.O. contacts

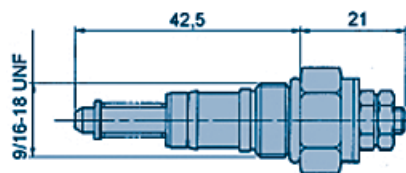
Setting: 140 kPa (1,4 bar)



### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR 3-WIRES, COMPATIBLE WITH MICROPROCESSORS

**P173944**

Setting: 140 kPa (1,4 bar)



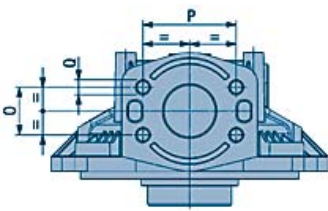
### VISUAL DIFFERENTIAL PRESSURE INDICATOR

**P162400** N.O. contacts

**P163839** N.C. contacts

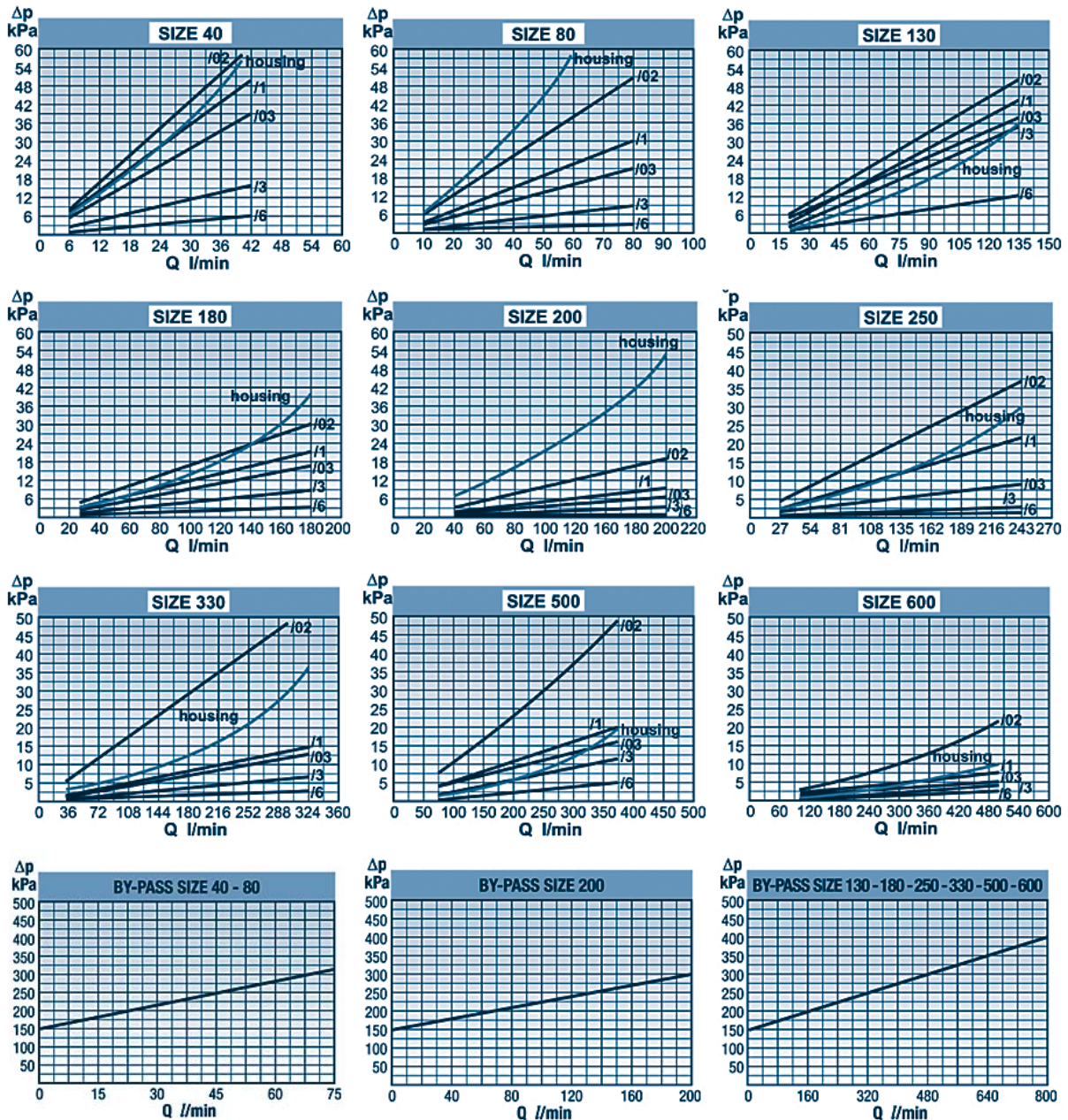
Setting: 140 kPa (1,4 bar)

## SAE Flanges 3000



FLANGE SAE J518 3000 PSI	O	P	Q
1 1/2	35,8	69,8	M12
2	42,9	77,8	M12

## Performance Curves



# FLK-FLS

In-line return filters  
with take apart element

## FLK 90

---



- Operating pressure at 3000 kPa (30 bar).
- Flow rate 100 lpm

## FLK 110

---



- Operating pressure at 2000 kPa (20 bar).
- Flow rate 140 lpm



# FBK-FRCA

In-line return spin-on filters,  
up to 10 bar

IN-LINE  
RETURN FILTERS



## Technical Data

- Operating pressure at 1000 kPa (10 bar).
- Static pressure testing at 1500 kPa (15 bar).
- By-pass valve setting 150 kPa (1,5 bar) or 170 kPa (1,7 bar) per ISO 3968.
- Operating temperature -20 +100°C.
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO 3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1.

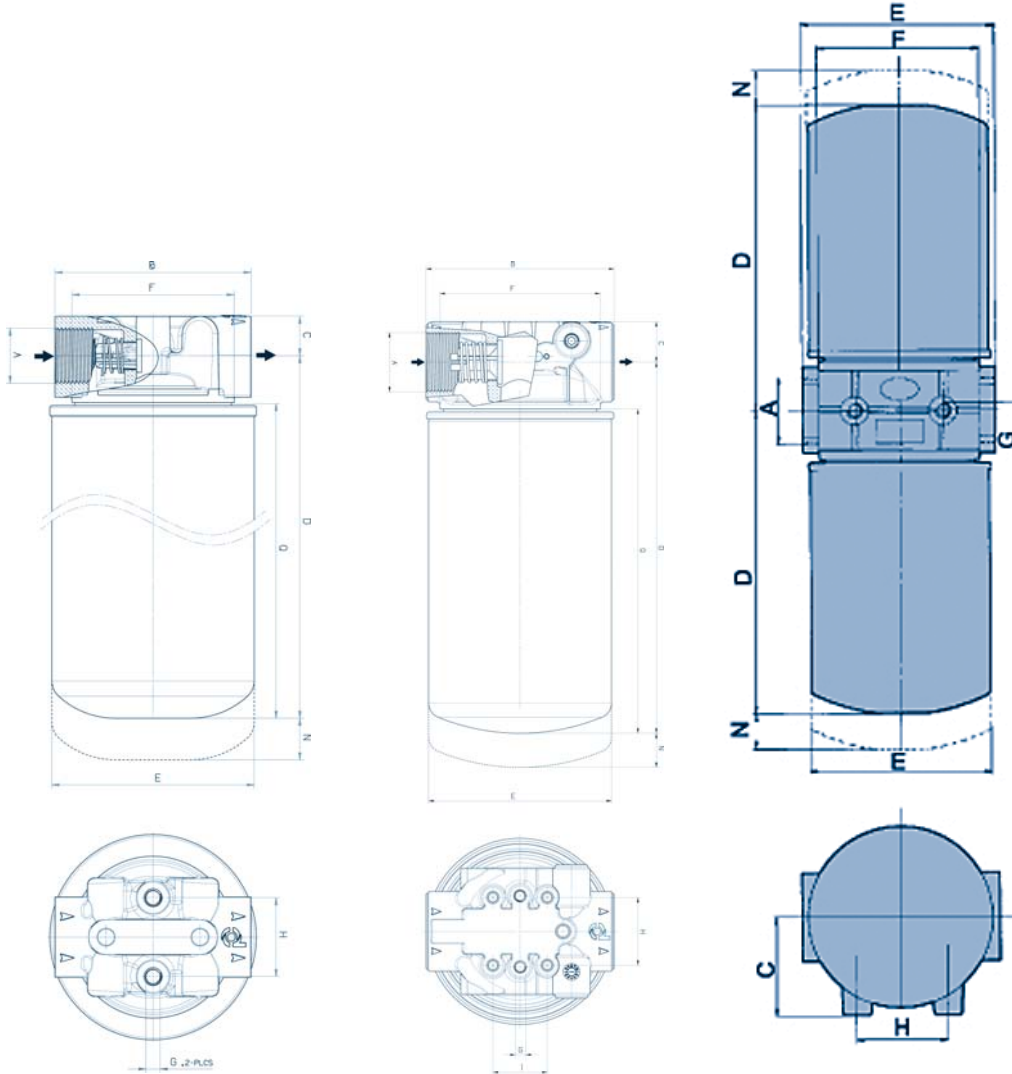
## Filter Elements

- Wire mesh 60-90 micron.
- Synteq® synthetic media with 10-25 micron.
- Cellulose media with 10-30 micron, reinforced with wire mesh.
- Collapse resistance 1000 kPa (10 bar) per ISO 2941.



## Specifications

IN-LINE  
RETURN FILTERS



SIZE 60-80 <sup>2</sup>

SIZE 160-200 <sup>1</sup>

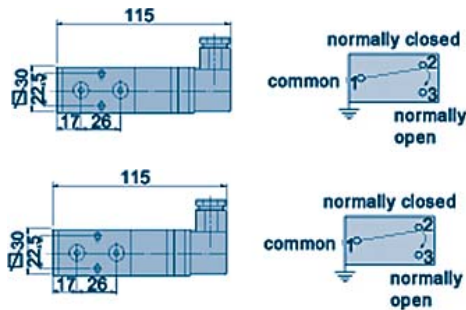
SIZE 380-400 <sup>2</sup>

<sup>1</sup> By-pass valve setting 150 kPa (1,5 bar)

<sup>2</sup> By-pass valve setting 170 kPa (1,7 bar)

FLOW l/min	/6		FLOW l/min	/3		FLOW l/min	/1		FLOW l/min	/03		/02		
	TYPE	ELEMENT		TYPE	ELEMENT		TYPE	ELEMENT		TYPE	ELEMENT	TYPE	ELEMENT	
	WIRE MESH MEDIA		CELLULOSE MEDIA								SYNTHETIC MEDIA			
60	K040635 FRCA 60/6	P171607 CA 60/6	60	K040634 FRCA 60/3	P171606 CA 60/3	50	K040633 FRCA 60/1	P550268 CA 60/1	40	K040632 FRCA 60/03	P171604 CA 60/03	K040631 FRCA 60/02	P171602 CA 60/02	
80	K040645 FRCA 80/6	P171612 CA 80/6	70	K040644 FRCA 80/3	P171611 CA 80/3	60	K040643 FRCA 80/1	P171610 CA 80/1	50	K040642 FRCA 80/03	P171609 CA 80/03	K040641 FRCA 80/02	P171608 CA 80/02	
160	K051155 FRCA 160/6	P171617 CA 160/6	150	K051154 FRCA 160/3	P171616 CA 160/3	140	K051153 FRCA 160/1	P550148 CA 160/1	120	K051152 FRCA 160/03	P171614 CA 160/03	K051151 FRCA 160/02	P171613 CA 160/02	
200	K051165 FRCA 200/6	P171622 CA 200/6	190	K051164 FRCA 200/3	P171621 CA 200/3	160	K051163 FRCA 200/1	P171620 CA 200/1	140	K051162 FRCA 200/03	P171619 CA 200/03	K051161 FRCA 200/02	P171618 CA 200/02	
380	K250035 FRCA 380/6	P171617 CA 160/6	340	K250034 FRCA 380/3	P171616 CA 160/3	300	K250033 FRCA 380/1	P550148 CA 160/1	280	K250032 FRCA 380/03	P171614 CA 160/03	K250031 FRCA 380/02	P171613 CA 160/02	
400	K250040 FRCA 400/6	P171622 CA 200/6	360	K250039 FRCA 400/3	P171621 CA 200/3	320	K250038 FRCA 400/1	P171620 CA 200/1	300	K250037 FRCA 400/03	P171619 CA 200/03	K250036 FRCA 400/02	P171618 CA 200/02	

## Service Indicators



### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR

**P171961** (501.02)

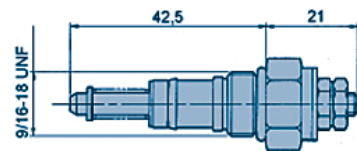
**P171963** (501.04)

Setting: 120 kPa (1,2 bar)

Max. values: 30 ACV - 30 DCV - 0,5 A res. and ind.

Protection class: IP 65

Cable clamp: PG 11

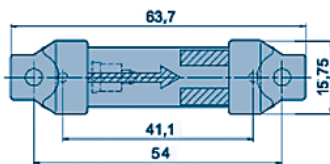


### VISUAL DIFFERENTIAL PRESSURE INDICATOR

**P162400** N.O. contacts

**P163839** N.C. contacts

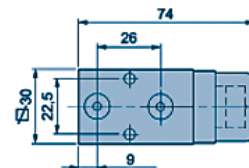
Setting: 140 kPa (1,4 bar)



### VISUAL DIFFERENTIAL PRESSURE INDICATOR

**P162696** (506.05)

Setting: 140 kPa (1,4 bar)



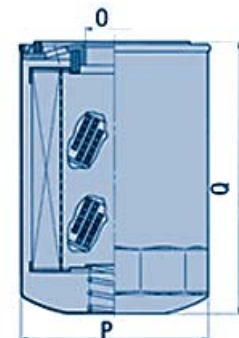
### VISUAL DIFFERENTIAL PRESSURE INDICATOR

**P171950** (502.04)

Setting: 140 kPa (1,4 bar)

- FRCA 60/80** > Use visual indicator **P162696**
- FRCA 160/200** > Use electrical indicator **P171961 - P162400**  
Use visual indicator **P171950 - P162696**
- FRCA 380/400** > Use electrical indicator **P171961**  
Use visual indicator **P171950 - P162696**

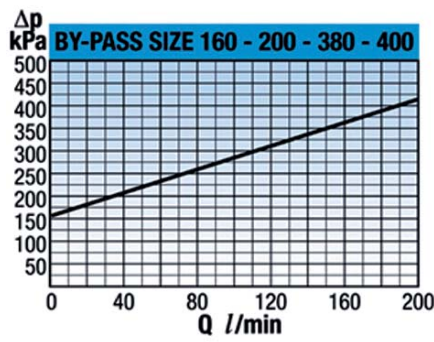
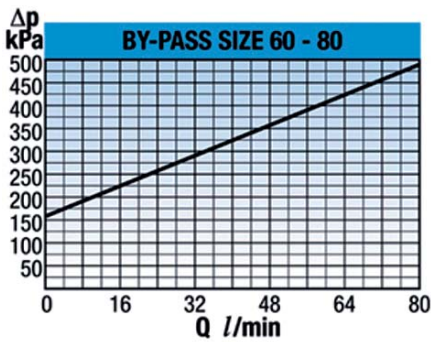
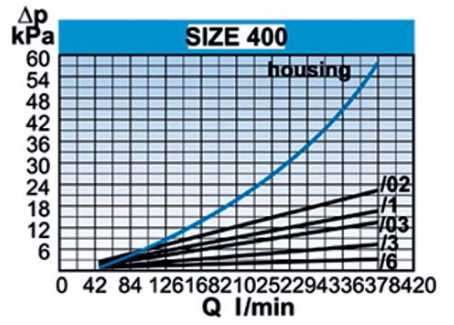
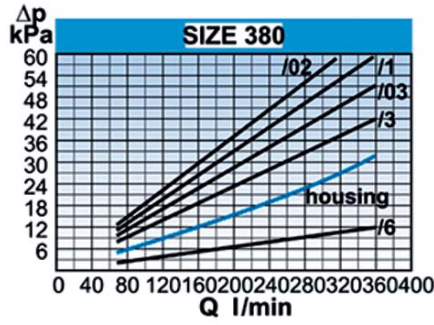
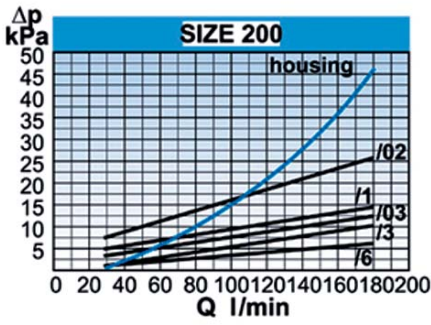
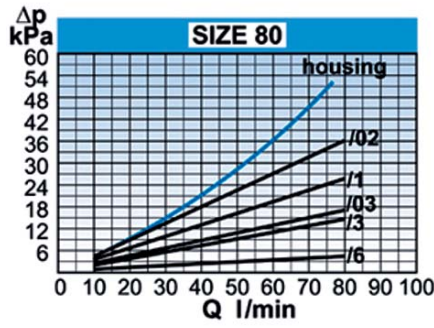
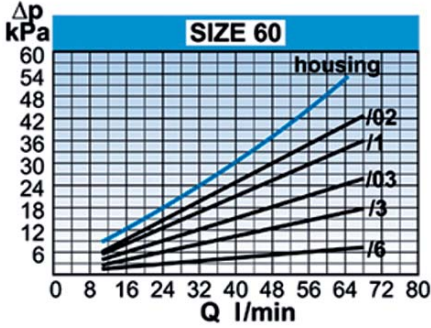
DIMENSIONS ASSY (mm)										DIMENSIONS ELEMENT (mm)		
A	B	C	D	E	F	G	H	N	Kg.	O	P	Q
G 3/4	95	19	172	96	75	M8	38	20	1	G 3/4	96	146
G 3/4	95	19	232	96	75	M8	38	20	1,1	G 3/4	96	209
G 1 1/4	132	28	215	126	112	M8	50	24	2	G 1 1/4	128	181
G 1 1/4	132	28	263	126	112	M8	50	24	2	G 1 1/4	128	236
G 1 1/2	138	70	218	126	112	M10	65	24	4	G 1 1/4	128	181
G 1 1/2	138	70	273	126	112	M10	65	24	4	G 1 1/4	128	236



IN-LINE RETURN FILTERS

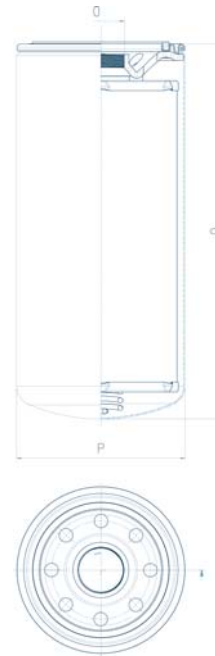
**Performance Curves**

IN-LINE  
RETURN FILTERS



## Specifications

FLOW l/min	<b>/3</b>	FLOW l/min	<b>/02</b>	DIMENSIONS (mm)		
	CELLULOSE MEDIA		SYNTHETIC MEDIA	O	P	Q
230	<b>P764409</b> CA 250/3	170	<b>P763668</b> CA 250/02	1" ½ -16UN-2B	136	306
200	<b>P764410</b> CA 220/3	150	<b>P764411</b> CA 220/02	1" ½ -16UN-2B	136	236

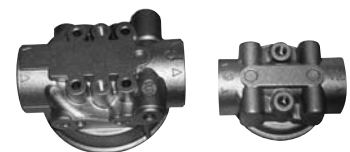


IN-LINE  
RETURN FILTERS

## Heads

Filter assies aren't delivered predisposition, heads are.  
Using indicators is mandatory, as they are not tapped/plugged.

- Head FRCA 60/80      P763450 to use with visual indicator P162696
- Head FRCA 60/80      Standard = P173441 (no predisposition)
- Head FRCA 60/80      P175017 with predisposition G 1/8"
- Head FRCA 160/200    Standard = P176846 (no predisposition)
- Head FRCA 160/200    P760071 to use with electrical indicator P171961 - visual indicator P171950
- Head FRCA 160/200    P761314 with predisposition G 1/8"
- Head FRCA 160/200    P764407 to use with P162400 indicator
- Head FRCA 160/200    P764408 to use with P162696
- Head FRCA 250/220    Standard: P764412 (no predisposition)
- Head FRCA 250/220    Standard: P764413 with predisposition G 1/8"
- Head FRCA 250/220    P764414 to use with P162400
- Head FRCA 250/220    P764415 to use with P162696
- Head FRCA 380/400    P761264 to use with electrical indicator P171961









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# SUCTION FILTERS





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# IN TANK SUCTION FILTERS





# *PXX-FIOA*

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**In tank threaded suction strainers**



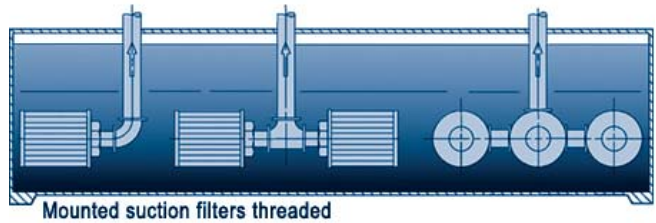
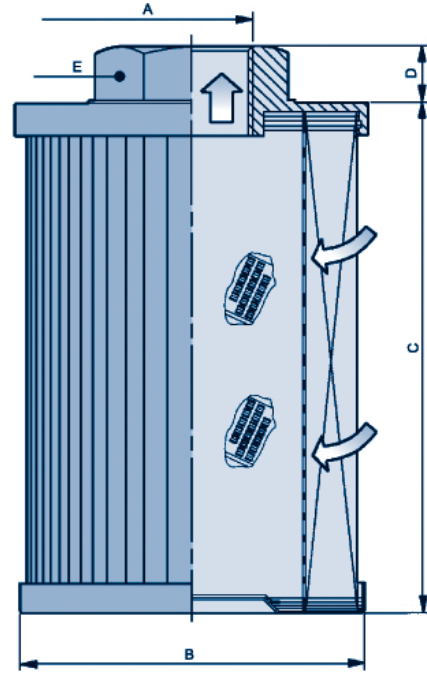
IN TANK  
SUCTION FILTERS

### Technical Data

- Operating temperature -20 +100°C.
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO 3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1.

### Filter Elements

- Wire mesh 60-90 micron.
- Cellulose media 30 micron.
- Collapse resistance 500 kPa (5 bar) per ISO 2941.



FLOW l/min	/9		/6		/3	
	WIRE MESH MEDIA				CELLULOSE MEDIA	
	TYPE	TYPE	FLOW l/min	$\beta_{36(c)}=1000$		TYPE
10	P171861 FIOA 20	P171863 FIOA 20/6	5	P171862 FIOA 20/3		
17	P171865 FIOA 35	P171867 FIOA 35/6	9	P171866 FIOA 35/3		
25	P171869 FIOA 50	P171871 FIOA 50/6	13	P171870 FIOA 50/3		
43	P171873 FIOA 85	P171875 FIOA 85/6	20	P171874 FIOA 85/3		
45	P171877 FIOA 90	P171879 FIOA 90/6	25	P171878 FIOA 90/3		
65	P171885 FIOA 130	P171887 FIOA 130/6	35	P171886 FIOA 130/3		
80	P763478 FIOA 160	P764370 FIOA 160/6	40	P764371 FIOA 160/3		
85	P171889 FIOA 175	P171891 FIOA 175/6	45	P171890 FIOA 175/3		
90	P172452 FIOA 180	P172454 FIOA 180/6	50	P172453 FIOA 180/3		
110	P760151 FIOA 220	P760173 FIOA 220/6	55	P760175 FIOA 220/3		
116	P171893 FIOA 230	P171895 FIOA 230/6	60	P171894 FIOA 230/3		
186	P171897 FIOA 360	P171899 FIOA 360/6	90	P171898 FIOA 360/3		
250	P171901 FIOA 500	P171903 FIOA 500/6	120	P171902 FIOA 500/3		
300	P171905 FIOA 600	P171907 FIOA 600/6	150	P171906 FIOA 600/3		
400	P171909 FIOA 800	P171911 FIOA 800/6	200	P171910 FIOA 800/3		

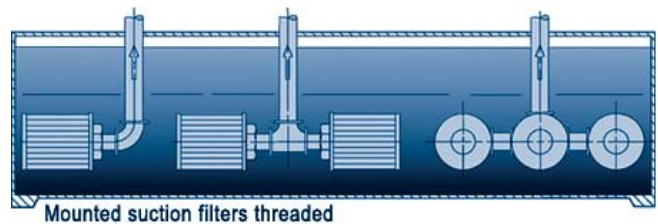
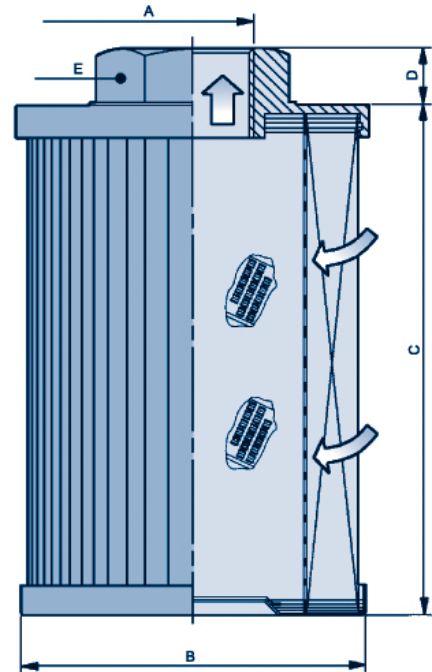
DIMENSIONS ELEMENT (mm)					
A	B	C	D	S	Kg.
G 3/8	52	68	9	22	0,10
G 1/2	69	76	12	27	0,16
G 3/4	75	83	12	36	0,20
G 1	95	83	14	46	0,32
G 1	75	131	10	46	0,50
G 1 1/4	95	172	12	60	0,68
G 1 1/2	86	130	12	60	0,65
G 1 1/2	140	98	15	60	0,70
G 1 1/2	95	205	12	60	0,75
G 2	101	205	14	80	0,80
G 2	140	138	15	80	1,00
G 2	140	205	15	80	1,20
G 2	140	301	15	80	1,60
G 2 1/2	140	301	16	106	1,60
G 3	140	301	16	106	1,60

### Technical Data

- Operating temperature -20 +100°C.
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO 3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded NPT.

### Filter Elements

- Wire mesh 250 micron.
- Collapse resistance 500 kPa (5 bar) per ISO 2941.

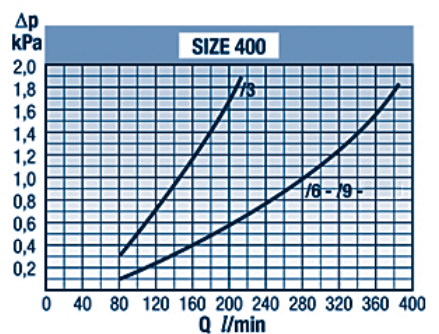
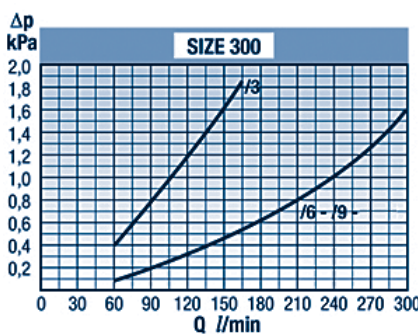
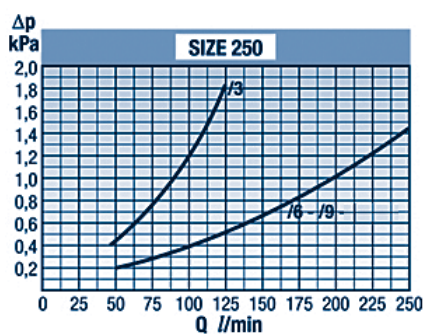
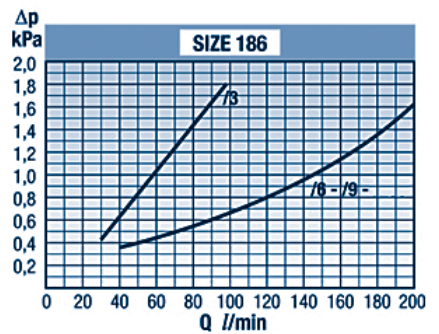
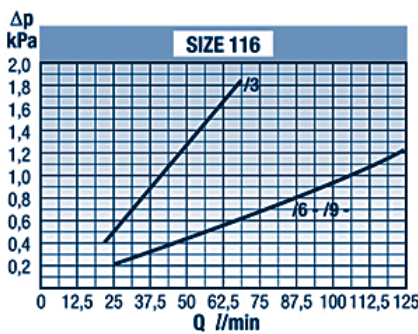
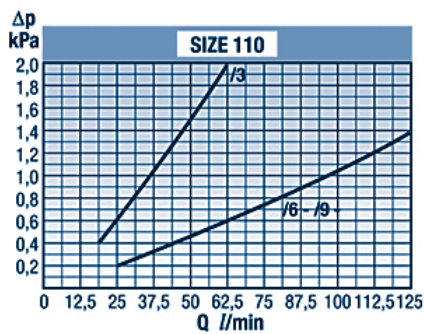
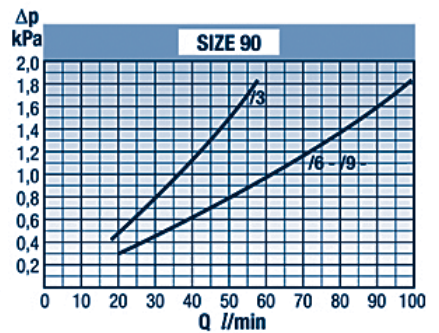
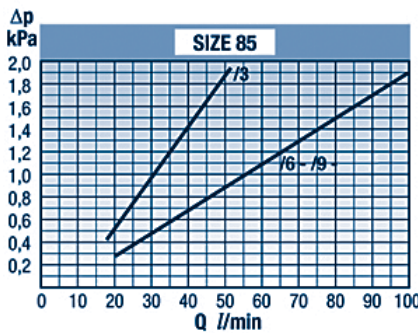
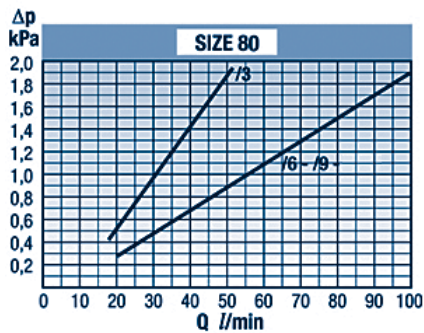
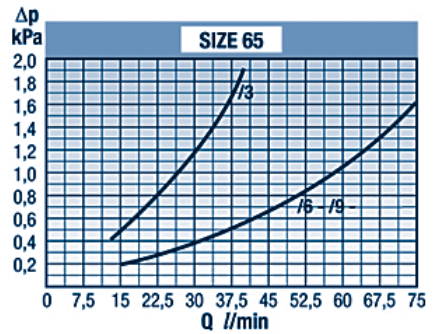
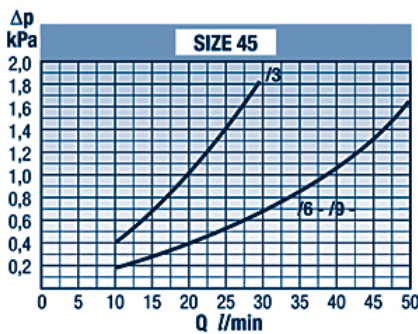
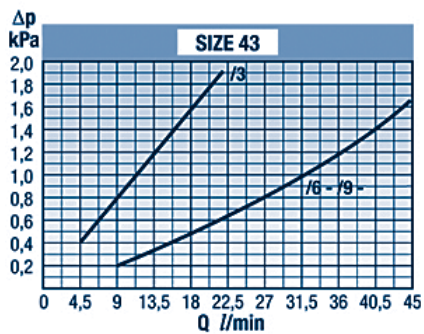
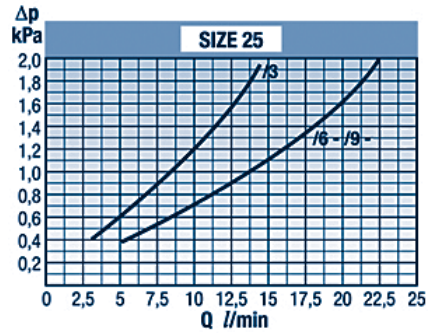
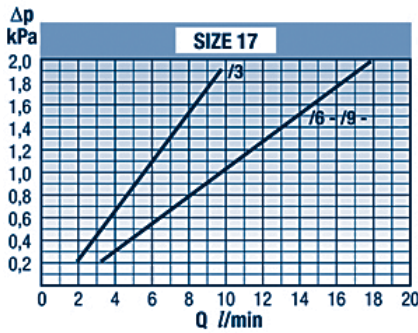
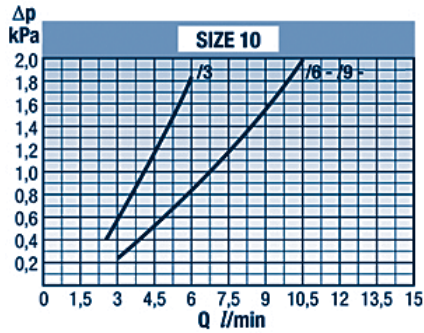


IN TANK  
SUCTION FILTERS

FLOW l/min	/250 WIRE MESH MEDIA		DIMENSIONS ELEMENT (mm)					
	TYPE		A	B	C	D	S	Kg.
10			3/8	52	68	9	22	0,10
17			1/2	69	76	12	27	0,16
25		P175334	3/4 NPT	75	83	12	36	0,20
43		P175335	1 NPT	95	83	14	46	0,32
45		P175336	1 NPT	75	131	10	46	0,50
65		P175337	1 1/4 NPT	95	172	12	60	0,68
85		P175340	1 1/2 NPT	86	130	12	60	0,65
90		P175338	1 1/2 NPT	140	98	15	60	0,70
110			2	95	205	12	60	0,75
116			2	101	205	14	80	0,80
186			2	140	138	15	80	1,00
250		P175339	2 NPT	140	205	15	80	1,20
300		P175342	2 1/2 NPT	140	301	15	80	1,60
400		P175343	3 NPT	140	301	16	106	1,60



### Performance Curves



IN TANK  
SUCTION FILTERS



# FHK-FIR

**In tank filters  
for stationary application**



IN TANK  
SUCTION FILTERS

## Technical Data

- Operating pressure at 1000 kPa (10 bar).
- Static pressure testing at 1500 kPa (15 bar).
- By-pass valve not working in suction.
- Operating temperature -20 +100°C.
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1.
- Not suitable for service indicator, predisposition working only for return application.

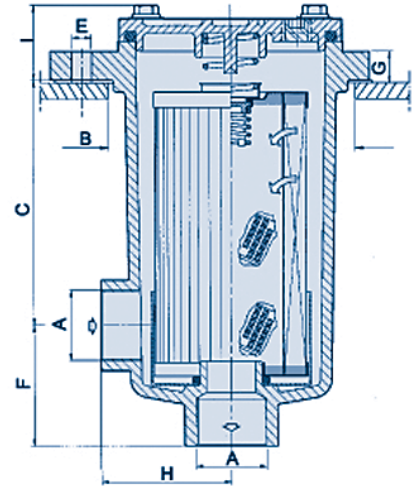
## Filter Elements

- Wire mesh 60-90 micron.
- Synteq® synthetic media with 10-25 micron reinforced with wire mesh.
- Cellulose media with 10-30 micron, reinforced with wire mesh.
- Collapse resistance 1000 kPa (10 bar) per ISO 2941.
- Replacement element includes spring and O-ring seal.

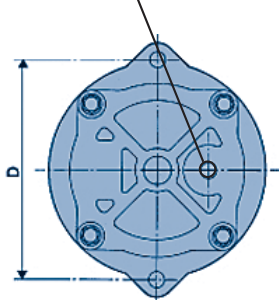
# FHK-FIR

In tank suction filters  
for stationary application

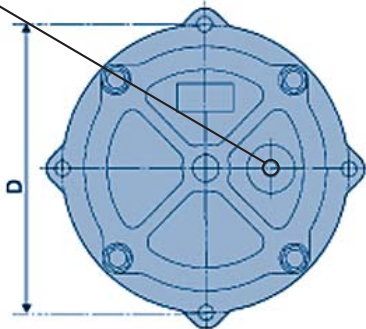
## Specifications



Plugged Predisposition



SIZE 15-30-50



SIZE 90-170-250

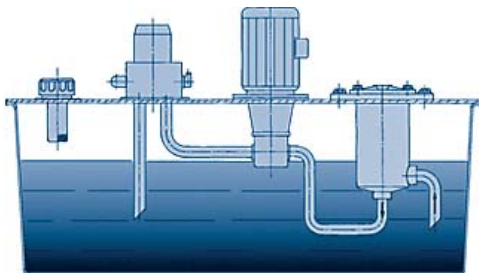
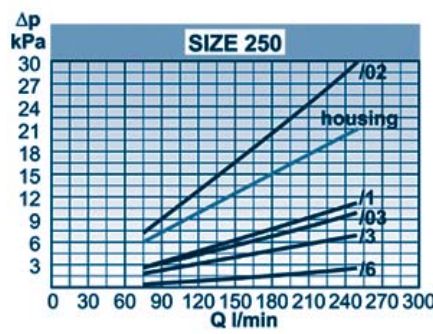
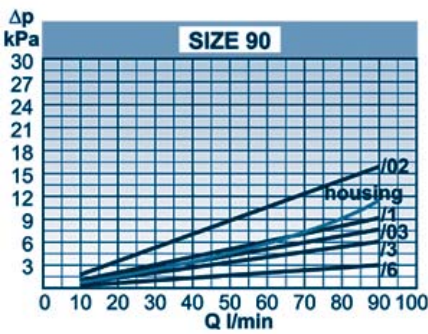
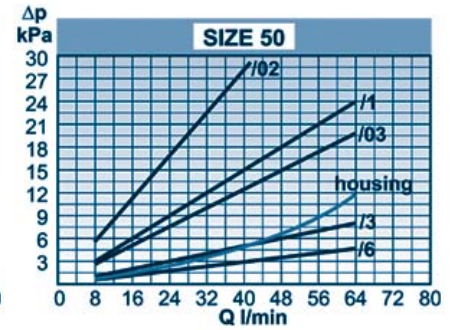
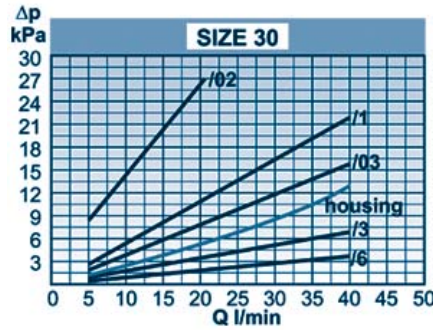
FLOW l/min	/9		/6
	WIRE MESH MEDIA		
	TYPE	ELEMENT	ELEMENT
15	K035009 FIR 30	P171500 CR 30	P171505 CR 30/6
30	K040560 FIR 60	P171524 CR 60	P171529 CR 60/6
50	K040566 FIR 100	P171530 CR 100	P171535 CR 100/6
90	K051134 FIR 180	P171536 CR 180	P171541 CR 180/6
250	K070117 FIR 500	P171566 CR 500	P171571 CR 500/6

FLOW l/min	/3		/1	
	CELLULOSE MEDIA			
	$\beta_{50(c)}=1000$		$\beta_{36(c)}=1000$	
FLOW l/min	TYPE	ELEMENT	TYPE	ELEMENT
20	K030245 FIR 30/3	P171504 CR 30/3	K030244 FIR 30/1	P171503 CR 30/1
40	K040564 FIR 60/3	P171528 CR 60/3	K040563 FIR 60/1	P171527 CR 60/1
65	K040570 FIR 100/3	P171534 CR 100/3	K040569 FIR 100/1	P171533 CR 100/1
120	K051138 FIR 180/3	P171540 CR 180/3	K051137 FIR 180/1	P171539 CR 180/1
400	K070121 FIR 500/3	P171570 CR 500/3	K070120 FIR 500/1	P171569 CR 500/1

FLOW l/min	/03		/02	
	SYNTHETIC MEDIA			
	$\beta_{23(c)}=1000$		$\beta_{11(c)}=1000$	
FLOW l/min	ELEMENT	TYPE	ELEMENT	
15	P171502 CR 30/03	K035010 FIR 30/02	P171501 CR 30/02	
35	P171526 CR 60/03	K040561 FIR 60/02	P171525 CR 60/02	
60	P171532 CR 100/03	K040567 FIR 100/02	P171531 CR 100/02	
110	P171538 CR 180/03	K051135 FIR 180/02	P171537 CR 180/02	
350	P171568 CR 500/03	K070118 FIR 500/02	P171567 CR 500/02	



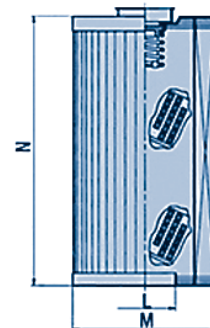
## Performance Curves



Suction filter location

DIMENSIONS ASSY (mm)									
A	B	C	D	E	F	G	H	I	Kg.
G 1/2	88	61	100	7	40	11	49	29	0,8
G 3/4	110	68	126	9	52	14	59	36	1,3
G 1	110	110	126	9	54	14	59	36	1,5
G 1 1/4	156	176	175	9	63	18	83	48	3,0
G 2	204	168	220	9	78	20	108	53	5,5

DIMENSIONS ELEMENT (mm)		
L	M	N
26	52	67
29	70	82
29	70	128
41	95	203
65	140	203



### IMPORTANT NOTES:

- 1) To foresee hole diameter on top of the tank to be  $\phi B + 2\text{mm}$
- 2) To maintain the filter outlet (ref.  $\phi F$ ) well below the oil level to avoid foam formation.





# *Replacement elements for FDK-FIRDA Serie*

**In tank suction filters for stationary application,  
with double inlet connection**



IN TANK  
SUCTION FILTERS

## **Filter Elements**

- Wire mesh 60-90 micron.
- Synteq® synthetic media with 10-25 micron.
- Cellulose media reinforced with wire mesh 10-30 micron.
- Collapse resistance 1000 kPa (10 bar) per ISO 2941.

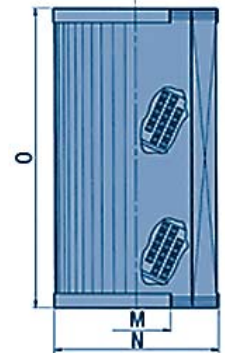
# Replacement elements for FDK-FIRDA Serie

In tank suction filters for stationary application, with double inlet connection

## Specifications

FLOW l/min	/9		/6		FLOW l/min	/3		/1		FLOW l/min	/03		/02		DIMENSIONS ELEMENT (mm)		
	WIRE MESH MEDIA					CELLULOSE MEDIA					SYNTHETIC MEDIA						
ELEMENT	ELEMENT	$\beta_{50(e)}=1000$	$\beta_{38(e)}=1000$	ELEMENT	ELEMENT	$\beta_{23(e)}=1000$	$\beta_{11(e)}=1000$	ELEMENT	ELEMENT	M	N	O					
15	P171643 C 25	P171649 C 25/6	20	P171647 C 25/3	P171646 C 25/1	15	P171645 C 25/03	P171644 C 25/02	26/29	50	70						
30	P171650 C 40	P171656 C 40/6	40	P171654 C 40/3	P171653 C 40/1	30	P171652 C 40/03	P171651 C 40/02	35	70	85						
60	P171657 C 100	P171663 C 100/6	80	P171661 C 100/3	P171660 C 100/1	60	P171659 C 100/03	P171658 C 100/02	35	70	130						
150	P171664 C 250	P171670 C 250/6	200	P171668 C 250/3	P171667 C 250/1	180	P171666 C 250/03	P171665 C 250/02	52	100	210						
300	P171671 C 630	P171677 C 630/6	400	P171675 C 630/3	P171674 C 630/1	350	P171673 C 630/03	P171672 C 630/02	76	137	250						

IN TANK  
SUCTION FILTERS

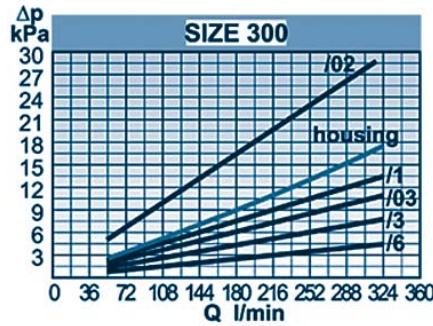
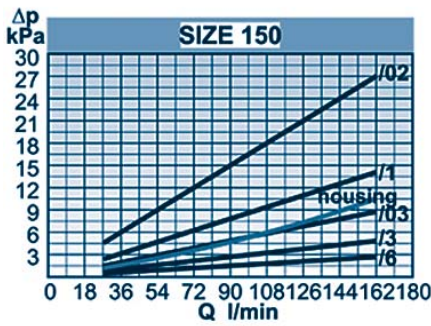
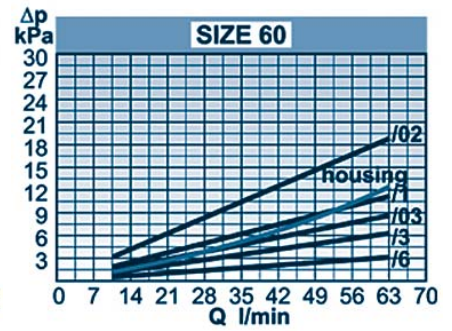
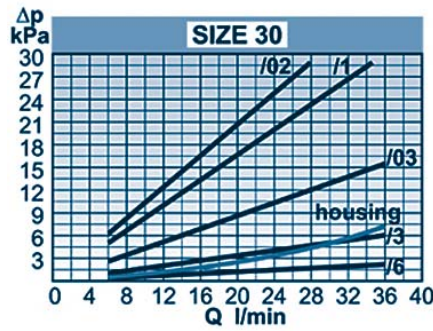
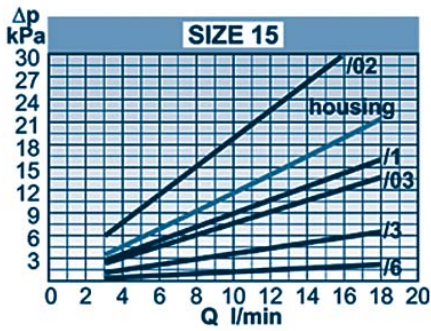


FDK-FIRDA SERIE

# Replacement elements for FDK-FIRDA Serie

In tank suction filters for stationary application, with double inlet connection

## Performance Curves









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# IN-LINE SUCTION FILTERS



# FLK-FLA

**In-line suction filters  
with take apart element**



IN-LINE  
SUCTION FILTERS

## Technical Data

- Operating pressure at 3000 kPa (30 bar).
- Static pressure testing at 4500 kPa (45 bar).
- By-pass valve setting 30 kPa (0,3 bar) per ISO 3968.
- Operating temperature -20 +100°C.
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO 3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1 or flanged per SAE J 518 - 3000 PSI.

## Filter Elements

- Wire mesh 60-90 micron.
- Synteq® synthetic media with 10-25 micron.
- Cellulose media 10-30 micron.
- Collapse resistance 1000 kPa (10 bar) per ISO 2941.
- Replacement element includes spring and O-ring seal.



# FLK-FLA

## In-line suction filters with take apart element

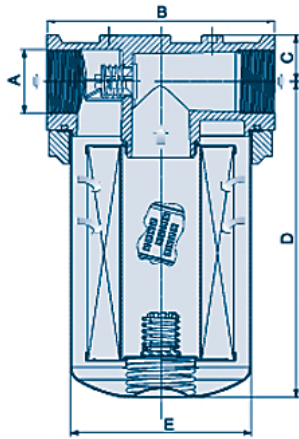
### Specifications

IN-LINE  
SUCTION FILTERS

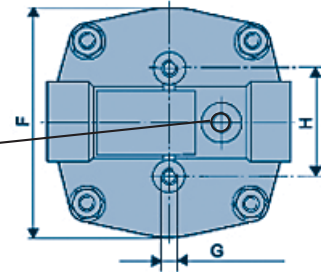
FLOW l/min	/9		/6		FLOW l/min	/3		/1		FLOW l/min	/03		/02	
	WIRE MESH MEDIA					CELLULOSE MEDIA					SYNTHETIC MEDIA			
	TYPE	ELEMENT	TYPE	ELEMENT		$\beta_{30(c)}=1000$		$\beta_{38(c)}=1000$			$\beta_{23(c)}=1000$		$\beta_{11(c)}=1000$	
20	K030253 FLA 50 K030361 FLA 50 P	P171518 CR 50	K030258 FLA 50/6 K030364 FLA 50/6 P	P171523 CR 50/6	15	K030257 FLA 50/3 K030363 FLA 50/3 P	P171522 CR 50/3	K030256 FLA 50/1 K030362 FLA 50/1 P	P171521 CR 50/1	10	P171520 CR 50/03	K030254 FLA 50/02 K030355 FLA 50/02 P	P171519 CR 50/02	
40	K030265 FLA 100 K030356 FLA 100 P	P171530 CR 100	K030270 FLA 100/6 K030360 FLA 100/6 P	P171535 CR 100/6	30	K030269 FLA 100/3 K030359 FLA 100/3 P	P171534 CR 100/3	K030268 FLA 100/1 K030358 FLA 100/1 P	P171533 CR 100/1	25	P171532 CR 100/03	K030266 FLA 100/02 K030357 FLA 100/02 P	P171531 CR 100/02	
65	K040590 FLA 150 K040932 FLA 150 P	P171584 CR 125	K040595 FLA 150/6 K040936 FLA 150/6 P	P171589 CR 125/6	55	K040594 FLA 150/3 K040935 FLA 150/3 P	P171588 CR 125/3	K040593 FLA 150/1 K040934 FLA 150/1 P	P171587 CR 125/1	45	P171586 CR 125/03	K040591 FLA 150/02 K040933 FLA 150/02 P	P171585 CR 125/02	
90	K040602 FLA 180 K040937 FLA 180 P	P171536 CR 180	K040607 FLA 180/6 K040941 FLA 180/6 P	P171541 CR 180/6	60	K040606 FLA 180/3 K040940 FLA 180/3 P	P171540 CR 180/3	K040605 FLA 180/1 K040939 FLA 180/1 P	P171539 CR 180/1	55	P171538 CR 180/03	K040603 FLA 180/02 K040603 FLA 180/02 P	P171537 CR 180/02	
125	K070153 FLA 250 K070396 FLA 250 P	P171590 CR 220	K070158 FLA 250/6 K070399 FLA 250/6 P	P171595 CR 220/6	80	K070157 FLA 250/3 K070398 FLA 250/3 P	P171594 CR 220/3	K070156 FLA 250/1 K070397 FLA 250/1 P	P171593 CR 220/1	70	P171592 CR 220/03	K070154 FLA 250/02 K070496 FLA 250/02 P	P171591 CR 220/02	
170	K070165 FLA 330 K070400 FLA 330 P	P171560 CR 330	K070170 FLA 330/6 K070404 FLA 330/6 P	P171565 CR 330/6	110	K070169 FLA 330/3 K070403 FLA 330/3 P	P171564 CR 330/3	K070168 FLA 330/1 K070402 FLA 330/1 P	P171563 CR 330/1	90	P171562 CR 330/03	K070166 FLA 330/02 K070401 FLA 330/02 P	P171561 CR 330/02	
250	K070177 FLA 500 K070405 FLA 500 P	P171566 CR 500	K070182 FLA 500/6 K070410 FLA 500/6 P	P171571 CR 500/6	200	K070181 FLA 500/3 K070409 FLA 500/3 P	P171570 CR 500/3	K070180 FLA 500/1 K070408 FLA 500/1 P	P171569 CR 500/1	170	P171568 CR 500/03	K070178 FLA 500/02 K070406 FLA 500/02 P	P171567 CR 500/02	
125	K070189 FLAF 250 K070503 FLAF 250 P	P171590 CR 220	K070194 FLAF 250/6 K070502 FLAF 250/6 P	P171595 CR 220/6	80	K070193 FLAF 250/3 K070501 FLAF 250/3 P	P171594 CR 220/3	K070192 FLAF 250/1 K070500 FLAF 250/1 P	P171593 CR 220/1	70	P171592 CR 220/03	K070190 FLAF 250/02 K070498 FLAF 250/02 P	P171591 CR 220/02	
170	K070201 FLAF 330 K070510 FLAF 330 P	P171560 CR 330	K070206 FLAF 330/6 K070509 FLAF 330/6 P	P171565 CR 330/6	110	K070205 FLAF 330/3 K070508 FLAF 330/3 P	P171564 CR 330/3	K070204 FLAF 330/1 K070507 FLAF 330/1 P	P171563 CR 330/1	90	P171562 CR 330/03	K070202 FLAF 300/02 K070505 FLAF 330/02 P	P171561 CR 330/02	
250	K070213 FLAF 500 K070515 FLAF 500 P	P171566 CR 500	K070218 FLAF 500/6 K070411 FLAF 500/6 P	P171571 CR 500/6	200	K070217 FLAF 500/3 K070514 FLAF 500/3 P	P171570 CR 500/3	K070216 FLAF 500/1 K070513 FLAF 500/1 P	P171569 CR 500/1	170	P171568 CR 500/03	K070214 FLAF 500/02 K070511 FLAF 500/02 P	P171567 CR 500/02	
300	K070225 FLAF 800 K070412 FLAF 800 P	P171578 CR 800	K070230 FLAF 800/6 K070416 FLAF 800/6 P	P171583 CR 800/6	250	K070229 FLAF 800/3 K070415 FLAF 800/3 P	P171582 CR 800/3	K070228 FLAF 800/1 K070414 FLAF 800/1 P	P171581 CR 800/1	200	P171580 CR 800/03	K070226 FLAF 800/02 K070516 FLAF 800/02 P	P171579 CR 800/02	
100	K040614 FLA 200 K040942 FLA 200 P	P171596 CL 200	K040619 FLA 200/6 K040945 FLA 200/6 P	P171601 CL 200/6	70	K040618 FLA 200/3 K040944 FLA 200/3 P	P171600 CL 200/3	K040617 FLA 200/1 K040943 FLA 200/1 P	P171599 CL 200/1	80	P171598 CL 200/03	K040615 FLA 200/02 K040115 FLA 200/02 P	P171597 CL 200/02	

IN BLUE FILTERS ASSY WITH PREDISPOSITION SERIE FLK-FLA

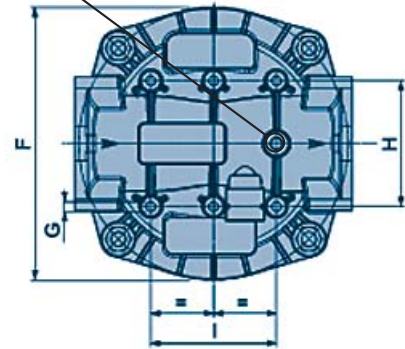
## Specifications



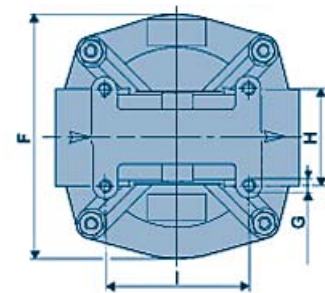
Plugged Predisposition



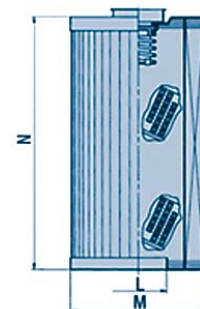
SIZE 20-40-65-90



SIZE 125-170-250-300



SIZE 100

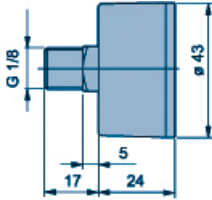


DIMENSIONS ASSY (mm)										DIMENSIONS ELEMENT (mm)		
A	B	C	D	E	F	G	H	I	Kg.	L	M	N
G 1/2	120	21	139	90	116	M8	54	-	1,5	29	70	75
G 3/4	120	24	193	90	116	M8	54	-	1,8	29	70	128
G 1	140	31	250	110	135	M8	68	-	2,8	41	95	169
G 1 1/4	140	31	284	110	135	M8	68	-	3,0	41	95	203
G 1 1/2	212	44	224	170	208	M8	96	96	6,0	65	140	136
G 1 1/2	212	44	294	170	208	M8	96	96	6,2	65	140	203
G 2	212	44	294	170	208	M8	96	96	6,2	65	140	203
FLANGE SAE 1 1/2	212	44	224	170	208	M8	96	96	6,0	65	140	136
FLANGE SAE 1 1/2	212	44	294	170	208	M8	96	96	6,2	65	140	203
FLANGE SAE 2	212	44	294	170	208	M8	96	96	7,2	65	140	203
FLANGE SAE 2	212	44	505	170	208	M8	96	96	9,5	65	140	400
G 1 1/4	152	30	237	124	152	M8	60	90	2,9	46	112	180

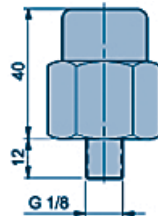
# FLK-FLA

In-line suction filters  
with take apart element

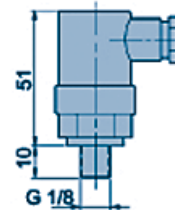
## Service Indicators



**VACUUM GAUGE**  
**P171954** (500.02)  
 Scale: -100÷300 kPa (-1÷3 bar)



**VISUAL PRESSURE GAUGE**  
**P171959** (503.02)  
 Setting: 30 kPa (0,3 bar)

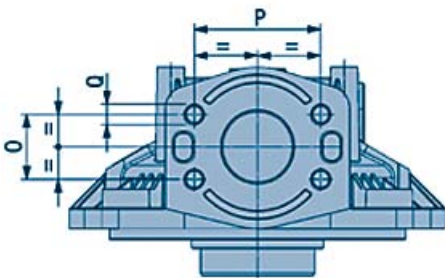


**ELECTRICAL VACUUM GAUGE**  
**P171967** (504.02) N.O. contacts  
**P173105** (504.06) N.C. contacts  
 Setting: -30 kPa (-0,3 bar)  
 Protection class: IP 65  
 Cable clamp: PG 7  
 Max. values: 48 VAC - 30 DCV  
 0,5 A res - 0,2 A. ind

Available on request :

Electrical differential indicator **P163642** with special predisposition

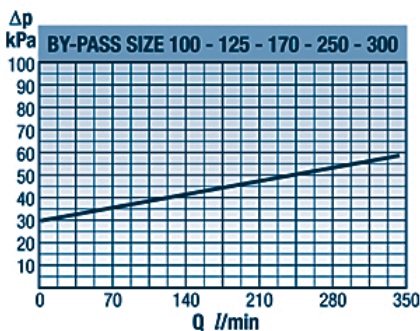
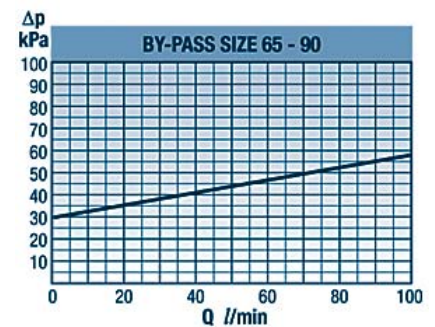
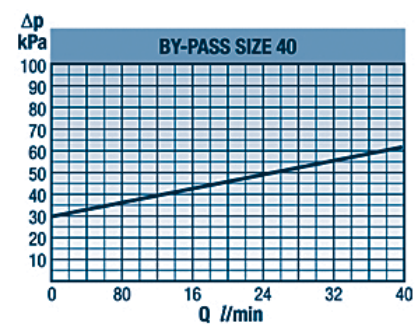
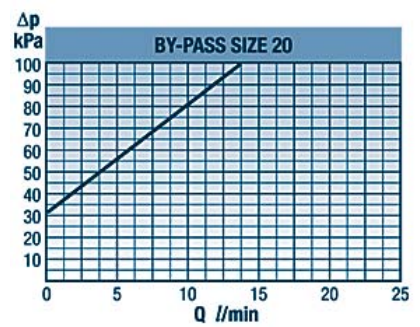
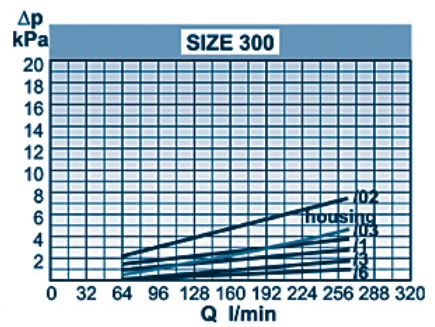
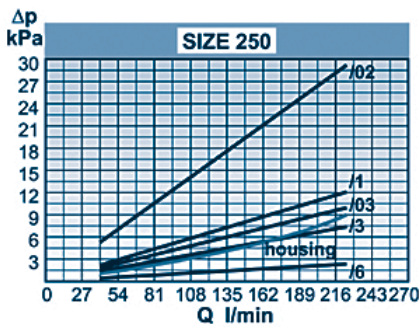
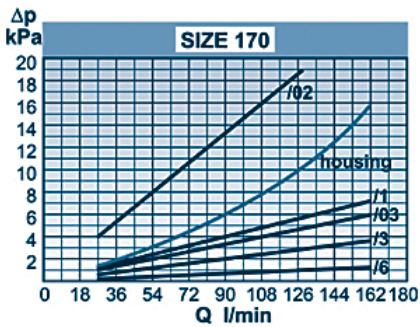
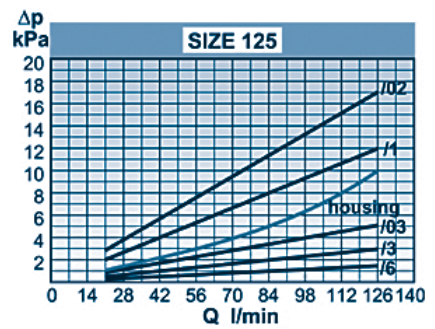
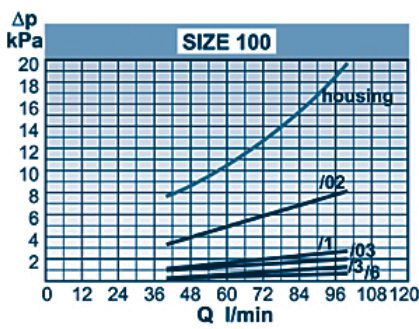
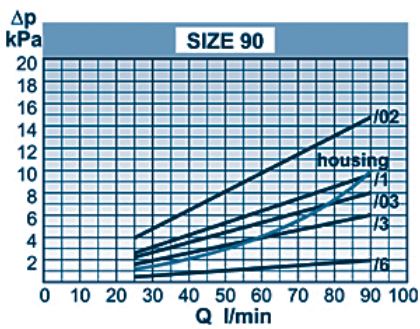
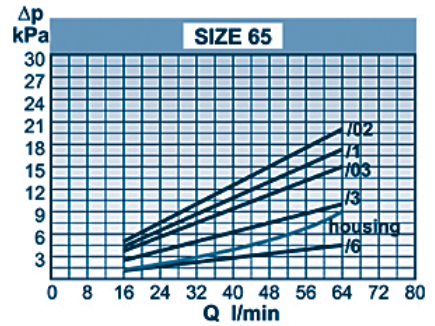
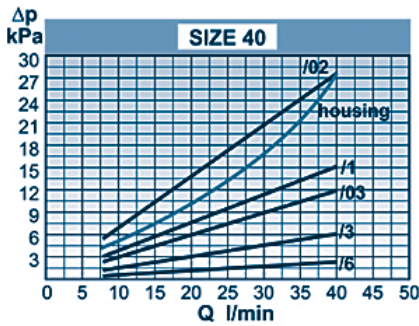
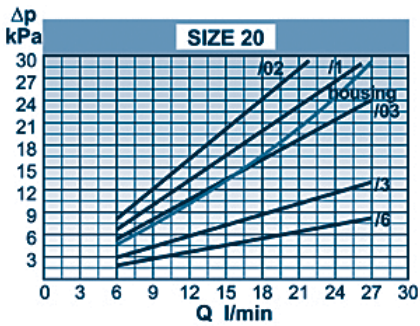
## SAE Flanges 3000



FLANGE SAE J518 3000 PSI	O	P	Q
1 1/2	35,8	69,8	M12
2	42,9	77,8	M12



## Performance Curves



IN-LINE  
SUCTION FILTERS





# PXX-FAL

## In-line suction filters to be clamped

### Technical Data

- Operating pressure 400 kPa (4 bar).
- Stating pressure testing at 600 kPa (6 bar).
- Operating temperature -20 +100° C.
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop determined per ISO 3968 with oilkinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.



IN-LINE  
SUCTION FILTERS

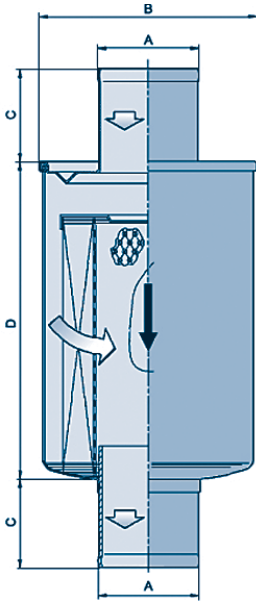
### Filter Elements

- Wire mesh 160 micron.
- Collapse resistance 500 kPa (5 bar) per ISO 2941.

# PXX-FAL

In-line suction filters to be clamped

## Specifications

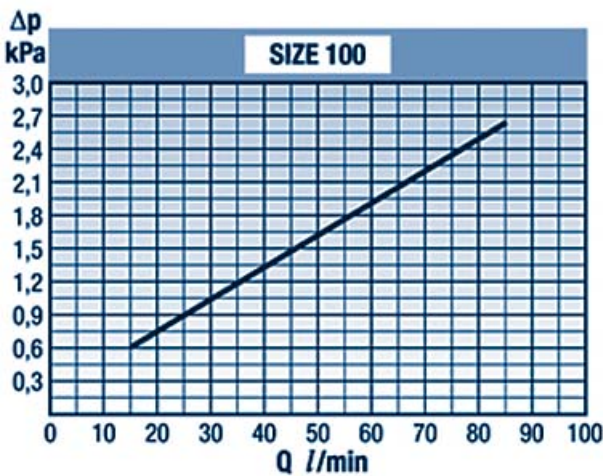
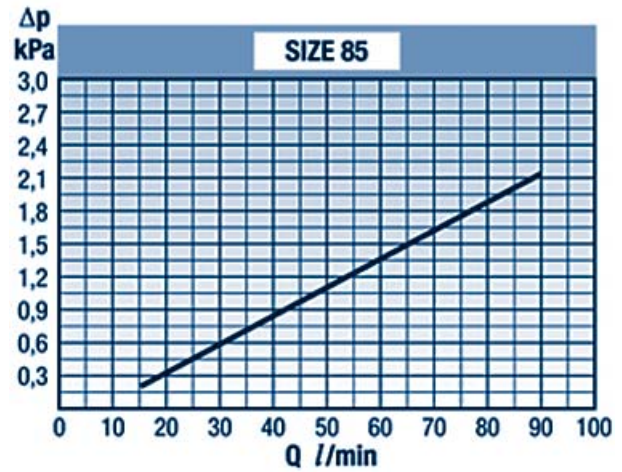
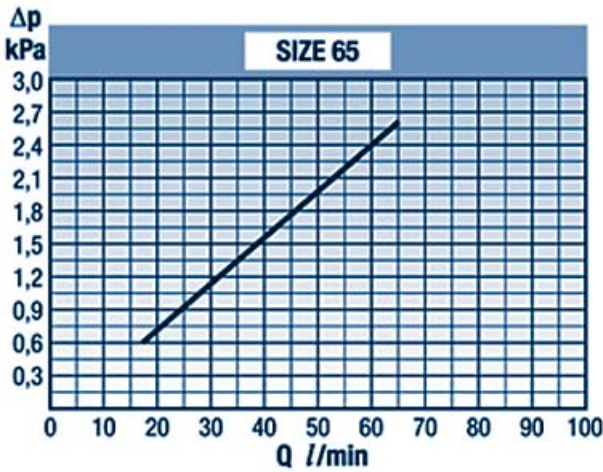
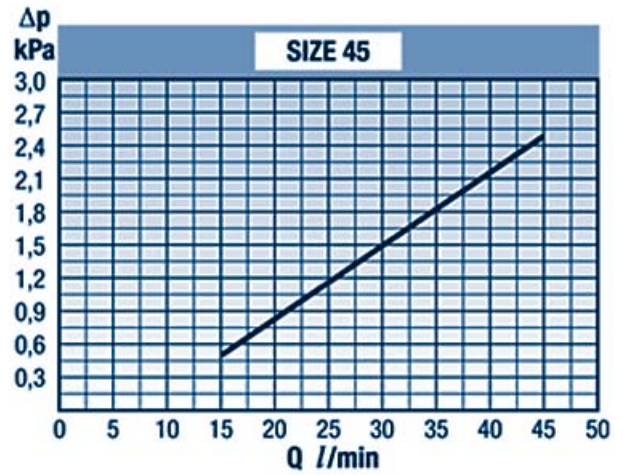
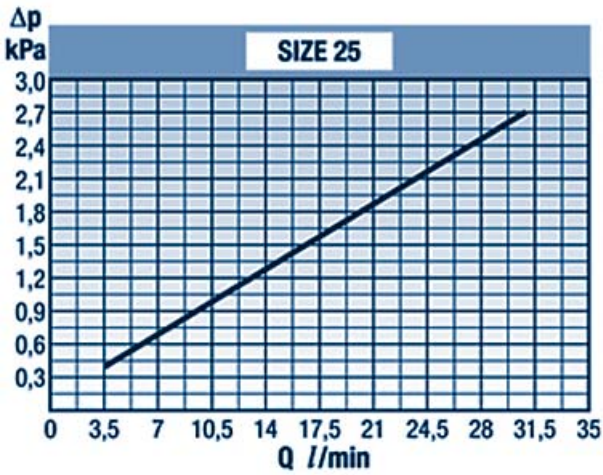


FLOW l/min	/160 WIRE MESH MEDIA		DIMENSIONS (mm)				
	TYPE	A	B	C	D	Kg.	
25	P176903	18	74	23	100	0,40	
45	P175142	30	74	23	100	0,35	
65	P175143	38	74	23	100	0,35	
85	P761040	38	74	23	160	0,40	
100	P176904	50	82	22	160	0,50	

IN-LINE  
SUCTION FILTERS



## Performance Curves







# FBK-FACA

## In-line suction spin-on filters

### Technical Data

- Operating pressure at 1000 kPa (10 bar).
- Static pressure testing at 1500 kPa (15 bar).
- By-pass valve setting 30 kPa (0,3bar) per ISO 3968.
- Operating temperature -20 +100°C.
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO 3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1.

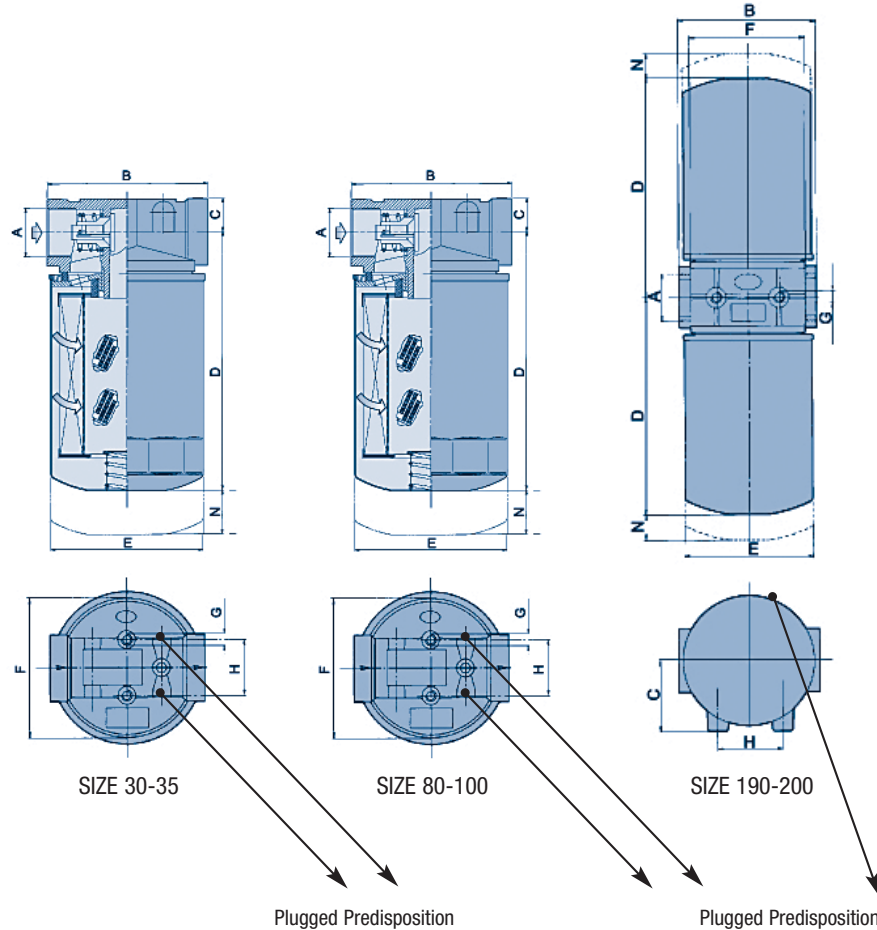


IN-LINE  
SUCTION FILTERS

### Filter Elements

- Wire mesh 60 micron.
- Synteq® synthetic media with 10-25 micron.
- Cellulose media 10-30 micron.
- Collapse resistance 1000 kPa (10 bar) per ISO 2941.

## Specifications

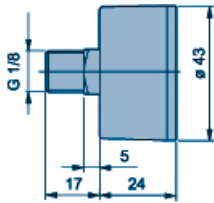


IN-LINE SUCTION FILTERS

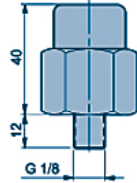
HEADS	/6		/3				/1		/03		/02	
	FLOW l/min	ELEMENT	FLOW l/min	TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT	FLOW l/min	ELEMENT	TYPE	ELEMENT
P761262	30	P171607 CA 60/6	CELLULOSE MEDIA									
			25	K040629 FACA 60/3	P171606 CA 60/3	20	K040628 FACA 60/1	P550268 CA 60/1	15	K040627 FACA 60/03	P171604 CA 60/03	K040626 FACA 60/02
	K041141 FACA 60/3 P	K041140 FACA 60/1 P		K041139 FACA 60/03 P			K041138 FACA 60/02 P					
35	P171612 CA 80/6	30	K040639 FACA 80/3	P171611 CA 80/3	25	K040638 FACA 80/1	P171610 CA 80/1	20	K040637 FACA 80/03	P171609 CA 80/03	K040636 FACA 80/02	P171608 CA 80/02
P761259	80	P171617 CA 160/6	CELLULOSE MEDIA									
			80	K041149 FACA 160/3	P171616 CA 160/3	70	K051148 FACA 160/1	P550148 CA 160/1	60	K051147 FACA 160/03	P171614 CA 160/03	K051146 FACA 160/02
	K051334 FACA 160/3 P	K051230 FACA 160/1 P		K051333 FACA 160/03 P			K051332 FACA 160/02 P					
100	P171622 CA 200/6	100	K051159 FACA 200/3	P171621 CA 200/3	90	K051158 FACA 200/1	P171620 CA 200/1	80	K051157 FACA 200/03	P171619 CA 200/03	K051156 FACA 200/02	P171618 CA 200/02
P761260	190	P171671 CA 160/6	CELLULOSE MEDIA									
			190	K250004 FACA 380/3	P171618 CA 160/3	170	K250003 FACA 380/1	P550148 CA 160/1	150	K250002 FACA 380/03	P171614 CA 160/03	K250001 FACA 380/02
	K250109 FACA 380/3 P	K250062 FACA 380/1 P		K250108 FACA 380/03 P			K250107 FACA 380/02 P					
200	P171622 CA 200	200	K250009 FACA 400/3	P171621 CA 200/3	180	K250008 FACA 400/1	P171620 CA 200/1	180	K250007 FACA 400/03	P171619 CA 200/03	K250006 FACA 400/02	P171618 CA 200/02
			K250116 FACA 400/3 P		K250115 FACA 400/1 P		K250114 FACA 400/03 P		K250113 FACA 400/02 P			

IN BLUE FILTERS ASSY WITH PREDISPOSITION SERIE FBK-FACA

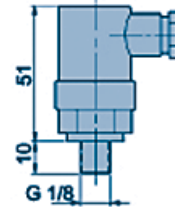
## Service Indicators



**VACUUM GAUGE**  
**P171954** (500.02)  
 Scale: -100÷300 kPa (-1÷3 bar)

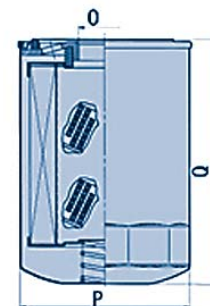


**VISUAL VACUUM GAUGE**  
**P171959** (503.02)  
 Setting: 30 kPa (0,3 bar)



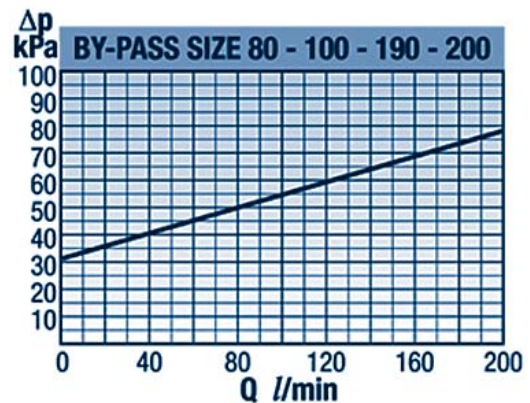
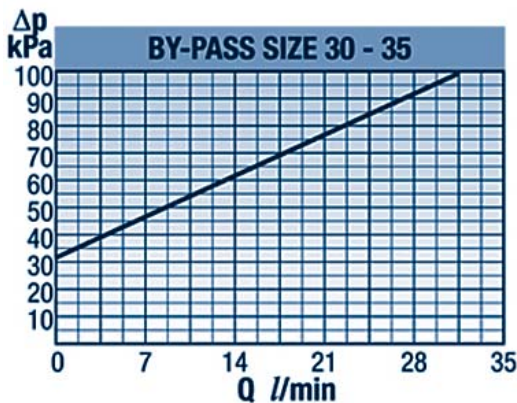
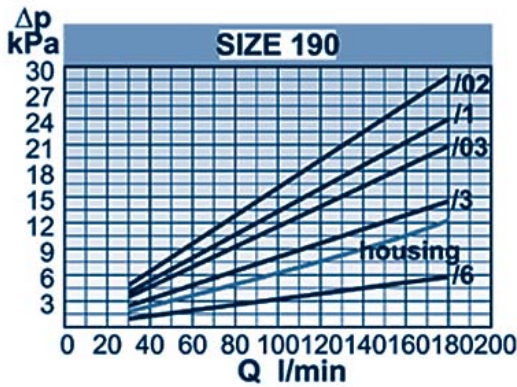
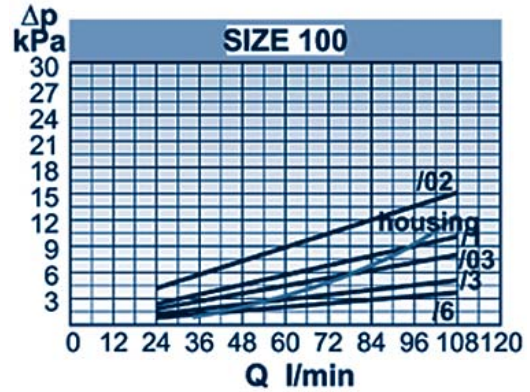
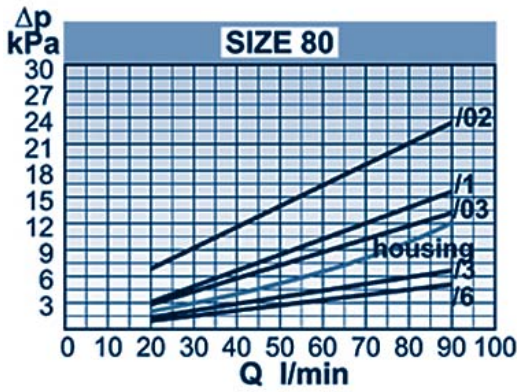
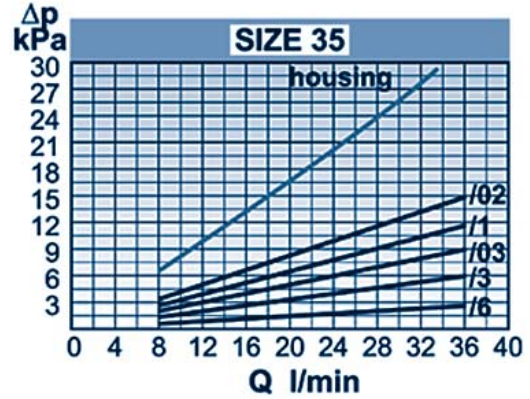
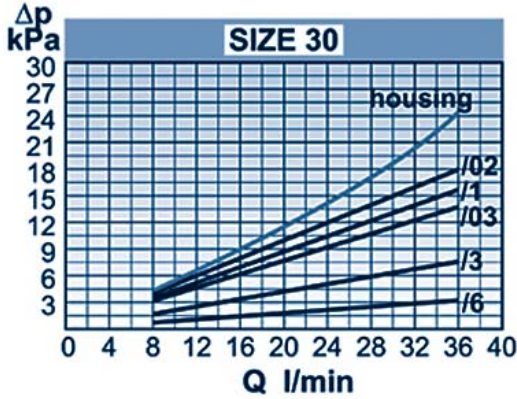
**ELECTRICAL VACUUM GAUGE**  
**P171967** (504.02) N.O. contacts  
**P173105** (504.06) N.C. contacts  
 Setting: -30 kPa (-0,3 bar)  
 Protection class: IP 65  
 Cable clamp: PG 7  
 Max. values: 48 VAC - 30 DCV  
 0,5 A res - 0,2 A. ind

DIMENSIONS ASSY (mm)										DIMENSIONS ELEMENT (mm)		
A	B	C	D	E	F	G	H	N	Kg.	O	P	Q
G 3/4	95	19	172	96	75	M8	38	20	1	G 3/4	96	146
G 3/4	95	19	232	96	75	M8	38	20	1,1	G 3/4	96	209
G 1 1/4	132	28	215	126	112	M8	50	24	2	G 1 1/4	128	181
G 1 1/4	132	28	263	126	112	M8	50	24	2	G 1 1/4	128	236
G 1 1/2	138	70	218	126	112	M10	65	24	4	G 1 1/4	128	181
G 1 1/2	138	70	273	126	112	M10	65	24	4	G 1 1/4	128	236





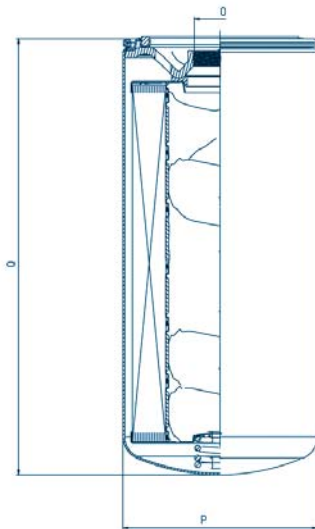
**Performance Curves**



IN-LINE  
SUCTION FILTERS

## Hydraulic specifications

CELLULOSE		SYNTEQ® = SYNTHETIC MEDIA		DIMENSIONS		
	<b>/3</b> 30 MICRON NOM.		<b>/02</b> 10 MICRON ABS.	mm		
<b>FLOW</b> l/min	<b>TYPE</b>	<b>FLOW</b> l/min	<b>TYPE</b>	<b>O</b>	<b>P</b>	<b>Q</b>
120	<b>P764409</b> CA 250/3	90	<b>P763668</b> CA 250/02	1" ½ -16UN-2B	136	306
100	<b>P764410</b> CA 220/3	80	<b>P764411</b> CA 220/02	1" ½ -16UN-2B	136	236



## Heads

Head FACA 60/80	standard = P173442 (no predisposition)
Head FACA 60/80	P761262 with predisposition G 1/8"
Head FACA 60/80	P175001 without by-pass valve with predisposition G 1/8"
Head FACA 160/200	standard = P173203 (no predisposition)
Head FACA 160/200	P761259 with predisposition G 1/8"
Head FACA 160/200	P173403 without by-pass valve with predisposition G 1/8"
Head FACA 250/220	standard = P764419 (no predisposition)
Head FACA 250/220	P764420 with predisposition G 1/8"
Head FACA 250/220	P764421 without by-pass valve with predisposition G 1/8"





Donaldson.  
*Filtration Solutions*

# IN-LINE FILTERS







Donaldson®  
*Filtration Solutions*

# MEDIUM PRESSURE FILTERS



# FMK-FM

**In-line medium pressure filters,  
up to 120 bar, with take apart**



## Technical Data

- Filter head in tempered aluminum.
- Aluminum bowl.
- Max. operating pressure at 12 MPa (120 bar), static pressure testing at 18 MPa (180 bar).
- Fatigue pressure of 2.000.000 cycles at 0 - 8 MPa (0 - 80 bar) per NFPA T 3.10.5 R2:2000
- By-pass valve integrated in the head setting 600 kPa (6 bar) per ISO 3968.
- On request, filter can be supplied without by-pass valve, stating letter "S".
- Operating temperature -20 +120°C.
- Compatibility hydraulic fluids per ISO2943.
- Flow rate and pressure drop per ISO3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1.
- Tapped predisposition for indicator.

## Filter Elements

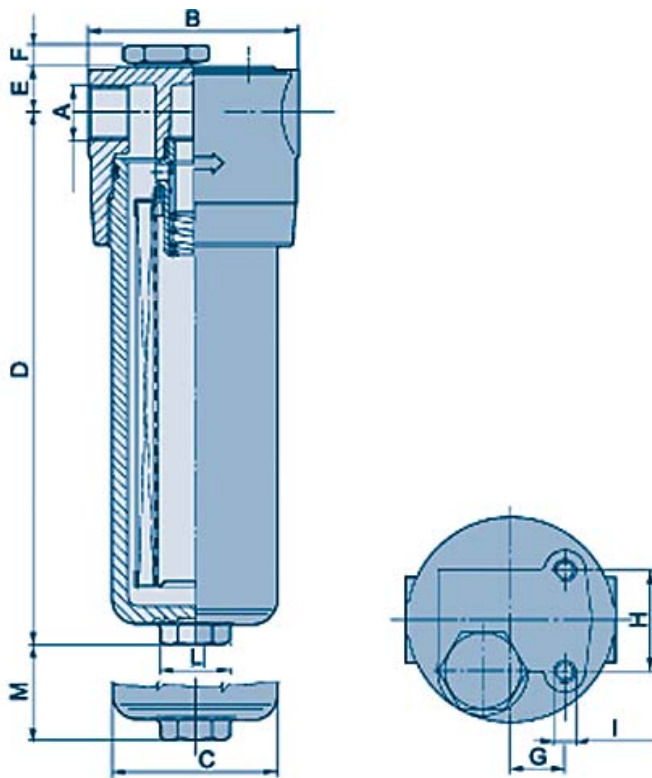
- Synteq® synthetic media with 5 - 10 - 25 micron, reinforced with wire mesh
- Cellulose media 10 micron, reinforced with wire mesh.
- Wire mesh 30 - 60 micron.
- Collapse resistance 2 MPa (20 bar) per ISO 2941.
- End load rating per ISO 3723.
- Flow fatigue characteristics per ISO 3724.
- Element integrity per ISO 2942.
- Filtration efficiency by multipass-test per ISO 16889.



# FMK-FM

In-line medium pressure filters, up to 120 bar, with take apart

## Specifications



MEDIUM PRESSURE  
FILTERS

	/6		/3M			/1			/03		/02		/01	
	WIRE MESH MEDIA					CELLULOSE MEDIA			SYNTHETIC MEDIA					
FLOW l/min	TYPE	ELEMENT	TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT	TYPE	ELEMENT	TYPE	ELEMENT
40					40	K020081 FM 140/1	P171704 CM 140/1	40	K020080 FM 140/03	P171703 CM 140/03	K020079 FM 140/02	P171702 CM 140/02	K020078 FM 140/01	P171701 CM 140/01
50	K020083 FM 140/6	P171706 CM 140/6	K020082 FM 140/3M	P171705 CM 140/3M	50			50						
60					60	K020087 FM 180/1	P171710 CM 180/1	60	K020086 FM 180/03	P171709 CM 180/03	K020085 FM 180/02	P171708 CM 180/02	K020084 FM 180/01	P171707 CM 180/01
80	K020089 FM 180/6	P171712 CM 180/6	K020088 FM 180/3M	P171711 CM 180/3M	80			80						

### Service Indicators

#### ELECTRONIC DIFFERENTIAL PRESSURE INDICATOR

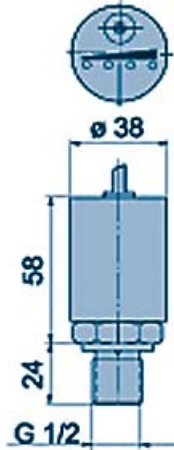
Measures element restriction and indicates servicing required

**P171970** (505.06)

Setting: 500 kPa (5 bar)

Max. values: 30 ACV - 0,5 A res. - 0,2 A ind.

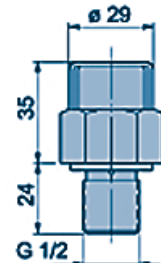
Protection class: IP 65



#### VISUAL DIFFERENTIAL PRESSURE INDICATOR

**P171945** (506.06)

Setting: 140 kPa (1,4 bar)



#### VISUAL ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR

**P171947** (507.03)

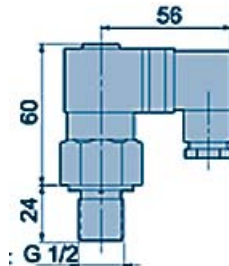
**P171944** (507.06) with thermostat at min. temperature at 30°C

Setting: 500 kPa (5 bar)

Max. values: 250 ACV - 30 DCV - 5 A res. and ind.

Protection class: IP 65

Cable clamp: PG 11



#### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR

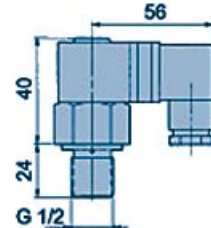
**P761056**

Setting: 500 kPa (5 bar)

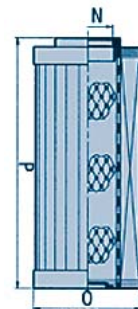
Max. values: 250 ACV - 30 DCV - 5 A res. and ind.

Protection class: IP 65

Cable clamp: PG 11



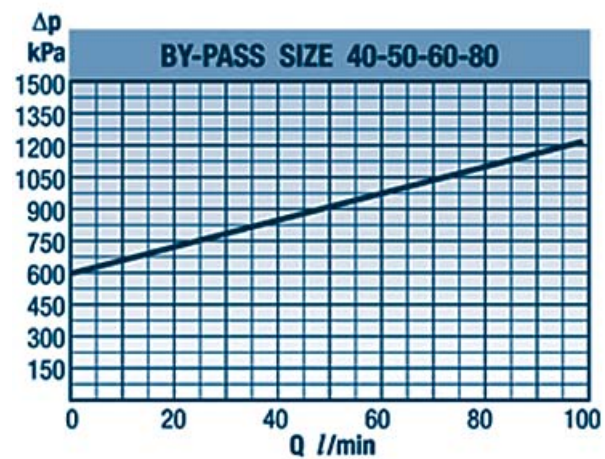
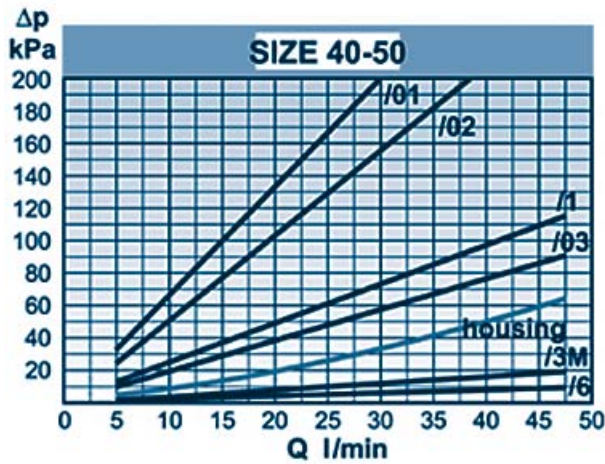
DIMENSIONS ASSY (mm)												DIMENSIONS ELEMENT (mm)		
A	B	C	D	E	F	G	H	I	L	M	Kg.	N	O	P
G 1/2	78	60	146	17	9	20	38	M8	Hex 27	30	0,9	22,2	43	90
G 1/2	78	60	146	17	9	20	38	M8	Hex 27	30	0,9	22,2	43	90
G 1/2	78	60	232	17	9	20	38	M8	Hex 27	30	1,2	22,2	43	176
G 1/2	78	60	232	17	9	20	38	M8	Hex 27	30	1,2	22,2	43	176



# FMK-FM

In-line medium pressure filters, up to 120 bar, with take apart

## Performance Curves



MEDIUM PRESSURE FILTERS



# HMK 04 - DURAMAX

In-line medium pressure filters,  
up to 34 bar with spin-on element



## Technical Data

- Operating pressure at 3,45 MPa (34,5 bar).
- Static pressure testing at 6,9 MPa (69 bar).
- By-pass valve setting 170 kPa (1,7 bar) differential per ISO 3968.
- Available by-pass valve with setting 350 kPa (3,5 bar) differential.
- Operating temperature -20 +120°C (-20 +107° C for cellulose).
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO 3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1.
- Tapped predisposition for electrical indicator.

## Filter Elements

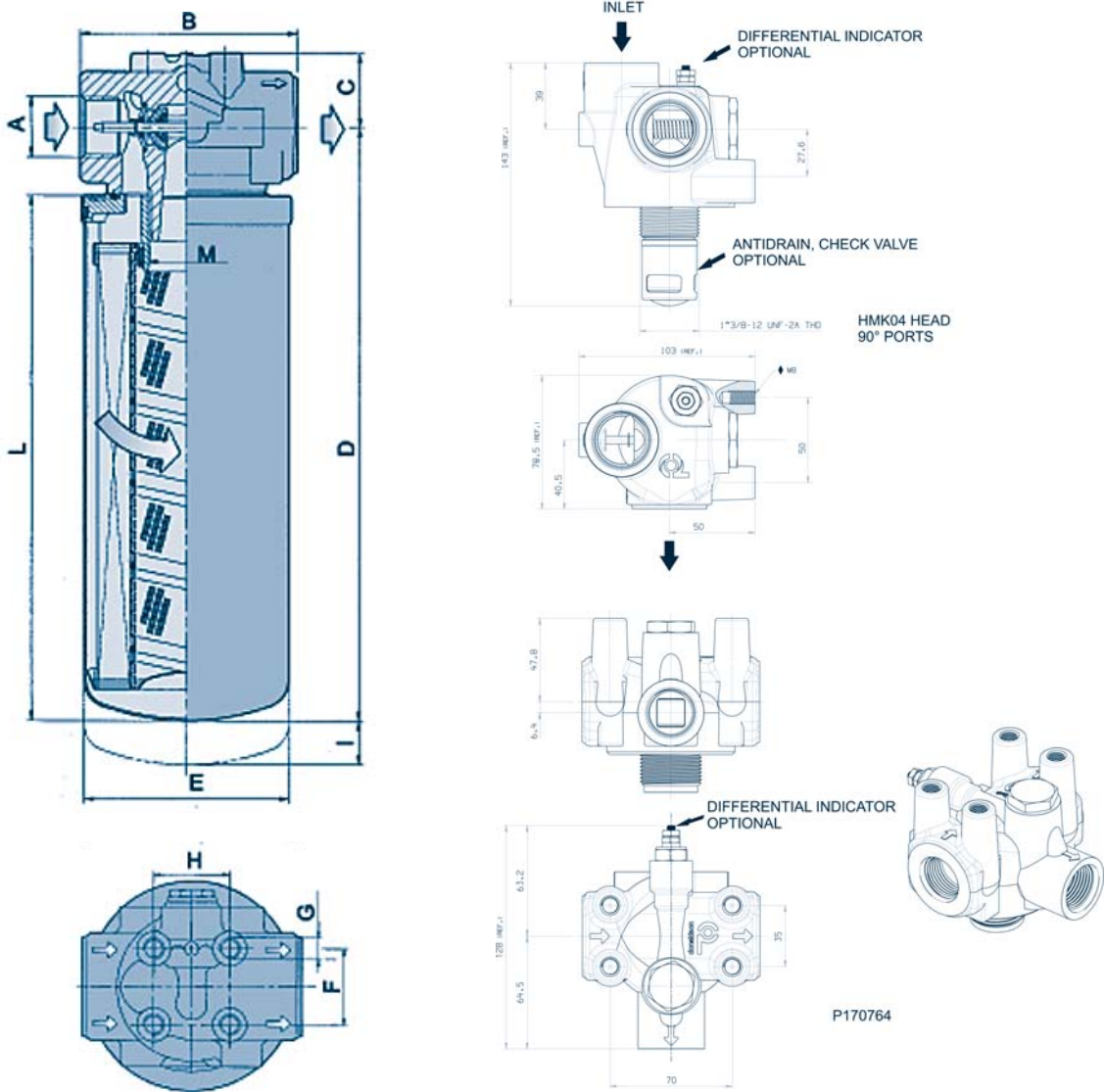
- Cellulose paper 10 micron.
- Synteq® synthetic media with 5-10-16-22-40 micron.
- Heavy duty steel can with die cast baffle for added strength and a special head-to-spin-on O-ring seal.
- Element collapse resistance 2 MPa (20 bar) per ISO 2941.
- Spin-on burst resistance 6,9 MPa (69 bar)
- Element pressure fatigue strength per NFPA T3.10.17 0 - 3,45 MPa (0 - 34,5 bar) for 100.000 cycles.
- Available intermediate length spin-on L=180 mm.



# HMK 04 - DURAMAX

In-line medium pressure filters,  
up to 34 bar with spin-on element

## Specifications



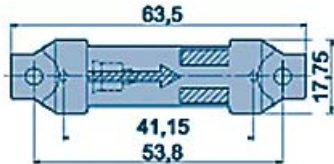
MEDIUM PRESSURE FILTERS

FLOW l/min	#20		#7		#4		/02		/01		
	SYNTHETIC MEDIA										
	$\beta_{50(c)}=1000$		$\beta_{23(c)}=1000$		$\beta_{20(c)}=1000$		$\beta_{11(c)}=1000$		$\beta_{8(c)}=1000$		
TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT	TYPE	ELEMENT	ELEMENT	FLOW l/min	TYPE	ELEMENT	
120	K045739 HMK 405/3	P165335 K 405/3	110	K045743 HMK 405/03	P164381 K 405/03	K045745 HMK 405/02	P164375 K 405/02	P761064	100	K045747 HMK 405/01	P165354 K 405/01
120	K045795 HMK 405/3	P165335 K 405/3	110	K045793 HMK 405/03	P164381 K 405/03	K045792 HMK 405/02	P164375 K 405/02	P761064	100	K045791 HMK 405/01	P165354 K 405/01
120	K045805 HMK 405/3	P165335 K 405/3	110	K045803 HMK 405/03	P164381 K 405/03	K045802 HMK 405/02	P164375 K 405/02	P761064	100	K045801 HMK 405/01	P165354 K 405/01
140	K045740 HMK 409/3	P165338 K 409/3	130	K045744 HMK 409/03	P164384 K 409/03	K045746 HMK 409/02	P164378 K 409/02	P173133	120	K045748 HMK 409/01	P165332 K 409/01
140	K045800 HMK 409/3	P165338 K 409/3	130	K045798 HMK 409/03	P164384 K 409/03	K045797 HMK 409/02	P164378 K 409/02	P173133	120	K045796 HMK 409/01	P165332 K 409/01
140	K045810 HMK 409/3	P165338 K 409/3	130	K045808 HMK 409/03	P164384 K 409/03	K045807 HMK 409/02	P164378 K 409/02	P173133	120	K045806 HMK 409/01	P165332 K 409/01

**COMPLETE ASSY WITH INDICATOR P162400 INCLUDED**

**COMPLETE ASSY WITH INDICATOR P162696 INCLUDED**

## Service Indicators



### VISUAL DIFFERENTIAL PRESSURE INDICATOR

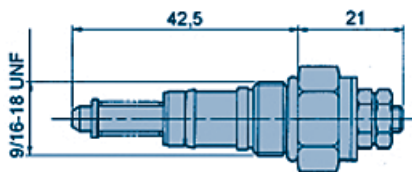
**P162696** (506.05)

Red at 140 kPa (1,4 bar)

Max. operating temperature 82°C

### AVAILABLE MODEL FOR BY-PASS 350 kPa (3,5 bar):

**P167580** with red at 280 kPa (2,8 bar)



### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR

**P162400** N.O. contacts, color-coded wascher: green

**P163839** N.C. contacts, color-coded wascher: red

Settings: 140 kPa (1,4 bar)

Max. values: 30 DCV - 0,2 A

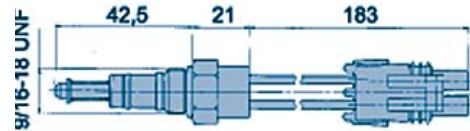
### AVAILABLE MODEL FOR BY-PASS 350 kPa (3,5 bar):

**P165194** N.O. contacts, color-coded wascher: red/white

**P167455** N.C. contacts, color-coded wascher: red/green

Settings: 270 kPa (2,7 bar)

Max. values: 30 DCV - 0,2 A



### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR 2 WIRES, CANON CONNECTOR

**P171143** N.O. contacts

Settings: 140 kPa (1,4 bar)

Max. values: 30 DCV - 0,2 A

### AVAILABLE MODEL FOR BY-PASS 350 kPa (3,5 bar):

**P171087** N.O. contacts, packard connector

Settings: 270 kPa (2,7 bar)

Max. values: 30 DCV - 0,2 A

**P170926** N.C. contacts, packard connector

Settings: 270 kPa (2,7 bar)

Max. values: 30 DCV - 0,1 A



### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR 3 WIRES, COMPATIBLE WITH MICROPROCESSORS

**P173944** N.O. and N.C. contacts

Settings: 140 kPa (1,4 bar)

Max. values: 24 DCV - 2 A and 110 ACV - 2 A

### AVAILABLE MODEL FOR BY-PASS 350 kPa (3,5 bar):

**P173893** N.O. and N.C. contacts

Settings: 270 kPa (2,7 bar)

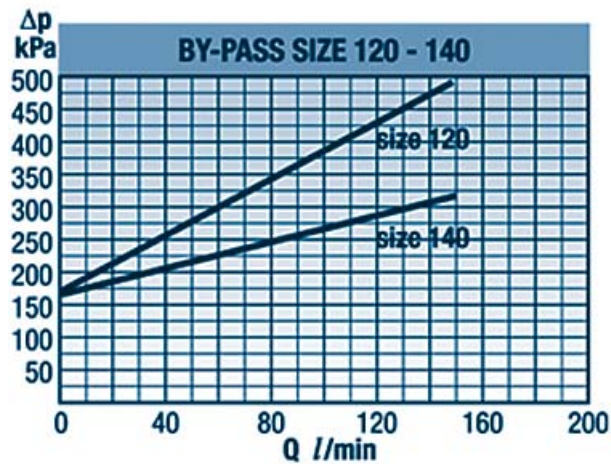
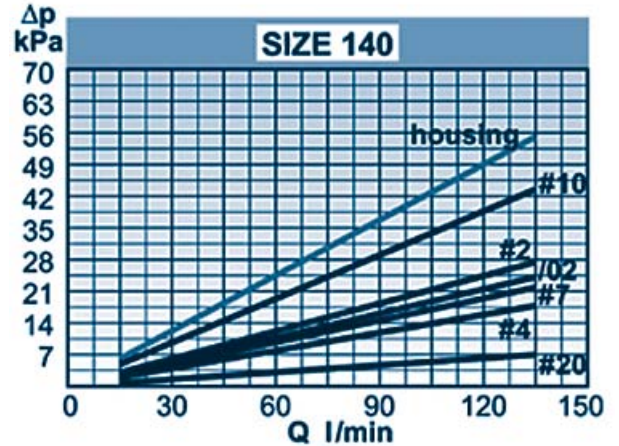
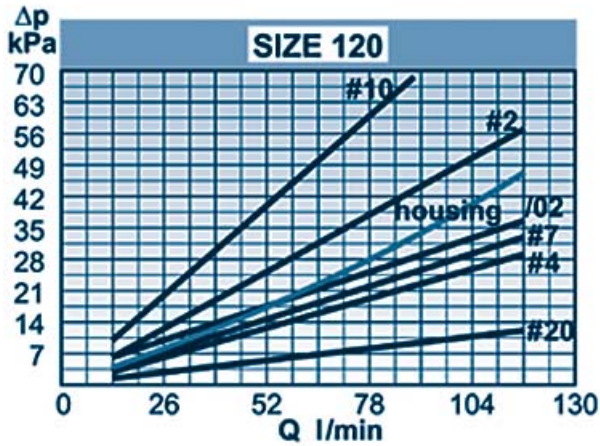
Max. values: 24 DCV - 2 A and 110 ACV - 2 A

FLOW l/min	#10		DIMENSIONS (mm)											Assembly weight kg.	Spin-on weight kg.
	CELULOSE MEDIA		A	B	C	D	E	F	G	H	I	L	M		
	TYPE	ELEMENT	$\beta_{23(c)}=1000$												
100	K045741 HMK 405/1	P163419 K 405/1	G 3/4	98	34	181	94	35	M10	35	20	152	1 3/8-12 UN 2B	1,8	1
100	K045794 HMK 405/1	P163419 K 405/1	G 3/4	98	34	181	94	35	M10	35	20	152	1 3/8-12 UN 2B	1,8	1
100	K045804 HMK 405/1	P163419 K 405/1	G 3/4	98	34	181	94	35	M10	35	20	152	1 3/8-12 UN 2B	1,8	1
110	K045742 HMK 409/1	P163324 K 409/1	G 1	98	34	269	94	35	M10	35	20	240	1 3/8-12 UN 2B	2,4	1,6
110	K045799 HMK 409/1	P163324 K 409/1	G 1	98	34	269	94	35	M10	35	20	240	1 3/8-12 UN 2B	2,4	1,6
110	K045809 HMK 409/1	P163324 K 409/1	G 1	98	34	269	94	35	M10	35	20	240	1 3/8-12 UN 2B	2,4	1,6

# HMK 04 - DURAMAX

In-line medium pressure filters,  
up to 34 bar with spin-on element

## Performance Curves



## Heads

HEAD ASSY	BY-PASS VALVE Kpa	SNOUT THREAD	IN & OUT PORTS	MOUNTING HOLES THREAD	INDICATOR PREDISP.	THREAD PREDISP.	INDICATOR	SETTINGS Kpa
P175029	no	1 3/8-12	G 3/4	M10x1,5	1 sx	9/16-18	P165194	275
P762554	172	1 3/8-12	G 3/4	M10x1,5	no			
P173386	172	1 3/8-12	G 3/4	M10x1,5	1 sx	9/16-18	plug	
P173385	345	1 3/8-12	G 3/4	M10x1,5	no			
P173438	172	1 3/8-12	G 1	M10x1,5	1 sx	9/16-18	plug	
P760924	345	1 3/8-12	G 1	M10x1,5	1 sx	9/16-18	P167455	275
P762982	345	1 3/8-12	G 1	M10x1,5	1 sx	9/16-18	plug	
P173132	345	1 3/8-12	G 1	M10x1,5	1 sx	9/16-18	P165194	275
P762801	172	1 3/8-12	1 5/16-12	M10x1,5	1 sx	9/16-18	plug	
P761378	248	1 3/8-12	1 5/16-12	M10x1,5	1 sx	9/16-18	plug	
P763139	345	1 3/8-12	1 5/16-12	M10x1,5	no			
P763617	172	1 3/8-12	1 1/16-12	M10x1,5	no			
P167473	172	1 3/8-12	1 1/16-12	3/8-16 UNC	no			
P173918	345	1 3/8-12	1 1/16-12	3/8-16 UNC	1 sx	9/16-18	plug	
P764322	345	1 3/8-12	1 1/16-12	3/8-16 UNC	1 sx	9/16-18	P165194	275



# HMK 05 - DURAMAX

In-line medium pressure filters,  
up to 24 bar with spin-on element



## Technical Data

- Operating pressure at 2,4 MPa (24 bar).
- Static pressure testing at 5,5 MPa (55 bar).
- By-pass valve setting 170 kPa (1,7 bar) differential per ISO 3968.
- Available by-pass valve with setting 350 kPa (3,5 bar) differential.
- Operating temperature -20 +120°C (-20 +107° C for cellulose).
- Compatibility with hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO 3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1.
- Tapped predisposition for electrical indicator.

## Filter Elements

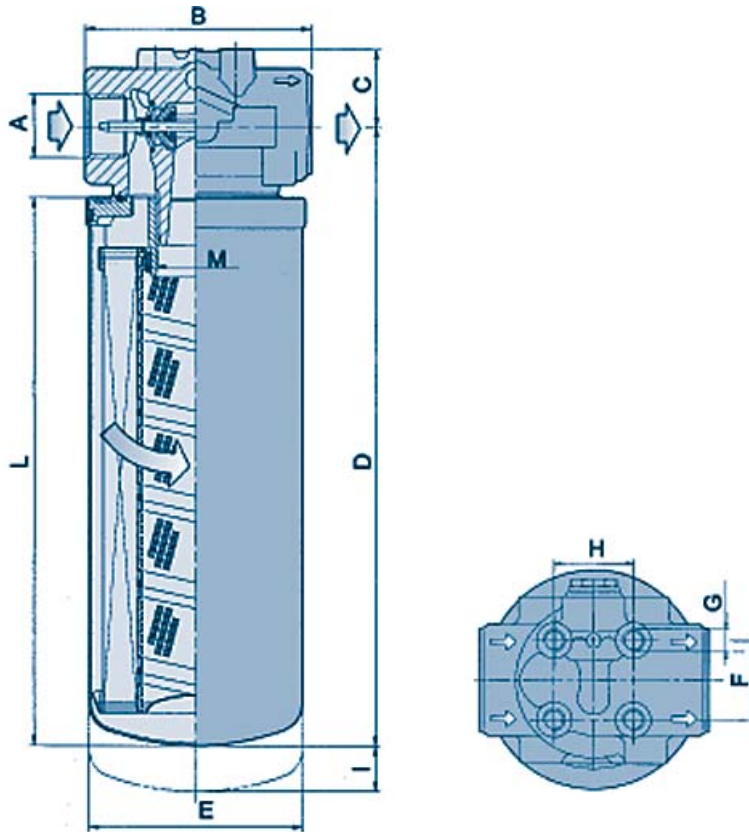
- Cellulose paper 10 micron.
- Synteq® synthetic media with 5-10-16-22-40 micron.
- Heavy duty steel can with die cast baffle for added strength and a special head-to-spin-on O-ring seal.
- Element collapse resistance 1,4 MPa (14 bar) per ISO 2941.
- Spin-on burst resistance 5,5 MPa (55 kPa)
- Element pressure fatigue strength per NFPA T3.10.17 0 - 2,4 MPa (0 - 24 bar) for 100.000 cycles.
- Available intermediate length spin-on L=200 mm.



# HMK 05 - DURAMAX

In-line medium pressure filters,  
up to 24 bar with spin-on element

## Specifications



MEDIUM PRESSURE  
FILTERS

		#20		#9		#4		/02		/01		
SYNTHETIC MEDIA												
		$\beta_{50(c)}=1000$		$\beta_{23(c)}=1000$		$\beta_{20(c)}=1000$		$\beta_{11(c)}=1000$		$\beta_{8(c)}=1000$		
FLOW l/min	TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT	ELEMENT	FLOW l/min	TYPE	ELEMENT
200	K053123 HMK 513/3	P165672 K 513/3	180	K053125 HMK 513/03	P165569 K 513/03	170	K053126 HMK 513/02	P165659 K 513/02	P176779	160	K053127 HMK 513/01	P165675 K 513/01
200	K053144 HMK 513/3	P165672 K 513/3	180	K053142 HMK 513/03	P165569 K 513/03	170	K053141 HMK 513/02	P165659 K 513/02	P176779	160	K053140 HMK 513/01	P165675 K 513/01
200	K053148 HMK 513/3	P165672 K 513/3	180	K053146 HMK 513/03	P165569 K 513/03	170	K053132 HMK 513/02	P165659 K 513/02	P176779	160	K053145 HMK 513/01	P165675 K 513/01

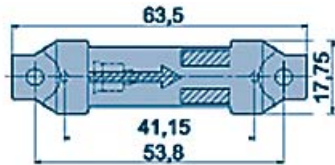
**COMPLETE ASSY WITH INDICATOR P162400 INCLUDED**

**COMPLETE ASSY WITH INDICATOR P162696 INCLUDED**

# HMK 05 - DURAMAX

In-line medium pressure filters,  
up to 24 bar with spin-on element

## Service Indicators



### VISUAL DIFFERENTIAL PRESSURE INDICATOR

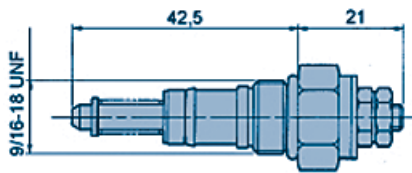
**P1692696** (506.05)

Red at 140 kPa (1,4 bar)

Max. operating temperature 82°C

### AVAILABLE MODEL FOR BY-PASS 350 kPa (3,5 bar):

**P167580** with red at 280 kPa (2,8 bar)



### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR

**P162400** N.O. contacts, color-coded wascher: green

**P163839** N.C. contacts, color-coded wascher: red

Settings: 140 kPa (1,4 bar)

Max. values: 30 DCV - 0,2 A

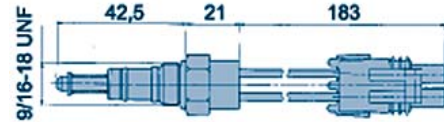
### AVAILABLE MODEL FOR BY-PASS 350 kPa (3,5 bar):

**P165194** N.O. contacts, color-coded wascher: red/white

**P167455** N.C. contacts, color-coded wascher: red/green

Settings: 270 kPa (2,7 bar)

Max. values: 30 DCV - 0,2 A



### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR 2 WIRES, CANON CONNECTOR

**P171143** N.O. contacts

Settings: 140 kPa (1,4 bar)

Max. values: 30 DCV - 0,2 A

### AVAILABLE MODEL FOR BY-PASS 350 kPa (3,5 bar):

**P171087** N.O. contacts, packard connector

Settings: 270 kPa (2,7 bar)

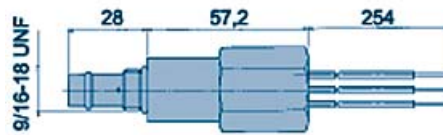
Max. values: 30 DCV - 0,2 A

### AVAILABLE MODEL FOR BY-PASS 350 kPa (3,5 bar):

**P170926** N.C. contacts, packard connector

Settings: 270 kPa (2,7 bar)

Max. values: 30 DCV - 0,1 A



### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR 3 WIRES, COMPATIBLE WITH MICROPROCESSORS

**P173944** N.O. and N.C. contacts

Settings: 140 kPa (1,4 bar)

Max. values: 24 DCV - 2 A and 110 ACV - 2 A

### AVAILABLE MODEL FOR BY-PASS 350 kPa (3,5 bar):

**P173893** N.O. and N.C. contacts

Settings: 270 kPa (2,7 bar)

Max. values: 24 DCV - 2 A and 110 ACV - 2 A

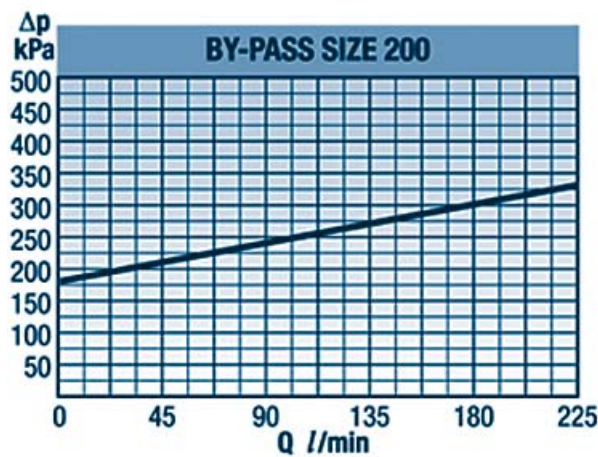
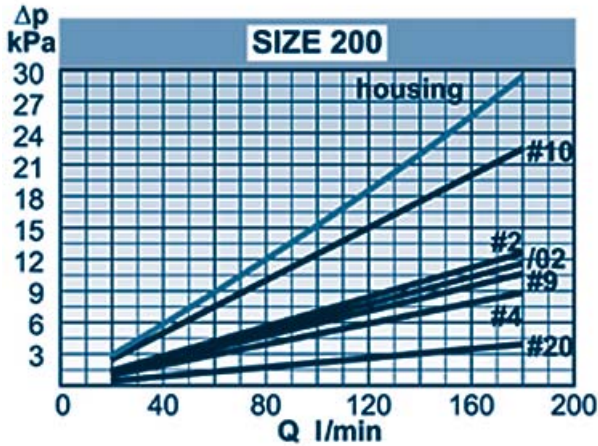
#10			DIMENSIONS (mm)										Assembly weight kg.		Spin-on weight kg.		
			CELULOSE MEDIA														
β <sub>23(c)</sub> =1000			A	B	C	D	E	F	G	H	I	L	M				
FLOW l/min	TYPE	ELEMENT	G 1 1/4	121	39	329	117	48	M10	48	21	295	1 3/4-12 UN 2B	3,4	2,4		
160	K053124 HMK 513/1	P165705 K 513/1	G 1 1/4	121	39	329	117	48	M10	48	21	295	1 3/4-12 UN 2B	3,4	2,4		
160	K053143 HMK 513/1	P165705 K 513/1	G 1 1/4	121	39	329	117	48	M10	48	21	295	1 3/4-12 UN 2B	3,4	2,4		
160	K053147 HMK 513/1	P165705 K 513/1	G 1 1/4	121	39	329	117	48	M10	48	21	295	1 3/4-12 UN 2B	3,4	2,4		

MEDIUM PRESSURE FILTERS

# HMK 05 - DURAMAX

In-line medium pressure filters, up to 24 bar with spin-on element

## Performance Curves



## Heads

HEAD ASSY	BY-PASS VALVE Kpa	SNOUT THREAD	IN & OUT PORTS	MOUNTING HOLES THREAD	INDICATOR PREDISP.	THREAD PREDISP.	INDICATOR	SETTINGS Kpa
P173448	1,72	1 3/4-12	G 1 1/4	M10x1,5	2 sx	9/16-18	plug+P162696	1,4
P761446	3,45	1 3/4-12	G 1 1/4	M10x1,5	1 sx	9/16-18	P165194	2,75
P175095	3,45	1 3/4-12	1 5/8-12	M10x1,5	1 dx	9/16-18	plug	



Donaldson®  
*Filtration Solutions*

# HIGH PRESSURE FILTERS





# FPK02&04-AP220

**In-line high pressure filters,  
up to 420 bar**



## Technical Data

- Filter head casting in spheroidal cast iron.
- Extruded steel bowl.
- Operating pressure at 30 MPa (300 bar)
- Static pressure testing at 63 MPa (630 bar).
- Fatigue pressure of 2.000.000 cycles at 0 - 30 MPa (0 - 300 bar) per NFPA T 3.10.5 R2:2000
- By-pass valve setting 350 kPa (3,5 bar) per ISO3968 for K020171 to K020177 and 600 kPa (6 bar) for K041585 to K041593.
- Operating temperature -20 +120°C.
- Compatibility hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1.

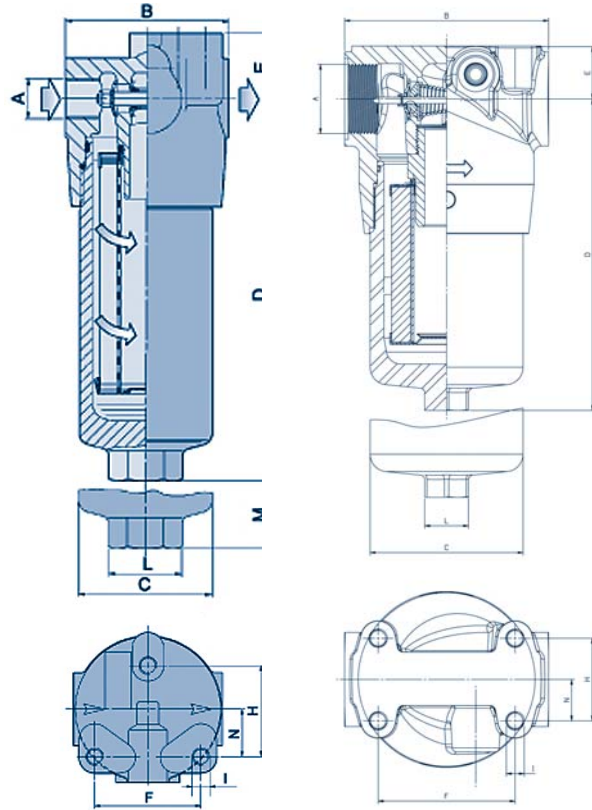
## Filter Elements

- Synteq® synthetic media (5 - 10 - 25 micron), reinforced with wire mesh
- Collapse resistance 2 MPa (20 bar) per ISO 2941. (They can also be supplied at 21 MPa (210 bar) on customer's request).

# FPK02&04-AP220

In-line high pressure filters, up to 420 bar

## Specifications



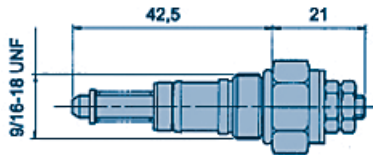
AP 221 / 222

AP 223 / 224 / 225

FLOW l/min	/03		FLOW l/min	/02		FLOW l/min	/01	
	SYNTHETIC MEDIA							
	$\beta_{23(c)}=1000$			$\beta_{11(c)}=1000$			$\beta_{8(c)}=1000$	
TYPE	ELEMENT	TYPE	ELEMENT	TYPE	ELEMENT	TYPE	ELEMENT	
50	K020173 AP 221.03	P169797 AP 472.53	40	K020172 AP 221.02	P169447 AP 472.52	30	K020171 AP 221.01	P169446 AP 472.51
90	K020177 AP 222.03	P169450 AP 473.53	80	K020176 AP 222.02	P169449 AP 473.52	70	K020175 AP 222.01	P169798 AP 473.51
180	K041585 AP 223.03	P164172 AP 474.53	150	K041588 AP 223.02	P164164 AP 474.52	120	K041591 AP 223.01	P164592 AP 474.51
350	K041586 AP 224.03	P164174 AP 475.53	300	K041589 AP224.02	P164166 AP 475.52	250	K041592 AP 224.01	P164594 AP 475.51
450	K041587 AP 225.03	P164176 AP 476.53	400	K041590 AP225.02	P164168 AP 476.52	350	K041593 AP 225.01	P164596 AP 476.51



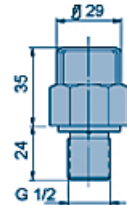
## Service Indicators



### VISUAL DIFFERENTIAL PRESSURE INDICATOR

**P761058**

Settings: 300 kPa (3 bar)



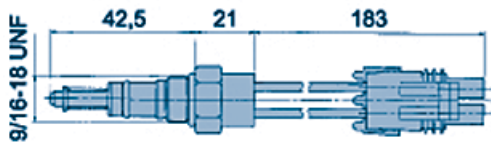
### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR

**P763975** N.O. contacts

**P763976** N.O. contacts

Settings: 270 kPa (2,7 bar)

Max. values: 30 DCV - 0,2 A



### ELECTRICAL DIFFERENTIAL PRESSURE

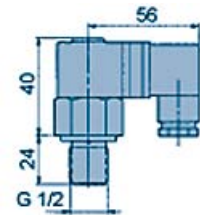
**P761057**

Settings: 300 kPa (3 bar)

Max. values: 250 ACV 30 DCV - 5 A res. and ind.

Protection class: IP 65

Cable clamp: PG 11



### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR 2 WIRES, CANON CONNECTOR

**P171087** N.O. contacts

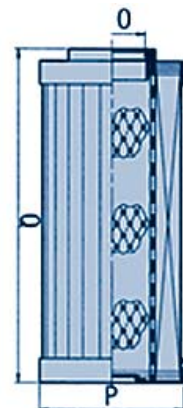
**P763978** N.C. contacts

Settings: 270 kPa (2,7 bar)

Max. values: 30 DCV - 0,2 A res.

DIMENSIONS ASSY (mm)											
A	B	C	D	E	F	H	I	L	M	N	Kg.
G 1/2	85	70	166	34	60,5	52,5	M10	Hex30	40	27,5	3,0
G 3/4	85	70	276	34	60,5	52,5	M10	Hex30	40	27,5	4,0
G 1 1/4	140	105	216	36,5	94	57	M12	Hex30	47		12,0
G 1 1/4	140	105	309	36,5	94	57	M12	Hex30	47		15,0
G 1 1/2	140	105	431	36,5	94	57	M12	Hex30	47		15,0

DIMENSIONS ELEMENT (mm)		
O	P	Q
24	50	113
24	50	207
43	78	115
43	78	208
43	78	330

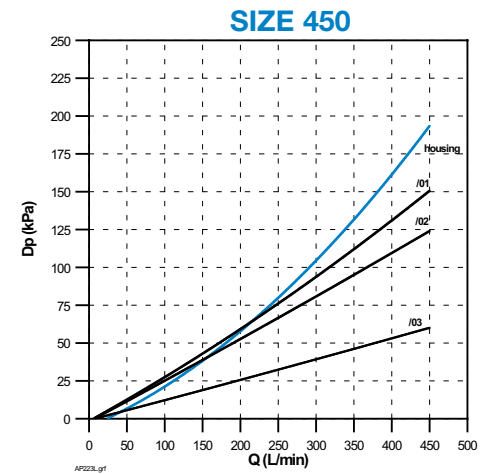
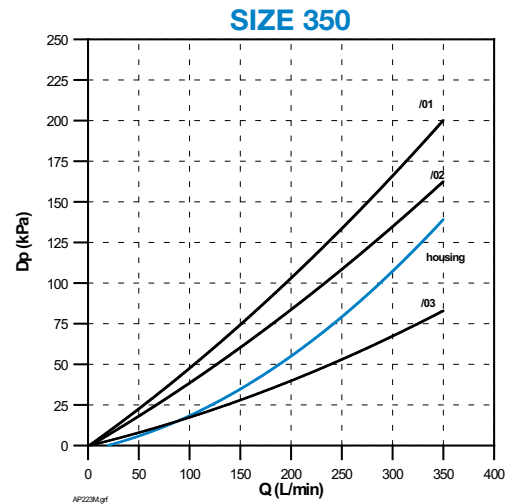
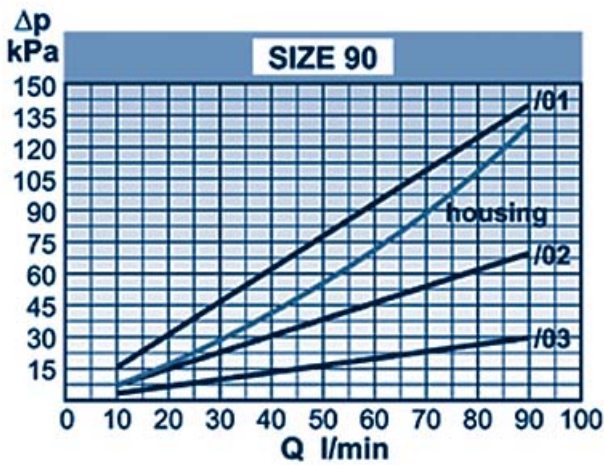
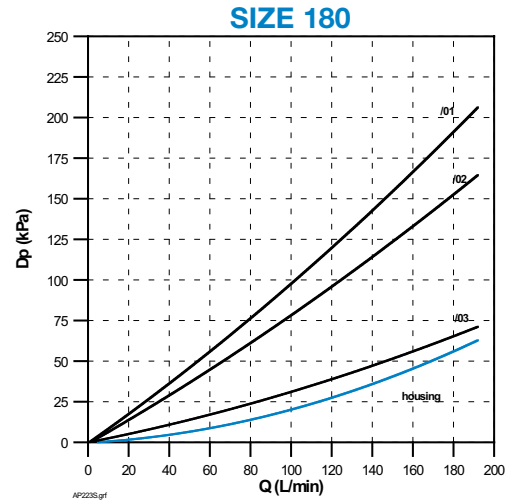
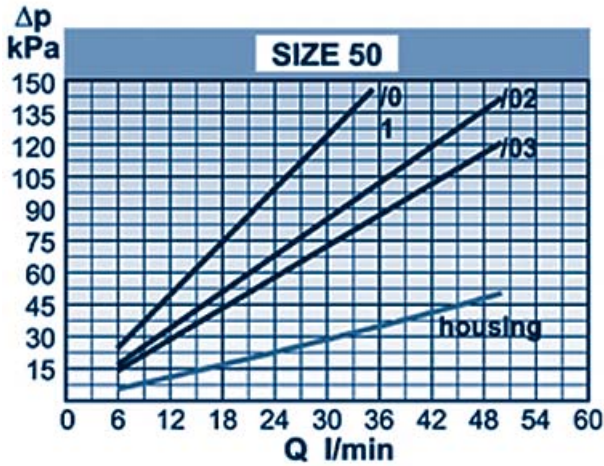




# FPK02&04-AP220

In-line high pressure filters, up to 420 bar

## Performance Curves



HIGH PRESSURE  
FILTERS

# FPK02-AP280

In-line high pressure filters,  
up to 420 bar



## Technical Data

- Filter head casting in spheroidal cast iron.
- Extruded steel bowl.
- Operating pressure at 42 MPa (420 bar)
- Static pressure testing at 63 MPa (630 bar).
- Fatigue pressure of 2.000.000 cycles at 0 - 30 MPa (0 - 300 bar) per NFPA T 3.10.5.1.
- By-pass valve setting 600 kPa (6 bar) per ISO3968.
- Operating temperature -20 +120°C.
- Compatibility hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1.

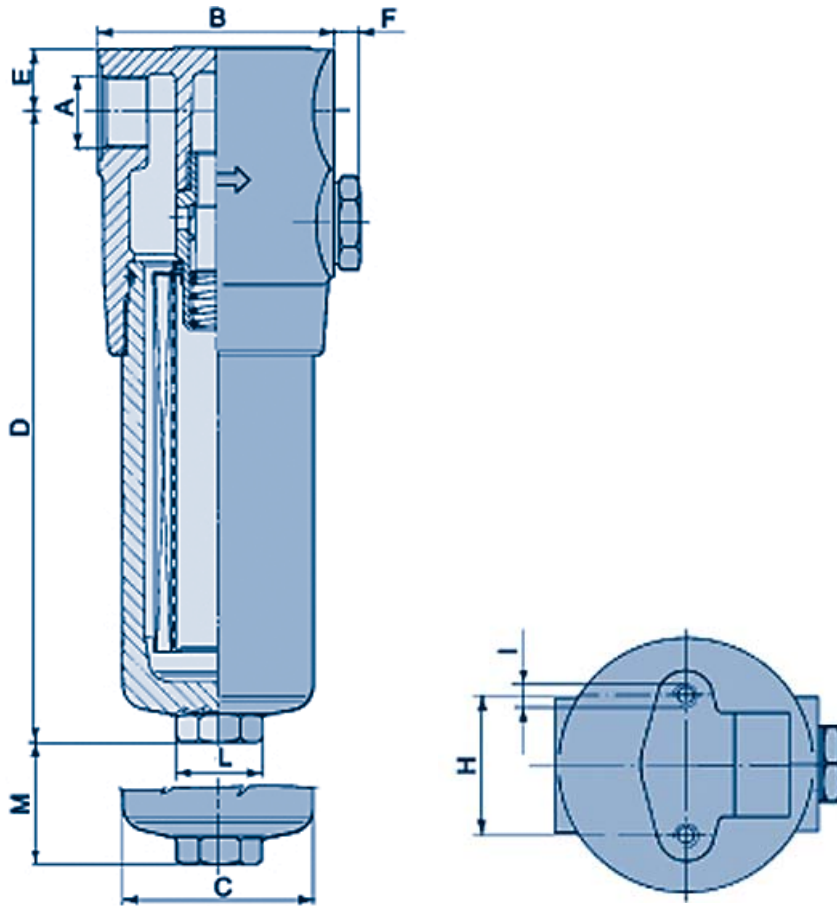
## Filter Elements

- Synteq® synthetic media (5 - 10 - 25 micron), reinforced with wire mesh.
- Collapse resistance 2 MPa (20 bar) per ISO 2941. (They can also be supplied at 21 MPa (210 bar) on customer's request).

# FPK02-AP280

In-line high pressure filters,  
up to 420 bar

## Specifications



		/03		/02		/01		
		SYNTHETIC MEDIA						
		$\beta_{23(c)}=1000$		$\beta_{11(c)}=1000$		$\beta_{8(c)}=1000$		
FLOW l/min	TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT
30	K020104 AP 358.03	P171715 CM 230/03	30	K020103 AP 358.02	P171714 CM 230/02	20	K020169 AP 358.01	P171713 CM 230/01
50	K020110 AP 359.03	P165136 CM 250/03	50	K020109 AP 359.02	P165006 CM 250/02	40	K020108 AP 359.01	P165041 CM 250/01
90	K020116 AP 360.03	P165138 CM 290/03	90	K020115 AP 360.02	P165015 CM 290/02	70	K020114 AP 360.01	P165043 CM 290/01

HIGH PRESSURE  
FILTERS



## Service Indicators

### ELECTRONIC DIFFERENTIAL PRESSURE INDICATOR

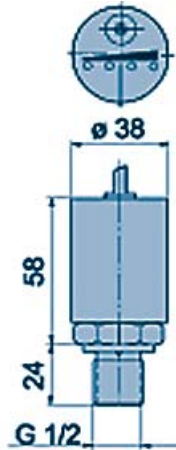
Measures element restriction and indicates servicing required

**P171970** (505.06)

Setting: 500 kPa (5 bar)

Max. values: 30 ACV - 0,5 A res. - 0,2 A ind.

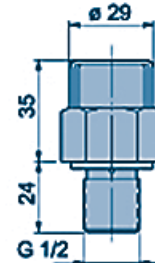
Protection class: IP 65



### VISUAL DIFFERENTIAL PRESSURE INDICATOR

**P171945** (506.06)

Setting: 500 kPa (5 bar)



### VISUAL ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR

**P171947** (507.03)

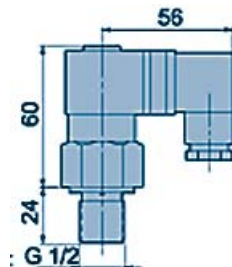
**P171944** (507.06) with thermostat at min. temperature at 30°C

Setting: 500 kPa (5 bar)

Max. values: 250 ACV - 30 DCV - 5 A res. and ind.

Protection class: IP 65

Cable clamp: PG 11



### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR

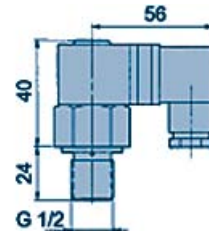
**P761056**

Setting: 500 kPa (5 bar)

Max. values: 250 ACV - 30 DCV - 5 A res. and ind.

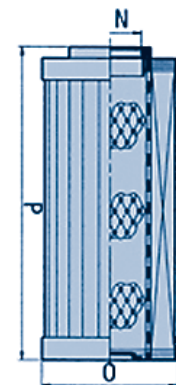
Protection class: IP 65

Cable clamp: PG 11



DIMENSIONS ASSY (mm)										
A	B	C	D	E	F	H	I	L	M	Kg.
G 1/2	85	70	174	23	9	46	M8	Hex30	40	3,5
G 1/2	85	70	200	23	9	46	M8	Hex30	40	4,2
G 3/4	85	70	301	23	9	46	M8	Hex30	40	6,0

DIMENSIONS ELEMENT (mm)		
N	O	P
25,4	46	87
25,4	46	113
25,4	46	208

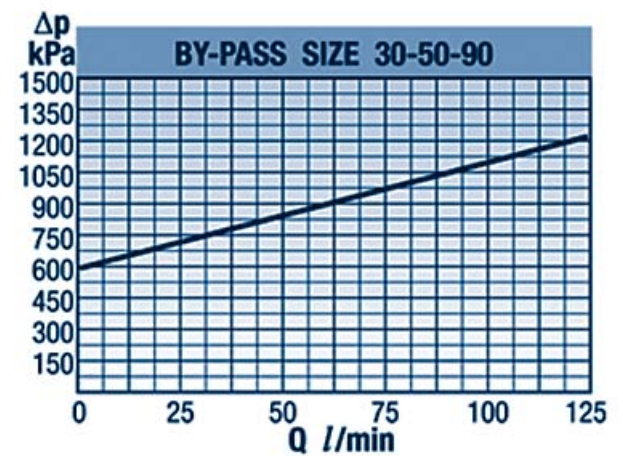
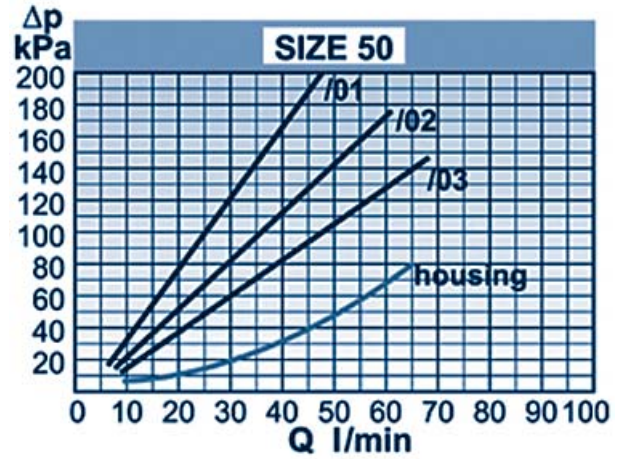




# FPK02-AP280

In-line high pressure filters,  
up to 420 bar

## Performance Curves



# FPK03&04-AP420

In-line high pressure filters,  
up to 420 bar



## Technical Data

- Filter head casting in spheroidal cast iron.
- Extruded steel bowl.
- Operating pressure at 42 MPa (420 bar)
- Static pressure testing at 63 MPa (630 bar).
- Fatigue pressure of 2.000.000 cycles at 0 - 30 MPa (0 - 300 bar) per NFPA T 3.10.5.1.
- By-pass valve setting 600 kPa (6 bar) per ISO 3968.
- Reverse flow valve which allows fluid to pass through the element in one direction but to by-pass the element when the flow is reversed. State letter "V" while placing the order.
- Operating temperature -20 +120°C.
- Compatibility hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1 or flanged per SAE J518-6000 PSI
- Tapped predisposition for indicator.

## Filter Elements

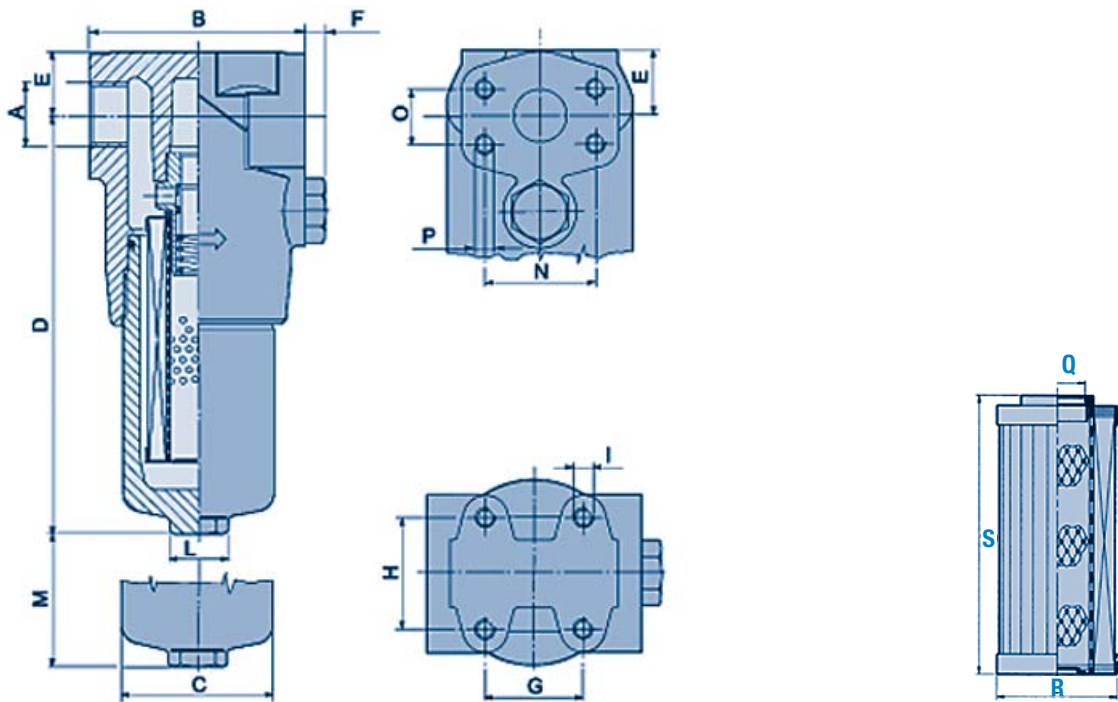
- Synteq® synthetic media (5 - 10 - 25 micron), reinforced with wire mesh.
- Collapse resistance 2 MPa (20 bar) per ISO 2941. (They can also be supplied at 21 MPa (210 bar) on customer's request).



# FPK03&04-AP420

In-line high pressure filters, up to 420 bar

## Specifications



		/03		/02		/01	
		SYNTHETIC MEDIA					
		$\beta_{23(c)}=1000$		$\beta_{11(c)}=1000$		$\beta_{8(c)}=1000$	
FLOW l/min	TYPE	ELEMENT	FLOW l/min	TYPE	ELEMENT	FLOW l/min	ELEMENT
50	K030286 AP 361.03	P171733 AP 451.53	50	K030285 AP 361.02	P171732 AP 451.52	40	K030284 AP 361.01 P171731 AP 451.51
80	K030289 AP 362.03	P171736 AP 452.53	80	K030288 AP 362.02	P171735 AP 452.52	60	K030287 AP 362.01 P171734 AP 452.51
80	K030292 AP 362.08	P171736 AP 452.53	80	K030291 AP 362.07	P171735 AP 452.52	60	K030290 AP 362.06 P171734 AP 452.51
120	K030295 AP 363.03	P171739 AP 453.53	120	K030294 AP 363.02	P171738 AP 453.52	80	K030293 AP 363.01 P171737 AP 453.51
120	K030298 AP 363.08	P171739 AP 453.53	120	K030297 AP 363.07	P171738 AP 453.52	80	K030296 AP 363.06 P171737 AP 453.51
180	K040676 AP 364.03	P171742 AP 454.53	180	K040675 AP 364.02	P171741 AP 454.52	160	K040674 AP 364.01 P171740 AP 454.51
180	K040679 AP 364.08	P171742 AP 454.53	180	K040678 AP 364.07	P171741 AP 454.52	160	K040677 AP 364.06 P171740 AP 454.51
300	K040682 AP 365.03	P171745 AP 455.53	300	K040681 AP 365.02	P171744 AP 455.52	270	K040680 AP 365.01 P171743 AP 455.51
300	K040685 AP 365.08	P171745 AP 455.53	300	K040684 AP 365.07	P171744 AP 455.52	270	K040683 AP 365.06 P171743 AP 455.51
400	K040688 AP 366.03	P171748 AP 456.53	400	K040687 AP 366.02	P171747 AP 456.52	320	K040686 AP 366.01 P171746 AP 456.51
400	K040691 AP 366.08	P171748 AP 456.53	400	K040690 AP 366.07	P171747 AP 456.52	320	K040689 AP 366.06 P171746 AP 456.51

### Service Indicators

#### ELECTRONIC DIFFERENTIAL PRESSURE INDICATOR

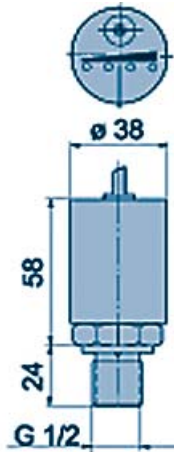
Measures element restriction and indicates servicing required

**P171970** (505.06)

Setting: 500 kPa (5 bar)

Max. values: 30 ACV - 0,5 A res. - 0,2 A ind.

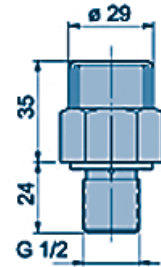
Protection class: IP 65



#### VISUAL DIFFERENTIAL PRESSURE INDICATOR

**P171945** (506.06)

Setting: 500 kPa (5 bar)



#### VISUAL ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR

**P171947** (507.03)

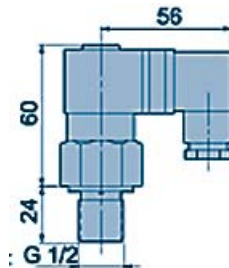
**P171944** (507.06) with thermostat at min. temperature at 30°C

Setting: 500 kPa (5 bar)

Max. values: 250 ACV - 30 DCV - 5 A res. and ind.

Protection class: IP 65

Cable clamp: PG 11



#### ELECTRICAL DIFFERENTIAL PRESSURE INDICATOR

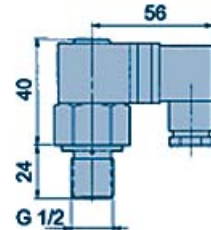
**P761056**

Setting: 500 kPa (5 bar)

Max. values: 250 ACV - 30 DCV - 5 A res. and ind.

Protection class: IP 65

Cable clamp: PG 11



DIMENSIONS ASSY (mm)														
A	B	C	D	E	F	G	H	I	L	M	N	O	P	Kg.
G 1/2	110	78	186	33	9	50	57	M10	Hex30	50				6,1
G 3/4	110	78	215	33	9	50	57	M10	Hex30	50				6,7
3/4 SAE 6000	110	78	215	33	9	50	57	M10	Hex30	50	50,8	23,8	M10	6,8
G 1	110	78	320	33	9	50	57	M10	Hex30	50				8,2
1 SAE 6000	110	78	320	33	9	50	57	M10	Hex30	50	57,15	27,76	M12	8,4
G 1 1/4	140	105	256	46	9	94	57	M12	Hex30	55				14,8
1 1/4 SAE 6000	140	105	256	46	9	94	57	M12	Hex30	55	66,68	31,75	M14	15,1
G 1 1/2	140	105	356	46	9	94	57	M12	Hex30	55				17,2
1 1/2 SAE 6000	140	105	356	46	9	94	57	M12	Hex30	55	79,38	36,5	M16	17,2
G 1 1/2	140	105	496	46	9	94	57	M12	Hex30	55				20,1
1 1/2 SAE 6000	140	105	496	46	9	94	57	M12	Hex30	55	79,38	36,5	M16	20,1

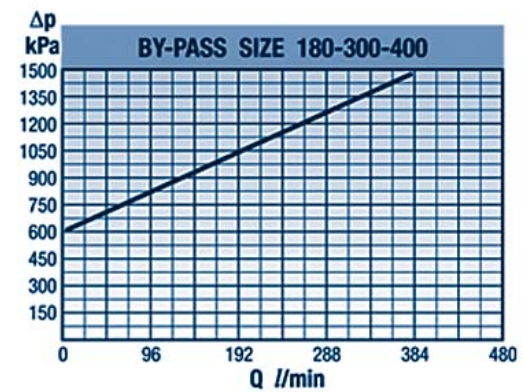
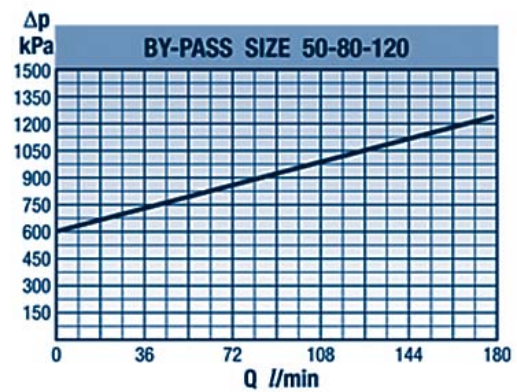
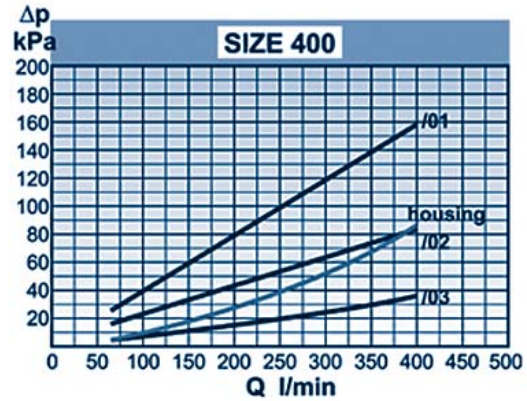
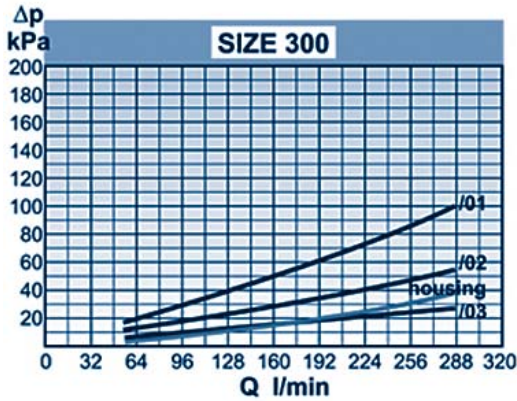
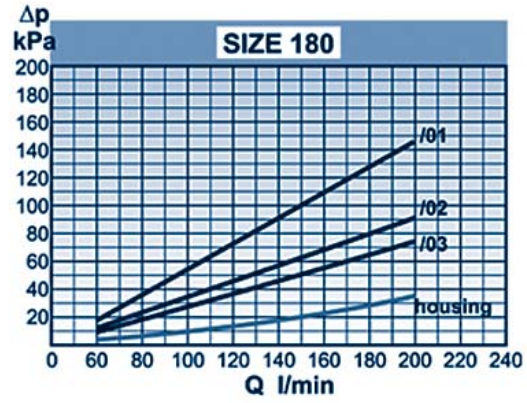
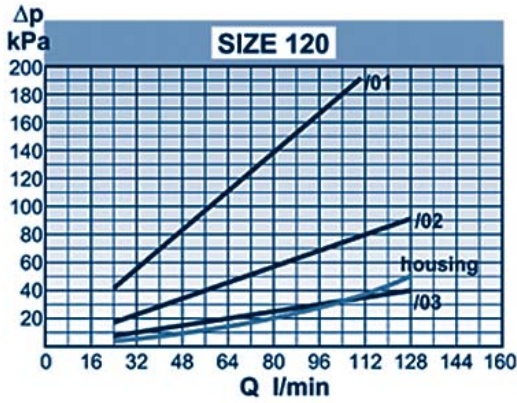
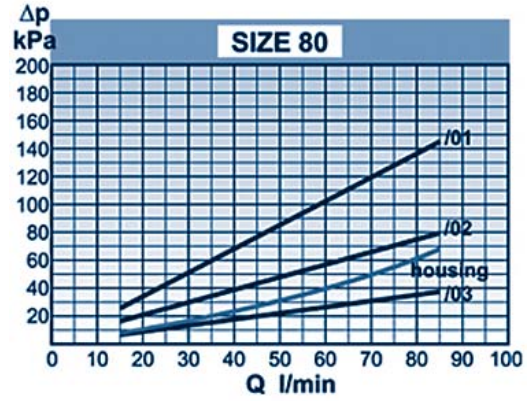
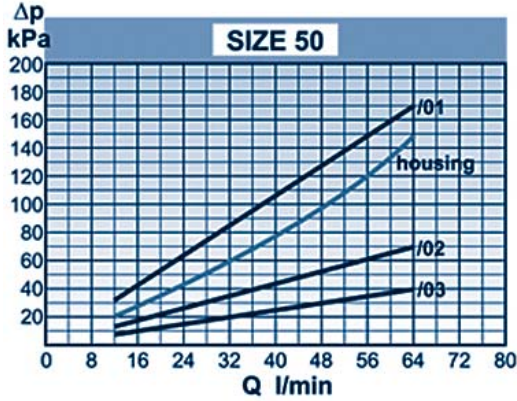
DIMENSIONS ELEMENT (mm)		
Q	R	S
27	54	87
27	54	122
27	54	122
27	54	230
27	54	230
40	78	140
40	78	140
40	78	240
40	78	240
40	78	380
40	78	380



# FPK03&04-AP420

In-line high pressure filters,  
up to 420 bar

## Performance Curves



HIGH PRESSURE  
FILTERS



# FCK-LC

In-line high pressure filters,  
“Last Chance”

## Technical Data

- Steel head.
- Steel bowl.
- Operating pressure at 42 MPa (420 bar)
- Static pressure testing at 63 MPa (630 bar).
- Fatigue pressure of 2.000.000 cycles at 0 - 30 MPa (0 - 300 bar) per NFPA T 3.10.5.1.
- Operating temperature -20 +120°C.
- Compatibility hydraulic fluids per ISO 2943.
- Flow rate and pressure drop per ISO3968 with oil kinematic viscosity 30 cSt at 40°C and density 0,875 kg/dm<sup>3</sup>.
- Ports threaded per ISO 228/1.



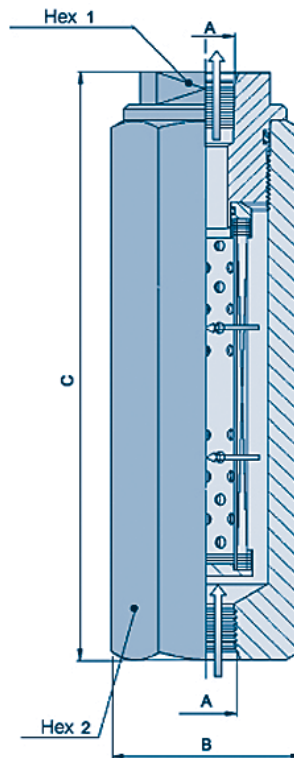
## Filter Elements

- Synteq® synthetic media (5 - 10 - 25 micron), reinforced with wire mesh
- Wire mesh 60 micron.
- Collapse resistance 20 MPa (200 bar) per ISO 2941.

# FCK-LC

In-line high pressure filters,  
"Last Chance"

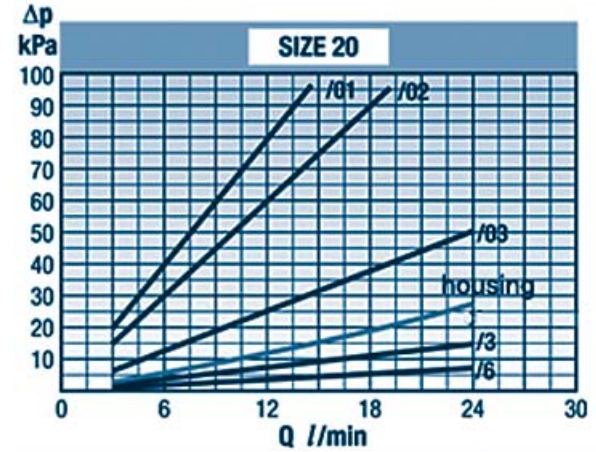
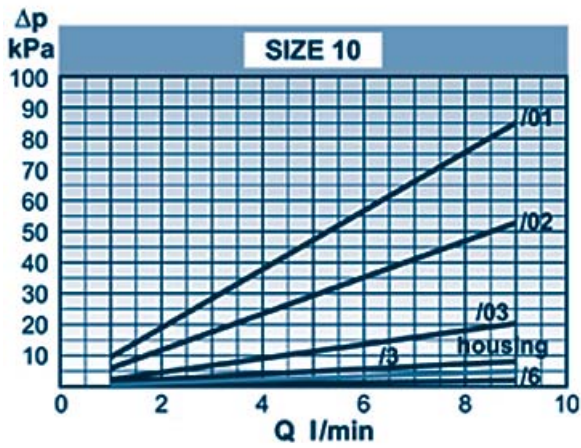
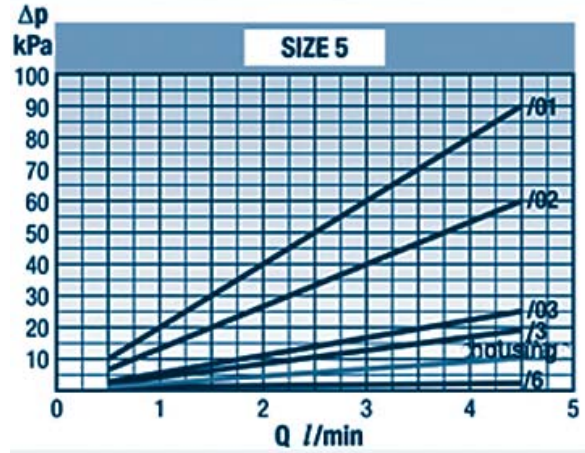
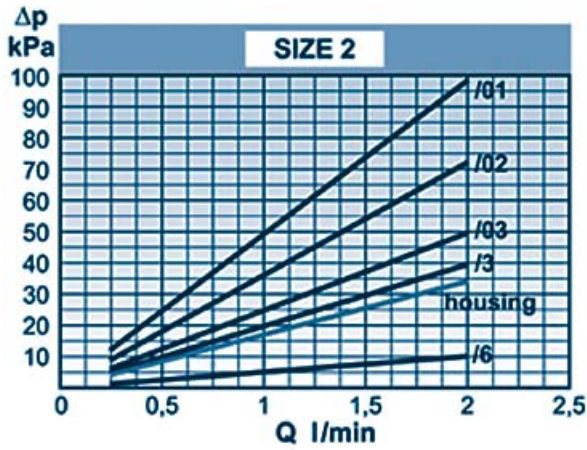
## Specifications



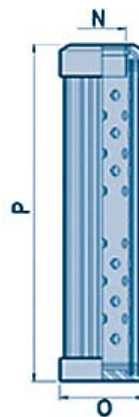
FLOW l/min	/6		/03		/02		/01	
	WIRE MESH MEDIA		SYNTHETIC MEDIA					
			$\beta_{23(c)}=1000$		$\beta_{11(c)}=1000$		$\beta_{8(c)}=1000$	
	TYPE	ELEMENT	TYPE	ELEMENT	TYPE	ELEMENT	TYPE	ELEMENT
2	K010009 LC 2/6	P171771 CLC 2/6	K010007 LC 2/03	P171769 CLC 2/03	K010006 LC 2/02	P171768 CLC 2/02	K010005 LC 2/01	P171767 CLC 2/01
5	K020124 LC 5/6	P171776 CLC 5/6	K020122 LC 5/03	P171774 CLC 5/03	K020121 LC 5/02	P171773 CLC 5/02	K020120 LC 5/01	P171772 CLC 5/01
10	K020129 LC 10/6	P171781 CLC 10/6	K020127 LC 10/03	P171779 CLC 10/03	K020126 LC 10/02	P171778 CLC 10/02	K020125 LC 10/01	P171777 CLC 10/01
20	K030303 LC 20/6	P763493 CLC 140/6	K030301 LC 20/03	P763485 CLC 140/03	K030300 LC 20/02	P763489 CLC 140/02	K030299 LC 20/01	P763487 CLC 140/01



## Performance Curves



DIMENSIONS ASSY (mm)						DIMENSIONS ELEMENT (mm)		
A	B	C	Hex 1	Hex 2	Kg.	N	O	P
G 3/8	42	103	27	36	0,5	9,5	21	47
G 1/2	58	135	30	50	1,0	15,8	28,6	70
G 1/2	58	182	30	50	1,5	15,8	28,6	117
G 1/2	70	181	33	33	2,6	22,2	43	90



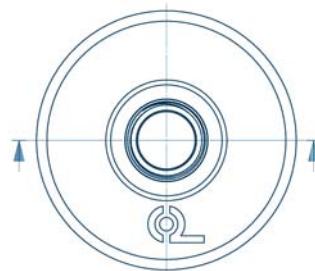
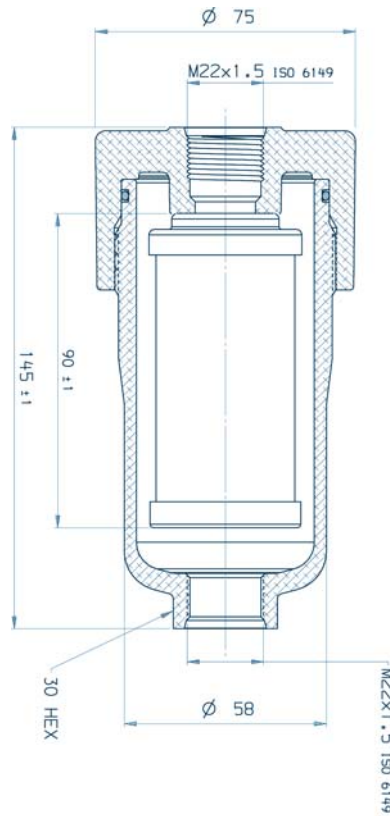


# FCK-LC

In-line high pressure filters,  
“Last Chance”

**Coming soon**

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*Filtration Solutions*

# ACCESSORIES



# PXX-TCO

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Filler caps with breather



# PXX-TCA

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Anti-vandalism filler cap  
with breather



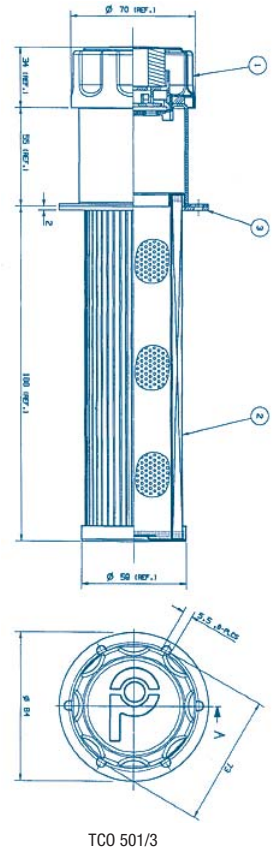
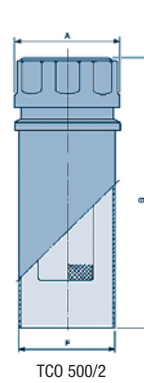
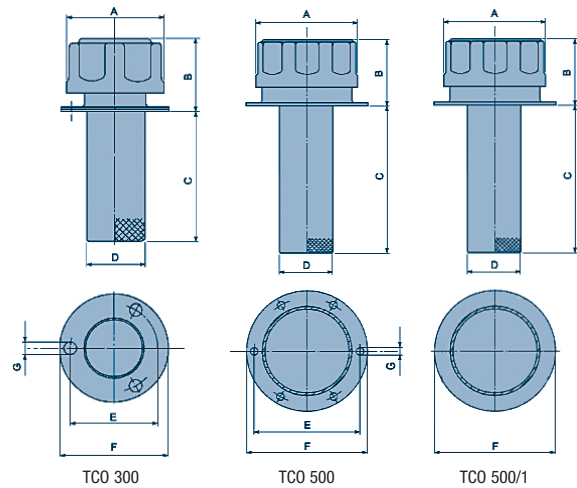


# PXX-TCO

## Filler caps with breather

### Technical Data

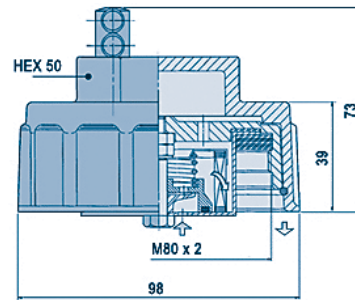
- **Series TCO 300:**
  - Not removable 500 micron mesh basket.
- **Series TCO 501/3:**
  - Not removable 125 micron mesh basket.
- **Series TCO 500:**
  - Removable 500 micron mesh basket.
  - 40-10 micron air filter.
  - Easy tightening.
  - Drilled flanges and fixing screws.
- **Series TCO 500/1:**
  - Features as TCO 500 but with weldable flange.
- **Series TCO 500/2:**
  - Features as TCO 500 but with longer weldable external tube.
- **Series TCO 500, 500/1, 500/2 and TCO 501/3:**
  - Available with pressure relief valve setting at 40 kPa (0,4 bar).
- **For all tank mounting hole: D+2mm**



				WITH PRESSURE RELIEF VALVE				DIMENSIONS (mm)							
/4		/1		/4		/1		A	B	C	D	E	F	G	Kg.
FLOW l/min	TYPE	FLOW l/min	TYPE	FLOW l/min	TYPE	FLOW l/min	TYPE								
300	P171847 TCO 300	270	P171848 TCO 301	-	-	-	-	46	35	63	28	41	51	5,5	0,1
500	P171849 TCO 500	470	P171855 TCO 501	500	P171850 TCO 500/V	470	P171857 TCO 501/V	70	46	100	38	73	84	5,5	0,25
500	P171851 TCO 500/1	470	P171856 TCO 501/1	500	P171852 TCO 500/1/V	470	P171858 TCO 501/1/V	70	46	100	38	-	84	-	0,25
500	P171853 TCO 500/2	470	P171859 TCO 501/2	500	P171854 TCO 500/2/V	470	P171860 TCO 501/2/V	70	180	-	-	-	64	-	0,60
500	-	470	P761184 TCO 501/3	500	-	470	TCO 501/3V	70	89	188	59	73	84	5,5 x 7	0,45

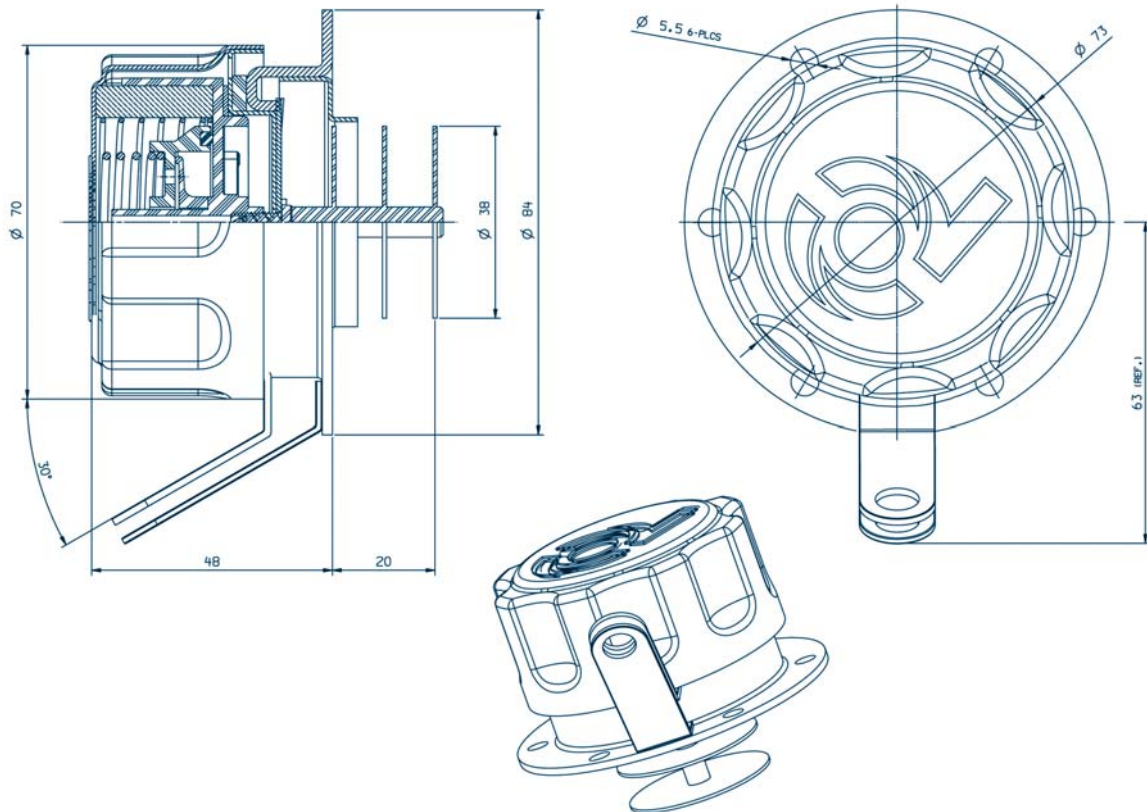
## Technical Data

- Aluminium cap with anti-vandalism blocking system.
- P173475 with pressure relief valve setting 70kPa (0,7 bar):



## Example

P173266 is an example of customized TCO equipped with relief valve; anti-splash system and lock connections.





# PXX-FS

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Tank breathers with take apart element



# PXX-FFCA

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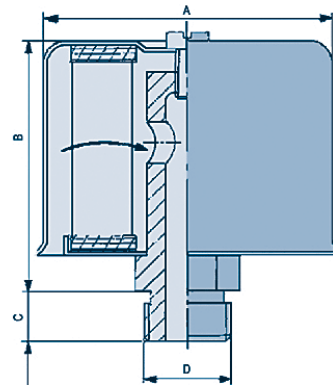
Tank breathers spin-on  
with flange and fixing screws



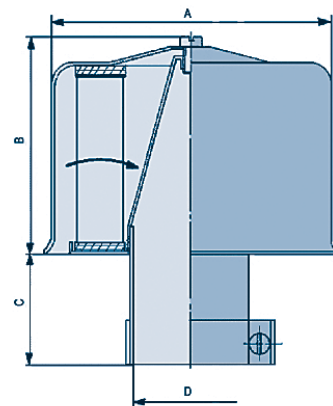


### Technical Data

- To filter air entering the reservoir.
- Ports threaded per ISO 228/1 and ISO 262.
- Filter elements in wire mesh 60-40 micron and cellulose media 10 micron.



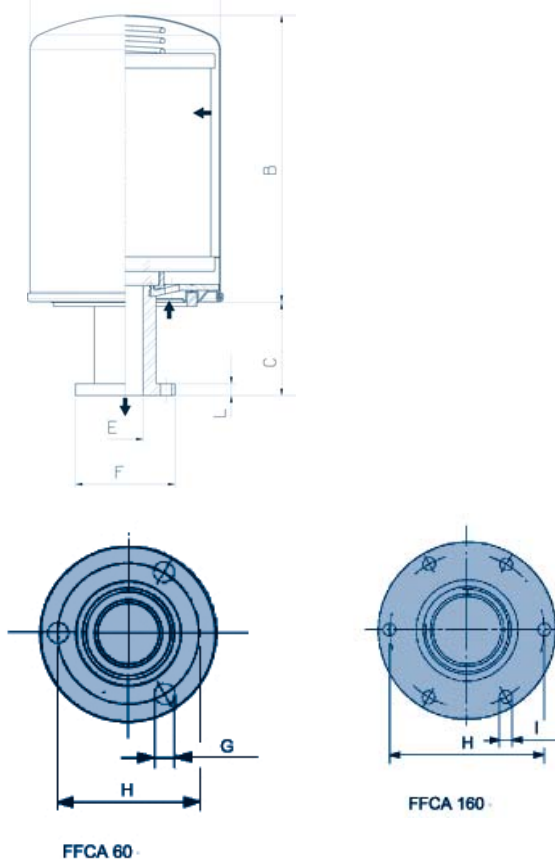
FLOW l/min	/4 WIRE MESH MEDIA		FLOW l/min	/1 CELLULOSE MEDIA		DIMENSIONS (mm)				
	TYPE	ELEMENT		TYPE	ELEMENT	A	B	C	D	Kg.
200	P172381 FS 1/4	P172433 CS 1/4	200	P761046 FS 1/1	P172435 CS 1/1	52	44	9	M 12 x 1.5	0,09
200	P172382 FS 3/4	P172433 CS 1/4	200	P761047 FS 3/1	P172435 CS 1/1	52	45	9	M 18 x 1.5	0,13
200	P172383 FS 4/4	P172433 CS 1/4	200	P761048 FS 4/1	P172435 CS 1/1	52	46	10	M 22 x 1.5	0,17
200	P172384 FS 5/4	P172433 CS 1/4	200	P761049 FS 5/1	P172435 CS 1/1	52	44	9	G 1/4	0,11
200	P172385 FS 6/4	P172433 CS 1/4	200	P761050 FS 6/1	P172435 CS 1/1	52	45	9	G 3/8	0,13
500	P172386 FS 7/4	P171783 CS 2/4	500	P761051 FS 7/1	P175447 CS 2/1	72	64	10	G 1/2	0,27
1000	P172387 FS 8/4	P171784 CS 3/4	1000	P761052 FS 8/1	P761045 CS 3/1	108	76	15	G 1	0,75



FLOW l/min	/6 WIRE MESH MEDIA		/4 WIRE MESH MEDIA		FLOW l/min	/1 CELLULOSE MEDIA		DIMENSIONS (mm)				
	TYPE	ELEMENT	TYPE	ELEMENT		TYPE	ELEMENT	A	B	C	D	Kg.
1500	P172389 FS 9/6	P171786 CS 4/6	P172388 FS 9	P171785 CS 4	1500	P761053 FS 9/1	P761054 CS 4/1	132	100	48	50	0,8

## Technical Data

- To vent the reservoir compensating oil volume changes, filtering air in suction.
- Cellulose media with filtration efficiency 30-10 micron



FLOW l/min	/1 CELULLOSE MEDIA		DIMENSIONS (mm)									
	TYPE	ELEMENT	A	B	C	D	E	F	G	H	I	L
1200	P172365 FFCA 60/1	P550268 CA 60/1	96	149	50	199	18	50	5,5	41	-	6
2400	P172369 FFCA 160/1	P550148 CA 160/1	126	181	50	231	32	84	-	73	5,5	6



# PXX-LVO

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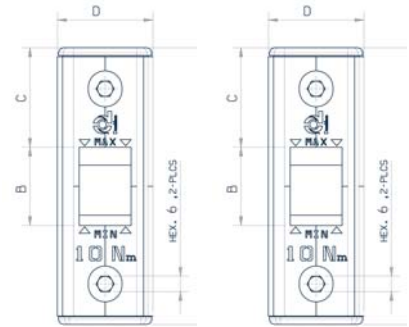
Vertical Oil Level gauge for tank



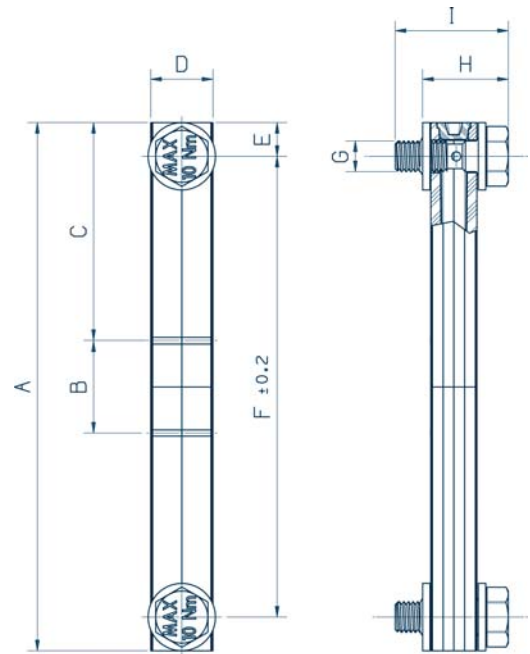


### Technical Data

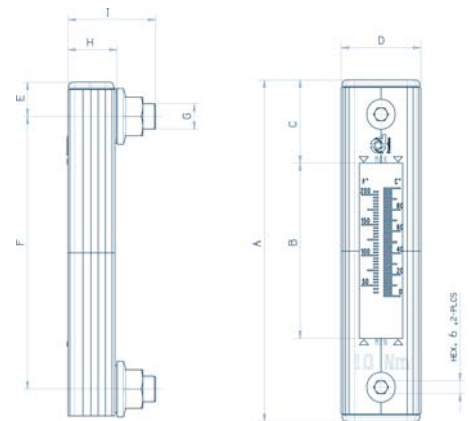
- Installed on tanks holding mineral oils or petroleum based fluids, they allow a clear and direct oil level or oil level and temperature indication.
- Lens of transparent material protected by metal section, seals "O" Ring of "BUNA" rubber.
- Maximum working pressure: 100 kPa (1bar) for pressurised tanks.
- Recommended bolt tightening torque 10 Nm, with inside nut for tightening directly on the tank.
- LVO serie without thermometer.
- LVOT with thermometer 30°- 90°C.



LVO



LV0150



LVOT

TYPE	DIMENSIONS									
	mm									
	A	B	C	D	E	F	G	H	I	Kg.
P171913 LVO 76/10	107	31	23	40	16	76	M10	20	40	0,20
P171915 LVO 76/10	107	31	23	40	16	76	M10	20	40	0,20
P171914 LVO 76/12	107	31	23	40	16	76	M12	20	40	0,20
P171916 LVO 76/12	107	31	23	40	16	76	M12	20	40	0,20
P171917 LVO 127/10	158	82	23	40	16	127	M10	20	40	0,24
P171919 LVO 127/10	158	82	23	40	16	127	M10	20	40	0,24
P171918 LVO 127/12	158	82	23	40	16	127	M12	20	40	0,24
P171920 LVO 127/12	158	82	23	40	16	127	M12	20	40	0,24
P177439 LVO 150/10	172			20	11	150	M10	15	30	0,15
P177438 LVO 150/10	172	30	60	20	11	150	M10	15	30	0,15
P171921 LVO 254/12	285	209	23	40	16	254	M12	20	40	0,40
P171922 LVO 254/12	285	209	23	40	16	254	M12	20	40	0,40



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# SERVICE INSTRUCTIONS

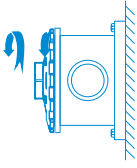
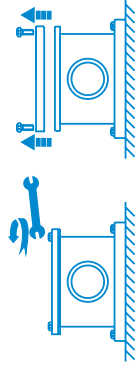
## Filter FIK-FDK FHK



## Filter FIK



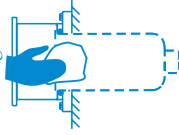
3. Remove the cover.



4. Remove the filter element as gently as possible avoiding contaminant drops in the clean side of the housing. Discard the cartridge, the seal and the spring.



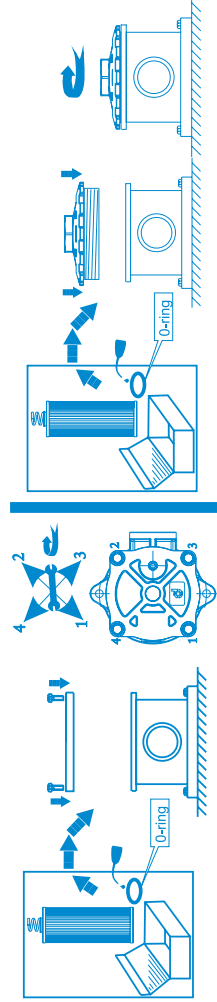
5. Clean out any sediment from the inside of the housing/bowl.



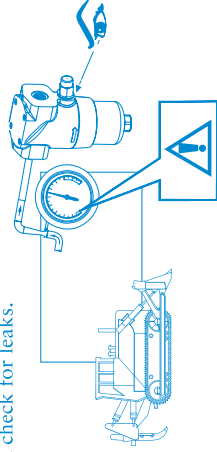
6. Clean out any sediment from the cover side and lubricate the seal.



7. Lubricate element o-ring with clean system oil and install the element. Reassemble the cover until the threads end.



8. Bleed the hydraulic system and check for leaks.



NEVER attempt to clean a used cellulose or synthetic filter element. The filter media will be damaged.

ONLY use genuine replacement parts.

NEVER substitute an incorrect part even if it is of the same size.

NEVER fit a damaged replacement filter element (e.g. Dented canister; warped end caps, ripped media).

Once the spin-on or cartridge has been replaced, if there are the conditions (filter installed vertically with head pointing upwards), we recommend to fill the filter with clean oil before pressurizing the system.

NEVER run the system without a filter element - there would be no system protection.

ALWAYS dispose of used filter elements and old oil in accordance with local regulations.

ALWAYS wear protective equipment such as safety glasses and gloves during filter replacement.

This equipment has been assessed in accordance with the guidelines laid down in the European Pressure Directive 97/23/C.

We hereby declare the equipment meets the requirements of article 3, section 3, thus meeting the directive requirements.

Under the provisions of this directive the filter assembly is suitable for use with group 2 fluids only.



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Engine-europe@emea.donaldson.com

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www.Donaldson.com

# Hydraulic Filters Service Instructions

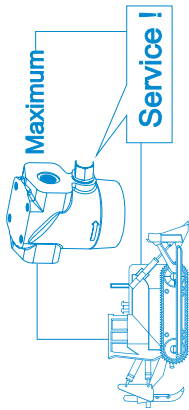
*Only to be used by professionals*



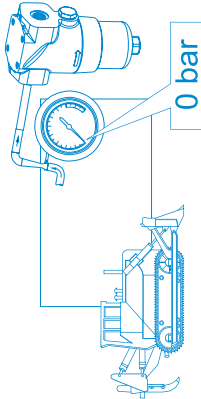
# Donaldson®

## Filter Replacement Instructions

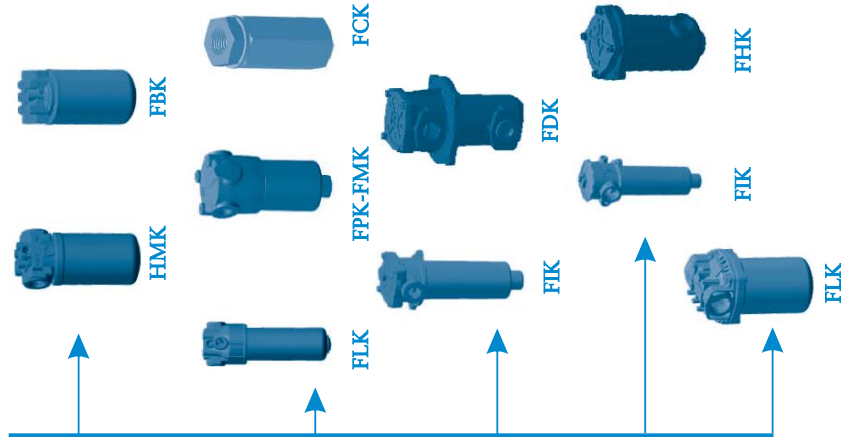
1. The filter requires servicing when the indicator shows the element to be clogged or in accordance with the service interval instructions of the OEM.



2. Turn off and check that there is no pressure.



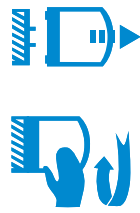
3. Remove filter :



## Filter HMK-FBK



3. Remove the spin-on filter.



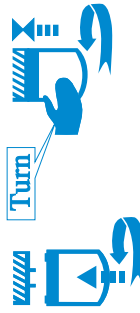
4. Discard both the spin-on and its seal.



5. Clean the surfaces of the filter head. Lubricate thread and spin-on seal with clean system oil.

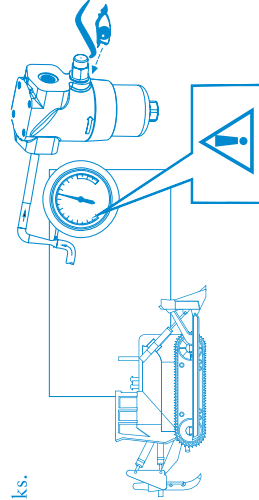


6. Screw the spin-on filter till upper surface and turn spin-on as shown by below figure.



Type	HMK	FBK
Ø	94	117
Turn	3/4	1/2
	3/4	1/2
	1	1

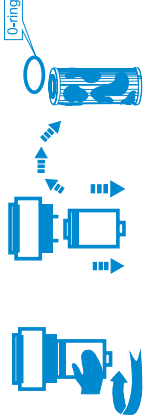
7. Bleed the hydraulic system and check for leaks.



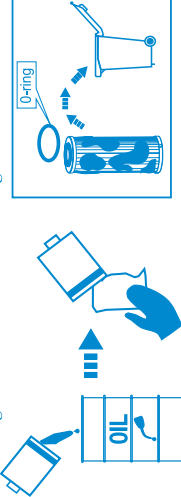
## Filter FPK-FMK FLK-FCK



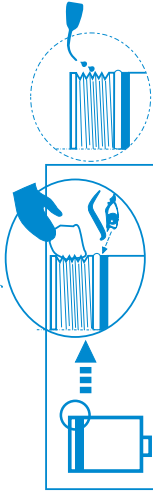
3. Unscrew the housing and remove the cartridge.



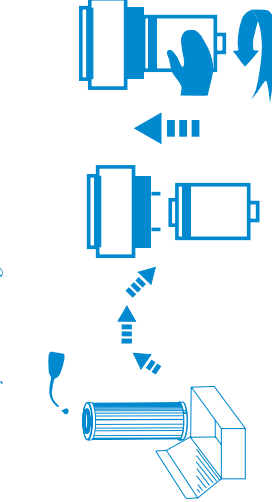
4. Clean out any sediment from the inside of the housing/bowl. Discard the cartridge and its seal.



5. Check the seal integrity, lubricate the seal and the threads with clean system oil.



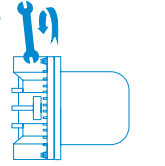
6. Lubricate element o-ring with clean system oil and install element. Reassemble the housing until threads end.



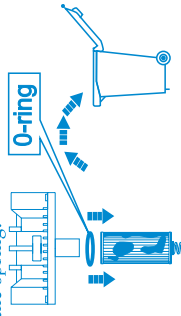
## Filter FLK



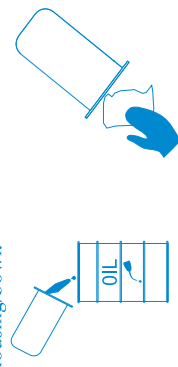
3. Remove the housing.



4. Remove and discard the cartridge, the seal and the spring.



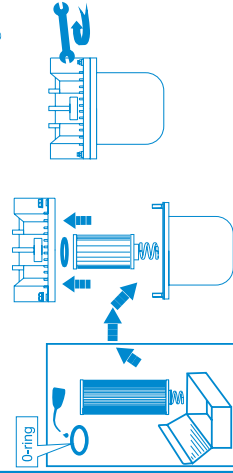
5. Clean out any sediment from the inside of the housing/bowl.



6. Clean out any sediment from the head side and lubricate the seal.



7. Lubricate element o-ring with clean system oil and install element. Reassemble the housing.





TYPE	ELEMENT	PAGE		FAMILY	
K010005	P171767	184	In-Line Filters	FCK LC	High Pressure Filters
K010006	P171768	184	In-Line Filters	FCK LC	High Pressure Filters
K010007	P171769	184	In-Line Filters	FCK LC	High Pressure Filters
K010009	P171771	184	In-Line Filters	FCK LC	High Pressure Filters
K020078	P171701	158	In-Line Filters	FMK FM	Medium Pressure Filters
K020079	P171702	158	In-Line Filters	FMK FM	Medium Pressure Filters
K020080	P171703	158	In-Line Filters	FMK FM	Medium Pressure Filters
K020081	P171704	158	In-Line Filters	FMK FM	Medium Pressure Filters
K020082	P171705	158	In-Line Filters	FMK FM	Medium Pressure Filters
K020083	P171706	158	In-Line Filters	FMK FM	Medium Pressure Filters
K020084	P171707	158	In-Line Filters	FMK FM	Medium Pressure Filters
K020085	P171708	158	In-Line Filters	FMK FM	Medium Pressure Filters
K020086	P171709	158	In-Line Filters	FMK FM	Medium Pressure Filters
K020087	P171710	158	In-Line Filters	FMK FM	Medium Pressure Filters
K020088	P171711	158	In-Line Filters	FMK FM	Medium Pressure Filters
K020089	P171712	158	In-Line Filters	FMK FM	Medium Pressure Filters
K020103	P171714	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
K020104	P171715	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
K020108	P165041	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
K020109	P165006	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
K020110	P165136	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
K020114	P165043	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
K020115	P165015	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
K020116	P165138	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
K020120	P171772	184	In-Line Filters	FCK LC	High Pressure Filters
K020121	P171773	184	In-Line Filters	FCK LC	High Pressure Filters
K020122	P171774	184	In-Line Filters	FCK LC	High Pressure Filters
K020124	P171776	184	In-Line Filters	FCK LC	High Pressure Filters
K020125	P171777	184	In-Line Filters	FCK LC	High Pressure Filters
K020126	P171778	184	In-Line Filters	FCK LC	High Pressure Filters
K020127	P171779	184	In-Line Filters	FCK LC	High Pressure Filters
K020129	P171781	184	In-Line Filters	FCK LC	High Pressure Filters
K0201691	P171713	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
K020171	P169446	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
K020172	P169447	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
K020173	P169797	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
K020175	P169798	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
K020176	P169449	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
K020177	P169450	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
K030207	P171500	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030208	P171501	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030210	P171503	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030211	P171504	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030212	P171505	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030213	P171500	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030214	P171501	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030216	P171503	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030217	P171504	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030218	P171505	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030225	P171500	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030226	P171501	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030227	P171502	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030228	P171503	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030229	P171504	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030230	P171505	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030231	P171500	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030232	P171501	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030233	P171502	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030234	P171503	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030235	P171504	55	Return Line Filters	FIK FIOT	In Tank Return Filters

TYPE	ELEMENT	PAGE		FAMILY	
K030236	P171505	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030244	P171503	70	Return Line Filters	FHK FIR	In Tank Return Filters
K030244	P171503	128	Suction Filters	FHK FIR	In Tank Suction Filters
K030245	P171504	70	Return Line Filters	FHK FIR	In Tank Return Filters
K030245	P171504	128	Suction Filters	FHK FIR	In Tank Suction Filters
K030253	P171518	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030254	P171519	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030256	P171521	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030257	P171522	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030258	P171523	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030259	P171518	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030260	P171519	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030261	P171520	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030262	P171521	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030263	P171522	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030264	P171523	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030265	P171530	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030266	P171531	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030268	P171533	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030269	P171534	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030270	P171535	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030271	P171530	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030272	P171531	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030273	P171532	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030274	P171533	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030275	P171534	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030276	P171535	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030284	P171731	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030285	P171732	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030286	P171733	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030287	P171734	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030288	P171735	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030289	P171736	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030290	P171734	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030291	P171735	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030292	P171736	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030293	P171737	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030294	P171738	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030295	P171739	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030296	P171737	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030297	P171738	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030298	P171739	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K030299	P763487	184	In-Line Filters	FCK LC	High Pressure Filters
K030300	P763489	184	In-Line Filters	FCK LC	High Pressure Filters
K030301	P763485	184	In-Line Filters	FCK LC	High Pressure Filters
K030303	P763493	184	In-Line Filters	FCK LC	High Pressure Filters
K030304	P171829	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030305	P171830	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030306	P171832	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030307	P171833	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030310	P171838	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030311	P171839	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030312	P171841	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030313	P171842	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030314	P171844	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030315	P171845	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030325	P171523	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030326	P171534	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030329	P171500	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030331	P171504	50	Return Line Filters	FIK FIO	In Tank Return Filters

TYPE	ELEMENT	PAGE		FAMILY	
K030332	P171505	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030333	P171500	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030334	P171501	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030335	P171503	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030336	P171504	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030337	P171505	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030341	P171500	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030342	P171504	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030343	P171500	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030344	P171503	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030345	P171504	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030346	P171505	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030355	P171519	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030356	P171530	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030357	P171531	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030358	P171533	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030359	P171534	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030360	P171535	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030361	P171518	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030362	P171521	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030363	P171522	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030364	P171523	138	Suction Filters	FLK FLA	In-Line Suction Filters
K030365	P171530	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030366	P171531	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030367	P171532	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030368	P171533	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030371	P171535	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030372	P171518	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030373	P171519	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030374	P171520	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030375	P171521	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030376	P171522	108	Return Line Filters	FLK FLS	In-Line Return Filters
K030378	P171501	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030379	P171503	50	Return Line Filters	FIK FIO	In Tank Return Filters
K030387	P171501	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030388	P171502	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030389	P171503	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030394	P171505	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030395	P171501	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030396	P171502	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K030524	P171829	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030525	P171844	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030526	P171841	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030527	P171838	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030529	P171832	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030530	P171830	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030531	P171845	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030532	P171842	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030533	P171839	62	Return Line Filters	FIK FIS	In Tank Return Filters
K030535	P171833	62	Return Line Filters	FIK FIS	In Tank Return Filters
K035009	P171500	70	Return Line Filters	FHK FIR	In Tank Return Filters
K035009	P171500	128	Suction Filters	FHK FIR	In Tank Suction Filters
K035010	P171501	70	Return Line Filters	FHK FIR	In Tank Return Filters
K035010	P171501	128	Suction Filters	FHK FIR	In Tank Suction Filters
K040115	P171597	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040500	P171530	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040501	P171531	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040503	P171533	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040504	P171534	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040505	P171535	50	Return Line Filters	FIK FIO	In Tank Return Filters





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TYPE	ELEMENT	PAGE		FAMILY	
K040598	P171586	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040599	P171587	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040600	P171588	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040601	P171589	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040602	P171536	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040603	P171537	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040603	P171537	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040605	P171539	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040606	P171540	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040607	P171541	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040608	P171536	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040609	P171537	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040610	P171538	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040611	P171539	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040612	P171540	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040613	P171541	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040614	P171596	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040615	P171597	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040617	P171599	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040618	P171600	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040619	P171601	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040620	P171596	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040621	P171597	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040622	P171598	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040623	P171599	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040624	P171600	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040626	P171602	148	Suction Filters	FBK FACA	In-Line Suction Filters
K040627	P171604	148	Suction Filters	FBK FACA	In-Line Suction Filters
K040628	P550268	148	Suction Filters	FBK FACA	In-Line Suction Filters
K040629	P171606	148	Suction Filters	FBK FACA	In-Line Suction Filters
K040631	P171602	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K040632	P171604	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K040633	P550268	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K040634	P171606	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K040635	P171607	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K040636	P171608	148	Suction Filters	FBK FACA	In-Line Suction Filters
K040637	P171609	148	Suction Filters	FBK FACA	In-Line Suction Filters
K040638	P171610	148	Suction Filters	FBK FACA	In-Line Suction Filters
K040639	P171611	148	Suction Filters	FBK FACA	In-Line Suction Filters
K040641	P171608	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K040642	P171609	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K040643	P171610	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K040644	P171611	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K040645	P171612	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K040674	P171740	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040675	P171741	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040676	P171742	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040677	P171740	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040678	P171741	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040679	P171742	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040680	P171743	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040681	P171744	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040682	P171745	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040683	P171743	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040684	P171744	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040685	P171745	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040686	P171746	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040687	P171747	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040688	P171748	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040689	P171746	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters

TYPE	ELEMENT	PAGE		FAMILY	
K040690	P171747	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040691	P171748	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
K040758	P171524	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040759	P171530	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040760	P171831	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040761	P171529	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040762	P171535	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040763	P171834	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040767	P171527	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040768	P171533	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040769	P171840	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040770	P171526	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040771	P171532	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040772	P171843	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040773	P171525	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040774	P171531	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040775	P171846	62	Return Line Filters	FIK FIS	In Tank Return Filters
K040865	P171521	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040866	P171522	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040867	P171523	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040868	P171518	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040869	P171525	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040870	P171527	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040871	P171528	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040872	P171529	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040873	P171524	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040875	P171533	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040876	P171534	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040877	P171535	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040878	P171530	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040879	P171531	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040880	P171533	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040882	P171534	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040883	P171535	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040884	P171530	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040888	P171530	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040889	P171531	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040891	P171535	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040892	P171518	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040893	P171521	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040894	P171522	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040895	P171523	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040896	P171524	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040897	P171526	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040898	P171527	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040899	P171528	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040900	P171529	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040901	P171530	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040902	P171533	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040903	P 171534	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040904	P171535	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040932	P171584	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040933	P171585	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040934	P171587	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040935	P171588	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040936	P171589	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040937	P171536	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040939	P171539	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040940	P171540	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040941	P171541	138	Suction Filters	FLK FLA	In-Line Suction Filters

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K040942	P171596	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040943	P171599	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040944	P171600	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040945	P171601	138	Suction Filters	FLK FLA	In-Line Suction Filters
K040948	P171584	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040949	P171585	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040950	P171586	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040951	P171587	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040952	P171588	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040953	P171589	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040954	P171536	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040955	P171537	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040956	P171538	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040957	P171539	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040958	P171540	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040959	P171541	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040960	P171596	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040961	P171599	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040962	P171600	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040963	P171601	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040963	P171601	108	Return Line Filters	FLK FLS	In-Line Return Filters
K040970	P171611	148	Suction Filters	FBK FACA	In-Line Suction Filters
K040971	P171519	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040985	P171531	50	Return Line Filters	FIK FIO	In Tank Return Filters
K040993	P171519	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K040994	P171520	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K041008	P171525	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K041016	P171531	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K041017	P171532	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K041023	P171532	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K041029	P171537	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K041124	P171597	108	Return Line Filters	FLK FLS	In-Line Return Filters
K041125	P171598	108	Return Line Filters	FLK FLS	In-Line Return Filters
K041138	P171602	148	Suction Filters	FBK FACA	In-Line Suction Filters
K041139	P171604	148	Suction Filters	FBK FACA	In-Line Suction Filters
K041140	P550268	148	Suction Filters	FBK FACA	In-Line Suction Filters
K041141	P171606	148	Suction Filters	FBK FACA	In-Line Suction Filters
K041145	P171608	148	Suction Filters	FBK FACA	In-Line Suction Filters
K041146	P171609	148	Suction Filters	FBK FACA	In-Line Suction Filters
K041147	P171610	148	Suction Filters	FBK FACA	In-Line Suction Filters
K041149	P171616	148	Suction Filters	FBK FACA	In-Line Suction Filters
K041159	P171621	148	Suction Filters	FBK FACA	In-Line Suction Filters
K041230	P550148	148	Suction Filters	FBK FACA	In-Line Suction Filters
K041301	P762421	80	Return Line Filters	FIK COMBO 120 Series	Return & Suction In Tank Filters
K041319	P171530	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041320	P171531	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041321	P171532	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041322	P171533	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041329	P171535	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041330	P171831	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041331	P171846	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041332	P171843	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041334	P171840	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041336	P171834	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041337	P171524	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041338	P171525	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041339	P171526	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041340	P171527	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041342	P171529	62	Return Line Filters	FIK FIS	In Tank Return Filters
K041511	P763652	80	Return Line Filters	FIK COMBO 120 Series	Return & Suction In Tank Filters





# Index by Type



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K041591	P164592	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
K041592	P164594	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
K041593	P164596	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
K041595	P763652	80	Return Line Filters	FIK COMBO 120 Series	Return & Suction In Tank Filters
K041596	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041597	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041598	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041599	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041600	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041601	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041602	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041603	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041604	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041605	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041606	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041607	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041608	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041609	P764198	95	Return Line Filters	FIK COMBO 200 Series	Return & Suction In Tank Filters
K041610	P762421	80	Return Line Filters	FIK COMBO 120 Series	Return & Suction In Tank Filters
K045739	P165335	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045740	P165338	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045741	P163419	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045742	P163324	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045743	P164381	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045744	P164384	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045745	P164375	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045746	P164378	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045747	P165354	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045748	P165332	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045791	P165354	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045792	P164375	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045793	P164381	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045794	P163419	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045795	P165335	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045796	P165332	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045797	P164378	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045798	P164384	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045799	P163324	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045800	P165338	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045801	P165354	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045802	P164375	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045803	P164381	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045804	P163419	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045805	P165335	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045806	P165332	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045807	P164378	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045808	P164384	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045809	P163324	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K045810	P165338	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
K051109	P171536	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051110	P171537	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051112	P171539	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051113	P171540	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051114	P171541	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051115	P171536	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051116	P171537	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051118	P171539	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051119	P171540	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051120	P171541	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051121	P171536	55	Return Line Filters	FIK FIOT	In Tank Return Filters

TYPE	ELEMENT	PAGE		FAMILY	
K051123	P171537	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051124	P171538	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051125	P171539	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051126	P171540	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051127	P171541	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051128	P171536	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051129	P171537	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051130	P171538	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051131	P171539	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051132	P171540	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051133	P171541	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051134	P171536	70	Return Line Filters	FHK FIR	In Tank Return Filters
K051134	P171536	128	Suction Filters	FHK FIR	In Tank Suction Filters
K051135	P171537	70	Return Line Filters	FHK FIR	In Tank Return Filters
K051135	P171537	128	Suction Filters	FHK FIR	In Tank Suction Filters
K051137	P171539	70	Return Line Filters	FHK FIR	In Tank Return Filters
K051137	P171539	128	Suction Filters	FHK FIR	In Tank Suction Filters
K051138	P171540	70	Return Line Filters	FHK FIR	In Tank Return Filters
K051138	P171540	128	Suction Filters	FHK FIR	In Tank Suction Filters
K051146	P171613	148	Suction Filters	FBK FACA	In-Line Suction Filters
K051147	P171614	148	Suction Filters	FBK FACA	In-Line Suction Filters
K051148	P550148	148	Suction Filters	FBK FACA	In-Line Suction Filters
K051151	P171613	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K051152	P171614	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K051153	P550148	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K051154	P171616	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K051155	P171617	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K051156	P171618	148	Suction Filters	FBK FACA	In-Line Suction Filters
K051157	P171619	148	Suction Filters	FBK FACA	In-Line Suction Filters
K051158	P171620	148	Suction Filters	FBK FACA	In-Line Suction Filters
K051161	P171618	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K051162	P171619	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K051163	P171620	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K051164	P171621	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K051165	P171622	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K051227	P171540	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051229	P171540	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051231	P171539	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051232	P171539	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051233	P171537	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051235	P171539	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051236	P171540	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051237	P171541	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051238	P171536	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051239	P171537	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051241	P171541	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051242	P171536	50	Return Line Filters	FIK FIO	In Tank Return Filters
K051243	P171536	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051244	P171538	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051245	P171539	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051246	P171540	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051247	P171541	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051248	P171536	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051249	P171537	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051250	P171541	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051261	P171618	148	Suction Filters	FBK FACA	In-Line Suction Filters
K051263	P171538	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K051332	P171613	148	Suction Filters	FBK FACA	In-Line Suction Filters
K051333	P171614	148	Suction Filters	FBK FACA	In-Line Suction Filters
K051334	P171616	148	Suction Filters	FBK FACA	In-Line Suction Filters

TYPE	ELEMENT	PAGE		FAMILY	
K051338	P171619	148	Suction Filters	FBK FACA	In-Line Suction Filters
K051339	P171620	148	Suction Filters	FBK FACA	In-Line Suction Filters
K051340	P171621	148	Suction Filters	FBK FACA	In-Line Suction Filters
K053123	P165672	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053124	P165705	167	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053125	P165569	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053126	P165659	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053127	P165675	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053132	P165659	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053140	P165675	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053141	P165659	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053142	P165569	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053143	P165705	167	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053144	P165672	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053145	P165675	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053146	P165569	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053147	P165705	167	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K053148	P165672	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
K070003	P171542	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070004	P171543	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070006	P171545	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070007	P171546	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070008	P171547	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070009	P171548	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070010	P171549	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070012	P171551	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070013	P171552	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070014	P171553	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070015	P171554	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070016	P171555	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070018	P171557	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070019	P171558	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070020	P171559	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070021	P171560	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070022	P171561	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070024	P171563	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070025	P171564	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070026	P171565	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070027	P171566	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070028	P171567	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070030	P171569	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070031	P171570	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070032	P171571	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070033	P171572	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070034	P171573	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070036	P171575	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070037	P171576	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070038	P171577	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070039	P171578	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070040	P171579	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070042	P171581	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070043	P171582	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070044	P171583	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070045	P171572	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070046	P171573	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070048	P171575	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070049	P171576	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070050	P171577	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070051	P171578	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070052	P171579	50	Return Line Filters	FIK FIO	In Tank Return Filters





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K070118	P171567	128	Suction Filters	FHK FIR	In Tank Suction Filters
K070120	P171569	70	Return Line Filters	FHK FIR	In Tank Return Filters
K070120	P171569	128	Suction Filters	FHK FIR	In Tank Suction Filters
K070121	P171570	70	Return Line Filters	FHK FIR	In Tank Return Filters
K070121	P171570	128	Suction Filters	FHK FIR	In Tank Suction Filters
K070153	P171590	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070154	P171591	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070156	P171593	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070157	P171594	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070158	P171595	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070159	P171590	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070160	P171591	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070161	P171592	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070162	P171593	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070163	P171594	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070164	P171595	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070165	P171560	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070166	P171561	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070168	P171563	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070169	P171564	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070170	P171565	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070171	P171560	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070172	P171561	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070173	P171562	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070174	P171563	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070175	P171564	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070176	P171565	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070177	P171566	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070178	P171567	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070180	P171569	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070181	P171570	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070182	P171571	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070183	P171566	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070184	P171567	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070185	P171568	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070186	P171569	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070187	P171570	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070188	P171571	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070189	P171590	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070190	P171591	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070192	P171554	50	Return Line Filters	FIK FIO	In Tank Return Filters
K070192	P171593	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070193	P171594	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070194	P171595	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070195	P171590	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070196	P171591	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070197	P171592	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070198	P171593	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070199	P171594	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070200	P171595	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070201	P171560	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070202	P171561	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070204	P171563	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070205	P171564	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070206	P171565	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070207	P171560	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070208	P171561	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070209	P171562	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070210	P171563	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070211	P171564	108	Return Line Filters	FLK FLS	In-Line Return Filters









TYPE	ELEMENT	PAGE		FAMILY	
K070513	P171569	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070514	P171570	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070515	P171566	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070516	P171579	138	Suction Filters	FLK FLA	In-Line Suction Filters
K070558	P171591	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070559	P171592	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070560	P171590	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070561	P171591	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070562	P171592	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070563	P171593	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070564	P171594	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070565	P171561	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070566	P171562	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070567	P171563	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070568	P171565	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070569	P171560	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070571	P171566	108	Return Line Filters	FLK FLS	In-Line Return Filters
K070742	P171582	55	Return Line Filters	FIK FIOT	In Tank Return Filters
K250001	P171613	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250002	P171614	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250003	P550148	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250004	P171618	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250006	P171618	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250007	P171619	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250008	P171620	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250009	P171621	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250031	P171613	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K250032	P171614	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K250033	P550148	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K250034	P171616	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K250035	P171617	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K250036	P171618	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K250037	P171619	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K250038	P171620	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K250039	P171621	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K250040	P171622	114	Return Line Filters	FBK FRCA	In-Line Return Filters
K250062	P550148	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250107	P171613	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250108	P171614	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250109	P171618	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250113	P171618	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250114	P171619	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250115	P171620	148	Suction Filters	FBK FACA	In-Line Suction Filters
K250116	P171621	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171847		190	Accessories	PXX TCO	Filer Caps with breather
P171848		190	Accessories	PXX TCO	Filer Caps with breather
P171849		190	Accessories	PXX TCO	Filer Caps with breather
P171850		190	Accessories	PXX TCO	Filer Caps with breather
P171851		190	Accessories	PXX TCO	Filer Caps with breather
P171852		190	Accessories	PXX TCO	Filer Caps with breather
P171853		190	Accessories	PXX TCO	Filer Caps with breather
P171854		190	Accessories	PXX TCO	Filer Caps with breather
P171855		190	Accessories	PXX TCO	Filer Caps with breather
P171856		190	Accessories	PXX TCO	Filer Caps with breather
P171857		190	Accessories	PXX TCO	Filer Caps with breather
P171858		190	Accessories	PXX TCO	Filer Caps with breather
P171859		190	Accessories	PXX TCO	Filer Caps with breather
P171860		190	Accessories	PXX TCO	Filer Caps with breather
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P171918		198	Accessories	PXX LVO	Vertical Oil Level Gauge
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P171922		198	Accessories	PXX LVO	Vertical Oil Level Gauge
P172365	P550268	195	Accessories	PXX FFCA	Tank Breathers Spin-On with flange & fixing screws
P172369	P550148	195	Accessories	PXX FFCA	Tank Breathers Spin-On with flange & fixing screws
P172381	P172433	194	Accessories	PXX FS	Tank Breathers with take apart element
P172382	P172433	194	Accessories	PXX FS	Tank Breathers with take apart element
P172383	P172433	194	Accessories	PXX FS	Tank Breathers with take apart element
P172384	P172433	194	Accessories	PXX FS	Tank Breathers with take apart element
P172385	P172433	194	Accessories	PXX FS	Tank Breathers with take apart element
P172386	P171783	194	Accessories	PXX FS	Tank Breathers with take apart element
P172387	P171784	194	Accessories	PXX FS	Tank Breathers with take apart element
P172388	P171785	194	Accessories	PXX FS	Tank Breathers with take apart element
P172389	P171786	194	Accessories	PXX FS	Tank Breathers with take apart element
P173475		191	Accessories	PXX TCA	Anti-Vandalism Filler Cap with breather
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P175143		144	Suction Filters	PXX FAL	In-Line Suction Filters
P176903		144	Suction Filters	PXX FAL	In-Line Suction Filters
P176904		144	Suction Filters	PXX FAL	In-Line Suction Filters
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P177439		198	Accessories	PXX LVO	Vertical Oil Level Gauge
P761040		144	Suction Filters	PXX FAL	In-Line Suction Filters
P761046	P172435	194	Accessories	PXX FS	Tank Breathers with take apart element
P761047	P172435	194	Accessories	PXX FS	Tank Breathers with take apart element
P761048	P172435	194	Accessories	PXX FS	Tank Breathers with take apart element
P761049	P172435	194	Accessories	PXX FS	Tank Breathers with take apart element
P761050	P172435	194	Accessories	PXX FS	Tank Breathers with take apart element
P761051	P175447	194	Accessories	PXX FS	Tank Breathers with take apart element
P761052	P761045	194	Accessories	PXX FS	Tank Breathers with take apart element
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P761184		190	Accessories	PXX TCO	Filer Caps with breather
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P763668		151	Suction Filters	FBK FACA	In-Line Suction Filters
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P764409		151	Suction Filters	FBK FACA	In-Line Suction Filters
P764410		117	Return Line Filters	FBK FRCA	In-Line Return Filters
P764410		151	Suction Filters	FBK FACA	In-Line Suction Filters
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P163324	K045809	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P163419	K045741	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P163419	K045794	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P163419	K045804	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164164	K041588	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P164166	K041589	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P164168	K041590	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P164172	K041585	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P164174	K041586	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P164176	K041587	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P164375	K045745	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164375	K045792	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164375	K045802	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164378	K045746	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164378	K045797	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164378	K045807	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164381	K045743	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164381	K045793	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164381	K045803	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164384	K045744	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164384	K045798	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164384	K045808	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P164592	K041591	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P164594	K041592	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P164596	K041593	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P165006	K020109	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
P165015	K020115	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
P165041	K020108	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
P165043	K020114	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
P165136	K020110	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
P165138	K020116	176	In-Line Filters	FPK 02 AP280	High Pressure Filters
P165332	K045748	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P165332	K045796	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P165332	K045806	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P165335	K045739	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P165335	K045795	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P165335	K045805	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P165338	K045740	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P165338	K045800	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P165338	K045810	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P165354	K045747	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P165354	K045791	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P165354	K045801	162	In-Line Filters	HMK 04 Duramax	Medium Pressure Filters
P165569	K053125	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165569	K053142	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165569	K053146	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165569	K053126	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165569	K053132	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165569	K053141	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165672	K053123	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165672	K053144	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165672	K053148	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165675	K053127	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165675	K053140	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165675	K053145	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165705	K053124	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
P165705	K053143	166	In-Line Filters	HMK 05 Duramax	Medium Pressure Filters
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P169449	K020176	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P169450	K020177	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P169797	K020173	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P169798	K020175	172	In-Line Filters	FPK 02 & 04 AP220	High Pressure Filters
P171500	K030207	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171500	K030213	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171500	K030225	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171500	K030231	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171500	K030329	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171500	K030333	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171500	K030341	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171500	K030343	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171500	K035009	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171500	K035009	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171501	K030208	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171501	K030214	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171501	K030226	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171501	K030232	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171501	K030334	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171501	K030378	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171501	K030387	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171501	K030395	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171501	K035010	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171501	K035010	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171502	K030227	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171502	K030233	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171502	K030388	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171502	K030396	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171502		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171502		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171502		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171502		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171502		70	Return Line Filters	FHK FIR	In Tank Return Filters
P171502		128	Suction Filters	FHK FIR	In Tank Suction Filters
P171503	K030210	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171503	K030216	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171503	K030228	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171503	K030234	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171503	K030244	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171503	K030244	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171503	K030335	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171503	K030344	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171503	K030379	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171503	K030389	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171504	K030211	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171504	K030217	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171504	K030229	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171504	K030235	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171504	K030245	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171504	K030245	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171504	K030331	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171504	K030336	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171504	K030342	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171504	K030345	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171505	K030212	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171505	K030218	50	Return Line Filters	FIK FIO	In Tank Return Filters
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P171505	K030346	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171505	K030394	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171505		70	Return Line Filters	FHK FIR	In Tank Return Filters
P171505		128	Suction Filters	FHK FIR	In Tank Suction Filters
P171518	K030253	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171518	K030259	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171518	K030361	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171518	K030372	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171518	K040506	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171518	K040536	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171518	K040868	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171518	K040892	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171519	K030254	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171519	K030260	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171519	K030355	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171519	K030373	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171519	K040507	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171519	K040537	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171519	K040971	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171519	K040993	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171520	K030261	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171520	K030374	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171520	K040538	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171520	K040994	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171520		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171520		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171520		138	Suction Filters	FLK FLA	In-Line Suction Filters
P171521	K030256	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171521	K030262	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171521	K030362	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171521	K030375	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171521	K040509	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171521	K040539	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171521	K040865	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171521	K040893	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171522	K030257	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171522	K030263	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171522	K030363	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171522	K030376	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171522	K040510	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171522	K040540	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171522	K040866	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171522	K040894	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171523	K030258	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171523	K030264	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171523	K030325	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171523	K030364	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171523	K040511	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171523	K040541	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171523	K040867	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171523	K040895	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171524	K040512	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171524	K040542	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171524	K040560	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171524	K040560	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171524	K040758	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171524	K040873	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171524	K040896	55	Return Line Filters	FIK FIOT	In Tank Return Filters

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P171525	K040543	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171525	K040561	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171525	K040561	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171525	K040773	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171525	K040869	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171525	K041008	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171525	K041338	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171526	K040544	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171526	K040770	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171526	K040897	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171526	K041339	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171526		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171526		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171526		70	Return Line Filters	FHK FIR	In Tank Return Filters
P171526		128	Suction Filters	FHK FIR	In Tank Suction Filters
P171527	K040515	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171527	K040545	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171527	K040563	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171527	K040563	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171527	K040767	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171527	K040870	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171527	K040898	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171527	K041340	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171528	K040516	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171528	K040546	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171528	K040564	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171528	K040564	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171528	K040871	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171528	K040899	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171528		62	Return Line Filters	FIK FIS	In Tank Return Filters
P171528		62	Return Line Filters	FIK FIS	In Tank Return Filters
P171529	K040517	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171529	K040547	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171529	K040761	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171529	K040872	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171529	K040900	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171529	K041342	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171529		70	Return Line Filters	FHK FIR	In Tank Return Filters
P171529		128	Suction Filters	FHK FIR	In Tank Suction Filters
P171530	K030265	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171530	K030271	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171530	K030356	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171530	K030365	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171530	K040500	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171530	K040518	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171530	K040530	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171530	K040548	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171530	K040566	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171530	K040566	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171530	K040759	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171530	K040878	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171530	K040884	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171530	K040888	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171530	K040901	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171530	K041319	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171530	K041536	54	Return Line Filters	FIK FIO, 4 HOLES FLANGES	In Tank Return Filters
P171530	K041560	54	Return Line Filters	FIK FIO, 4 HOLES FLANGES	In Tank Return Filters
P171530	K041572	59	Return Line Filters	FIK FIOT, 4 HOLES FLANGE	In Tank Return Filters

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P171531	K030357	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171531	K030366	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171531	K040501	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171531	K040519	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171531	K040531	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171531	K040549	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171531	K040567	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171531	K040567	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171531	K040774	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171531	K040879	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171531	K040889	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171531	K040985	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171531	K041016	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171531	K041320	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171531	K041541	54	Return Line Filters	FIK FIO, 4 HOLES FLANGES	In Tank Return Filters
P171531	K041548	59	Return Line Filters	FIK FIOT, 4 HOLES FLANGE	In Tank Return Filters
P171531	K041565	54	Return Line Filters	FIK FIO, 4 HOLES FLANGES	In Tank Return Filters
P171531	K041577	59	Return Line Filters	FIK FIOT, 4 HOLES FLANGE	In Tank Return Filters
P171532	K030273	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171532	K030367	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171532	K040532	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171532	K040550	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171532	K040771	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171532	K041017	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171532	K041023	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171532	K041321	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171532	K041522	59	Return Line Filters	FIK FIOT, 4 HOLES FLANGE	In Tank Return Filters
P171532	K041540	54	Return Line Filters	FIK FIO, 4 HOLES FLANGES	In Tank Return Filters
P171532	K041553	59	Return Line Filters	FIK FIOT, 4 HOLES FLANGE	In Tank Return Filters
P171532	K041564	54	Return Line Filters	FIK FIO, 4 HOLES FLANGES	In Tank Return Filters
P171532		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171532		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171532		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171532		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171532		70	Return Line Filters	FHK FIR	In Tank Return Filters
P171532		128	Suction Filters	FHK FIR	In Tank Suction Filters
P171532		138	Suction Filters	FLK FLA	In-Line Suction Filters
P171533	K030268	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171533	K030274	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171533	K030358	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171533	K030368	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171533	K040503	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171533	K040521	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171533	K040551	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171533	K040569	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171533	K040569	128	Suction Filters	FHK FIR	In Tank Suction Filters
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P171533	K040875	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171533	K040880	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171533	K040902	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171533	K041322	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171533	K041539	54	Return Line Filters	FIK FIO, 4 HOLES FLANGES	In Tank Return Filters
P171533	K041551	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171533	K041552	59	Return Line Filters	FIK FIOT, 4 HOLES FLANGE	In Tank Return Filters
P171533	K041563	54	Return Line Filters	FIK FIO, 4 HOLES FLANGES	In Tank Return Filters
P171533	K041575	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171533	K041575	59	Return Line Filters	FIK FIOT, 4 HOLES FLANGE	In Tank Return Filters
P171534	K040552	55	Return Line Filters	FIK FIOT	In Tank Return Filters

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P171534	K030269	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171534	K030275	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171534	K030326	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171534	K030359	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171534	K040504	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171534	K040522	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171534	K040570	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171534	K040570	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171534	K040876	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171534	K040882	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171534	K041522	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171534	K041538	54	Return Line Filters	FIK FIO, 4 HOLES FLANGES	In Tank Return Filters
P171534	K041550	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171534	K041551	59	Return Line Filters	FIK FIOT, 4 HOLES FLANGE	In Tank Return Filters
P171534	K041562	54	Return Line Filters	FIK FIO, 4 HOLES FLANGES	In Tank Return Filters
P171534	K041574	59	Return Line Filters	FIK FIOT, 4 HOLES FLANGE	In Tank Return Filters
P171534		62	Return Line Filters	FIK FIS	In Tank Return Filters
P171534		62	Return Line Filters	FIK FIS	In Tank Return Filters
P171535	K030270	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171535	K030276	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171535	K030360	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171535	K030371	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171535	K040505	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171535	K040523	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171535	K040535	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171535	K040553	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171535	K040762	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171535	K040877	50	Return Line Filters	FIK FIO	In Tank Return Filters
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P171535	K040891	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171535	K040904	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171535	K041329	62	Return Line Filters	FIK FIS	In Tank Return Filters
P171535	K041537	54	Return Line Filters	FIK FIO, 4 HOLES FLANGES	In Tank Return Filters
P171535	K041550	59	Return Line Filters	FIK FIOT, 4 HOLES FLANGE	In Tank Return Filters
P171535	K041561	54	Return Line Filters	FIK FIO, 4 HOLES FLANGES	In Tank Return Filters
P171535	K041573	59	Return Line Filters	FIK FIOT, 4 HOLES FLANGE	In Tank Return Filters
P171535		70	Return Line Filters	FHK FIR	In Tank Return Filters
P171535		128	Suction Filters	FHK FIR	In Tank Suction Filters
P171536	K040602	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171536	K040608	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171536	K040937	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171536	K040954	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171536	K041549	59	Return Line Filters	FIK FIOT, 4 HOLES FLANGE	In Tank Return Filters
P171536	K051109	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171536	K051115	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171536	K051121	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171536	K051128	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171536	K051134	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171536	K051134	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171536	K051238	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171536	K051242	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171536	K051243	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171536	K051248	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171537	K040603	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171537	K040603	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171537	K040609	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171537	K040955	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171537	K041029	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171537	K051110	50	Return Line Filters	FIK FIO	In Tank Return Filters



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P171537	K051123	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171537	K051129	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171537	K051135	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171537	K051135	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171537	K051233	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171537	K051239	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171537	K051249	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171538	K040610	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171538	K040956	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171538	K051124	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171538	K051130	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171538	K051244	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171538	K051263	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171538		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171538		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171538		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171538		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171538		70	Return Line Filters	FHK FIR	In Tank Return Filters
P171538		128	Suction Filters	FHK FIR	In Tank Suction Filters
P171538		138	Suction Filters	FLK FLA	In-Line Suction Filters
P171539	K040605	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171539	K040611	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171539	K040939	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171539	K040957	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171539	K051112	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171539	K051118	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171539	K051125	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171539	K051131	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171539	K051137	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171539	K051137	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171539	K051231	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171539	K051232	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171539	K051235	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171539	K051245	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171540	K040606	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171540	K040612	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171540	K040940	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171540	K040958	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171540	K051113	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171540	K051119	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171540	K051126	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171540	K051132	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171540	K051138	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171540	K051138	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171540	K051227	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171540	K051229	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171540	K051236	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171540	K051246	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171541	K040607	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171541	K040613	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171541	K040941	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171541	K040959	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171541	K051114	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171541	K051120	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171541	K051127	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171541	K051133	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171541	K051237	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171541	K051241	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171541	K051247	55	Return Line Filters	FIK FIOT	In Tank Return Filters

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P171541		70	Return Line Filters	FHK FIR	In Tank Return Filters
P171541		128	Suction Filters	FHK FIR	In Tank Suction Filters
P171542	K070003	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171542	K070057	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171542	K070280	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171542	K070458	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171543	K070004	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171543	K070058	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171543	K070281	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171543	K070459	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171544	K070059	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171544	K070319	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171544		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171544		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171545	K070006	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171545	K070060	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171545	K070283	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171545	K070322	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171546	K070007	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171546	K070061	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171546	K070284	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171546	K070460	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171547	K070008	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171547	K070062	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171547	K070285	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171547	K070461	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171548	K070009	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171548	K070063	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171548	K070286	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171548	K070462	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171549	K070010	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171549	K070064	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171549	K070355	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171549	K070463	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171550	K070065	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171550	K070464	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171550		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171550		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171551	K070012	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171551	K070066	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171551	K070288	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171551	K070323	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171552	K070013	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171552	K070067	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171552	K070289	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171552	K070324	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171553	K070014	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171553	K070068	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171553	K070290	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171553	K070325	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171554	K070015	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171554	K070069	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171554	K070192	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171554	K070465	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171555	K070016	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171555	K070070	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171555	K070326	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171555	K070356	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171556	K070071	55	Return Line Filters	FIK FIOT	In Tank Return Filters

# Index by Element



TYPE	ELEMENT	PAGE		FAMILY	
P171556	K070327	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171556		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171556		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171557	K070018	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171557	K070072	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171557	K070293	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171557	K070328	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171558	K070019	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171558	K070073	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171558	K070294	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171558	K070329	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171559	K070020	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171559	K070074	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171559	K070295	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171559	K070330	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171560	K070021	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171560	K070075	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171560	K070165	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171560	K070171	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171560	K070201	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171560	K070207	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171560	K070296	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171560	K070365	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171560	K070400	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171560	K070420	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171560	K070510	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171560	K070569	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171560		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171561	K070022	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171561	K070076	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171561	K070166	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171561	K070172	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171561	K070202	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171561	K070208	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171561	K070297	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171561	K070331	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171561	K070401	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171561	K070421	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171561	K070505	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171561	K070565	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171561		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171562	K070077	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171562	K070173	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171562	K070209	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171562	K070332	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171562	K070422	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171562	K070566	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171562		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171562		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171562		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171562		138	Suction Filters	FLK FLA	In-Line Suction Filters
P171562		138	Suction Filters	FLK FLA	In-Line Suction Filters
P171563	K070024	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171563	K070078	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171563	K070168	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171563	K070174	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171563	K070204	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171563	K070210	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171563	K070299	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171563	K070333	55	Return Line Filters	FIK FIOT	In Tank Return Filters

TYPE	ELEMENT	PAGE		FAMILY	
P171563	K070402	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171563	K070423	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171563	K070507	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171563	K070567	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171563		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171563		105	Return Line Filters	FLK FLV - REPLACEMENT E	In-Line Return Filters
P171564	K070025	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171564	K070079	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171564	K070169	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171564	K070175	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171564	K070205	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171564	K070211	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171564	K070300	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171564	K070334	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171564	K070403	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171564	K070424	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171564	K070434	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171564	K070508	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171564		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171564		105	Return Line Filters	FLK FLV - REPLACEMENT E	In-Line Return Filters
P171565	K070026	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171565	K070080	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171565	K070170	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171565	K070176	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171565	K070206	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171565	K070212	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171565	K070301	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171565	K070335	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171565	K070404	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171565	K070425	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171565	K070509	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171565	K070568	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171565		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171565		105	Return Line Filters	FLK FLV - REPLACEMENT E	In-Line Return Filters
P171566	K070027	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171566	K070081	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171566	K070117	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171566	K070117	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171566	K070177	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171566	K070183	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171566	K070213	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171566	K070219	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171566	K070302	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171566	K070366	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171566	K070405	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171566	K070426	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171566	K070515	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171566	K070571	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171566		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171567	K070028	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171567	K070082	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171567	K070118	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171567	K070118	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171567	K070178	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171567	K070184	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171567	K070214	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171567	K070220	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171567	K070303	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171567	K070336	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171567	K070406	138	Suction Filters	FLK FLA	In-Line Suction Filters



TYPE	ELEMENT	PAGE		FAMILY	
P171567	K070427	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171567	K070435	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171567	K070511	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171567		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171568	K070083	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171568	K070185	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171568	K070221	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171568	K070367	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171568	K070428	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171568	K070436	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171568		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171568		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171568		70	Return Line Filters	FHK FIR	In Tank Return Filters
P171568		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171568		128	Suction Filters	FHK FIR	In Tank Suction Filters
P171568		138	Suction Filters	FLK FLA	In-Line Suction Filters
P171568		138	Suction Filters	FLK FLA	In-Line Suction Filters
P171569	K070030	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171569	K070084	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171569	K070120	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171569	K070120	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171569	K070180	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171569	K070186	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171569	K070216	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171569	K070222	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171569	K070305	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171569	K070337	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171569	K070408	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171569	K070429	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171569	K070437	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171569	K070513	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171569		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171570	K070031	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171570	K070085	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171570	K070121	70	Return Line Filters	FHK FIR	In Tank Return Filters
P171570	K070121	128	Suction Filters	FHK FIR	In Tank Suction Filters
P171570	K070181	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171570	K070187	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171570	K070217	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171570	K070223	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171570	K070306	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171570	K070338	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171570	K070409	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171570	K070430	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171570	K070438	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171570	K070514	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171570		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171570		105	Return Line Filters	FLK FLV - REPLACEMENT E	In-Line Return Filters
P171571	K070032	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171571	K070086	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171571	K070182	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171571	K070188	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171571	K070218	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171571	K070224	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171571	K070307	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171571	K070339	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171571	K070410	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171571	K070411	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171571	K070431	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171571	K070439	108	Return Line Filters	FLK FLS	In-Line Return Filters

TYPE	ELEMENT	PAGE		FAMILY	
P171571		70	Return Line Filters	FHK FIR	In Tank Return Filters
P171571		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171571		105	Return Line Filters	FLK FLV - REPLACEMENT E	In-Line Return Filters
P171571		128	Suction Filters	FHK FIR	In Tank Suction Filters
P171572	K070033	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171572	K070045	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171572	K070087	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171572	K070099	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171572	K070308	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171572	K070343	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171572	K070358	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171572	K070466	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171573	K070034	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171573	K070046	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171573	K070088	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171573	K070100	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171573	K070277	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171573	K070340	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171573	K070364	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171573	K070467	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171574	K070089	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171574	K070101	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171574	K070369	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171574	K070468	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171574		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171574		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171574		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171574		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171574		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171575	K070036	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171575	K070048	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171575	K070090	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171575	K070102	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171575	K070309	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171575	K070317	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171575	K070341	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171575	K070469	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171576	K070037	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171576	K070049	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171576	K070091	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171576	K070103	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171576	K070310	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171576	K070318	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171576	K070342	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171576	K070344	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171577	K070038	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171577	K070050	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171577	K070092	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171577	K070104	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171577	K070311	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171577	K070345	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171577	K070357	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171577	K070454	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171578	K070039	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171578	K070051	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171578	K070093	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171578	K070105	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171578	K070225	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171578	K070231	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171578	K070303	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171578	K070359	50	Return Line Filters	FIK FIO	In Tank Return Filters

TYPE	ELEMENT	PAGE		FAMILY	
P171578	K070412	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171578	K070440	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171578	K070455	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171578	K070470	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171579	K070040	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171579	K070052	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171579	K070094	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171579	K070106	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171579	K070226	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171579	K070232	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171579	K070312	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171579	K070346	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171579	K070349	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171579	K070360	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171579	K070441	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171579	K070516	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171580	K070095	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171580	K070107	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171580	K070233	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171580	K070442	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171580	K070456	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171580	K070471	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171580		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171580		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171580		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171580		50	Return Line Filters	FIK FIO	In Tank Return Filters
P171580		138	Suction Filters	FLK FLA	In-Line Suction Filters
P171581	K070042	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171581	K070054	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171581	K070096	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171581	K070108	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171581	K070228	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171581	K070234	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171581	K070314	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171581	K070320	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171581	K070347	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171581	K070350	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171581	K070414	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171581	K070443	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171582	K070043	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171582	K070055	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171582	K070097	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171582	K070109	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171582	K070229	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171582	K070235	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171582	K070315	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171582	K070321	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171582	K070348	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171582	K070415	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171582	K070444	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171582	K070742	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171583	K070044	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171583	K070056	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171583	K070098	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171583	K070110	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171583	K070230	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171583	K070236	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171583	K070316	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171583	K070362	50	Return Line Filters	FIK FIO	In Tank Return Filters
P171583	K070416	138	Suction Filters	FLK FLA	In-Line Suction Filters

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P171583	K070445	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171583	K070457	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171583	K070478	55	Return Line Filters	FIK FIOT	In Tank Return Filters
P171584	K040590	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171584	K040596	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171584	K040932	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171584	K040948	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171584		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171585	K040591	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171585	K040597	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171585	K040933	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171585	K040949	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171585		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171586	K040598	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171586	K040950	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171586		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171586		138	Suction Filters	FLK FLA	In-Line Suction Filters
P171587	K040593	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171587	K040599	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171587	K040934	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171587	K040951	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171587		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171587		105	Return Line Filters	FLK FLV - REPLACEMENT E	In-Line Return Filters
P171588	K040594	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171588	K040600	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171588	K040935	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171588	K040952	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171588		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171588		105	Return Line Filters	FLK FLV - REPLACEMENT E	In-Line Return Filters
P171589	K040595	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171589	K040601	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171589	K040936	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171589	K040953	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171589		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171589		105	Return Line Filters	FLK FLV - REPLACEMENT E	In-Line Return Filters
P171590	K070153	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171590	K070159	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171590	K070189	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171590	K070195	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171590	K070396	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171590	K070432	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171590	K070503	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171590	K070560	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171590		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171591	K070154	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171591	K070160	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171591	K070190	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171591	K070196	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171591	K070496	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171591	K070498	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171591	K070558	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171591	K070561	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171591		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171592	K070161	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171592	K070197	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171592	K070559	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171592	K070562	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171592		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171592		138	Suction Filters	FLK FLA	In-Line Suction Filters
P171592		138	Suction Filters	FLK FLA	In-Line Suction Filters



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P171593	K070162	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171593	K070192	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171593	K070198	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171593	K070397	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171593	K070417	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171593	K070500	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171593	K070563	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171593		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171593		105	Return Line Filters	FLK FLV - REPLACEMENT E	In-Line Return Filters
P171594	K070157	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171594	K070163	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171594	K070193	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171594	K070199	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171594	K070398	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171594	K070418	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171594	K070501	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171594	K070564	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171594		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171594		105	Return Line Filters	FLK FLV - REPLACEMENT E	In-Line Return Filters
P171595	K070158	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171595	K070164	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171595	K070194	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171595	K070200	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171595	K070399	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171595	K070419	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171595	K070433	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171595	K070502	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171595		104	Return Line Filters	FLK FL - REPLACEMENT E	In-Line Return Filters
P171595		105	Return Line Filters	FLK FLV - REPLACEMENT E	In-Line Return Filters
P171596	K040614	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171596	K040620	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171596	K040942	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171596	K040960	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171596		105	Return Line Filters	FLK FLV - REPLACEMENT E	In-Line Return Filters
P171597	K040115	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171597	K040615	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171597	K040621	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171597	K041124	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171598	K040622	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171598	K041125	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171598		138	Suction Filters	FLK FLA	In-Line Suction Filters
P171599	K040617	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171599	K040623	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171599	K040943	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171599	K040961	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171600	K040618	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171600	K040624	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171600	K040944	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171600	K040962	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171601	K040619	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171601	K040945	138	Suction Filters	FLK FLA	In-Line Suction Filters
P171601	K040963	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171601	K040963	108	Return Line Filters	FLK FLS	In-Line Return Filters
P171602	K040626	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171602	K040631	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171602	K041138	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171604	K040627	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171604	K040632	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171604	K041139	148	Suction Filters	FBK FACA	In-Line Suction Filters

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P171606	K040629	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171606	K040634	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171606	K041141	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171607	K040635	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171607		148	Suction Filters	FBK FACA	In-Line Suction Filters
P171608	K040636	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171608	K040641	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171608	K041145	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171609	K040637	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171609	K040642	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171609	K041146	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171610	K040638	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171610	K040643	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171610	K041147	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171611	K040639	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171611	K040644	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171611	K040970	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171612	K040645	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171612		148	Suction Filters	FBK FACA	In-Line Suction Filters
P171613	K051146	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171613	K051151	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171613	K051332	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171613	K250001	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171613	K250031	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171613	K250107	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171614	K051147	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171614	K051152	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171614	K051333	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171614	K250002	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171614	K250032	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171614	K250108	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171616	K041149	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171616	K051154	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171616	K051334	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171616	K250034	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171617	K051155	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171617	K250035	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171617		148	Suction Filters	FBK FACA	In-Line Suction Filters
P171618	K051156	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171618	K051161	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171618	K051261	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171618	K250004	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171618	K250006	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171618	K250036	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171618	K250109	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171618	K250113	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171619	K051157	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171619	K051162	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171619	K051338	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171619	K250007	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171619	K250037	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171619	K250114	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171620	K051158	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171620	K051163	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171620	K051339	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171620	K250008	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171620	K250038	114	Return Line Filters	FBK FRCA	In-Line Return Filters
P171620	K250115	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171621	K041159	148	Suction Filters	FBK FACA	In-Line Suction Filters
P171621	K051164	114	Return Line Filters	FBK FRCA	In-Line Return Filters







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P171740	K040677	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171741	K040675	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171741	K040678	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171742	K040676	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171742	K040679	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171743	K040680	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171743	K040683	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171744	K040681	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171744	K040684	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171745	K040682	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171745	K040685	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171746	K040686	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171746	K040689	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171747	K040687	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171747	K040690	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171748	K040688	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171748	K040691	180	In-Line Filters	FPK 03 & 04 AP420	High Pressure Filters
P171767	K010005	184	In-Line Filters	FCK LC	High Pressure Filters
P171768	K010006	184	In-Line Filters	FCK LC	High Pressure Filters
P171769	K010007	184	In-Line Filters	FCK LC	High Pressure Filters
P171771	K010009	184	In-Line Filters	FCK LC	High Pressure Filters
P171772	K020120	184	In-Line Filters	FCK LC	High Pressure Filters
P171773	K020121	184	In-Line Filters	FCK LC	High Pressure Filters
P171774	K020122	184	In-Line Filters	FCK LC	High Pressure Filters
P171776	K020124	184	In-Line Filters	FCK LC	High Pressure Filters
P171777	K020125	184	In-Line Filters	FCK LC	High Pressure Filters
P171778	K020126	184	In-Line Filters	FCK LC	High Pressure Filters
P171779	K020127	184	In-Line Filters	FCK LC	High Pressure Filters
P171781	K020129	184	In-Line Filters	FCK LC	High Pressure Filters
P171783	P172386	194	Accessories	PXX FS	Tank Breathers with take apart element
P171784	P172387	194	Accessories	PXX FS	Tank Breathers with take apart element
P171785	P172388	194	Accessories	PXX FS	Tank Breathers with take apart element
P171786	P172389	194	Accessories	PXX FS	Tank Breathers with take apart element
P171794		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171795		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171796		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171797		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171798		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171799		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171800		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171801		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171802		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171803		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171804		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171805		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171806		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171807		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171808		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171809		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171810		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171811		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171812		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171813		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171814		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171815		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171816		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171817		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171818		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171819		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters
P171820		66	Return Line Filters	PXX FCRS - REPLACEMENT E	In Tank Return Filters



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