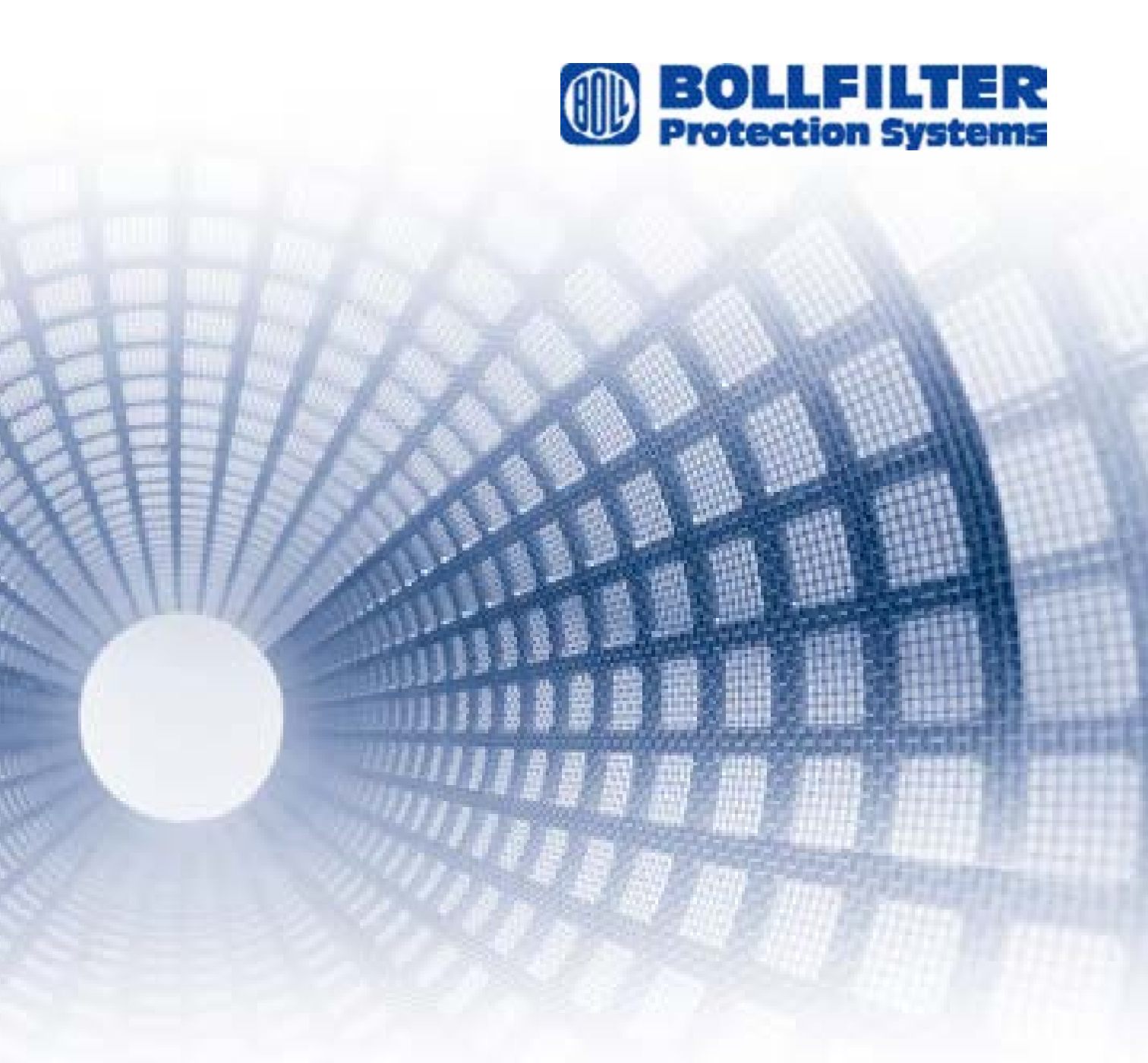
BOLLFILTER
Protection Systems



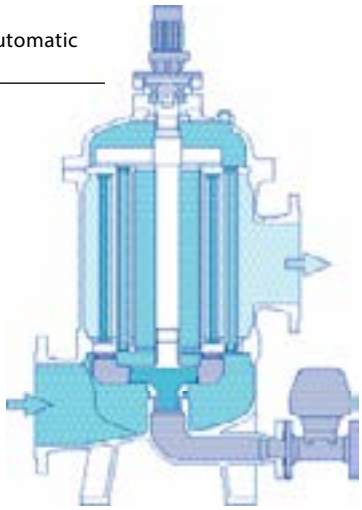
# PRODUCTS

Boll & Kirch Filterbau GmbH

## Design and Operation

In all BOLLFILTERs Automatic, wedge wire or wire mesh candles are cleaned automatically by backflushing without interrupting operation. This can be actuated either by differential pressure or is time controlled. Automatic filters are used for applications with continuous contamination and for which manual cleaning is uneconomical, or if the sites and processes are automated.

BOLLFILTER Automatic
Type 6.18



The main field of application for this BOLLFILTER Automatic is water filtration. The internal components are therefore always made of stainless steel. The fully automatic backflushing of the filter element is very efficient. Axial- and cross-flow backflushing is generated with filter candles open at both ends – the bipolar functional principle.

## Application

Filtration of

oil fuel water coolant chemicals, alkalines

Installed in the pressure or suction line to protect the downstream plant components from contamination.

## Advantages

- large filter surfaces, long service times
- precisely defined grades of filtration
- systematic removal of filtered particles
- precise backflushing device
- low flushing quantities
- backflushing without interrupting operation
- low pressure losses
- low maintenance
- low operating costs
- long life time
- compact, space-saving design

## Filter types

BOLLFILTER Automatic Type 6.18/6.19

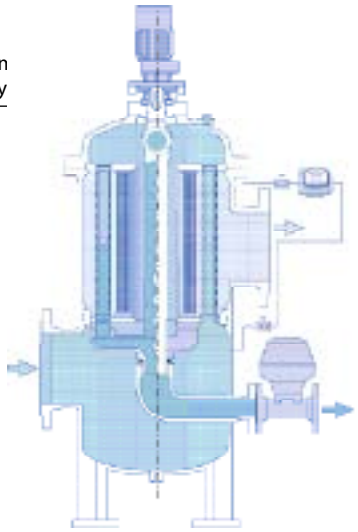
Version with external medium connection for low operating pressures (Type 6.19 DN 50-DN 400)

| | |
|---|---|
| Nominal diameters | DN 50 - DN 1000 / 2" - 40" |
| Backflushing | actuated by differential pressure or time control |
| Material variations Filter housing | nodular cast iron, carbon steel, c.s. rubber lined, stainless steel, special alloys |
| Pressure stages | PN 10* |
| Grades of filtration** | 30 µm – 5000 µm |

* dependent on the filter size, higher pressure stages available on request
** dependent on the filter size

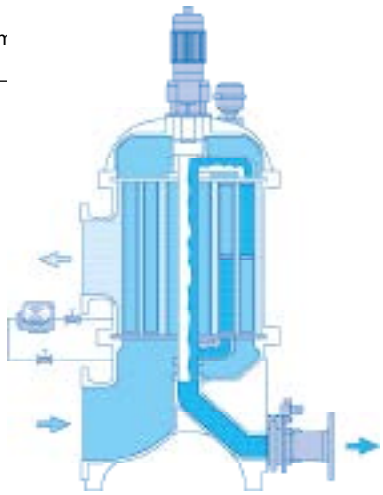
# Design and Operation

BOLLFILTER Auton
Type 6.18.2 Heavy



On the BOLLFILTER Automatic Type 6.18.2, rotating flushing arms are located above and below the filter element. The re-designed filter candles are backflushed alternately from above and below within one cleaning cycle, without interrupting of filtration and by using the internal medium. The hydrodynamic element, which is positioned in the centre of the filter candle, increases the flow velocity in addition and thus optimises the effectiveness of the backflushing process. This filter type is suitable for difficult operating conditions, e.g. for the filtration of river water, lake water or sea water.

BOLLFILTER Auton
Type 6.18.3C



The BOLLFILTER Automatic Type 6.18.3C presents an ideal solution for the filtration of ballast water. The small footprint makes it suitable for retrofits and new buildings. Furthermore, the filter is extremely durable and easy to maintain. The filter element with precision filter candles open at both ends is giving a dual backflushing effect. This design of the filter elements generates cross-flow turbulence in the backflush process which is further enhanced by the Hydrodynamic Element. The regeneration is very quick and effective without interrupting the filtration process.

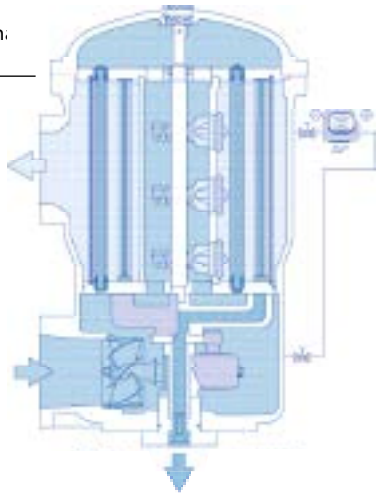
BOLLFILTER Automatic Type 6.18.2 Heavy Duty

BOLLFILTER Automatic Type 6.18.3C

| | | |
|---|---|---|
| Nominal diameters | DN 50 - DN 1000 / 2" - 40" | DN 200 – DN 900 |
| Backflushing | actuated by differential pressure or time control | actuated by differential pressure |
| Material variations Filter housing | carbon steel, c.s. rubber lined, stainless steel, special alloys | up to DN 400 nodular cast iron from DN 500 C-carbon steel |
| Pressure stages | PN 6 / PN 10* | up to DN 600 PN 10 / from DN 700 PN 6 |
| Grades of filtration** | 50 µm – 5000 µm | optional 30 µm, 40 µm or 50 µm |

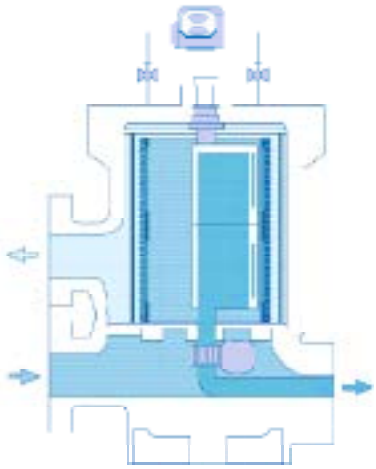
* dependent on the filter size, higher pressure stages available on request
** dependent on the filter size

BOLLFILTER Autom
Type 6.46



This compact filter, for horizontal or vertical installation, is used primarily in lubricating oil systems. Its turbine-driven, continuously rotating flushing mechanism works almost without wear, even with low quantities and pressure levels. The fine filter candles are resistant to differential pressure up to full operating pressure level. The continuous axial- and cross-flow backflushing system allows cleaning over the entire length of the candle. A safety element and over-flow valves in the first section of the filter provide safety in case of emergency.

BOLLFILT
Type 6.2



The BOLLFILTER Automatic Type 6.21 has been especially designed for the filtration of lower and continuous filtration volumes of liquid fuels. The filter operates predominantly for the protection of diesel injection pumps. When required, the media is cleaned one segment at a time by a rotating back-flush unit, without interrupting the filtration process. The working pressure remains almost constant and the flushing volumes are extremely low. The filter can optionally be equipped with a heating medium connection on the bottom of the housing and with a bypass filter.

## BOLLFILTER Automatic Type 6.46

| |
|---|
| DN 50 – DN 150 |
| continuous |
| nodular cast iron |
| PN 10 |
| 25 µm – 34 µm |

## BOLLFILTER Automatic Type 6.21/6.22

Version with Bypass-filter (Type 6.22.1)

| |
|---|
| DN 50 (optional with adapter to DN 32) |
| actuated by differential pressure |
| nodular cast iron |
| PN 16 |
| optional 10 µm, 25 µm, 34 µm oder 48 µm |

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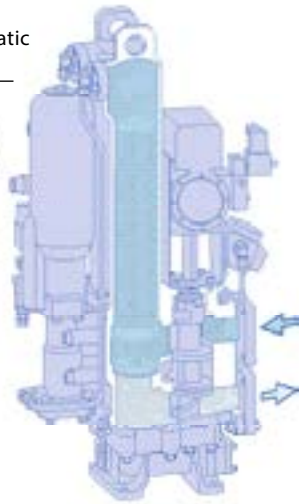
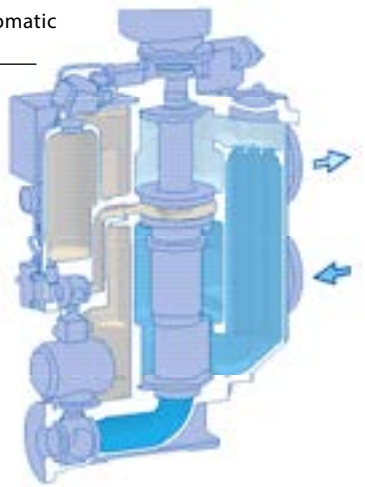
BOLLFILTER Automatic
Type 6.72



The BOLLFILTER Automatic Type 6.72 was specially developed for smaller flow rates of fuels and lubricating oils. Its special design allows filtration grades up to 6 µm. A bypass filter with change-over valve can be integrated to use Type 6.72 as a fuel filter.

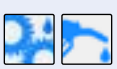
BOLLFILTER Automatic
Type 6.64



The automatic high-performance filter Type 6.64 is used mainly for the filtration of large volumes of fuels, lubricants, coolants and alkalines. In a compact housing with its several filter chambers, filtration and backflushing operate simultaneously and independently without interrupting the process. The filter candles are regenerated extremely quickly and efficiently by supporting backflushing with compressed air. This ensures only small volumes of flushing liquid are used. The system pressure remains constant during the backflushing process.

## BOLLFILTER Automatic Type 6.72

Version with bypass-filter (Type 6.72.1)



| |
|---|
| DN 40 – DN 80 |
| actuated by differential pressure or time control |
| nodular cast iron |
| PN 16 |
| 6 µm – 200 µm |

## BOLLFILTER Automatic Type 6.64

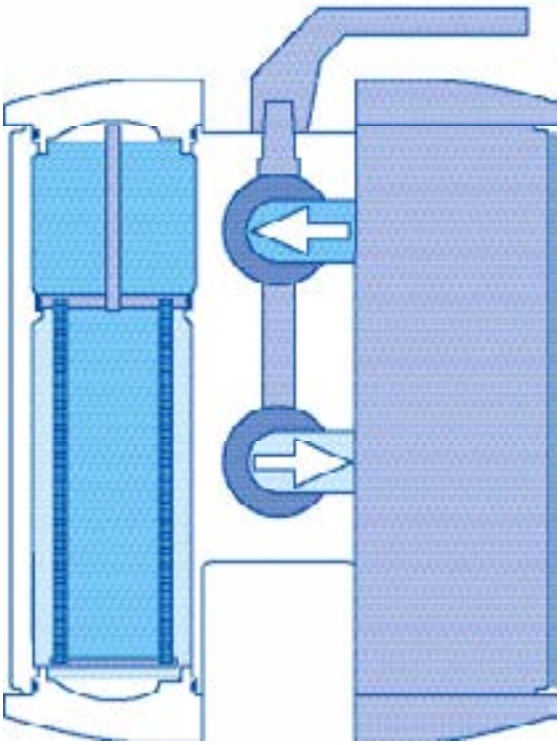
Version with treatment unit for the flushing liquid (Type 6.64.07)

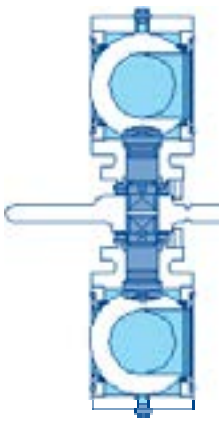
| |
|---|
| DN 100 – DN 400 |
| actuated by differential pressure or time control |
| nodular cast iron, nodular cast iron nickle plated |
| PN 16** |
| 6 µm – 200 µm |



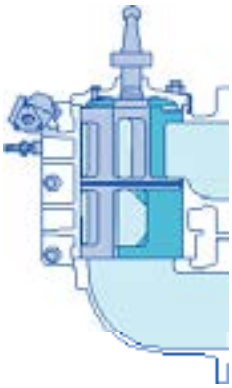
BOLLFILTER Protection Systems

# Design and Operation





Three-way ball valve



Change-over cock

## Filter types

BOLLFILTER Duplex Type 2.04.5

BOLLFILTER Duplex Type 2.05.5

| | BOLLFILTER Duplex Type 2.04.5 | BOLLFILTER Duplex Type 2.05.5 |
|---|---|---|
| Nominal diameters | DN 25 – DN 80 | DN 100 – DN 250 |
| Switch-over | change-over cock | change-over cock |
| Material variations Filter housing | nodular cast iron | cast iron, nodular cast iron, cast iron rubber lined |
| Pressure stages | PN 25* | PN 10 |
| Grades of filtration | 10 µm – 5000 µm | 10 µm – 5000 µm |

* dependent on the filter size

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Duplex filters comprise two filter housings. One chamber of the filter is on duty whilst the other clean half is on standby. When the contamination level exceeds a preset tolerance level, the flow can be switched manually to the cleaned half of the filter without any pressure shock. The contaminated filter element is cleaned whilst the process continues. Change-over is performed by a cylindrical cock valve or double stage three-way ball valves. The design prevents both filter chambers from being shut off at the same time.

## Application

Filtration of

- oil
- fuel
- water
- coolants
- gas
- chemicals alkalines

Installed in the pump pressure or suction line to protect the downstream process components from contamination.

## Advantages

- large filtration surfaces
- long service life
- low pressure losses
- precisely defined degrees of filtration
- long life time
- simple handling
- switch-over without pressure shock
- compact, space-saving design

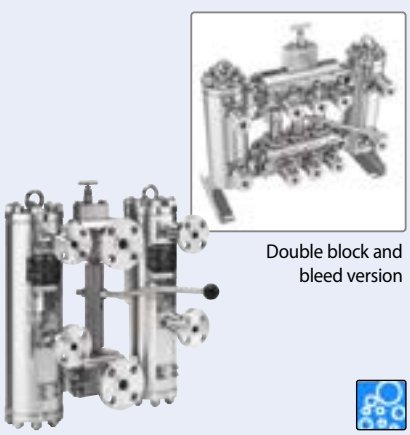
### BOLLFILTER Duplex Type BFD

| | |
|---|---|
| DN 25 – DN 150 | |
| ball valve | |
| nodular cast iron<br>cast steel, cast stainless steel | |
| PN 16 / PN 40* | |
| 0,5 µm – 5000 µm | |

### BOLLFILTER Duplex Type BFD-P

| | |
|---|---|
| DN 25 – DN 200 | |
| ball valve | |
| carbon steel, stainless steel;<br>non-welded | |
| max. PN 100 | |
| 0,1 µm – 250 µm | |

### BOLLFILTER Duplex Type BFD-C



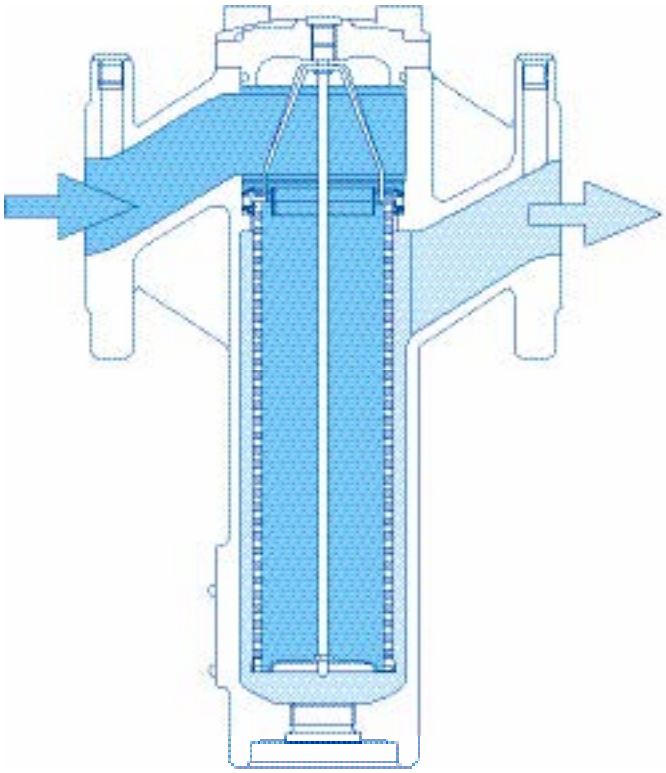
Double block and bleed version

| | |
|---|---|
| DN 20 – DN 200 | |
| ball valve | |
| carbon steel, stainless steel;<br>non-welded | |
| max. PN 500 | |
| 0,1 µm – 250 µm | |



BOLLFILTER Protection Systems

# Design and Operation



## Filter types

BOLLFILTER Simplex Type 1.12.2

BOLLFILTER Simplex Type 1.03.2

| | BOLLFILTER Simplex Type 1.12.2 | BOLLFILTER Simplex Type 1.03.2 |
|---|---|---|
| Nominal diameters | DN 25 – DN 80 | DN 65 – DN 300 |
| Inline connections | yes | yes |
| Material variations Filter housing | nodular cast iron, cast stainless steel (DN 25 und 50) | nodular cast iron, nodular cast iron rubber lined |
| Pressure stages | PN 32 / PN 40* | PN 10 |
| Grades of filtration | 10 µm – 5000 µm | 10 µm – 5000 µm |

* dependent on the filter size

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Simplex filters are the basic model of filter technology. They perform filtration tasks just as reliably as duplex filters or automatic filters. All filter elements with different filter materials can be installed. BOLLFILTER Simplex are used everywhere where process can be stopped at no great inconvenience or cost in order to clean or replace the filter elements.

## Application

Filtration of

- oil
- fuel
- water
- chemical alkalines
- gas

Installed in the pump pressure and suction line to protect the downstream plant components from contamination.

## Advantages

- large filtration surfaces
- low pressure losses
- precisely defined grades of filtration
- long life time
- simple handling
- compact design

BOLLFILTER Simplex Type 1.65.1 / 1.53.1

| |
|---|
| DN 65 – DN 350 |
| optional |
| carbon steel, stainless steel; welded |
| PN 10 / PN 40* |
| 10 µm – 5000 µm |

BOLLFILTER Simplex Type 1.78.1 / 1.58.1

| |
|---|
| DN 65 – DN 350 |
| no |
| carbon steel, stainless steel; welded |
| PN 10 / PN 40* |
| 3 µm – 250 µm |

BOLLFILTER Simplex Type BFB-P/-C

| |
|---|
| DN 25 – DN 200 |
| no |
| carbon steel, stainless steel; non-welded |
| max. PN 500 |
| 0,1 µm – 250 µm |



BOLLFILTER Protection Systems

# Design and Operation

The filter element is the core item of every filter. It essentially consists of a supporting body and a filter media. Various designs provide differing sized filtration surfaces. The required degree of filtration and cleaning can be achieved for every medium with the ideal combination of core components.

## Type of element

### Candle elements for automatic filters

In a candle element, several filter candles are assembled into a candle holder. This candle element is fitted in the filter housing and remains in the filter chamber during automatic cleaning by backflushing.

### Candle elements

This filter element contains several plug-in or screw-in candles, connected in parallel, all with the same dimensions. This results in a large filtration surface within a small filter housing design. These filter elements are characterised by an especially high resistance to differential pressure.

### Particle / coalescence element

The high-quality, extremely durable particle and coalescence elements are used for gas filtration and coalescence separation in chemical, petrochemical plants, the offshore sector and power stations.

## Properties


| | | | |
|---|---|---|---|
| Simplex filter types | – | 1.03.2, 1.65.1/1.53.1 | BFB-P/-C |
| Duplex filters types | – | 2.05.5, BFD | BFD-P/-C |
| Automatic filter types | 6.18/6.19, 6.18.2, 6.18.3C, 6.21/6.22, 6.46, 6.64, 6.72 | – | – |
| Filtration grades from/to | dependent on type of filter and filter media | 10 µm – 150 µm | > 0,1 µm |
| Filter media | stainless steel wire mesh, wedge wire profiles | stainless steel wire mesh | multi-layered microfibre glass |
| Magnetic insert | – | optional | optional |
| Flow direction | dependent on type of filter and filter element | ►[ ]◄ | [◄►] |
| Cleaning / replacement | automatic cleaning | manual cleaning | disposable |

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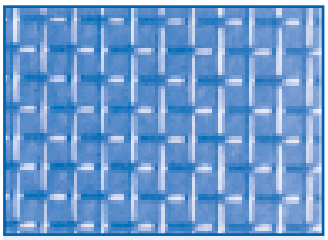
| Filter cartridge | Star-pleated element | Multimantle element | Ring element | Basket element |
|---|---|---|---|---|
| The filter cartridge is a disposable filter element for highest filtration requirements. The perforated plate supporting body guarantees optimum stability and optimum protection for the filter media. | The pleated filter media gives the filter element a large filtration surface on a small diameter. This allows long duty intervals and the use of fine filter meshes with low pressure losses. | The multimantle element consists of several cylindrical filter mantles. These provide a large filtration surface with a small space requirement and allow the use of fine filter meshes. | The ring element is constructed similarly to the basket element but it has an additional internal filter cylinder which increases the filtration area by approximately 30%. | The basket element is suitable for coarse filtration. The contamination collects in the basket and can be removed easily for cleaning. |
|  |  |  |  |  |
| BOLLFILTER Simplex Type 1.78.1/1.58.1, BFB-P | BOLLFILTER Simplex Type 1.12.2, 1.78.1/1.58.1,BFB-P | BOLLFILTER Simplex Type 1.03.2, 1.65.1/1.53.1 | BOLLFILTER Simplex Type 1.03.2, 1.65.1/1.53.1 | BOLLFILTER Simplex Type 1.12.2, 1.03.2, 1.65.1/1.53.1 |
| BOLLFILTER Duplex Type BFD, BFD-P, 2.04.5* | BOLLFILTER Duplex Type 2.04.5, BFD, BFD-P | BOLLFILTER Duplex Type 2.05.5 | BOLLFILTER Duplex Type 2.05.5 | BOLLFILTER Duplex Type 2.04.5, 2.05.5, BFD |
| Flushing liquid treatment for type 6.64 | – | – | – | – |
| 3 µm – 50 µm | 10 µm – 250 µm* | 10 µm – 2000 µm | 70 µm – 2000 µm | 70 µm* – 5000 µm |
| paper (1), polyester (2) or fibre glass (3) | stainless steel wire mesh | stainless steel wire mesh | stainless steel wire mesh | stainless steel wire mesh, perforated plate |
| – | optional | optional | optional | optional |
| ►[ ]◄ | ►[ ]◄ | ►[ ]◄ | [◄►] | [◄►] |
| disposable | manual cleaning | manual cleaning | manual cleaning | manual cleaning |
| * for type 2.04.5: not applicable for all housing sizes | * for types 1.12.2, 2.04.5: 10 µm – 150 µm | | | * for types 1.12.2, 2.04.5: 150 µm – 5000 µm |

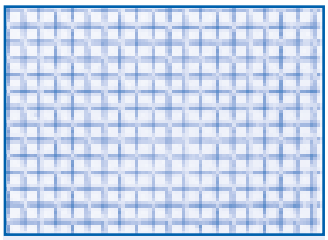


BOLLFILTER Protection Systems

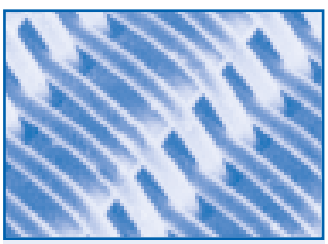
# Mesh types and properties

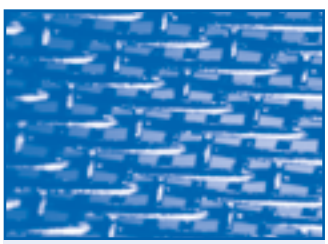
BOLLFILTERs are adapted individually to the widest possible range of applications. The use of the ideally suited type of mesh ensures the filter constantly fulfils its protective function and securely retains the defined solid particles. The maximum achievable grade of filtration depends on type of mesh, material, temperature and pressure resistance. Stainless steel wire meshes can be cleaned many times and can be used for long periods.



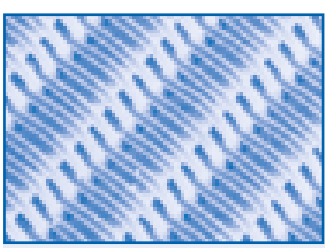


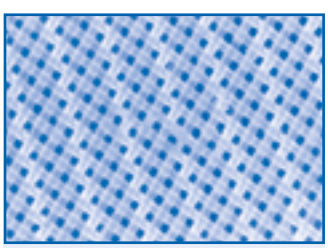
| | | |
|---|---|---|
| Type of weave | Linen weave | Linen weave |
| Version | 02 | 03 |
| Mesh no. | 10 | 26 |
| Picture scale | 1:1 | 1:1,5 |
| Mesh size (µm) (absolute) | 2000 | 800 |
| Passage area (%) | 60 | 60 |





| | | |
|---|---|---|
| Type of weave | Special twist** | Five heddle-twilled-weave |
| Version | 11 | 30 |
| Mesh no. | 128/18 | 5110 |
| Picture scale | 10:1 | 30:1 |
| Mesh size (µm) (absolute) | 80 | 80 |
| Passage area (%) | 44 | 20 |





| | | |
|---|---|---|
| Type of weave | Special twist** | Twill weave*** |
| Version | 19 | 20 |
| Mesh no. | 294/31 | 350/350 |
| Picture scale | 30:1 | 30:1 |
| Mesh size (µm) (absolute) | 34 | 34 |
| Passage area (%) | 44 | 24 |

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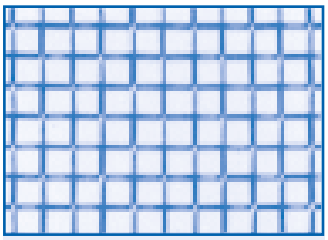
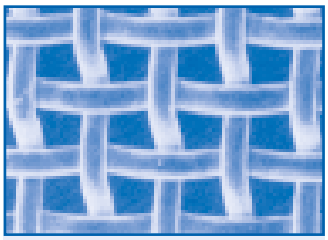


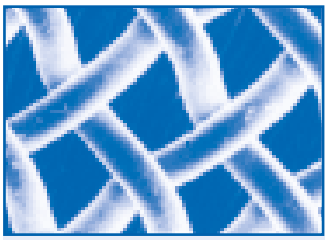
Linen weave
04
35
5:1
540

54



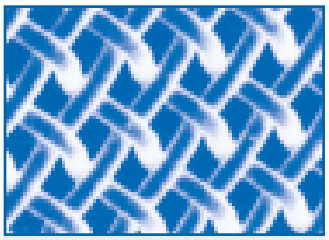
Linen weave
05
50
10:1
320

38



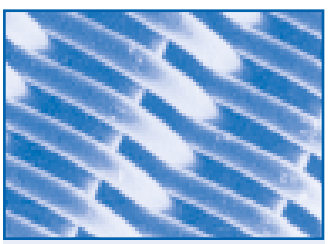
Linen weave
06
80
30:1
200

35



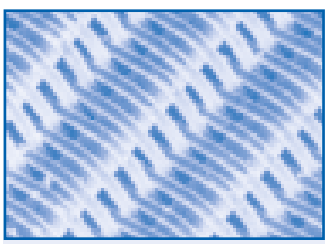
Linen weave
09
150
30:1
100

32



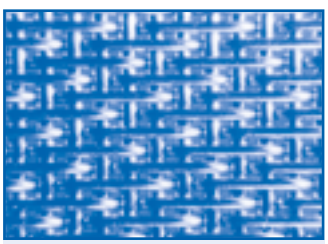
Special twist**
26
155/19
30:1
60

44



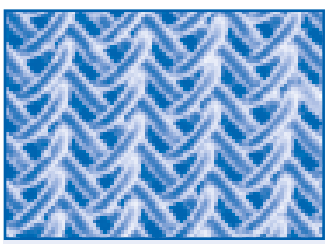
Special twist**
15
208/26
30:1
48

44



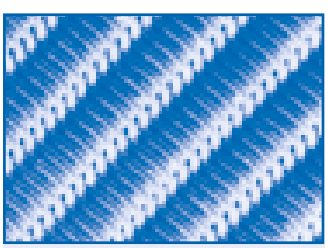
Five heddle-twilled-weave
32
5150
30:1
50

10



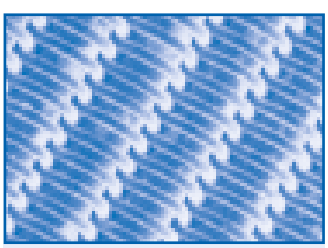
Twill weave
17
300/250
30:1
37

20



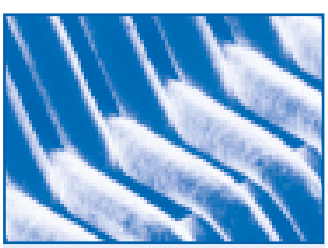
Special twist**
24
400/40
30:1
25

44



Special twist**
21
250/40
30:1
25

17,4



Special twist**
25
660/63
230:1
10

** wire mesh material:
Cr Ni Mo steel, material no.
1.4401/1.4301

*** wire mesh material:
polyester



BOLLFILTER Protection Systems

## Space for notes

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