

## Automatic filter AF 153 G

with radial scraper and external pressure cleaning

Connection sizes: G2, screw-in flange DN 50 and DN 65, cast design

### 1. Features

Filtration Group automatic backflush filters are suitable for all applications where low or medium viscosity liquids have to be filtered.

These compact, inline filter systems are designed for automatic cleaning. The system is cleaned by rotating the filter cartridge against a spring actuated scraper and backflushing with external pressure media.

#### Advantages:

- Low lifecycle costs because no filter material is consumed
- Cleaning without interrupting filtration
- Precise separation quality in accordance with the surface filter principle
- Top-quality, asymmetric filter medium made of multiple-sintered stainless steel fleece on a rugged inner core
- Efficient filter cleaning assures maximum process stability
- Solid construction and high-quality materials for a long service life
- Minimal liquid loss during cleaning
- Filter cleaned one segment at a time with a high backflush pulse
- Actual filter rating and nominal separation are indicated
- Integrated preseparation thanks to tangential inflow and preseparator tube
- Material variants open up a wide range of applications
- Modular Filtration Group Vario system for optimum filter selection
- Optional: Gas-tight shaft seals available
- Optional: Application in Ex zone 1 and 2
- Easy maintenance
- Worldwide distribution



## 2. Operating principle

The combined Filtration Group AF 153 G backflush filter belongs to the Vario series. The compact Filtration Group automatic filter system is used for filtration of a variety of low or medium-viscosity liquids.

This inline pressure filter consumes no filter material, which means there is also no need for subsequent disposal. The filter can be cleaned after switching off the system or, if necessary, without interrupting operation. The concentrated solids are drained off simply by opening the system for a short time.

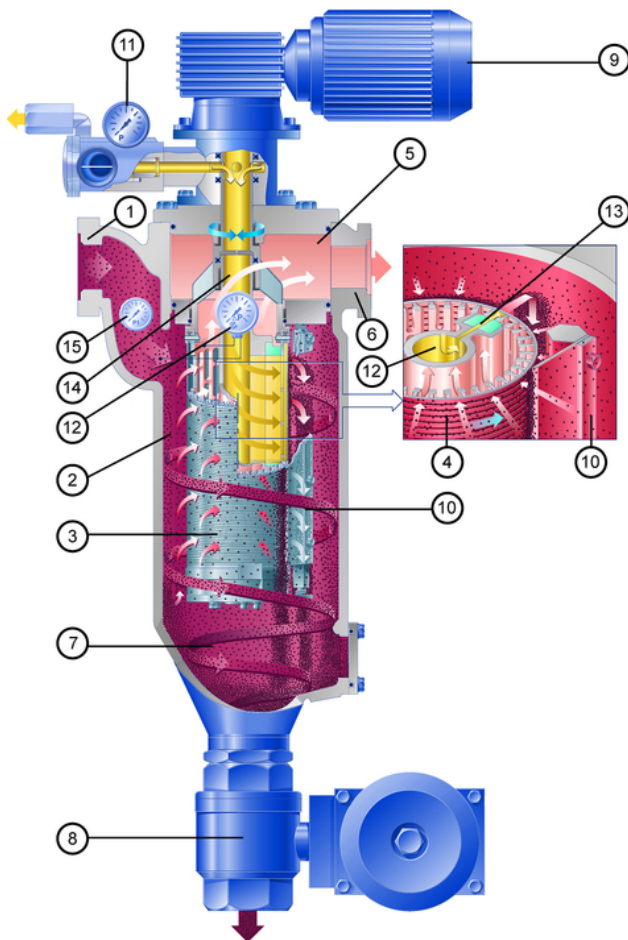
The medium to be cleaned is guided into the filter housing under pressure. It flows inward through the Filtration Group segmented element. Particles settle on the surface of the filter medium. The filtered fluid exits the filter housing at the top opposite the inlet connection.

The filter is cleaned when a preset differential pressure limit, a set interval or a defined filtered fluid quantity is reached.

The segmented element is turned against a spring actuated scraper as the drain and external pressure valves are opened. The segments are then guided one at a time past the pressure channel housing on the inside and the scraper on the outside. This causes them to open and close alternately. The integrated external pressure accumulator is pretensioned during closing, so that when one segment opens, an outward surge cleans the separated particles from the filter material. The particles are catapulted out as a result of this pulse cleaning principle. One turn suffices to clean all segments.

The residue that has settled in the collection cone can be emptied via the drain valve either when the machine is at a standstill or during filtration.

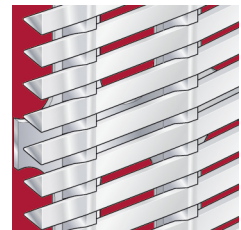
All filters in the Filtration Group Vario series are protected by patents.



### Used Filtration Group filter cartridges in the AF 153 G combined backflush filter:

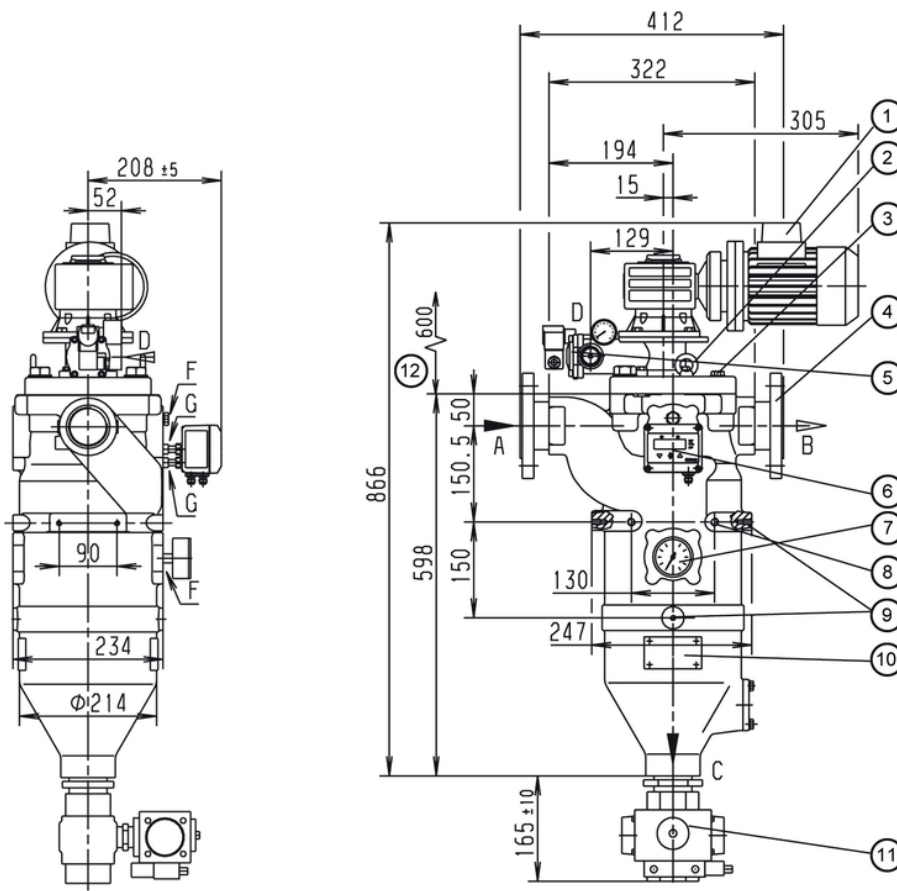
#### Filtration Group coiled cartridge (standard):

- Optimum cleaning by means of sharp-edged triangular wire
- Large effective filter surface
- Small, precise gap widths
- High differential pressure stability and torsional strength
- Several material combinations possible



- 1 Tangential inlet connection
- 2 Inlet plenum
- 3 Filtration Group coiled cartridge
- 4 Filtration Group triangular wire winding
- 5 Plenum for filtered fluid
- 6 Outlet connection for filtered fluid
- 7 Residue collection cone
- 8 Drain valve
- 9 Drive motor
- 10 Scraper
- 11 External pressure connection, external pressure and back-flush valves and gauge  $P_f$
- 12 Differential pressure contact gauge
- 13 External pressure nozzle
- 14 External pressure accumulator
- 15  $P_1$  gauge

### 3. Technical data



- 1 Cleaning drive: can be mounted turned 90°, 180° or 270°
- 2 Lifting eyebolts
- 3 Vent screw G1/4
- 4 If DN 65 screw-in flanges are used, the motor is mounted turned 90°
- 5 External pressure valve
- 6 Optional: Differential pressure indicator/switch
- 7 Optional: P1 gauge
- 8 Mounting holes M12
- 9 Mounting holes M8
- 10 Name-plate
- 11 Optional: Automatic drain valve
- 12 Clearance required = 600 mm

#### Filterdaten

- Max. operating pressure: 16 bar  
 Max. operating temperature: 100 °C  
 Materials:
- Housing and cover: Nodular cast iron
  - Internals: Nodular cast iron, steel
  - Bearing bushes: PTFE based
  - Seals: FPM (Viton)
  - Coiled cartridge: 1.4571 or 1.4571/Al ( $\Delta p$  max. 30 bar)
- Cover fastening: 4 x M20 hexagon screws  
 Connections and nominal diameters:
- A-inlet, B-outlet, C-drain: G2 threaded holes DIN 3852 form X
  - D-external pressure: G1 threaded holes DIN 3852 form Z (air: must be reduced to G1/2 by the customer)
  - F-gauge: G1/4
  - G-indicator: G1/8
  - Optional: A/B/C screw-in flanges DN 50 or DN 65 acc. to EN 1092-1/05A
- Drive shaft seal: Lip seal with O-ring  
 Outside coating: Synthetic resin primer, blue acc. to RAL 5007

#### Motor data

Worm gear motor  
 Multi-range winding

| V                       | Hz | kW   | rpm  | A   |
|-------------------------|----|------|------|-----|
| $\Delta$ 230 $\pm$ 10%  | 50 | 0.18 | 9.3  | 1.2 |
| $\lambda$ 400 $\pm$ 10% | 50 | 0.18 | 9.3  | 0.7 |
| $\Delta$ 266 $\pm$ 10%  | 60 | 0.22 | 11.2 | 1.1 |
| $\lambda$ 460 $\pm$ 10% | 60 | 0.22 | 11.2 | 0.7 |

Protection class: IP55; insulation class F; output torque: 97 Nm

#### Optional:

- Ex protection acc. to ATEX 2014/34/EU
- Electrical components in Ex II 2G T3
- Mechanical design in Ex II 2G c T3
- Worm gear motor Ex, output torque: 97 Nm

Weight: 92 kg

Volume: 12 l

**Other types available on request!**

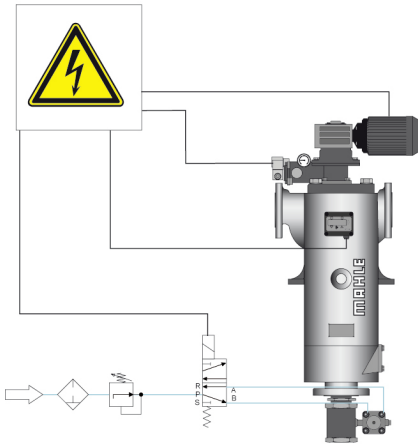
**Technical data is subject to change without notice**

## 4. Design and application

| Cartridge type<br>(see section 6) | Total surface<br>in cm <sup>2</sup> | Filter rating in $\mu\text{m}$ /<br>effective filter surface in cm <sup>2</sup> |    |    |    |    |     |     |     |     |     |  |  |
|-----------------------------------|-------------------------------------|---------------------------------------------------------------------------------|----|----|----|----|-----|-----|-----|-----|-----|--|--|
|                                   |                                     | 10                                                                              | 20 | 30 | 40 | 60 | 80  | 100 | 130 | 160 | 200 |  |  |
| AF 130XX6                         | 818                                 |                                                                                 |    | 48 | 63 | 91 | 117 | 142 | 176 | 206 |     |  |  |

 Recommended design

### Cleaning and emptying



#### Fully automatic operation:

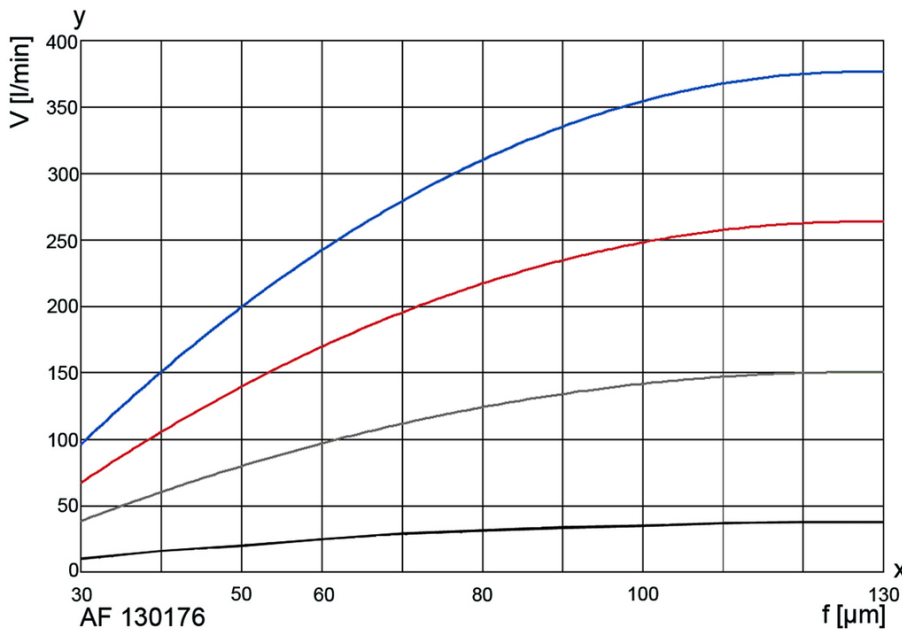
Filtration usually takes place under pressure. The filter is cleaned after a programmed time or a preset number of cycles or according to the differential pressure. We recommend cleaning the system at a differential pressure of approximately 0.5 to 0.7 bar. The cleaning motor is operated for around 7 s (about one turn of the filter cartridge). The external pressure and drain valves can be opened for this period. This suffices to clean the filter thoroughly.

The drain valve is opened in order to empty the filter. Depending on the residue concentration, this can either take place directly after cleaning or be time or cycle controlled. The opening time of the drain valve is 2 to 3 s.

Refer to the Instruction Manual for further information.





Filtration Group's team of specialists will be pleased to assist in any way. Tests can be carried out in the absence of reliable evaluation criteria.

## 5. Efficiency curves



The curves indicate the volume flow through the complete filter system (filter housing including cartridge) and are referred to a differential pressure of 0.3 bar. Specific process information is essential to guarantee reliable operation of an automatic filter.

Viscosity in mm<sup>2</sup>/s

-  1 mm<sup>2</sup>/s
-  33 mm<sup>2</sup>/s
-  100 mm<sup>2</sup>/s
-  500 mm<sup>2</sup>/s

y = Volume flow V [l/min]  
x = Gap width f [ $\mu\text{m}$ ]

## 6. Type number key

### Type number key with selection example for AF 15363-1321-43200/G3

#### Size

AF 1536 1 x 110x265 No. of steps x diameter x length [mm]

#### Cleaning drive

- 3 Gear motor 230/400 V, 50 Hz or 266/460 V, 60 Hz
- 4 Gear motor 230/400 V, 50 Hz Ex II 2G T3

#### Inlet and outlet connections

- 13 G2
- 14 Screw-in flange DN 50 for cast design
- 15 Screw-in flange DN 65 for cast design
- 18 G2½

#### Permissible operating pressure in bar (housing/cover)

- 2 PN 16

#### Material Seal FPM, bearing PTFE

- 1 Housing and cover nodular cast iron, internals steel, aluminium
- 3 Housing and cover nodular cast iron, internals stainless steel 1.4301/1.4571

#### Differential pressure indicator and gauge

- 1 PiS 3076, switching level at 1.2 bar, static 63 bar, aluminium/FPM
- 2 PiS 3076, switching level at 0.7 bar, static 63 bar, aluminium/FPM
- 4 PiS 3170, digital Δp gauge, 2 switching levels settable from 0 to 16 bar
- 5 PiS 3175, digital Δp gauge, 2 pressure transmitters settable from 0 to 16 bar

#### Valves and control throttles

- 3 External pressure valve G1 for liquid, 24 V
- 4 External pressure valve G1 for liquid, 230 V

#### Drain valve

- 2 Ball valve, electropneumatic 24 V
- 3 Ball valve, electropneumatic 230 V
- 4 Ball valve, electric 24 V
- 5 Ball valve, electric 230 V

#### Cleaning valve

- 0 Without/special version

#### Optional features

- 0 Without/special version

AF 1536 3 - 13 2 1 -4 3 2 0 0 -XXXX (end number for special version)/G3\*

\*end number completion:

**G1** cast iron, Version 1

**G3** cast iron, Version 3

| End number    | Special version                                               |
|---------------|---------------------------------------------------------------|
| 3001          | Standard complete inner assembly, without housing or drive    |
| 3002          | Standard complete inner assembly, without housing, with drive |
| 3700          | PTFE seals                                                    |
| Other numbers | On request                                                    |

Type number key with selection example for coiled or welded cartridges for AF 130

Series

AF 130 Coiled cartridge with triangular wire winding

| Materials | Inner core | Filter medium | Clamp rings | Wire width in mm |
|-----------|------------|---------------|-------------|------------------|
| <b>17</b> | Al         | 1.4571        | St          | 0.5              |
| <b>20</b> | Al/hc      | 1.4571        | 1.4571      | 0.5              |

**Overall length** Diameter x length in mm

**6** 110 x 265

**Gap width/rating in µm (see 4. Design and application)**

|            |       |            |        |
|------------|-------|------------|--------|
| <b>003</b> | 30 µm | <b>010</b> | 100 µm |
| <b>004</b> | 40 µm | <b>013</b> | 130 µm |
| <b>006</b> | 60 µm | <b>016</b> | 160 µm |
| <b>008</b> | 80 µm | <b>020</b> | 200 µm |

Other filter ratings on request

AF 130 17 6 -010

## 7. Spare parts

| No. | Designation         | Material no.   |          |
|-----|---------------------|----------------|----------|
|     |                     | FPM/C steel    | PTFE/VA  |
| 1   | Bush kit            |                | 70311579 |
| 2   | Seal kit (complete) | 70316111       | 70316118 |
| 3   | Scraper             | 70310724       | 70310731 |
| 4   | Distributor         |                | 70511099 |
| 5   | Filter cartridge    | See name-plate |          |

Please contact us for detailed technical information, any open questions about options, accessories and for general expert advice. Completion of the relevant questionnaire would facilitate in the coordination of all important parameters.

Comprehensive documentation on our filter range, filter elements and accessories can be provided. About installation and operation, please refer to the Instruction Manual.

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