# FHP series

**Maximum working pressure up to 42 MPa (420 bar) - Flow rate up to 630 l/min**



INSTALLATION, SERVICE AND MAINTENANCE MANUAL AND SAFETY INSTRUCTIONS

Please scan or click the QR codes to get updated electronic version of the related document:

FHP010 FHP011 FHP065 FHP135 FHP350 FHP351 FHP500

***For all the QR codes: Scan or click me!***

# FHP GENERAL INFORMATION

## Description

High Pressure filters

**In-line**
**Maximum working pressure up to 42 MPa (420 bar)**
**Flow rate up to 630 l/min**

FHP is a range of versatile high pressure filter for protection of sensitive components in high pressure hydraulic systems in the industrial equipment.
They are directly connected to the lines of the system through the hydraulic fittings.

### Available features:

- Female threaded connections up to 1 1/2" and flanged connections up to 2", for a maximum return flow rate of 630 l/min
- Fine filtration rating, to get a good cleanliness level into the system
- Bypass valve, to relieve excessive pressure drop across the filter media
- Check valve, to protect the system against reverse flow
- Reverse flow valve, to allow bidirectional flow through the filter housing. The back flow is not filtered. The filter requires the use of internal check valves to direct the flow through the element in one direction and around the element in the other
- Low collapse filter element "N", for use with filters provided with bypass valve
- High collapse filter element "H", for use with filters not provided with bypass valve
- Low collapse filter element with external support "R", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters provided with the bypass valve
- High collapse filter element with external support "S", for filter element protection against the back pressure caused by the check valve or the reverse flow in filters not provided with the bypass valve
- Visual, electrical and electronic differential clogging indicators

### Common applications:

Delivery lines, in any high pressure industrial equipment or mobile machines

## Technical data

### Filter housing materials

- Head: Phosphatized cast iron
- Housing: Phosphatized steel
- Bypass valve
  AISI 316L: FHP 010 - 011
  Brass: FHP 065 - 135
  Brass / AISI 304: FHP 350-351
  Steel: FHP 500
- Reverse Flow
  Steel: FHP 350 - FHP 500
- Check valve: Steel

### Pressure

- Test pressure: 63 MPa (630 bar)
- Burst pressure: 126 MPa (1260 bar)
- Pulse pressure fatigue test: 1 000 000 cycles with pressure from 0 to 42 MPa (420 bar)

### Bypass valve

- Opening pressure 0.6 MPa (6 bar) ±10%
- Other opening pressures on request.

### Filter element features

| Filter | | Filter element | |
|---|---|---|---|
| FHP | | HP | |
| Δp Element type | | | |
| **Element media** | **Construction** | **Δp Series** | **Δp** |
| A - Microfiber | Standard | N | 20 bar |
| | With external support | R | 20 bar |
| | High Δp | H | 210 bar |
| | High Δp with external support | S | 210 bar |
| M - Wire mesh | Standard | N | 20 bar |
| *Please see ordering code tables to check element Δp series availability based on filter features.* | | | |
| **Flow direction through the filter element:** From OUT to IN | | | |

### Seals

- Standard NBR series A
- Optional FPM series V

### Temperature

From -25 °C to +110 °C

### Connections

FHP 010 - 065 - 135 - 350 - 351 - 500:
In-line Inlet/Outlet
FHP 011:
90° Inlet/Outlet

### Note

FHP filters are provided for vertical mounting

## Weights [kg] and volumes [dm³]

| Filter series | Weights [kg] | | | | | | Volumes [dm³] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Length | 1 | 2 | 3 | 4 | 5 | Length | 1 | 2 | 3 | 4 | 5 |
| **FHP 010 - 011** | | 2.05 | 2.18 | 2.64 | 3.13 | - | | 0.10 | 0.12 | 0.15 | 0.20 | - |
| **FHP 065** | | 4.26 | 4.62 | 5.83 | - | - | | 0.25 | 0.30 | 0.50 | - | - |
| **FHP 135** | | 7.11 | 8.71 | 9.76 | - | - | | 0.43 | 0.76 | 0.97 | - | - |
| **FHP 350 - 351** | | 13.95 | 16.08 | 18.37 | 20.85 | - | | 1.00 | 1.72 | 2.49 | 3.32 | - |
| **FHP 500** | | 27.00 | 31.17 | 34.69 | 46.70 | 52.5 | | 1.71 | 2.43 | 3.04 | 5.18 | 6.51 |

## Flow rates [l/min]

| | | Filter element design - H Series | | | | | Filter element design - N Series | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Filter series | Length | A03 | A06 | A10 | A16 | A25 | A03 | A06 | A10 | A16 | A25 | M25 |
| **FHP 010** | **1** | 3 | 5 | 6 | 7 | 8 | 4 | 6 | 8 | 9 | 10 | 37 |
| | **2** | 5 | 7 | 13 | 16 | 22 | 6 | 8 | 16 | 19 | 24 | 40 |
| | **3** | 10 | 13 | 22 | 25 | 30 | 11 | 14 | 23 | 26 | 31 | 41 |
| | **4** | 12 | 15 | 25 | 27 | 32 | 16 | 19 | 27 | 30 | 33 | 41 |
| **FHP 011** | **1** | 3 | 5 | 6 | 7 | 9 | 4 | 6 | 8 | 9 | 11 | 47 |
| | **2** | 5 | 7 | 14 | 17 | 24 | 7 | 9 | 17 | 21 | 28 | 52 |
| | **3** | 11 | 14 | 25 | 29 | 36 | 11 | 14 | 26 | 30 | 37 | 53 |
| | **4** | 12 | 16 | 28 | 32 | 38 | 17 | 21 | 32 | 36 | 40 | 54 |
| **FHP 065** | **1** | 24 | 25 | 50 | 59 | 84 | 25 | 33 | 56 | 63 | 90 | 142 |
| | **2** | 33 | 38 | 68 | 77 | 98 | 34 | 52 | 72 | 79 | 106 | 143 |
| | **3** | 61 | 70 | 100 | 107 | 123 | 61 | 73 | 101 | 108 | 125 | 147 |
| **FHP 135** | **1** | 49 | 55 | 95 | 98 | 147 | 67 | 72 | 115 | 122 | 159 | 184 |
| | **2** | 89 | 106 | 129 | 131 | 163 | 105 | 111 | 140 | 142 | 192 | 209 |
| | **3** | 120 | 132 | 158 | 166 | 180 | 141 | 143 | 176 | 179 | 193 | 211 |
| **FHP 350 FHP 351** | **1** | 108 | 115 | 188 | 197 | 301 | 127 | 140 | 234 | 282 | 343 | 451 |
| | **2** | 196 | 225 | 317 | 323 | 396 | 256 | 278 | 394 | 415 | 465 | 480 |
| | **3** | 266 | 310 | 384 | 392 | 440 | 331 | 370 | 450 | 466 | 475 | 490 |
| | **4** | 308 | 333 | 391 | 398 | 445 | 369 | 393 | 456 | 474 | 495 | 503 |
| **FHP 500** | **1** | 144 | 157 | 265 | 268 | 355 | 269 | 305 | 390 | 406 | 444 | 612 |
| | **2** | 232 | 262 | 350 | 363 | 398 | 321 | 357 | 433 | 441 | 484 | 619 |
| | **3** | 293 | 301 | 398 | 408 | 455 | 396 | 416 | 497 | 499 | 537 | 622 |
| | **4** | 336 | 377 | 452 | 455 | 507 | 430 | 475 | 516 | 524 | 545 | 626 |
| | **5** | 420 | 428 | 494 | 500 | 544 | 475 | 493 | 535 | 545 | 569 | 627 |

**Maximum flow rate for a complete pressure filter with a pressure drop Δp = 1.5 bar.**

The reference fluid has a kinematic viscosity of 30 $mm^2/s$ (cSt) and a density of 0.86 $kg/dm^3$.

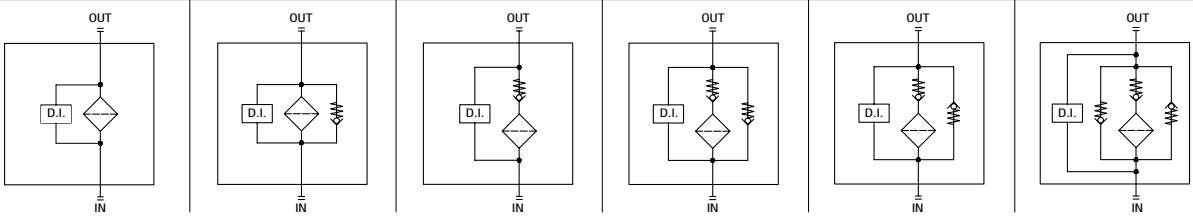
For different pressure drop or fluid viscosity we recommend to use our selection software available on www.mpfiltri.com.

You can also calculate the right size using the formulas present on the FILTER SIZING paragraph at the beginning of the full catalogue or at the beginning of the filter family brochure.

Please, contact our Sales Department for further additional information.

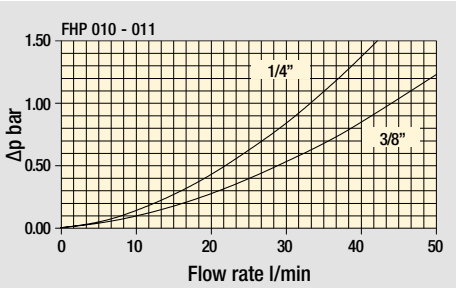
## Hydraulic diagram

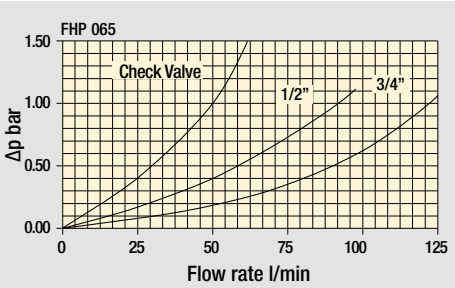
| Filter series | Style S | Style B | Style T | Style D | Style V | Style Z |
|---|---|---|---|---|---|---|
| **FHP 010 - 011** | • | • | - | - | • | • |
| **FHP 065** | • | • | • | - | - | - |
| **FHP 135** | • | • | • | - | - | - |
| **FHP 350-351** | • | • | • | • | • | • |
| **FHP 500** | • | • | • | • | • | • |

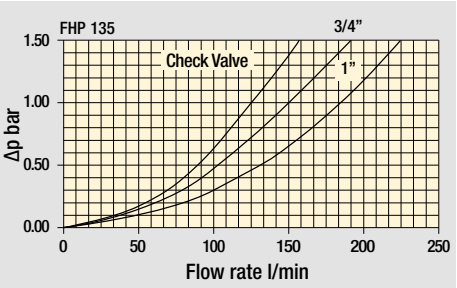


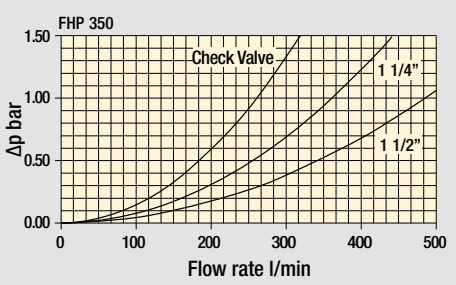
## Pressure drop

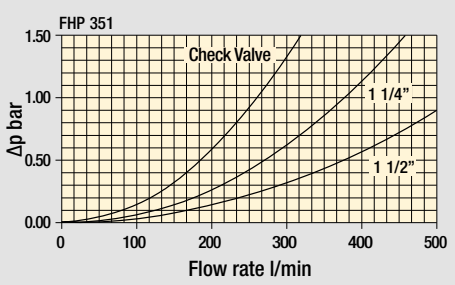
### Filter housings Δp pressure drop

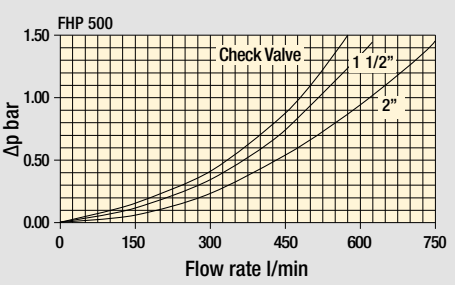


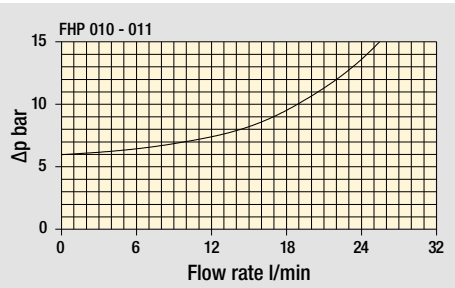



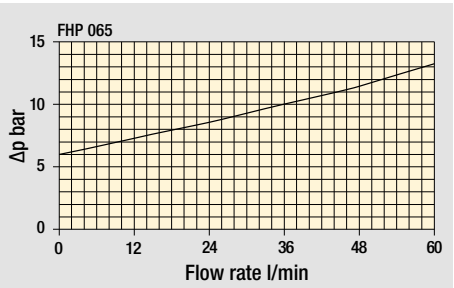



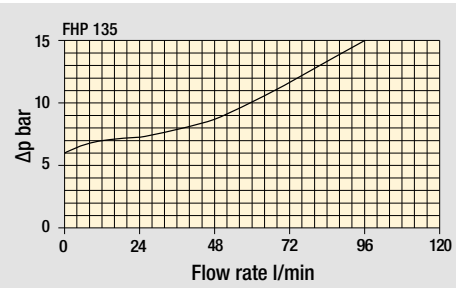



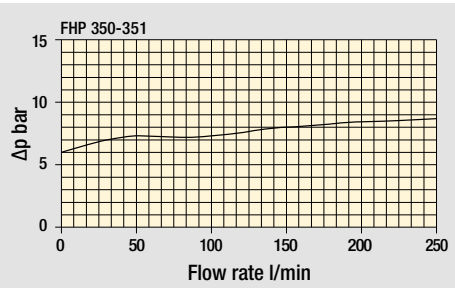



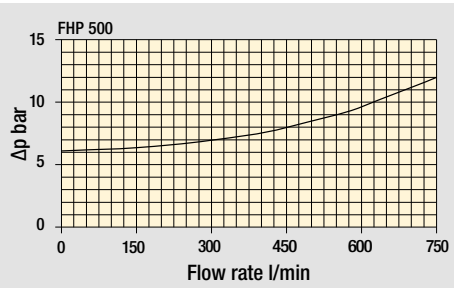

### Bypass valve pressure drop



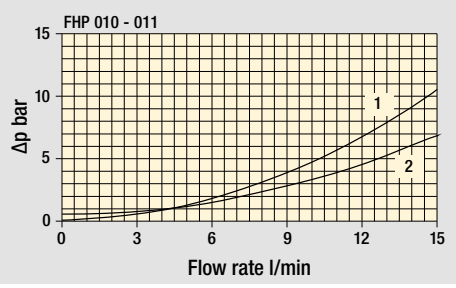



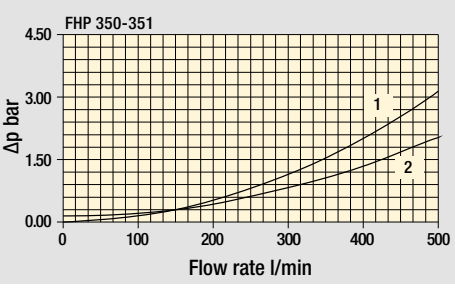



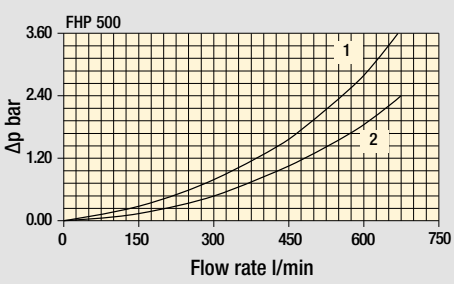

### Valves




Pressure drop with reverse flow valve in
1 - Filtering direction
2 - Opposite direction




Pressure drop with reverse flow valve in
1 - Filtering direction
2 - Opposite direction




Pressure drop with reverse flow valve in
1 - Opposite direction
2 - Filtering direction

The curves are plotted using mineral oil with density of 0.86 kg/dm³ in compliance with ISO 3968. Δp varies proportionally with density.

## Designation & Ordering code

### COMPLETE FILTER

Configuration example: FHP350 | 4 | B | A | D | 2 | A06 | N | P01

**Series and size**
- **FHP350**
- **FHP351**

**Length**
**1** | **2** | **3** | **4**

**Valves**

| | |
|---|---|
| **S** | Without bypass |
| **B** | With bypass 6 bar |
| **T** | With check valve, without bypass |
| **D** | With check valve, with bypass 6 bar |
| **V** | With reverse flow, without bypass |
| **Z** | With reverse flow, with bypass 6 bar |

**Seals**

| | |
|---|---|
| **A** | NBR |
| **V** | FPM |

**Connections**

| | | | |
|---|---|---|---|
| **A** | G 1 1/2” | **F** | 1 1/2” SAE 3000 psi/UNC + SAE 20 - 1 5/8” - 12 UN |
| **B** | 1 1/2” NPT | **G** | 1 1/4” SAE 3000 psi/M |
| **C** | SAE 24 - 1 7/8” - 12 UN | **H** | 1 1/4” SAE 3000 psi/UNC |
| **D** | 1 1/2” SAE 3000 psi/M + G 1 1/4” | **I** | 1 1/4” SAE 6000 psi/M (bolts M12, IAW ISO 6162-2:2018) |
| **E** | 1 1/2” SAE 3000 psi/UNC + 1 1/4” NPT | **L** | 1 1/4” SAE 6000 psi/UNC |

**Connection for differential pressure indicator**
- **2** With connection

**Filtration rating (filter media)**

| | | |
|---|---|---|
| **A03** | Inorganic microfiber | 3 µm |
| **A06** | Inorganic microfiber | 6 µm |
| **A10** | Inorganic microfiber | 10 µm |
| **A16** | Inorganic microfiber | 16 µm |
| **A25** | Inorganic microfiber | 25 µm |
| **M25** | Wire mesh | 25 µm |

| Element Δp | | Valves S | B | T | D | V | Z |
|---|---|---|---|---|---|---|---|
| **N** | 20 bar | - | • | - | - | - | - |
| **R** | 20 bar | - | - | - | • | - | • |
| **H** | 210 bar | • | - | - | - | - | - |
| **S** | 210 bar | - | - | • | - | • | - |

| Execution | | Filter length 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| **P01** | MP Filtri standard | • | • | • | • |
| **P02** | Maintenance from the bottom of the housing | - | - | - | • |
| **Pxx** | Customized | - | - | - | - |

### FILTER ELEMENT

Configuration example: HP320 | 4 | A06 | A | N | P01

**Element series and size**
- **HP320**

**Element length**
**1** | **2** | **3** | **4**

**Filtration rating (filter media)**

| | | |
|---|---|---|
| **A03** | Inorganic microfiber | 3 µm |
| **A06** | Inorganic microfiber | 6 µm |
| **A10** | Inorganic microfiber | 10 µm |
| **A16** | Inorganic microfiber | 16 µm |
| **A25** | Inorganic microfiber | 25 µm |
| **M25** | Wire mesh | 25 µm |

**Seals**

| | |
|---|---|
| **A** | NBR |
| **V** | FPM |

**Element Δp**

| | |
|---|---|
| **N** | 20 bar |
| **R** | 20 bar |
| **H** | 210 bar |
| **S** | 210 bar |

**Execution**

| | |
|---|---|
| **P01** | MP Filtri standard |
| **Pxx** | Customized |

### CLOGGING INDICATORS

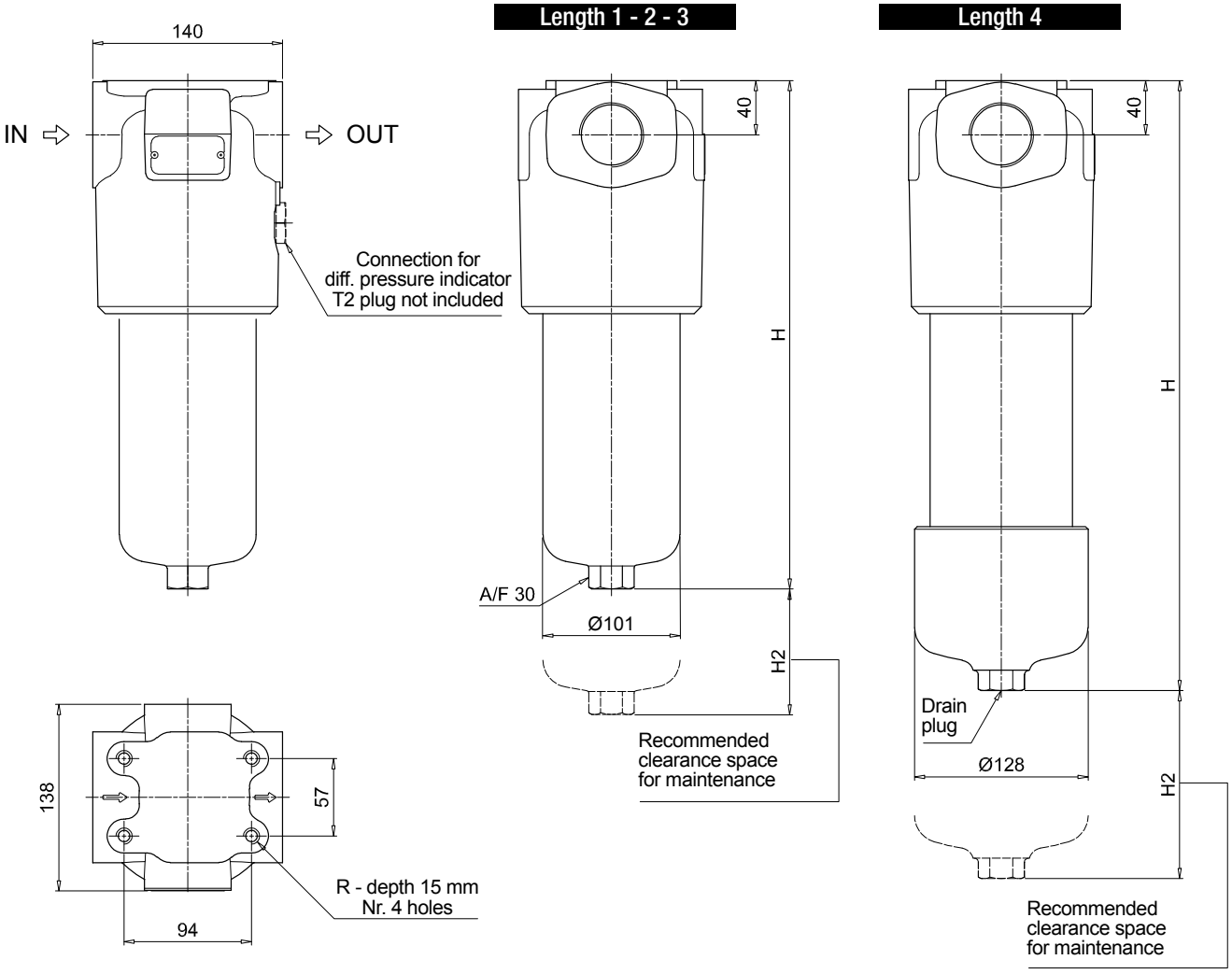
See page 786

| | |
|---|---|
| **DEA** | Electrical differential pressure indicator |
| **DEM** | Electrical differential pressure indicator |
| **DEU** | Electrical differential pressure indicator |
| **DLA** | Electrical / visual differential pressure indicator |
| **DLE** | Electrical / visual differential pressure indicator |
| **DTA** | Electronic differential pressure indicator |
| **DTI** | I-O Link electronic differential pressure indicator |
| **DVA** | Visual differential pressure indicator |
| **DVM** | Visual differential pressure indicator |

### PLUGS

See page 807

| | |
|---|---|
| **T2** | Plug (not included) |

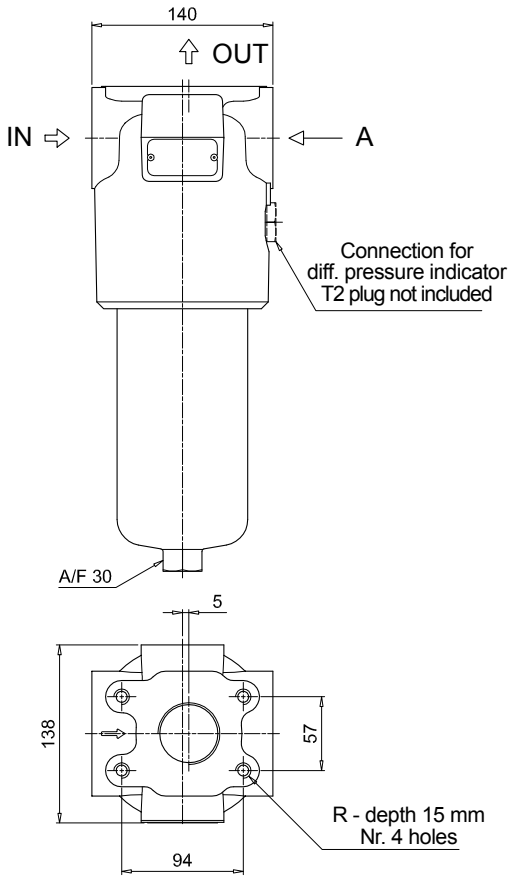


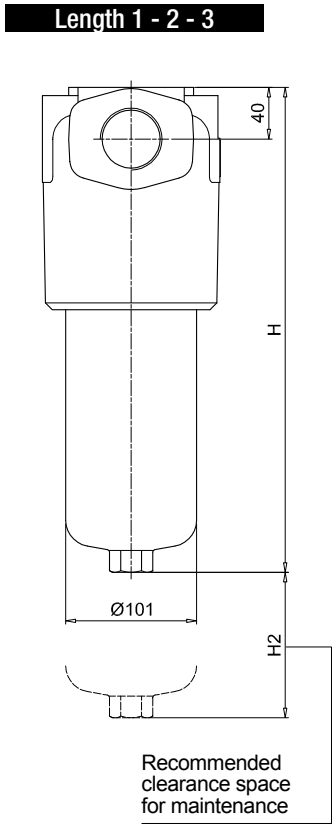

## FHP350

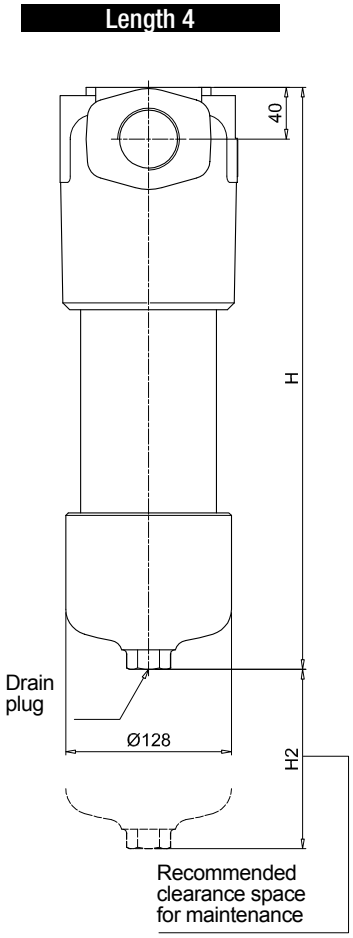
| Filter length | H [mm] | H2 [mm] Execution P01 | H2 [mm] Execution P02 |
|---|---|---|---|
| **1** | 295 | 150 | - |
| **2** | 418 | 150 | - |
| **3** | 550 | 150 | - |
| **4** | 703 | 150 | 550 |

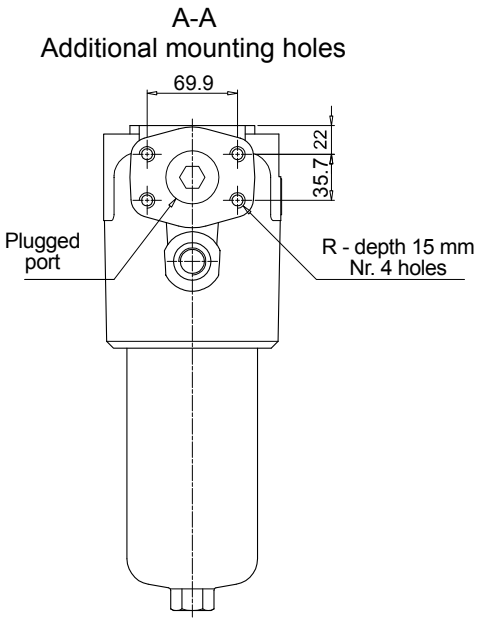
| Connections | R |
|---|---|
| **A** | M12 |
| **B - C** | 1/2" UNC |
| **D** | M12 |
| **E - F** | 1/2" UNC |
| **G** | M12 |
| **H** | 1/2" UNC |
| **I** | M12 |
| **L** | 1/2" UNC |

## Dimensions



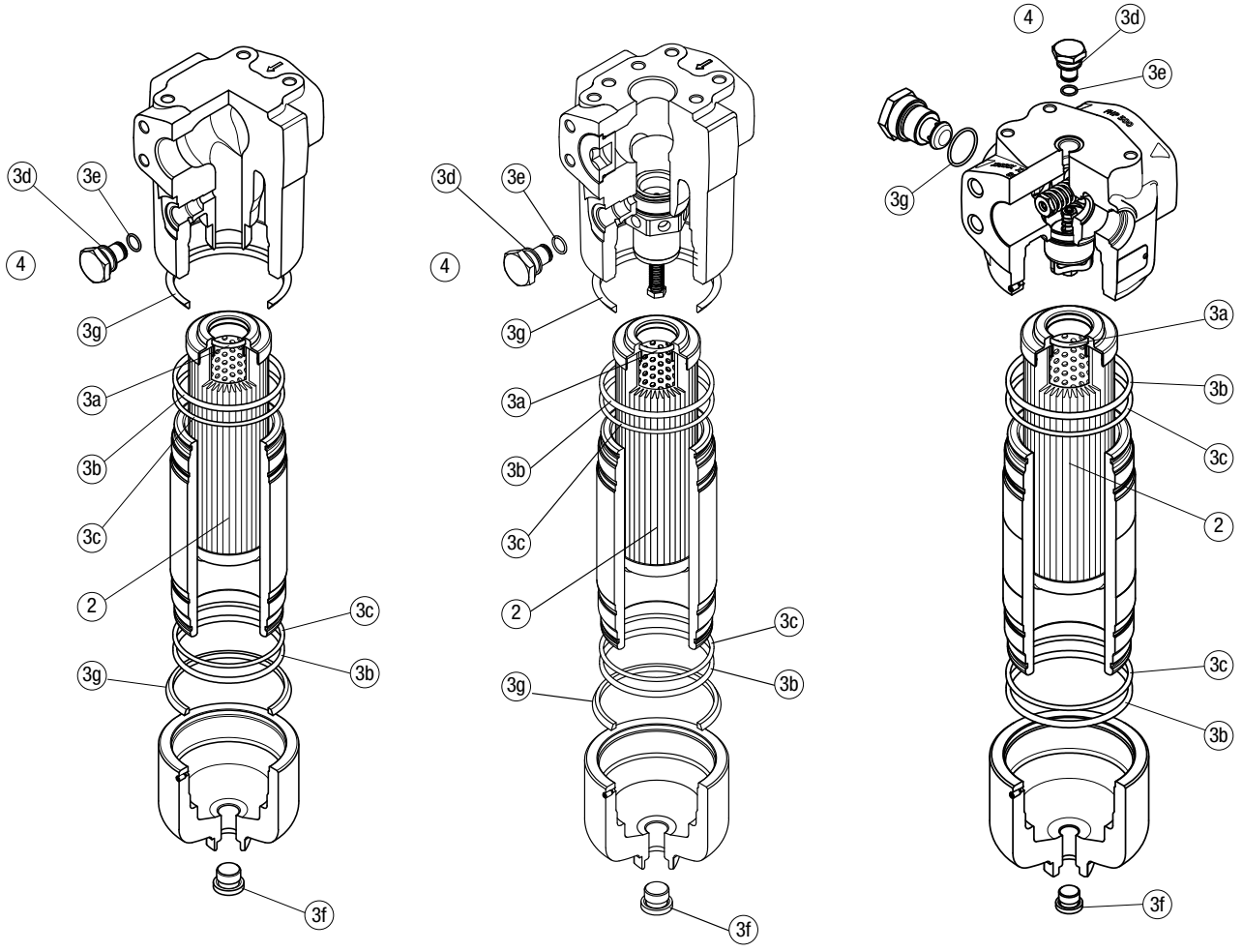

FHP351

| Filter length | H [mm] | H2 [mm] Execution P01 | H2 [mm] Execution P02 |
|---|---|---|---|
| 1 | 295 | 150 | - |
| 2 | 418 | 150 | - |
| 3 | 550 | 150 | - |
| 4 | 703 | 150 | 550 |

| Connections | R |
|---|---|
| A | M12 |
| B - C | 1/2" UNC |
| D | M12 |
| E - F | 1/2" UNC |
| G | M12 |
| H | 1/2" UNC |
| I | M12 |
| L | 1/2" UNC |

Order number for spare parts

| FHP 350 | FHP 351 | FHP 500 |
|---|---|---|




| Item: | Q.ty: 1 pc. 2 | Q.ty: 1 pc. 3 (3a ÷ 3g for FHP 350) (3a ÷ 3f for FHP 500) | | Q.ty: 1 pc. 4 | |
|---|---|---|---|---|---|
| Filter series | Filter element | Seal Kit code number NBR | Seal Kit code number FPM | Indicator connection plug NBR | Indicator connection plug FPM |
| **FHP 350 - 351** | See order table | 02050272 | 02050283 | T2H | T2V |
| **FHP 500** | | 02050330 | 02050331 | | |