

# FZP series

Maximum working pressure up to 42 Mpa (420 bar) - Flow rate up to 150 l/min



# FILTER SIZING

## INDEX

|                   | Page |
|-------------------|------|
| CALCULATION       | 23   |
| CORRECTIVE FACTOR | 24   |

**THE CORRECT FILTER SIZING HAVE TO BE BASED ON THE TOTAL PRESSURE DROP DEPENDING BY THE APPLICATION.**

FOR EXAMPLE, THE MAXIMUM TOTAL PRESSURE DROP ALLOWED BY A NEW AND CLEAN RETURN FILTER HAVE TO BE IN THE RANGE 0.4 ÷ 0.6 bar.

The pressure drop calculation is performed by adding together the value of the housing with the value of the filter element. The pressure drop  $\Delta p_c$  of the housing is proportional to the fluid density ( $\text{kg}/\text{dm}^3$ ); all the graphs in the catalogue are referred to mineral oil with density of  $0.86 \text{ kg}/\text{dm}^3$ .

The filter element pressure drop  $\Delta p_e$  is proportional to its viscosity ( $\text{mm}^2/\text{s}$ ), the corrective factor Y have to be used in case of an oil viscosity different than  $30 \text{ mm}^2/\text{s}$  (cSt).

**Sizing data for single filter element, head at top**

$\Delta p_c$  = Filter housing pressure drop [bar]

$\Delta p_e$  = Filter element pressure drop [bar]

Y = Corrective factor Y (see correspondent table), depending on the filter type, on the filter element size, on the filter element length and on the filter media

Q = flow rate (l/min)

V1 reference oil viscosity =  $30 \text{ mm}^2/\text{s}$  (cSt)

V2 = operating oil viscosity in  $\text{mm}^2/\text{s}$  (cSt)

**Filter element pressure drop calculation with an oil viscosity different than  $30 \text{ mm}^2/\text{s}$  (cSt)**

$\Delta p_e = Y : 1000 \times Q \times (V2:V1)$

$\Delta p_{\text{Tot.}} = \Delta p_c + \Delta p_e$

**Verification formula**

$\Delta p_{\text{Tot.}} \leq \Delta p_{\text{max allowed}}$

**Maximum total pressure drop ( $\Delta p_{\text{max}}$ ) allowed by a new and clean filter**

| Application                   | Range (bar)                         |
|-------------------------------|-------------------------------------|
| Suction filters               | 0.08 ÷ 0.10                         |
| Return filters                | 0.4 ÷ 0.6                           |
|                               | 0.4 ÷ 0.6 return lines              |
|                               | 0.3 ÷ 0.5 lubrication lines         |
| Low & Medium Pressure filters | 0.3 ÷ 0.4 off-line in power systems |
|                               | 0.1 ÷ 0.3 off-line in test benches  |
|                               | 0.4 ÷ 0.6 over-boost                |
| High Pressure filters         | 0.8 ÷ 1.5                           |
| Stainless Steel filters       | 0.8 ÷ 1.5                           |

**Generic filter calculation example**

Application data:

Tank top return filter

Pressure Pmax = 10 bar

Flow rate Q = 120 l/min

Viscosity V2 =  $46 \text{ mm}^2/\text{s}$  (cSt)

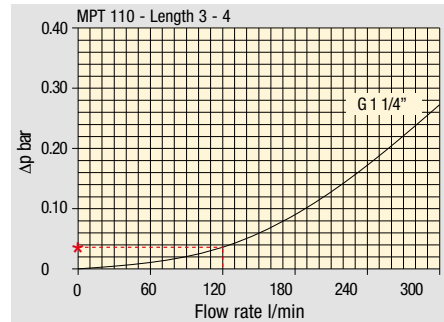
Oil density =  $0.86 \text{ kg}/\text{dm}^3$

Required filtration efficiency =  $25 \mu\text{m}$  with absolute filtration

With bypass valve and G 1 1/4" inlet connection

Calculation:

$\Delta p_c = 0.03 \text{ bar}$  (see graphic below)



Filter housings  $\Delta p$  pressure drop. The curves are plotted using mineral oil with density of  $0.86 \text{ kg}/\text{dm}^3$  in compliance with ISO 3968.  $\Delta p$  varies proportionally with density.

$\Delta p_e = (2.00 : 1000) \times 120 \times (46 : 30) = 0.37 \text{ bar}$

| Filter element | Absolute filtration H Series |       |       |       |      | Nominal filtration N Series |      |             |
|----------------|------------------------------|-------|-------|-------|------|-----------------------------|------|-------------|
|                | A03                          | A06   | A10   | A16   | A25  | P10                         | P25  | M25 M60 M90 |
| Type           |                              |       |       |       |      |                             |      |             |
| Return filters |                              |       |       |       |      |                             |      |             |
| MF 020         | 74.00                        | 50.08 | 20.00 | 16.00 | 9.00 | 6.43                        | 5.51 | 4.40        |
|                | 2                            | 29.20 | 24.12 | 8.00  | 7.22 | 5.00                        | 3.33 | 2.85        |
|                | 3                            | 22.00 | 19.00 | 6.56  | 5.33 | 4.33                        | 1.68 | 1.44        |
| MF 030         | 74.00                        | 50.08 | 20.00 | 16.00 | 9.00 | 6.43                        | 5.51 | 3.40        |
| MFX 030        | 1                            | 28.20 | 24.40 | 8.67  | 8.17 | 6.88                        | 4.62 | 3.96        |
|                | 2                            | 17.33 | 12.50 | 6.86  | 5.70 | 4.00                        | 3.05 | 2.47        |
|                | 3                            | 10.25 | 9.00  | 3.65  | 3.33 | 2.50                        | 1.63 | 1.32        |
|                | 4                            | 6.10  | 5.40  | 2.30  | 2.20 | 2.00                        | 1.19 | 0.96        |

$\Delta p_{\text{Tot.}} = 0.03 + 0.37 = 0.4 \text{ bar}$

The selection is correct because the total pressure drop value is inside the admissible range for top tank return filters.

In case the allowed max total pressure drop is not verified, it is necessary to repeat the calculation changing the filter length/size.

# FILTER SIZING Corrective factor

Corrective factor Y to be used for the filter element pressure drop calculation. The values depend to the filter size and length and to the filter media.  
Reference oil viscosity 30 mm<sup>2</sup>/s

## Return filters

| Filter element    | Absolute filtration<br>H Series |       |       |       |       | Nominal filtration<br>N Series |      |      |                   |
|-------------------|---------------------------------|-------|-------|-------|-------|--------------------------------|------|------|-------------------|
|                   | Type                            | A03   | A06   | A10   | A16   | A25                            | P10  | P25  | M25<br>M60<br>M90 |
| MF 020            | 1                               | 74.00 | 50.08 | 20.00 | 16.00 | 9.00                           | 6.43 | 5.51 | 4.40              |
|                   | 2                               | 29.20 | 24.12 | 8.00  | 7.22  | 5.00                           | 3.33 | 2.85 | 2.00              |
|                   | 3                               | 22.00 | 19.00 | 6.56  | 5.33  | 4.33                           | 1.68 | 1.44 | 1.30              |
| MF 030<br>MFX 030 | 1                               | 74.00 | 50.08 | 20.00 | 16.00 | 9.00                           | 6.43 | 5.51 | 3.40              |
| MF 100<br>MFX 100 | 1                               | 28.20 | 24.40 | 8.67  | 8.17  | 6.88                           | 4.62 | 3.96 | 1.25              |
|                   | 2                               | 17.33 | 12.50 | 6.86  | 5.70  | 4.00                           | 3.05 | 2.47 | 1.10              |
|                   | 3                               | 10.25 | 9.00  | 3.65  | 3.33  | 2.50                           | 1.63 | 1.32 | 0.96              |
|                   | 4                               | 6.10  | 5.40  | 2.30  | 2.20  | 2.00                           | 1.19 | 0.96 | 0.82              |
| MF 180<br>MFX 180 | 1                               | 3.67  | 3.05  | 1.64  | 1.56  | 1.24                           | 1.18 | 1.06 | 0.26              |
|                   | 2                               | 1.69  | 1.37  | 0.68  | 0.54  | 0.51                           | 0.43 | 0.39 | 0.12              |
| MF 190<br>MFX 190 | 2                               | 1.69  | 1.37  | 0.60  | 0.49  | 0.44                           | 0.35 | 0.31 | 0.11              |
| MF 400<br>MFX 400 | 1                               | 3.20  | 2.75  | 1.39  | 1.33  | 1.06                           | 0.96 | 0.87 | 0.22              |
|                   | 2                               | 2.00  | 1.87  | 0.88  | 0.85  | 0.55                           | 0.49 | 0.45 | 0.13              |
|                   | 3                               | 1.90  | 1.60  | 0.63  | 0.51  | 0.49                           | 0.39 | 0.35 | 0.11              |
| MF 750<br>MFX 750 | 1                               | 1.08  | 0.84  | 0.49  | 0.36  | 0.26                           | 0.21 | 0.19 | 0.06              |
| MLX 250           | 2                               | 3.00  | 3.04  | 1.46  | 1.25  | 1.17                           | -    | -    | M25<br>0.20       |
| MLX 660           | 2                               | 1.29  | 1.26  | 0.52  | 0.44  | 0.38                           | -    | -    | M25<br>0.10       |
| CU 025            |                                 | 78.00 | 48.00 | 28.00 | 24.00 | 9.33                           | 9.33 | 8.51 | 1.25              |
| CU 040            |                                 | 25.88 | 20.88 | 10.44 | 10.00 | 3.78                           | 3.78 | 3.30 | 1.25              |
| CU 100            |                                 | 15.20 | 14.53 | 5.14  | 4.95  | 2.00                           | 2.00 | 0.17 | 1.10              |
| CU 250            |                                 | 3.25  | 2.55  | 1.55  | 1.35  | 0.71                           | 0.71 | 0.59 | 0.25              |
| CU 630            |                                 | 1.96  | 1.68  | 0.85  | 0.72  | 0.42                           | 0.42 | 0.36 | 0.09              |
| CU 850            |                                 | 1.06  | 0.84  | 0.42  | 0.33  | 0.17                           | 0.17 | 0.13 | 0.04              |
| MR 100            | 1                               | 19.00 | 17.00 | 6.90  | 6.30  | 4.60                           | 2.94 | 2.52 | 1.60              |
|                   | 2                               | 11.70 | 10.80 | 4.40  | 4.30  | 3.00                           | 2.94 | 2.52 | 1.37              |
|                   | 3                               | 7.80  | 6.87  | 3.70  | 3.10  | 2.70                           | 2.14 | 1.84 | 1.34              |
|                   | 4                               | 5.50  | 4.97  | 2.60  | 2.40  | 2.18                           | 1.72 | 1.47 | 1.34              |
|                   | 5                               | 4.20  | 3.84  | 2.36  | 2.15  | 1.90                           | 1.60 | 1.37 | 1.34              |
| MR 250            | 1                               | 5.35  | 4.85  | 2.32  | 1.92  | 1.50                           | 1.38 | 1.20 | 0.15              |
|                   | 2                               | 4.00  | 3.28  | 1.44  | 1.10  | 1.07                           | 0.96 | 0.83 | 0.13              |
|                   | 3                               | 2.60  | 2.20  | 1.08  | 1.00  | 0.86                           | 0.77 | 0.64 | 0.12              |
|                   | 4                               | 1.84  | 1.56  | 0.68  | 0.56  | 0.44                           | 0.37 | 0.23 | 0.11              |
| MR 630            | 1                               | 3.10  | 2.48  | 1.32  | 1.14  | 0.92                           | 0.83 | 0.73 | 0.09              |
|                   | 2                               | 2.06  | 1.92  | 0.82  | 0.76  | 0.38                           | 0.33 | 0.27 | 0.08              |
|                   | 3                               | 1.48  | 1.30  | 0.60  | 0.56  | 0.26                           | 0.22 | 0.17 | 0.08              |
|                   | 4                               | 1.30  | 1.20  | 0.48  | 0.40  | 0.25                           | 0.21 | 0.16 | 0.08              |
|                   | 5                               | 0.74  | 0.65  | 0.30  | 0.28  | 0.13                           | 0.10 | 0.08 | 0.04              |
| MR 850            | 1                               | 0.60  | 0.43  | 0.34  | 0.25  | 0.13                           | 0.12 | 0.09 | 0.03              |
|                   | 2                               | 0.37  | 0.26  | 0.23  | 0.21  | 0.11                           | 0.08 | 0.07 | 0.03              |
|                   | 3                               | 0.27  | 0.18  | 0.17  | 0.17  | 0.05                           | 0.04 | 0.04 | 0.02              |
|                   | 4                               | 0.23  | 0.16  | 0.13  | 0.12  | 0.04                           | 0.03 | 0.03 | 0.02              |

## Return / Suction filters

| Filter element | Absolute filtration             |       |       |      |      |      |      |                   |      |
|----------------|---------------------------------|-------|-------|------|------|------|------|-------------------|------|
|                | Type                            | A10   | A16   | A25  |      |      |      |                   |      |
| RSX 116        | 1                               | 5.12  | 4.33  | 3.85 |      |      |      |                   |      |
|                | 2                               | 2.22  | 1.87  | 1.22 |      |      |      |                   |      |
| RSX 165        | 1                               | 2.06  | 1.75  | 1.46 |      |      |      |                   |      |
|                | 2                               | 1.24  | 1.05  | 0.96 |      |      |      |                   |      |
|                | 3                               | 0.94  | 0.86  | 0.61 |      |      |      |                   |      |
| Filter element | Absolute filtration<br>N Series |       |       |      |      |      |      |                   |      |
| Type           | A03                             | A06   | A10   | A16  | A25  | P10  | P25  | M25<br>M60<br>M90 |      |
| CU 110         | 1                               | 16.25 | 15.16 | 8.75 | 8.14 | 5.87 | 2.86 | 2.65              | 0.14 |
|                | 2                               | 12.62 | 10.44 | 6.11 | 6.02 | 4.16 | 1.60 | 1.49              | 0.12 |
|                | 3                               | 8.57  | 7.95  | 5.07 | 4.07 | 2.40 | 1.24 | 1.15              | 0.11 |
|                | 4                               | 5.76  | 4.05  | 2.80 | 2.36 | 1.14 | 0.91 | 0.85              | 0.05 |

## Low & Medium pressure filters

| Filter element | Absolute filtration<br>N-W Series |       |       |      |      | Nominal filtration<br>N Series |      |      |      |
|----------------|-----------------------------------|-------|-------|------|------|--------------------------------|------|------|------|
|                | Type                              | A03   | A06   | A10  | A16  | A25                            | P10  | P25  | M25  |
| CU 110         | 1                                 | 16.25 | 15.16 | 8.75 | 8.14 | 5.87                           | 2.86 | 2.65 | 0.14 |
|                | 2                                 | 12.62 | 10.44 | 6.11 | 6.02 | 4.15                           | 1.60 | 1.49 | 0.12 |
|                | 3                                 | 8.57  | 7.95  | 5.07 | 4.07 | 2.40                           | 1.24 | 1.15 | 0.11 |
|                | 4                                 | 5.76  | 4.05  | 2.80 | 2.36 | 1.14                           | 0.91 | 0.85 | 0.05 |
| CU 210         | 1                                 | 5.30  | 4.80  | 2.00 | 1.66 | 1.32                           | 0.56 | 0.43 | 0.12 |
|                | 2                                 | 3.44  | 2.95  | 1.24 | 1.09 | 0.70                           | 0.42 | 0.35 | 0.09 |
|                | 3                                 | 2.40  | 1.70  | 0.94 | 0.84 | 0.54                           | 0.33 | 0.23 | 0.05 |
| DN             | 016                               | 7.95  | 7.20  | 3.00 | 2.49 | 1.98                           | 0.84 | 0.65 | 0.18 |
|                | 025                               | 5.00  | 4.53  | 1.89 | 1.57 | 1.25                           | 0.53 | 0.41 | 0.11 |
|                | 040                               | 3.13  | 2.66  | 1.12 | 0.98 | 0.63                           | 0.38 | 0.32 | 0.08 |
| CU 400         | 2                                 | 3.13  | 2.55  | 1.46 | 1.22 | 0.78                           | 0.75 | 0.64 | 0.19 |
|                | 3                                 | 2.15  | 1.70  | 0.94 | 0.78 | 0.50                           | 0.40 | 0.34 | 0.10 |
|                | 4                                 | 1.60  | 1.28  | 0.71 | 0.61 | 0.40                           | 0.34 | 0.27 | 0.08 |
|                | 5                                 | 1.00  | 0.83  | 0.47 | 0.34 | 0.20                           | 0.24 | 0.19 | 0.06 |
|                | 6                                 | 0.82  | 0.58  | 0.30 | 0.27 | 0.17                           | 0.22 | 0.18 | 0.05 |
|                | CU 900                            | 1     | 0.86  | 0.63 | 0.32 | 0.30                           | 0.21 | -    | -    |
| CU 950         | 2                                 | 1.03  | 0.80  | 0.59 | 0.40 | 0.26                           | -    | -    | 0.05 |
|                | 3                                 | 0.44  | 0.40  | 0.27 | 0.18 | 0.15                           | -    | -    | 0.02 |
| MR 630         | 7                                 | 0.88  | 0.78  | 0.36 | 0.34 | 0.16                           | 0.12 | 0.96 | 0.47 |

**Corrective factor Y to be used for the filter element pressure drop calculation. The values depend to the filter size and length and to the filter media.**  
Reference oil viscosity 30 mm<sup>2</sup>/s

## High pressure filters

| Filter element |   | Absolute filtration<br>N - R Series |        |        |        |        | Nominal filtration<br>N Series |
|----------------|---|-------------------------------------|--------|--------|--------|--------|--------------------------------|
| Type           |   | A03                                 | A06    | A10    | A16    | A25    | M25                            |
| HP 011         | 1 | 332.71                              | 250.07 | 184.32 | 152.36 | 128.36 | -                              |
|                | 2 | 220.28                              | 165.56 | 74.08  | 59.13  | 37.05  | -                              |
|                | 3 | 123.24                              | 92.68  | 41.48  | 33.08  | 20.72  | -                              |
|                | 4 | 77.76                               | 58.52  | 28.37  | 22.67  | 16.17  | -                              |
| HP 039         | 2 | 70.66                               | 53.20  | 25.77  | 20.57  | 14.67  | 4.90                           |
|                | 3 | 36.57                               | 32.28  | 18.00  | 13.38  | 8.00   | 2.90                           |
|                | 4 | 26.57                               | 23.27  | 12.46  | 8.80   | 5.58   | 2.20                           |
| HP 050         | 1 | 31.75                               | 30.30  | 13.16  | 12.3   | 7.29   | 1.60                           |
|                | 2 | 24.25                               | 21.26  | 11.70  | 9.09   | 4.90   | 1.40                           |
|                | 3 | 17.37                               | 16.25  | 8.90   | 7.18   | 3.63   | 1.25                           |
|                | 4 | 12.12                               | 10.75  | 6.10   | 5.75   | 3.08   | 1.07                           |
|                | 5 | 7.00                                | 6.56   | 3.60   | 3.10   | 2.25   | 0.80                           |
| HP 065         | 1 | 58.50                               | 43.46  | 23.16  | 19.66  | 10.71  | 1.28                           |
|                | 2 | 42.60                               | 25.64  | 16.22  | 13.88  | 7.32   | 1.11                           |
|                | 3 | 20.50                               | 15.88  | 8.18   | 6.81   | 3.91   | 0.58                           |
| HP 135         | 1 | 20.33                               | 18.80  | 9.71   | 8.66   | 4.78   | 2.78                           |
|                | 2 | 11.14                               | 10.16  | 6.60   | 6.38   | 2.22   | 1.11                           |
|                | 3 | 6.48                                | 6.33   | 3.38   | 3.16   | 2.14   | 1.01                           |
| HP 150         | 1 | 17.53                               | 15.91  | 7.48   | 6.96   | 5.94   | 1.07                           |
|                | 2 | 8.60                                | 8.37   | 3.54   | 3.38   | 3.15   | 0.58                           |
|                | 3 | 6.53                                | 5.90   | 2.93   | 2.79   | 2.12   | 0.49                           |
| HP 320         | 1 | 10.88                               | 9.73   | 5.02   | 3.73   | 2.54   | 1.04                           |
|                | 2 | 4.40                                | 3.83   | 1.75   | 1.48   | 0.88   | 0.71                           |
|                | 3 | 2.75                                | 2.11   | 1.05   | 0.87   | 0.77   | 0.61                           |
|                | 4 | 2.12                                | 1.77   | 0.98   | 0.78   | 0.55   | 0.47                           |
| HP 500         | 1 | 4.44                                | 3.67   | 2.30   | 2.10   | 1.65   | 0.15                           |
|                | 2 | 3.37                                | 2.77   | 1.78   | 1.68   | 1.24   | 0.10                           |
|                | 3 | 2.22                                | 1.98   | 1.11   | 1.09   | 0.75   | 0.08                           |
|                | 4 | 1.81                                | 1.33   | 0.93   | 0.86   | 0.68   | 0.05                           |
|                | 5 | 1.33                                | 1.15   | 0.77   | 0.68   | 0.48   | 0.04                           |

| Filter element |   | Absolute filtration<br>N Series |      |      |      |      | Nominal filtration<br>N Series |
|----------------|---|---------------------------------|------|------|------|------|--------------------------------|
| Type           |   | A03                             | A06  | A10  | A16  | A25  | M25                            |
| HF 320         | 1 | 3.65                            | 2.95 | 2.80 | 1.80 | 0.90 | 0.38                           |
|                | 2 | 2.03                            | 1.73 | 1.61 | 1.35 | 0.85 | 0.36                           |
|                | 3 | 1.84                            | 1.42 | 1.32 | 1.22 | 0.80 | 0.35                           |

## Suction filters

| Filter element | Nominal filtration<br>N Series |     |
|----------------|--------------------------------|-----|
| Type           | P10                            | P25 |
| SF 250         | 65                             | 21  |

## Stainless steel high pressure filters

| Filter element |   | Absolute filtration<br>N Series |        |        |        |        |
|----------------|---|---------------------------------|--------|--------|--------|--------|
| Type           |   | A03                             | A06    | A10    | A16    | A25    |
| HP 011         | 1 | 332.71                          | 250.07 | 184.32 | 152.36 | 128.36 |
|                | 2 | 220.28                          | 165.56 | 74.08  | 59.13  | 37.05  |
|                | 3 | 123.24                          | 92.68  | 41.48  | 33.08  | 20.72  |
|                | 4 | 77.76                           | 58.52  | 28.37  | 22.67  | 16.17  |
| HP 039         | 2 | 70.66                           | 53.20  | 25.77  | 20.57  | 14.67  |
|                | 3 | 36.57                           | 32.28  | 18.00  | 13.38  | 8.00   |
|                | 4 | 26.57                           | 23.27  | 12.46  | 8.80   | 5.58   |
| HP 050         | 1 | 31.75                           | 30.30  | 13.16  | 12.3   | 7.29   |
|                | 2 | 24.25                           | 21.26  | 11.70  | 9.09   | 4.90   |
|                | 3 | 17.37                           | 16.25  | 8.90   | 7.18   | 3.63   |
|                | 4 | 12.12                           | 10.75  | 6.10   | 5.75   | 3.08   |
|                | 5 | 7.00                            | 6.56   | 3.60   | 3.10   | 2.25   |
| HP 135         | 1 | 20.33                           | 18.80  | 9.71   | 8.66   | 4.78   |
|                | 2 | 11.14                           | 10.16  | 6.60   | 6.38   | 2.22   |
|                | 3 | 6.48                            | 6.33   | 3.38   | 3.16   | 2.14   |

| Filter element |   | Absolute filtration<br>H - U Series |        |        |        |        |
|----------------|---|-------------------------------------|--------|--------|--------|--------|
| Type           |   | A03                                 | A06    | A10    | A16    | A25    |
| HP 011         | 1 | 424.58                              | 319.74 | 235.17 | 194.44 | 163.78 |
|                | 2 | 281.06                              | 211.25 | 94.53  | 75.45  | 47.26  |
|                | 3 | 130.14                              | 97.50  | 43.63  | 34.82  | 21.81  |
|                | 4 | 109.39                              | 82.25  | 36.79  | 29.37  | 18.40  |
| HP 039         | 2 | 70.66                               | 53.20  | 25.77  | 20.57  | 14.67  |
|                | 3 | 36.57                               | 32.28  | 18.00  | 13.38  | 8.00   |
|                | 4 | 26.57                               | 23.27  | 12.46  | 8.80   | 5.58   |
| HP 050         | 1 | 47.33                               | 34.25  | 21.50  | 20.50  | 14.71  |
|                | 2 | 29.10                               | 25.95  | 14.04  | 10.90  | 5.88   |
|                | 3 | 20.85                               | 19.50  | 10.68  | 8.61   | 4.36   |
|                | 4 | 14.55                               | 12.90  | 7.32   | 6.90   | 3.69   |
|                | 5 | 9.86                                | 9.34   | 6.40   | 4.80   | 2.50   |
| HP 135         | 1 | 29.16                               | 25.33  | 13.00  | 12.47  | 5.92   |
|                | 2 | 14.28                               | 11.04  | 7.86   | 7.60   | 4.44   |
|                | 3 | 8.96                                | 7.46   | 4.89   | 4.16   | 3.07   |

# FILTER SIZING Selection Software

**Step 1** Select "FILTERS"



**Step 2** Choose filter group (Return Filter, Pressure Filter, etc.)



**Step 3** Choose filter type (MPF, MPT, etc.) in function of the max working pressure and the max flow rate



**Step 4** Push "PROCEED"



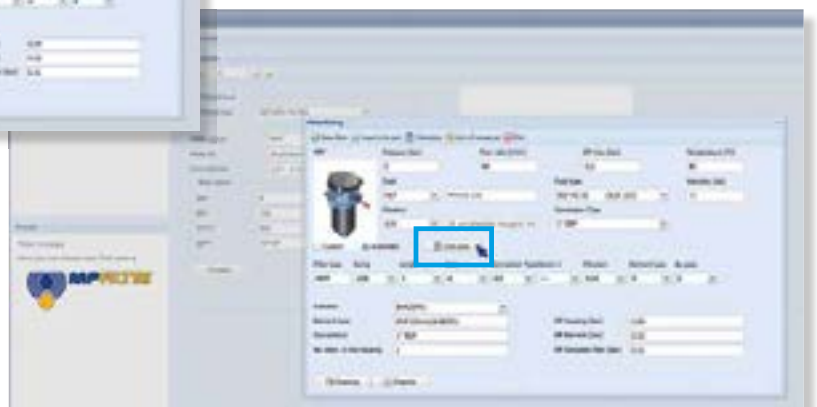
**Step 5**

Insert all application data to calculate the filter size following the sequence:

- working pressure
- working flow rate
- working pressure drop
- working temperature
- fluid material and fluid type
- filtration media
- connection type

**Step 6**

Push "CALCULATE" to have result; in case of any mistake, the system will advice which parameter is out of range to allow to modify/adjust the selection



**Step 7**

Download PDF Datasheet "Report.aspx" pushing the button "Drawing"

# FZP series

Maximum working pressure up to 42 Mpa (420 bar) - Flow rate up to 150 l/min



## Description

## Technical data

### Stainless steel high pressure filters

#### In-line

**Maximum working pressure up to 42 Mpa (420 bar)**  
**Flow rate up to 150 l/min**

FZP is a range of stainless steel high pressure filter for protection of sensitive components in high pressure hydraulic systems placed in difficult environmental conditions.

They are directly connected to the lines of the system through the hydraulic fittings.

#### Available features:

- 1 1/4" female threaded connections, for a maximum flow rate of 150 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
- 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
- High collapse filter element "U", for use with aggressive fluids
- Visual, electrical and electronic differential clogging indicators

#### Common applications:

- Off-shore equipment
- Water filtration systems
- Systems with strong or corrosive environmental conditions
- Systems with corrosive fluids

#### Filter housing materials

- Head: AISI 316L
- Housing: AISI 316L
- Bypass valve: AISI 316L

#### Seals

- Standard NBR series A (-25 °C to +110 °C)
- Optional FPM series V (-20 °C to +120 °C)
- Optional MFQ series F (-50 °C to +120 °C)

#### Bypass valve

Opening pressure 6 bar ±10%

#### Temperature

From -50 °C to +120 °C

#### Note

FZP filters are provided for vertical mounting.

#### Δp element type

Fluid flow through the filter element from OUT to IN.

Microfibre filter elements - series R: 20 bar.

Element series "R":

- End cap: Nylon
- Core tube: Tinned Steel
- External/Internal support: Wire mesh Epox painted
- Media/Support/Pre-filter: Microfibre/Syntetic

Microfibre filter elements - series S: 210 bar.

Element series "S":

- End cap: Tinned Steel
- Core tube: Tinned Steel
- External support: Wire mesh Epox painted
- Internal support: Wire mesh Stainless Steel
- Media/Support/Pre-filter: Microfibre/Syntetic

Stainless Steel Microfibre filter elements series U: 210 bar.

Element series "U":

- End cap: Stainless Steel
- Core tube: Stainless Steel
- External support: Stainless Steel
- Internal support: Stainless Steel
- Media/Support/Pre-filter: Microfibre/Syntetic

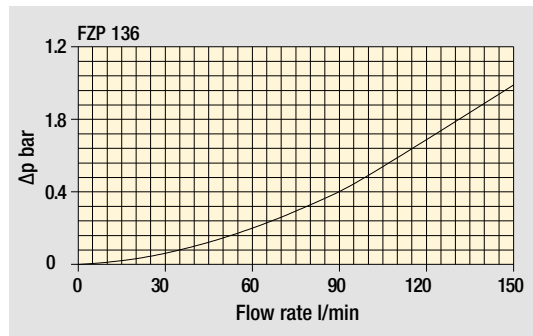
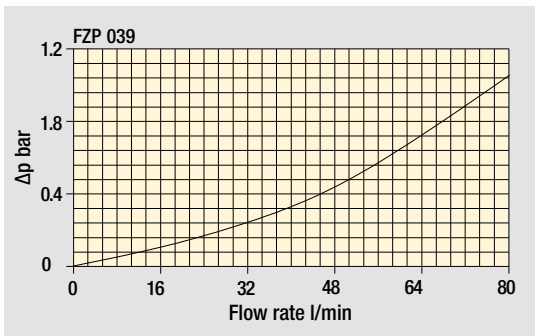


## Weights [kg] and volumes [dm³]

| Filter series  | Weights [kg] |     |      |      | Volumes [dm³] |        |      |      |      |      |
|----------------|--------------|-----|------|------|---------------|--------|------|------|------|------|
|                | Length       | 1   | 2    | 3    | 4             | Length | 1    | 2    | 3    | 4    |
| <b>FZP 039</b> | -            | -   | 4.5  | 5.1  | 5.6           | -      | -    | 0.19 | 0.26 | 0.34 |
| <b>FZP 136</b> | 8.3          | 8.3 | 10.2 | 11.5 | -             | 0.45   | 0.78 | 1.00 | -    | -    |



Filter housings  $\Delta p$  pressure drop



The curves are plotted using mineral oil with density of  $0.86 \text{ kg/dm}^3$  in compliance with ISO 3968.  
 $\Delta p$  varies proportionally with density.

Flow rates [l/min]

| Filter series | Length | Filter element design - R Series |     |     |     |     | Filter element design - S-U Series |     |     |     |     |
|---------------|--------|----------------------------------|-----|-----|-----|-----|------------------------------------|-----|-----|-----|-----|
|               |        | A03                              | A06 | A10 | A16 | A25 | A03                                | A06 | A10 | A16 | A25 |
| FZP 039       | 2      | 19                               | 25  | 43  | 50  | 59  | 19                                 | 23  | 41  | 45  | 55  |
|               | 3      | 34                               | 37  | 53  | 62  | 74  | 31                                 | 34  | 48  | 52  | 66  |
|               | 4      | 42                               | 46  | 63  | 72  | 81  | 38                                 | 41  | 55  | 71  | 78  |
| FZP 136       | 1      | 63                               | 67  | 102 | 108 | 136 | 47                                 | 53  | 87  | 89  | 127 |
|               | 2      | 95                               | 100 | 122 | 123 | 159 | 81                                 | 95  | 113 | 115 | 138 |
|               | 3      | 122                              | 124 | 148 | 150 | 160 | 106                                | 116 | 135 | 141 | 151 |

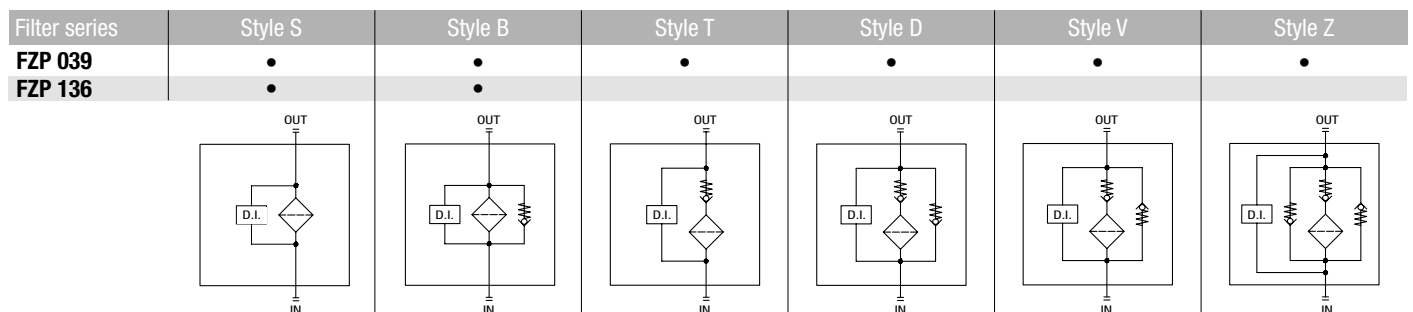
**Maximum flow rate for a complete stainless steel high pressure filter with a pressure drop  $\Delta p = 1.5 \text{ bar}$ .**

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

For different pressure drop or fluid viscosity we recommend to use our selection software available on [www.mpfiltri.com](http://www.mpfiltri.com).

Please, contact our Sales Department for further additional information.

Hydraulic symbols



## Designation & Ordering code

### COMPLETE FILTER

|  |                               |   |   |   |   |   |     |   |     |
|--|-------------------------------|---|---|---|---|---|-----|---|-----|
| <b>Series and size</b>                         | Configuration example: FZP039 | 2 | B | F | B | 2 | A03 | U | P01 |
| <b>FZP039</b>                                  |                               |   |   |   |   |   |     |   |     |
| <b>Length</b>                                  |                               |   |   |   |   |   |     |   |     |
| 2   3   4                                      |                               |   |   |   |   |   |     |   |     |
| <b>Valves</b>                                  |                               |   |   |   |   |   |     |   |     |
| <b>S</b> Without bypass                        |                               |   |   |   |   |   |     |   |     |
| <b>B</b> With bypass 6 bar                     |                               |   |   |   |   |   |     |   |     |
| <b>T</b> With check valve, without bypass      |                               |   |   |   |   |   |     |   |     |
| <b>D</b> With check valve, with bypass 6 bar   |                               |   |   |   |   |   |     |   |     |
| <b>V</b> With reverse flow, without bypass     |                               |   |   |   |   |   |     |   |     |
| <b>Z</b> With reverse flow, with bypass 6 bar  |                               |   |   |   |   |   |     |   |     |
| <b>Seals</b>                                   |                               |   |   |   |   |   |     |   |     |
| <b>A</b> NBR                                   |                               |   |   |   |   |   |     |   |     |
| <b>V</b> FPM                                   |                               |   |   |   |   |   |     |   |     |
| <b>F</b> MFQ                                   |                               |   |   |   |   |   |     |   |     |
| <b>Connections</b>                             |                               |   |   |   |   |   |     |   |     |
| <b>A</b> G 1/2"                                |                               |   |   |   |   |   |     |   |     |
| <b>B</b> 1/2" NPT                              |                               |   |   |   |   |   |     |   |     |
| <b>C</b> SAE 8 - 3/4" - 16 UNF                 |                               |   |   |   |   |   |     |   |     |
| <b>Connections for differential indicators</b> |                               |   |   |   |   |   |     |   |     |
| <b>1</b> Without                               |                               |   |   |   |   |   |     |   |     |
| <b>2</b> With connection                       |                               |   |   |   |   |   |     |   |     |
| <b>Filtration rating (filter media)</b>        |                               |   |   |   |   |   |     |   |     |
| <b>A03</b> Inorganic microfiber 3 µm           |                               |   |   |   |   |   |     |   |     |
| <b>A06</b> Inorganic microfiber 6 µm           |                               |   |   |   |   |   |     |   |     |
| <b>A10</b> Inorganic microfiber 10 µm          |                               |   |   |   |   |   |     |   |     |
| <b>A16</b> Inorganic microfiber 16 µm          |                               |   |   |   |   |   |     |   |     |
| <b>A25</b> Inorganic microfiber 25 µm          |                               |   |   |   |   |   |     |   |     |

| Element Δp                                       | Valves |   |   |   |   |   | Execution                     |
|--|--------|---|---|---|---|---|-------------------------------|
|  | S      | B | T | D | V | Z |                               |
| <b>R</b> 20 bar                                  |        | • |   | • |   | • | <b>P01</b> MP Filtri standard |
| <b>S</b> 210 bar                                 | •      |   | • |   | • |   | <b>Pxx</b> Customized         |
| <b>U</b> 210 bar, stainless steel filter element | •      | • | • | • | • | • |                               |

### FILTER ELEMENT

|   |                              |   |     |   |   |     |
|---|------------------------------|---|-----|---|---|-----|
| <b>Element series and size</b>          | Configuration example: HP039 | 2 | A03 | F | U | P01 |
| <b>HP039</b>                            |                              |   |     |   |   |     |
| <b>Element length</b>                   |                              |   |     |   |   |     |
| 2   3   4                               |                              |   |     |   |   |     |
| <b>Filtration rating (filter media)</b> |                              |   |     |   |   |     |
| <b>A03</b> Inorganic microfiber 3 µm    |                              |   |     |   |   |     |
| <b>A06</b> Inorganic microfiber 6 µm    |                              |   |     |   |   |     |
| <b>A10</b> Inorganic microfiber 10 µm   |                              |   |     |   |   |     |
| <b>A16</b> Inorganic microfiber 16 µm   |                              |   |     |   |   |     |
| <b>A25</b> Inorganic microfiber 25 µm   |                              |   |     |   |   |     |

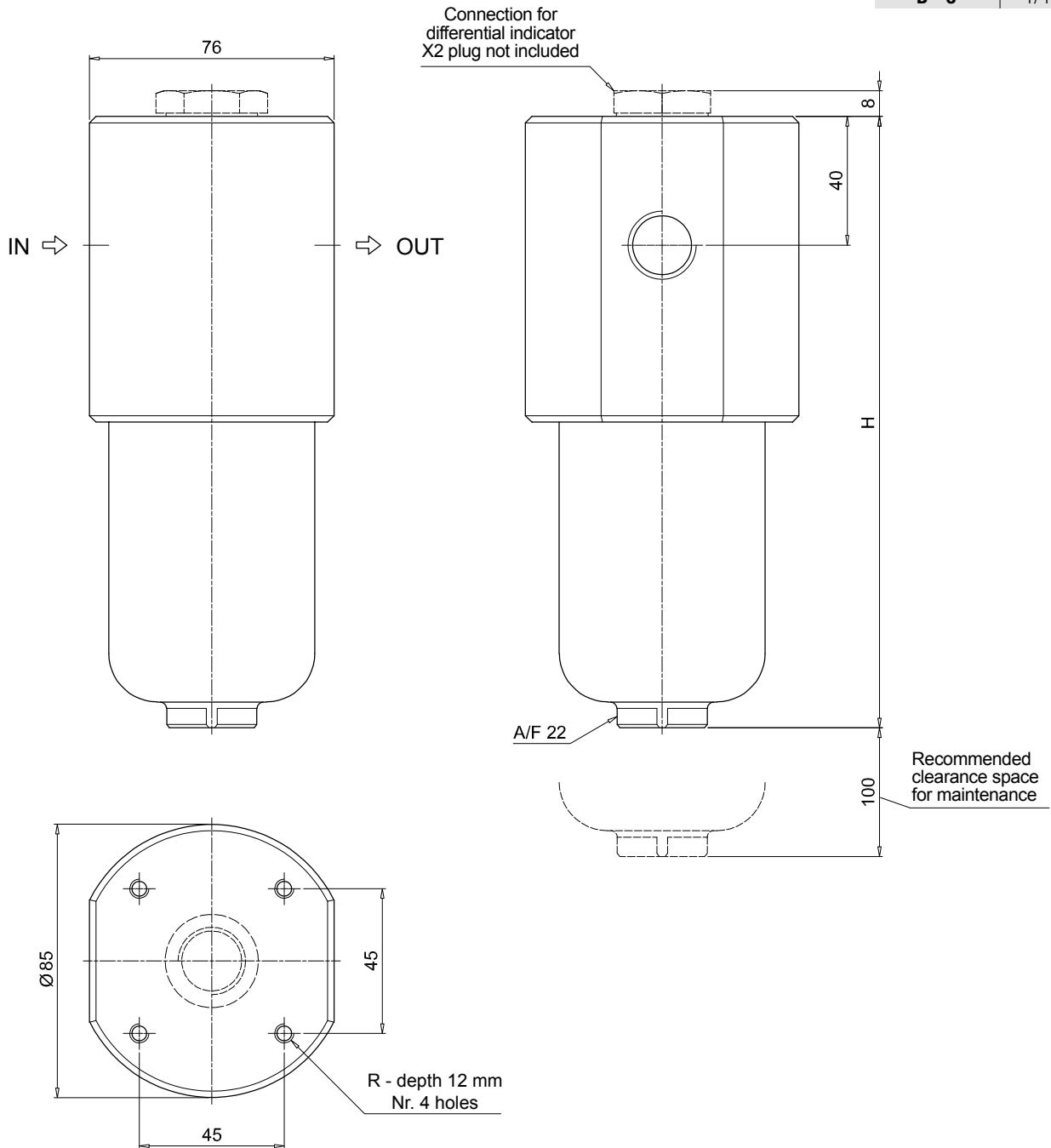
  

| Seals        | Element Δp                                       | Valves |   |   |   |   |   | Execution                     |
|--------------|--|--------|---|---|---|---|---|-------------------------------|
|              |  | S      | B | T | D | V | Z |                               |
| <b>A</b> NBR | <b>R</b> 20 bar                                  |        | • |   | • |   | • | <b>P01</b> MP Filtri standard |
| <b>V</b> FPM | <b>S</b> 210 bar                                 | •      |   | • |   | • |   | <b>Pxx</b> Customized         |
| <b>F</b> MFQ | <b>U</b> 210 bar, stainless steel filter element | •      | • | • | • | • | • |                               |

### ACCESSORIES

| Differential indicators                                     | page |  | page |
|---|------|--|------|
| <b>DEH</b> Hazardous area electronic differential indicator | 628  | <b>DVX</b> Visual differential indicator | 629  |
| <b>DEX</b> Electrical differential indicator                | 629  | <b>DVY</b> Visual differential indicator | 630  |
| <b>DLX</b> Electrical / visual differential indicator       | 629  |  |      |
| Additional features   | page |  |      |
| <b>X2</b> Plug  | 630  |  |      |

| FZP039        |          |
|---------------|----------|
| Filter length | H [mm]   |
| 2             | 179      |
| 3             | 222      |
| 4             | 266      |
| Connections   | R        |
| A             | M6       |
| B - C         | 1/4" UNC |



## Designation & Ordering code

### COMPLETE FILTER

|   |                               |   |   |   |   |   |     |   |     |
|---|-------------------------------|---|---|---|---|---|-----|---|-----|
| <b>Series and size</b><br><b>FZP136</b>   | Configuration example: FZP136 | 1 | B | A | B | 6 | A03 | R | P01 |
| <b>Length</b><br>1   2   3  |                               |   |   |   |   |   |     |   |     |
| <b>Valves</b><br>S Without bypass<br>B With bypass 6 bar  |                               |   |   |   |   |   |     |   |     |
| <b>Seals</b><br>A NBR<br>V FPM<br>F MFQ   |                               |   |   |   |   |   |     |   |     |
| <b>Connections</b><br>A G 3/4"<br>B 3/4" NPT<br>C SAE 12 - 1 1/16" - 12 UN<br>D G 1"<br>E 1" NPT<br>F SAE 16 - 1 5/16" - 12 UN<br>G G 1 1/4"<br>H 1 1/4" NPT<br>I SAE 20 - 1 5/8" - 12 UN                       |                               |   |   |   |   |   |     |   |     |
| <b>Connections for differential indicators</b><br>1 Without<br>6 With two connections on both sides   |                               |   |   |   |   |   |     |   |     |
| <b>Filtration rating (filter media)</b><br>A03 Inorganic microfiber 3 µm<br>A06 Inorganic microfiber 6 µm<br>A10 Inorganic microfiber 10 µm<br>A16 Inorganic microfiber 16 µm<br>A25 Inorganic microfiber 25 µm |                               |   |   |   |   |   |     |   |     |

| Element Δp                                | Valves |   | Execution              |
|---|--------|---|------------------------|
|   | S      | B |                        |
| R 20 bar                                  |        | • | P01 MP Filtri standard |
| S 210 bar                                 | •      |   | Pxx Customized         |
| U 210 bar, stainless steel filter element | •      | • |                        |

### FILTER ELEMENT

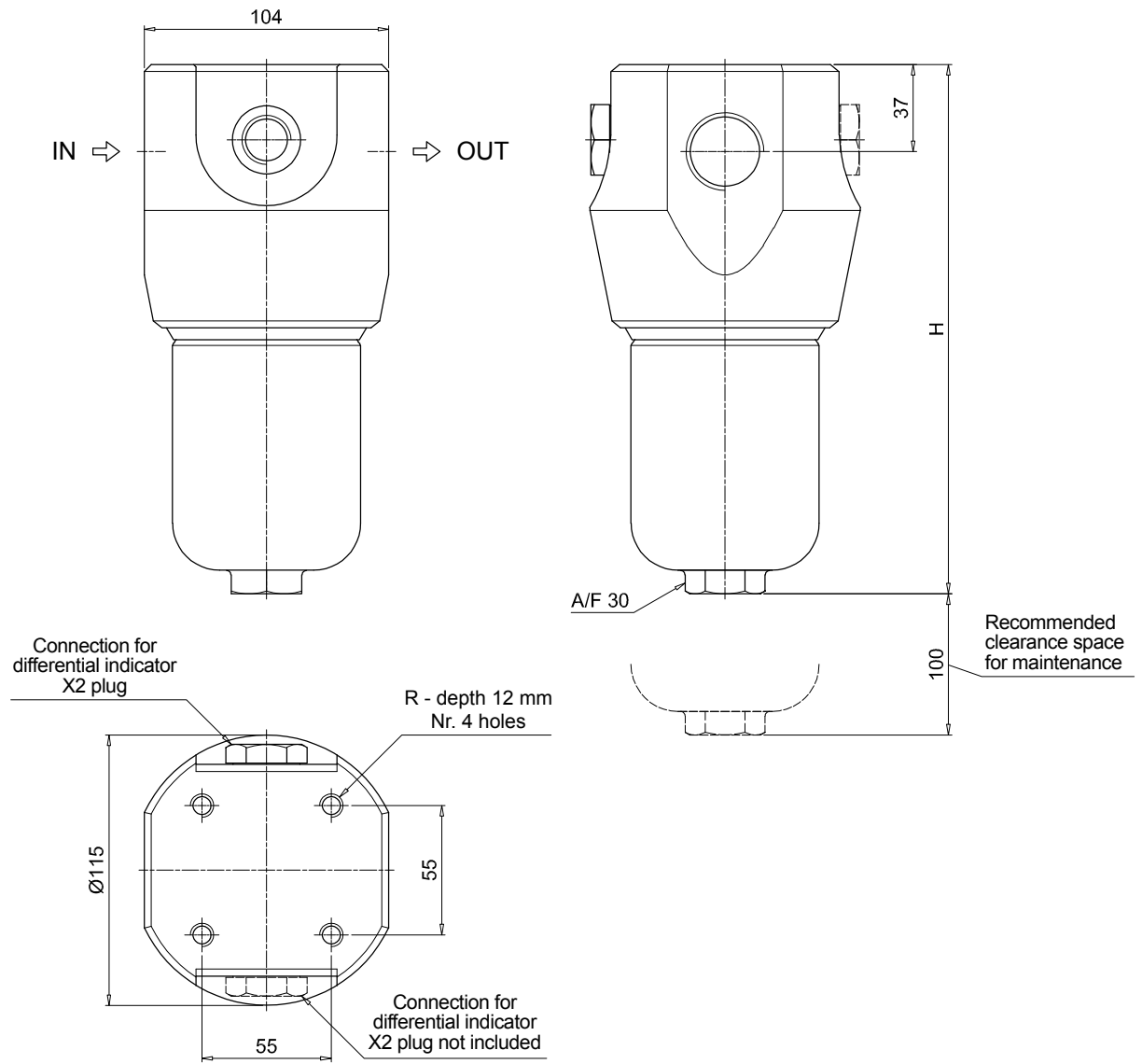
|   |                              |   |     |   |   |     |
|---|------------------------------|---|-----|---|---|-----|
| <b>Element series and size</b><br><b>HP135</b>  | Configuration example: HP135 | 1 | A03 | A | R | P01 |
| <b>Element length</b><br>1   2   3  |                              |   |     |   |   |     |
| <b>Filtration rating (filter media)</b><br>A03 Inorganic microfiber 3 µm<br>A06 Inorganic microfiber 6 µm<br>A10 Inorganic microfiber 10 µm<br>A16 Inorganic microfiber 16 µm<br>A25 Inorganic microfiber 25 µm |                              |   |     |   |   |     |

| Seals | Element Δp                                | Valves |   | Execution              |
|-------|---|--------|---|------------------------|
|       |   | S      | B |                        |
| A NBR | R 20 bar                                  |        | • | P01 MP Filtri standard |
| V FPM | S 210 bar                                 | •      |   | Pxx Customized         |
| F MFQ | U 210 bar, stainless steel filter element | •      | • |                        |

### ACCESSORIES

| Differential indicators                        | page |                                   | page |
|--|------|-----------------------------------|------|
| DEX Electrical differential indicator          | 626  | DVX Visual differential indicator | 626  |
| DLX Electrical / visual differential indicator | 626  | DVY Visual differential indicator | 627  |
| Additional features                            | page |                                   |      |
| X2 Plug  | 627  |                                   |      |

| FZP136        |          |
|---------------|----------|
| Filter length | H [mm]   |
| <b>1</b>      | 222      |
| <b>2</b>      | 335      |
| <b>3</b>      | 410      |
| Connections   | R        |
| <b>A</b>      | M10      |
| <b>B - C</b>  | 3/8" UNC |
| <b>D</b>      | M10      |
| <b>E - F</b>  | 3/8" UNC |
| <b>G</b>      | M10      |
| <b>H - I</b>  | 3/8" UNC |



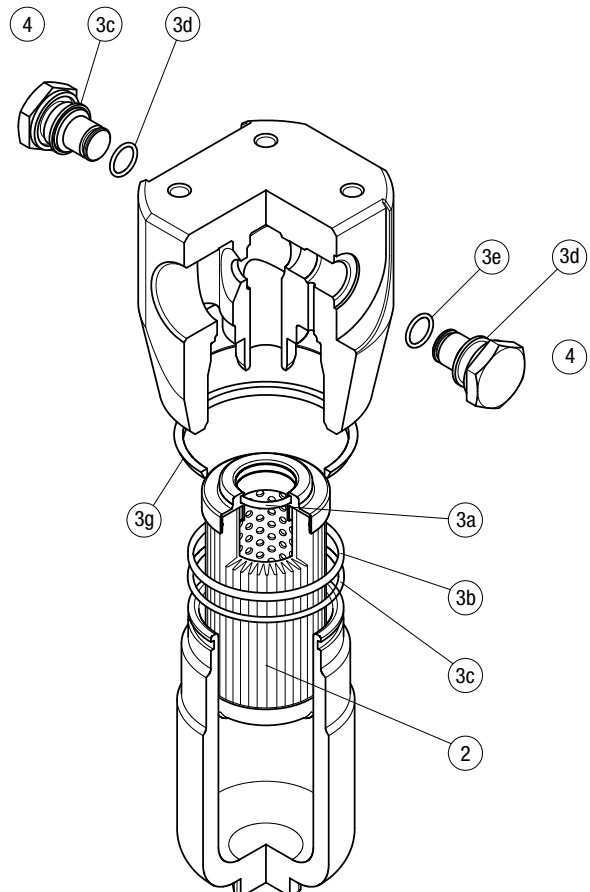
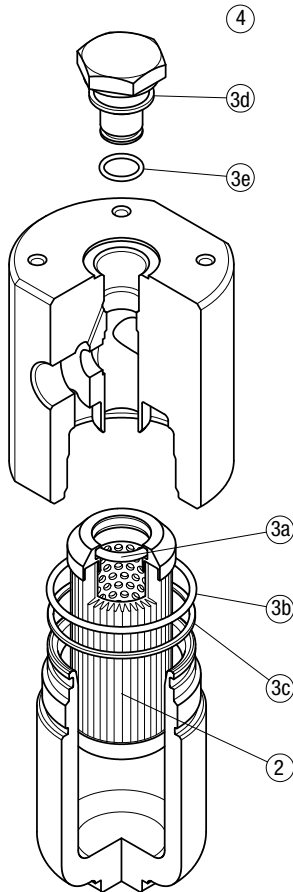
The position of the X2 plug is reversible

# FZP SPARE PARTS

Order number for spare parts

**FZP 039**

**FZP 136**



Q.ty:  
 nr. 0 pcs. for version 1  
 (without indicator port)  
 nr. 1 pc. for version 2  
 (with indicator port)

| Item:          | Q.ty: 1 pc.     | Q.ty: 1 pc.          |          | Q.ty: 1 pc.               |     |
|----------------|-----------------|----------------------|----------|---------------------------|-----|
| Filter series  | Filter element  | Seal Kit code number |          | Indicator connection plug |     |
| FZP 039        | See order table | NBR                  | FPM      | NBR                       | FPM |
|                |                 | 02050299             | 02050300 | X2H                       | X2V |
| <b>FZP 136</b> |                 | 02050636             | 02050637 |                           |     |