

# Suction Filter

## Pi 160

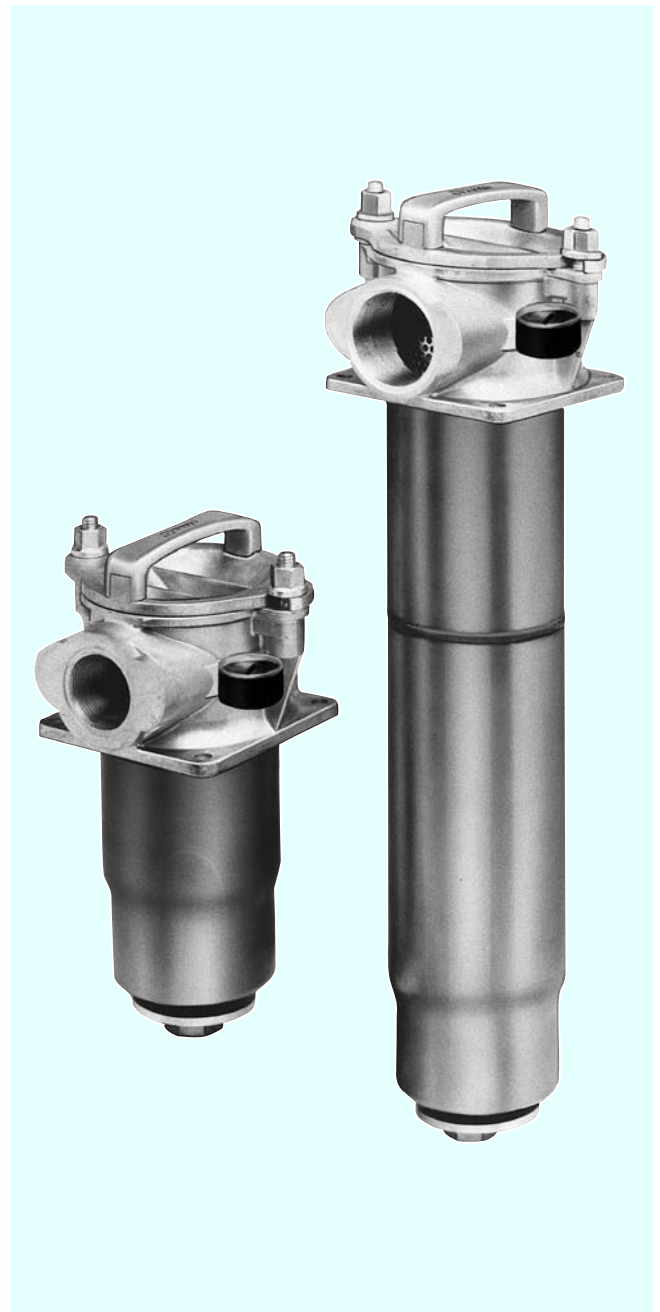
### 1. Description

Effective suction filters must meet two essential criteria: in addition to a good retention capacity they must warrant a very low pressure loss ensuring that the pump will not be destroyed by cavitation.

The Pi 160 suction filter also features other important details, for instance, shut-off valve which ensures that the tank will not drain empty if the filter is installed below the fluid level. On vertical installations the check valve prevents dissolved sludge from flowing back into the tank during element change.

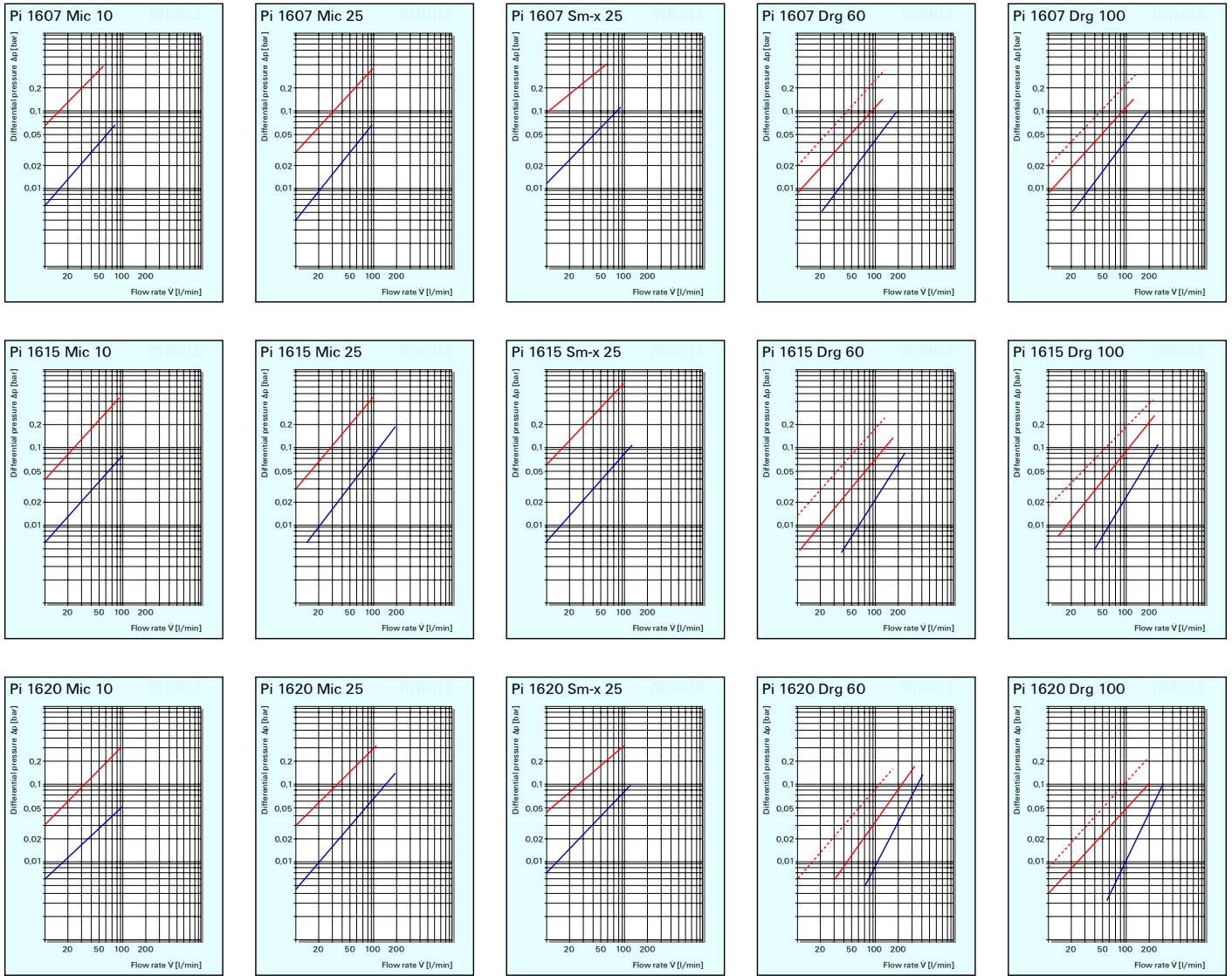
The system-adapted selection of the element permits protection of the system and pump within the fine range 10–25 microns with the Mic- qualities or in the coarse range with cleanable wire mesh elements. Sm-x material is available for filtration of high water based fluids.

- Low pressure loss
- Large filtering surface
- Vacuum gauge as standard equipment
- Hook lock facilitating maintenance
- Sludge and discharge lock
- System-adapted element selection
- Worldwide distribution



## 2. Flow rate/pressure drop curve compl. filter

— 33 mm<sup>2</sup>/s (4,5° E)  
— 190 mm<sup>2</sup>/s (25° E)  
- - - 500 mm<sup>2</sup>/s (66° E)



### Example for ordering filters:

1. Housing design  
 $\dot{V} = 100$  l/min, vacuum meter  
 Order-no. **777.481.3** · Type-no. **Pi 1615-366**

+ 2. Filter element  
 Sm-x 25  
 Order-no. **773.019.5** · Type-no. **852 754 Sm-x 25**

## 3. Order numbers

### 3.1 Housing design

### 3.2 Filter elements

( ) = filter surface area  
 [ ] = type number

| Order number | Type number   | Nominal size (NG)* |                     |                      |                          |                          |                          |                          |
|--------------|---------------|--------------------|---------------------|----------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|              |               |                    | ① with vacuum meter | ② with vacuum switch | Mic 10                   | Mic 25                   | Sm-x 25                  |                          |
| 777.485.4    | Pi 1607 - 166 | <b>80</b>          |                     |                      | (5650 cm <sup>2</sup> )  | (5650 cm <sup>2</sup> )  | (3750 cm <sup>2</sup> )  |                          |
| 777.484.7    | Pi 1607 - 165 |                    |                     | 230 V                | 772.933.8                | 772.942.9                | 772.957.7                |                          |
| 777.471.4    | Pi 1607 - 170 |                    |                     |                      | 42 V                     | [852 753 Mic 10]         | [852 753 Mic 25]         | [852 753 Sm-x 25]        |
| 777.483.9    | Pi 1615 - 166 | <b>100</b>         |                     |                      | (15700 cm <sup>2</sup> ) | (15700 cm <sup>2</sup> ) | (10300 cm <sup>2</sup> ) |                          |
| 777.482.1    | Pi 1615 - 165 |                    |                     | 230 V                | 772.938.7                | 772.944.5                | 773.019.5                |                          |
| 777.470.6    | Pi 1615 - 170 |                    |                     |                      | 42 V                     | [852 754 Mic 10]         | [852 754 Mic 25]         | [852 754 Sm-x 25]        |
| 777.481.3    | Pi 1615 - 366 |                    |                     |                      |                          | (15700 cm <sup>2</sup> ) | (15700 cm <sup>2</sup> ) | (10300 cm <sup>2</sup> ) |
| 777.480.5    | Pi 1615 - 365 |                    |                     |                      | 230 V                    | 772.938.7                | 772.944.5                | 773.019.5                |
| 777.473.0    | Pi 1615 - 370 |                    |                     |                      | 42 V                     | [852 754 Mic 10]         | [852 754 Mic 25]         | [852 754 Sm-x 25]        |
| 777.479.7    | Pi 1615 - 466 | <b>160</b>         |                     |                      | (16500 cm <sup>2</sup> ) | (16500 cm <sup>2</sup> ) | (11000 cm <sup>2</sup> ) |                          |
| 777.478.9    | Pi 1615 - 465 |                    |                     | 230 V                | 772.938.7                | 772.944.5                | 773.019.5                |                          |
| 777.472.2    | Pi 1615 - 470 |                    |                     |                      | 42 V                     | [852 754 Mic 10]         | [852 754 Mic 25]         | [852 754 Sm-x 25]        |
| 787.448.0    | Pi 1620 - 366 |                    |                     |                      |                          | (16500 cm <sup>2</sup> ) | (16500 cm <sup>2</sup> ) | (11000 cm <sup>2</sup> ) |
| 787.449.8    | Pi 1620 - 365 |                    |                     |                      | 230 V                    | 787.451.4                | 787.452.2                | 787.453.0                |
| 787.450.6    | Pi 1620 - 370 |                    |                     | 42 V                 | [852 821 Mic 10]         | [852 821 Mic 25]         | [852 821 Sm-x 25]        |                          |

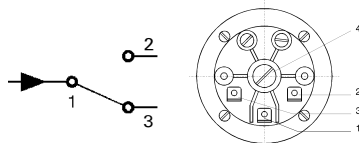
\* at operational viscosity (33 mm<sup>2</sup>/s); Sm-x 25 ( $\beta_{25} \geq 75$ ) and  $\Delta p \leq 0,1$  bar

## 4. Specifications

|                                   |  |
|-----------------------------------|--|
| Design:                           | suction filter with shut off valve   |
| Installation:                     | horizontally under oil level<br>vertically above oil level<br>when used with optional extension pipe |
| Temperature range:                | -10 °C to +120 °C<br>(other temperatures on request)   |
| Filter head material:             | GDAL   |
| Filter bowl material:             | St   |
| Material of seals:                | NBR / AL   |
| Indicating range vacuum meter:    | -1 bar to 0 bar  |
| Pressure setting vacuum switch:   | 200 mbar   |
| Electrical data of vacuum switch: |  |
| - Vacuum switch 220 V (Pis 3070)  |  |
| Maximum voltage:                  | 250 V $\sim$   |
| Maximum current on contact:       | 6 A $\sim$   |
| Contact:                          | AMP 6,3 DIN 46248  |
| Electrical connections:           | DIN 46247  |
| Type of protection:               | IP 54  |

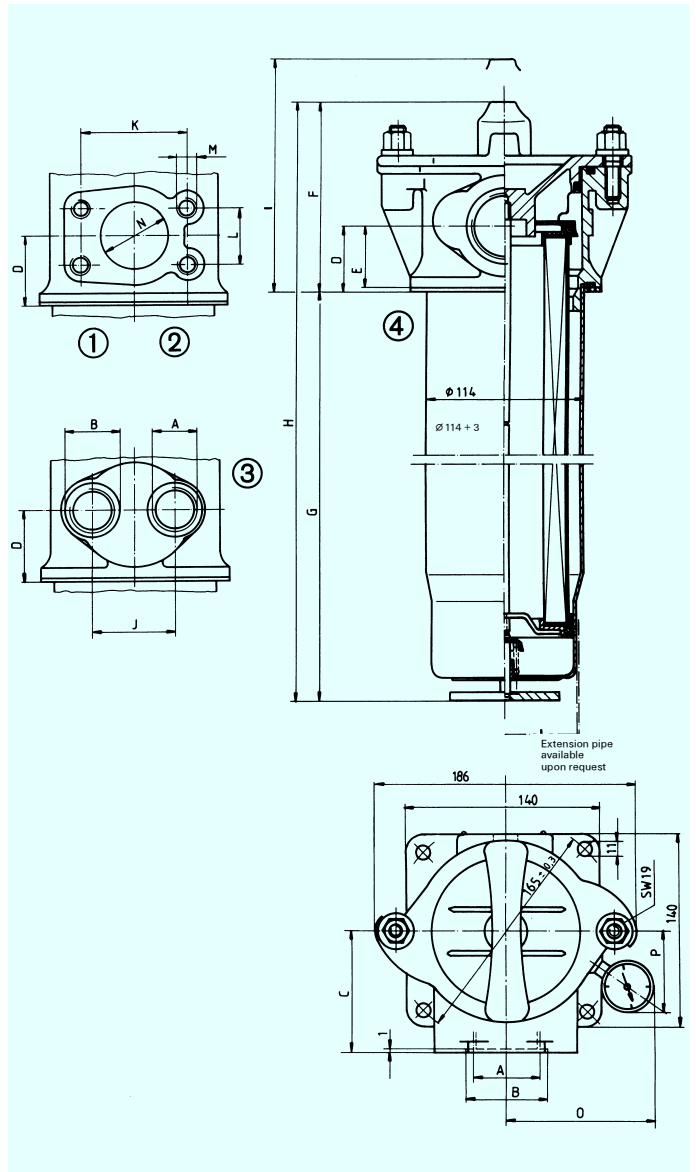
### Connecting plan

- 1 supply line
- 2 operating contact
- 3 normally closed contact
- 4 adjusting screw



### - Vacuum switch 42 V (HES 2200 BP)

|                         |  |
|-------------------------|--|
| Contact:                | Normally open  |
| Breaking capacity:      | 42 V / 6 W   |
| Type of protection:     | IP 54 - with protecting cap  |
| Electrical connections: | AMP 6,3 DIN 46248<br>for receptacle for tabs according to<br>Connection method, 2 pole |



## 5. Dimensions

| ▼ Dim. / Type ▶ | 1607-1.. | 1615-1.. | 1615-3.. | 1615-4.. | 1620-3.. |
|-----------------|----------|----------|----------|----------|----------|
| Fig.            | ④        | ④        | ②        | ③        | ①        |
| A               | G 1½     | G 2      | SAE 2"   | 2 x G 1  | SAE 3"   |
| B               | 56       | 68       |          | 41       |          |
| C               | 87       | 87       | 87       | 87       | 95       |
| D               | 49       | 49       | 53       | 53       | 73       |
| E               | 46       | 46       | 50       | 50       | 70       |
| F               | 144      | 144      | 144      | 144      | 182      |
| G               | 178      | 471      | 471      | 471      | 433      |
| H               | 322      | 615      | 615      | 615      | 615      |
| I               | 375      | 680      | 680      | 680      | 710      |
| J               |          |          |          | 60       |          |
| K               |          |          | 77,8     |          | 106,4    |
| L               |          |          | 42,9     |          | 61,9     |
| M               |          |          | M 12     |          | M 16     |
| N               |          |          | 50       |          | 76       |
| Weight          | 2,7 kg   | 3,5 kg   | 3,5 kg   | 3,5 kg   | 5,0 kg   |

| ▼ Dim. / Type ▶ | 66  | 65  | 70  |
|-----------------|-----|-----|-----|
| O               | 110 | 135 | 130 |
| P               | 64  | 71  | 55  |

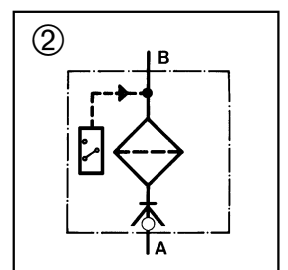
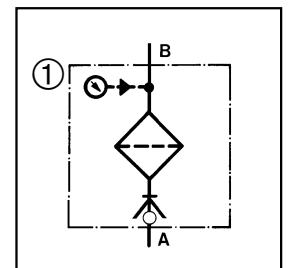
## 6. Order numbers

| 6.1 Housing design* |             |                   | 6.2 Filter elements** |                      |                         |                         |                         |
|---------------------|-------------|-------------------|-----------------------|----------------------|-------------------------|-------------------------|-------------------------|
| Order number        | Type number | Nominal size (NG) | ① with vacuum meter   | ② with vacuum switch | Wire mesh               |                         |                         |
|                     |             |                   |                       |                      | Drg 60                  | Drg 100                 |                         |
| 777.485.4           | Pi 1607-166 | <b>100</b>        |                       |                      | (2300 cm <sup>2</sup> ) | (2300 cm <sup>2</sup> ) |                         |
| 777.484.7           | Pi 1607-165 |                   |                       | 230 V                | 786.234.5               | 772.948.6               |                         |
| 777.471.4           | Pi 1607-170 |                   |                       |                      | 42 V                    | [852 753 Drg 60]        | [852 753 Drg 100]       |
| 777.483.9           | Pi 1615-166 | <b>160</b>        |                       |                      | (6250 cm <sup>2</sup> ) | (6250 cm <sup>2</sup> ) |                         |
| 777.482.1           | Pi 1615-165 |                   |                       | 230 V                | 786.235.2               | 772.952.8               |                         |
| 777.470.6           | Pi 1615-170 |                   |                       |                      | 42 V                    | [852 754 Drg 60]        | [852 754 Drg 100]       |
| 777.481.3           | Pi 1615-366 |                   |                       |                      |                         | (6250 cm <sup>2</sup> ) | (6250 cm <sup>2</sup> ) |
| 777.480.5           | Pi 1615-365 |                   |                       | 230 V                |                         | 786.235.2               | 772.952.8               |
| 777.473.0           | Pi 1615-370 |                   |                       |                      | 42 V                    | [852 754 Drg 60]        | [852 754 Drg 100]       |
| 777.479.7           | Pi 1615-466 | <b>315</b>        |                       |                      | (6250 cm <sup>2</sup> ) | (6250 cm <sup>2</sup> ) |                         |
| 777.478.9           | Pi 1615-465 |                   |                       | 230 V                | 786.235.2               | 772.952.8               |                         |
| 777.472.2           | Pi 1615-470 |                   |                       |                      | 42 V                    | [852 754 Drg 60]        | [852 754 Drg 100]       |
| 787.448.0           | Pi 1620-366 |                   |                       |                      |                         | (6600 cm <sup>2</sup> ) | (6600 cm <sup>2</sup> ) |
| 787.449.8           | Pi 1620-365 |                   |                       | 230 V                |                         | 787.454.8               | 787.455.5               |
| 787.450.6           | Pi 1620-370 |                   |                       | 42 V                 | [852 821 Drg 60]        | [852 821 Drg 100]       |                         |

\* at operational viscosity (33 mm<sup>2</sup>/s) and Drg 100

\*\* ( ) = filter surface area [] = type number

## 7. Symbols



## 9. Installation, operating and maintenance instructions

### 9.1 Filter installation

When installing the filter make sure that sufficient space is available to remove the filter element.  
The contamination indicator must be visible.

### 9.2 When must the filter element be replaced or cleaned?

During cold starts, the indicator may give a warning signal. If vacuummeter shows  $> 0,2$  bar or the electrical signal has not switched off after reaching operating temperature, the filter element must be replaced or cleaned after the end of the shift. Please always ensure that you have original MAHLE-replacement elements in stock; disposable elements (Mic or Sm-x) cannot be cleaned.

### 9.3 Element replacement

1. Stop system and relieve filter from pressure.
2. Unscrew nuts, turn cover counterclockwise and pull. Unscrew element from support.
3. Check O-ring on the filter for damage. Replace, if necessary.
4. Make sure that the part number on the spare element corresponds with the part number on the name plate of the filter.
5. Complete installation.

### 9.4 Cleaning Methods for cleanable elements

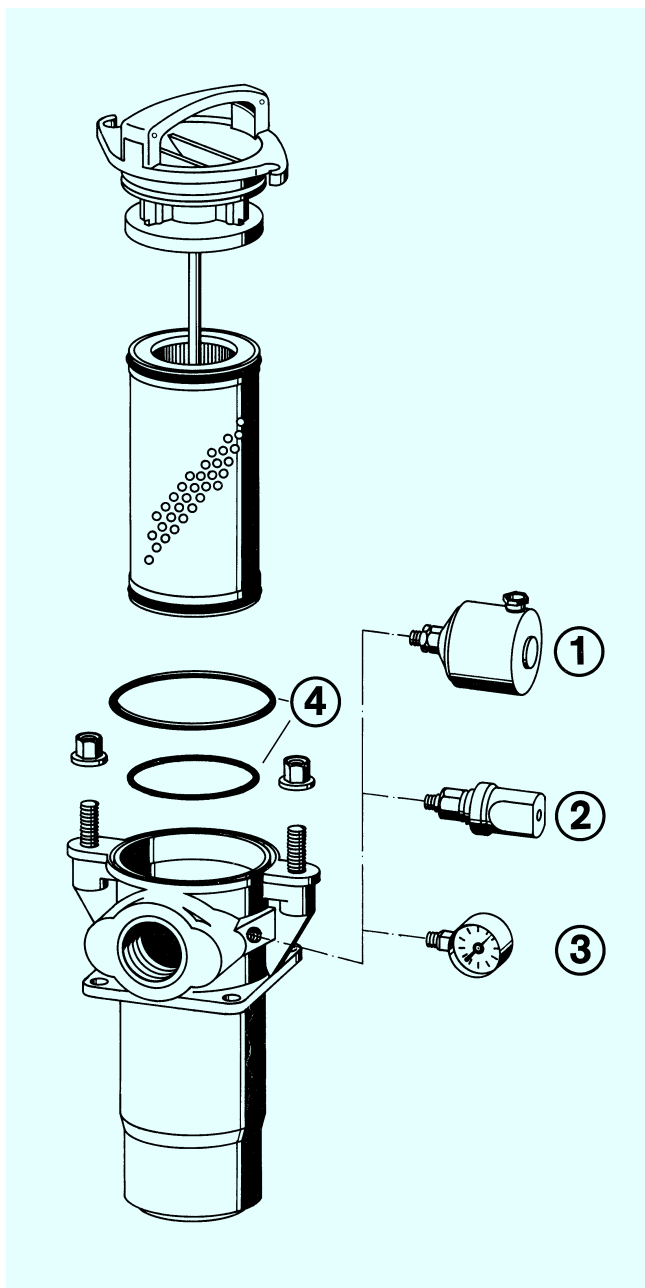
#### a) Ultrasonic cleaning

Insert the contaminated suction filter element into an ultrasonic bath for approx. 3 minutes; then rinse in clean liquid. Afterwards, blow air into the filter from the clean side inward.

#### b) Manual cleaning

1. Remove coarse external contamination in a separate cleaning tank using a brush and cleaning agent.
2. Place filter in unused cleaning liquid (approx. 20 min)
3. Wash filter with cleaning liquid from the outside to the inside.

Using either method, be sure that no dirt access to the clean side of filter.



## 8. Spare parts list

| Pos. | Type number / Order number   |
|------|--|
| ①    | Vacuum switch 230 V<br>[Pis 3070 / 200 mbar]<br>766.972.4  |
| ②    | Vacuum switch 42 V [HES 2200 BP]<br>830.889.2  |
| ③    | Vacuum meter [UM 1]<br>754.802.7   |
| ④    | Seal kit for filter housing + filter element<br>NBR 787.456.3<br>FPM 790.484.0<br>EPDM 790.485.7 |

Subject to technical alteration.



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