

Translation of the original instructions with installation instructions  
High-pressure filter Pi 480

Mat. No. of original instructions  
70308062



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## 2 General safety instructions

### 2.1 Safety instructions for installation and operating personnel

This translation of the original instructions contains important safety information which must be heeded at all times during installation, normal operation and maintenance.

Non-observance can result in the following risks to persons and the environment as well as in damage to the machine or system:

- ⇒ Failure of critical functions of the machine or system or of its component parts.
- ⇒ Danger to persons from electrical or mechanical effects as well as from chemical reactions.
- ⇒ Danger to the environment owing to the leakage of hazardous substances.

#### Before installation / start-up:

- Read this translation of the original instructions carefully.
- Make sure that installation and operating personnel are adequately trained.
- Make sure the contents of the original instructions are fully understood by the responsible persons.
- Define areas of responsibility and competence.
- Prepare a maintenance schedule.

#### During operation of the system:

- Keep this translation of the original instructions handy at the place of use.
- Heed the safety instructions. Always operate the machine or system in accordance with its ratings.

#### If in doubt:

- Consult the manufacturer.

### 2.2 Warning structure





Where possible, warnings are structured according to the following system:

Signal word	
Possibly with symbol	<b>Nature and source of the danger</b> ⇒ Potential consequences of non-observance • Action to avert the danger.

### 2.3 Warning symbols used

<b>⚠ DANGER!</b>
<b>Immediate danger!</b> ⇒ Non-observance will result in serious or fatal injury.
<b>⚠ WARNING!</b>
<b>Potentially dangerous situation!</b> ⇒ Non-observance can result in serious or fatal injury.
<b>⚠ CAUTION!</b>
<b>Potentially dangerous situation!</b> ⇒ Non-observance can result in minor or moderate injuries.
<b>CAUTION! (without a symbol)</b>
<b>Potentially dangerous situation!</b> ⇒ Non-observance can result in property damage.

## 2.4 Other symbols used

	Danger: High voltage!
	Danger information about explosion protection
	Information about environmental protection
	Wear protective clothing!
	Eye protection must be worn!
	Respirator must be worn!
	Hand symbol: Indicates general information and recommendations
	Bullet: Indicates the order in which actions are to be carried out
	Arrow: Indicates responses to actions

## 3 Glossary

### Initial differential pressure

Differential pressure at the start of the filtration process (when the filter element is "clean").

### Differential pressure (dP)

Pressure difference between the dirty side and the clean side.

### Wire cloth element

Filter element made of wire cloth.

### Filter element

Cylindrical support structure with star-pleated filter material. The substance to be filtered flows from the outside to the inside. Solids are retained on the outer surface of the filter element.

## 4 General information

### 4.1 Manufacturer

Filtration Group GmbH  
Schleifbachweg 45  
D-74613 Öhringen  
Phone +49 7941 6466-0  
Fax +49 7941 6466-429  
fm.de.sales@filtrationgroup.com  
www.industrial.filtrationgroup.com

### 4.2 Information about the original instructions

FG Mat. No. ....70308062  
Date: .....24.01.19  
Version: .....02

### 4.3 Negative declaration

Our fluid filtration and automatic filter products are designed for Group 2 fluids (not dangerous) as standard as defined by the Article 13 of the EC Pressure Equipment Directive. Since our filter housings have a pressure-volume product not exceeding 10,000 bar x litres, Article 4(3) applies, in other words a name-plate without a CE marking is affixed to these products. No declaration of conformity may be issued for this reason.

According to the criteria laid down in Article 2 of the Machinery Directive 2014/34/EU, our standard hydraulic filters are outside the scope of this directive. Under legal provisions, therefore, we are not allowed to affix a CE marking, nor are we permitted to issue a declaration of incorporation or conformity.

## 5 Intended use

### DANGER!

#### Operation contrary to the intended purpose can be dangerous!

- ⇒ The manufacturer is discharged from all liability and all warranty claims are rendered invalid.
- The filter is only allowed to be used in accordance with the operating conditions specified in the contract documentation and in the original instructions. All forms of use which deviate from or exceed the limits of use described above are considered to be contrary to the intended purpose.

### DANGER!

#### Operation contrary to the intended purpose can be dangerous!

- ⇒ The manufacturer is discharged from all liability and all warranty claims are rendered invalid.



#### Prohibited:

- Use for other purposes without prior consultation with the manufacturer.
- Use in hazardous areas unless explicitly mentioned in the contract documentation.
- Use with smouldering, burning or sticky particles.
- Use with highly explosive fluids or pastes.

The standard version is designed for Group 2 fluids as defined by the EC Pressure Equipment Directive 2014/68/EU Article 4(3) and Article 13.

Refer to "ATEX Recommendation Fluid Technology" before using in hazardous areas.

## 6 Functional description

### 6.1 Principle of the process

#### Filtration

A star-pleated filter element is mounted on a cylindrical support structure; the filter rating is determined by the element type. The fluid flows through the filter element from the outside to the inside. Solid particles are retained. The star pleat results in a larger effective filter surface.

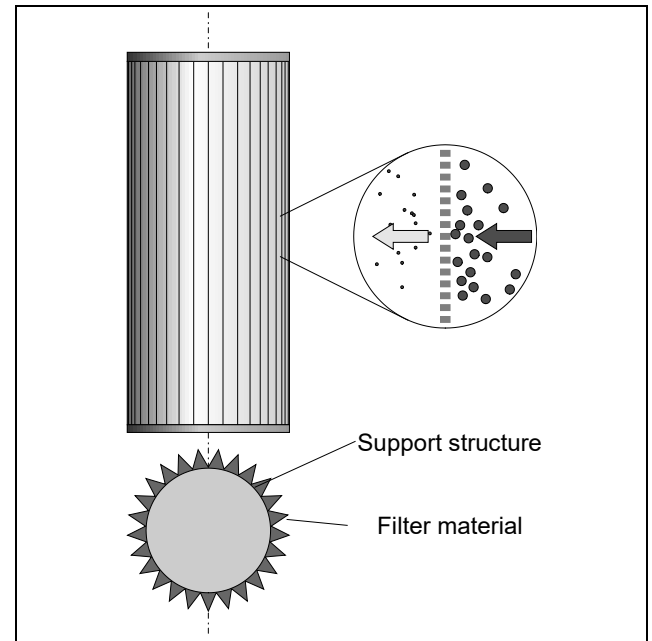


Fig. 1: Separation principle at the filter element

## 6.2 Main components of the filter

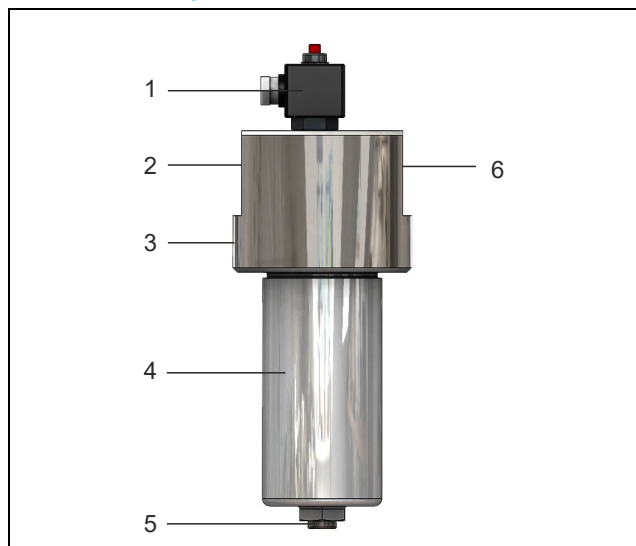


Fig. 2: Diagram of the main components

1	Maintenance indicator (optional)
2	Inlet
3	Filter head
4	Filter housing
5	Drain plug (optional)
6	Outlet

## 6.3 Operating principle of the filter

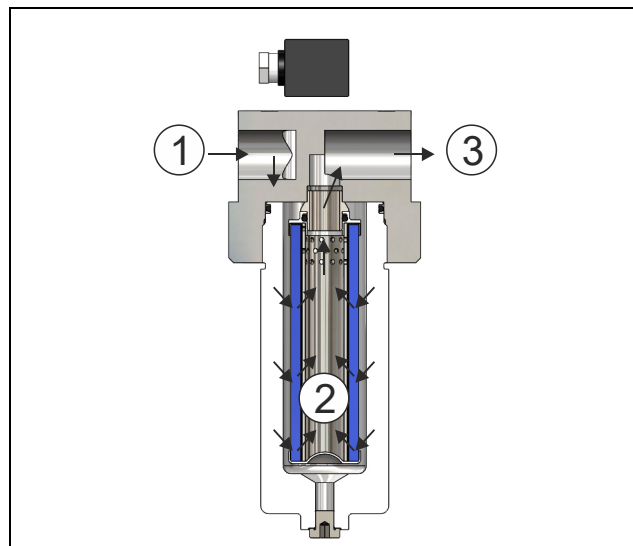


Fig. 3: Operating principle

- 1**  
Dirty fluid flows in through the inlet.
- 2**  
The fluid flows through the filter element to the clean side.
- 3**  
The filtered fluid exits the filter via the outlet.
- 4**  
Replace the filter element after the trial run or after flushing the system. Then comply with the intervals specified by the system manufacturer; the element should be replaced every six months at the latest.  
Wire cloth elements can be cleaned (refer to section 13.5). Disposable elements (MIC, SMX, PS) must be exchanged and disposed of correctly.

**Optional:**  
If a maintenance indicator is used, a signal is output when the maximum differential pressure is reached.

## 7 Technical data

### 7.1 Order-specific data

FGC.com		Filtration Group GmbH	
Made in Germany		Schieflachweg 45 D-74613 Öhringen	
		info.service@filtrationgroup.com	
TYPE			
ELEMENT			
PART NO.		JOB NO.	
TEMP. TS °C		MAWP PS bar	

The order-specific data can be taken from the name-plate.

### 7.2 Technical data

Nominal pressure:

Pi 48004-48010: ..... 2x10<sup>6</sup> load changes 450 bar

Pi 48016-48025: ..... 250 bar

Test pressure:

Pi 48004-48010: ..... 700 bar

Pi 48016-48025: ..... 325 bar

Temperature range: ..... -10°C to +120°C

Bypass setting (Pi48004-48010)\*: .....  $\Delta p$  7 bar  $\pm$  10%

Maintenance indicator setting\*: .....  $\Delta p$  5 bar  $\pm$  10%

Filter head / housing material: ..... 1.4401/1.4404

..... (TP316/TP316L)

Sealing material: ..... NBR / PTFE

\*Other pressures possible if conditions deviate from standard.

### 7.3 Technical data of the standard maintenance indicator (PiS 3192)

Switch: ..... NC / NO with reed contact

Protection class: ..... IP65

NO / NC contact load: ..... Max. 70 W,

..... max. 250 VAC/200 VDC, max. 1 A

As-delivered condition: ..... Normally closed

## 8 Transport and storage

### Transport

- Always transport horizontally in the original packaging.
- Avoid vibration.

### Storage

- Always store horizontally in the original packaging.
- Always store in a dry, frost-free room.



Seaworthy packaging is specified in the contract documentation as an option.

## 9 Installation

### **⚠ DANGER!**



**Danger if unauthorised work is carried out on the unit!**

⇒ Risk of injury to persons or damage to property.

- The unit is only allowed to be installed, accepted and tested by a qualified person (99/98/EC).

### **⚠ WARNING!**

**Danger if unauthorised work is carried out on the unit!**

⇒ Risk of injury to persons or damage to property.

- All installation work must be carried out by a suitably trained person.

### 9.1 Installation



It must be possible to remove the filter element in order to carry out maintenance work.



Use only suitable, chemically resistant seals for the piping.

- Prepare a suitable location for installing the unit.
- Make sure sufficient free space is available for removal (refer to section 9.1).
- Unpack the filter.
- Install the filter with the housing pointing downwards. Allow sufficient free space for removal. Fastening threads provided on the top (for dimensions, refer to section 9.1).
- Remove the protection caps from the connections.
- Connect the pipes to the filter without stress (refer to the arrow on the filter head).
- There must be no forces or moments due to external influences.

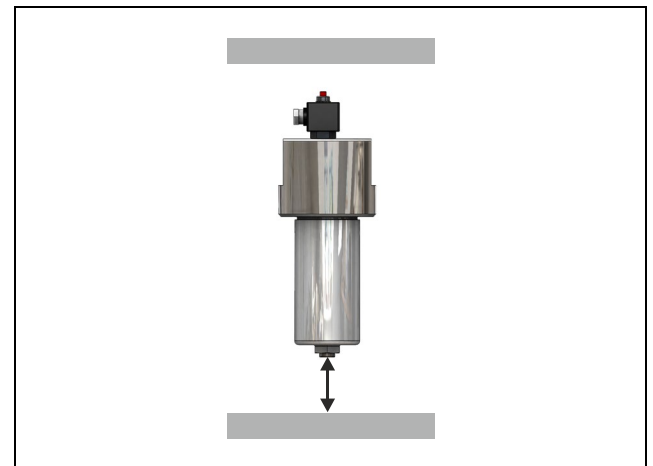


Fig. 4: Mechanical installation

### 9.2 Pressure relief

Design measures must be incorporated to prevent inadmissible excess pressure on the dirty side.

- Install a pressure relief device if necessary.

## 10 Start-up

### **DANGER!**

The filter must not be put into service until the relevant machinery into which it is to be incorporated has been declared in conformity with the applicable EC directives, harmonised standards, European standards or equivalent national standards.

- Make sure the protection caps have been removed from the connections.
  - Check that all pipe connections are tight.
  - Tighten all screws.
- ⇒ The filter is now ready for operation.

## 11 Normal operation



Please always ensure that you have a sufficient quantity of original FG replacement elements in stock.  
Disposable elements (MIC, SMX, PS) cannot be cleaned.

### **The following parameters must be monitored daily during normal operation**

- Differential pressure (if the optional maintenance indicator is installed)

#### 11.1 Filters without a maintenance indicator

- Replace the filter element after the trial run or after flushing the unit.
- Observe the instructions provided by the system manufacturer.

#### 11.2 Filters with a maintenance indicator (optional)

During cold starts, the maintenance indicator may give a warning signal (refer to the accessories documentation for the maintenance indicator).

- Do not depress the red button of the maintenance indicator until operating temperature has been reached.
- ⇒ If it immediately pops out again and / or the electrical signal is not switched off after reaching operating temperature, the filter element must be replaced.

Red button



Fig. 5: Maintenance indicator

## 12 Troubleshooting

Fault	Possible cause	Remedy
Warning signal from maintenance indicator	Cold start	Reset the signal after reaching operating temperature
	Filter dirty	Replace the filter

## 13 Maintenance

### **CAUTION!**

#### **Danger if unauthorised work is carried out on the unit!**

⇒ Risk of injury.

- All maintenance work must be carried out by a **TRAINED ENGINEERING FITTER**.

### 13.1 Maintenance work

- Shut down the filter
- Take steps to prevent the system from being switched on again by unauthorised persons.
- Wear protective clothing and equipment appropriate to the hazard potential of the medium (e.g. eye protection, respirator, protective clothing, etc.).



- Carry out the maintenance work.
- Start up the filter again.
- Observe the filter.  
Does it operate normally?

### 13.2 Inspection and maintenance schedule

- Refer also to the contract documentation.  
The inspection and maintenance schedule should be fixed individually by the owner.



The necessary inspection and maintenance work is dependent on the particular application.  
Please consult the manufacturer if necessary.



Maintenance and monitoring of the filter must be carried out as required by law and local regulations.



- A visual inspection is recommended whenever the filter is replaced or every six months at the latest.
- Carry out maintenance once a year.

### 13.3 Replacing the filter element

#### DANGER!

##### Risk of injury due to splashing of fluid!

- First relieve the pressure!
- Then open the filter!

#### DANGER!

##### Risk of injury!

- Only replace the filter element after shutting down the filter.

#### CAUTION!

- Keep all impurities away from the clean side of the filter element.
- Be careful not to damage the wire cloth with sharp or pointed objects.

1

- Shut down the filter (or the system) and relieve the pressure.
- Take steps to prevent the system from being switched on again by unauthorised persons.
- Wear protective clothing and equipment appropriate to the hazard potential of the medium (e.g. eye protection, respirator, protective clothing, etc.).



2

- Place a trough or a drip pan underneath the unit.

3

- Open the drain plug on the dirty side (5) (if any).

⇒ The filter is drained.

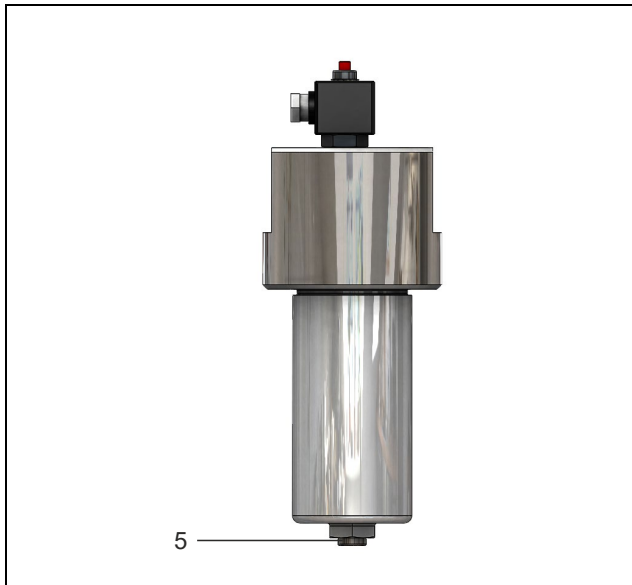


Fig. 6: Draining the filter

4

- Unscrew the filter housing (4) clockwise.
- Pull the filter housing down a hand's breadth.
- Unscrew the filter element (7) from the seat.
- Remove the filter element together with the filter housing.

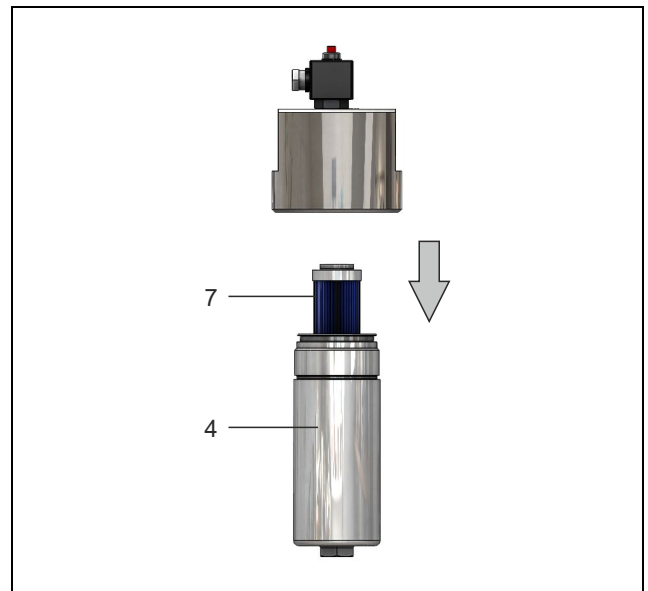


Fig. 7: Removing the filter element

5

- Check all sealing points and seals.
- Replace the seals if necessary.
- Replace dirty disposable filter elements with new FG elements (the order number on the name-plate must match the order number on the element).
- Clean the dirty wire cloth filter element (refer to section 13.5).

6

- Carefully position the open side of the filter element in the seat.
- Grease the seals and threads using a suitable fluid.
- Place the filter housing in position, then screw it on anti-clockwise as far as possible (torque for NG 40 to 100: 60 Nm, torque for NG 160 to 250: 100 Nm).

7

- Screw in the drain plugs (if any, torque: 30 Nm).

8

- Check that the filter is tight.

Observe the filter.

Does it operate normally?

### 13.4 Cleaning the filter housing


- Wear protective clothing and equipment appropriate to the hazard potential of the medium (e.g. eye protection, respirator, protective clothing, etc.).



- Open the filter and remove the filter element (refer to section 13.3).
- Remove any coarse impurities by mechanical means.
- Wash out the filter housing using a suitable cleaning solution.



### 13.5 Cleaning the wire cloth elements

	<ul style="list-style-type: none"><li>• Only wire cloth elements can be cleaned. Disposable elements (MIC, SMX, PS) must be replaced.</li><li>• After starting up the unit, check that all sealing points are tight.</li><li>• Defective seals must be replaced.</li><li>• The system can never be cleaned one hundred percent. The service life of the filter elements is gradually shortened.</li></ul>
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#### Ultrasonic cleaning

- Immerse dirty elements upright in an ultrasonic bath for approximately 90 to 120 minutes (turn over if necessary).

- Rinse the filter element in clean cleaning solution (e.g. naphtha).
- Carefully blow out the filter element with compressed air from the clean side to the outside.

#### Manual cleaning

Required for filter ratings coarser than 40 µm.

- Remove coarse, external impurities with a brush dipped in cleaning solution (e.g. naphtha).
- Leave the filter element to stand for approximately 20 minutes in clean cleaning solution.
- Then rinse it with cleaning solution from the clean side to the outside.
- Carefully blow out the filter element with compressed air from the clean side to the outside.

## 14 Assembly drawing

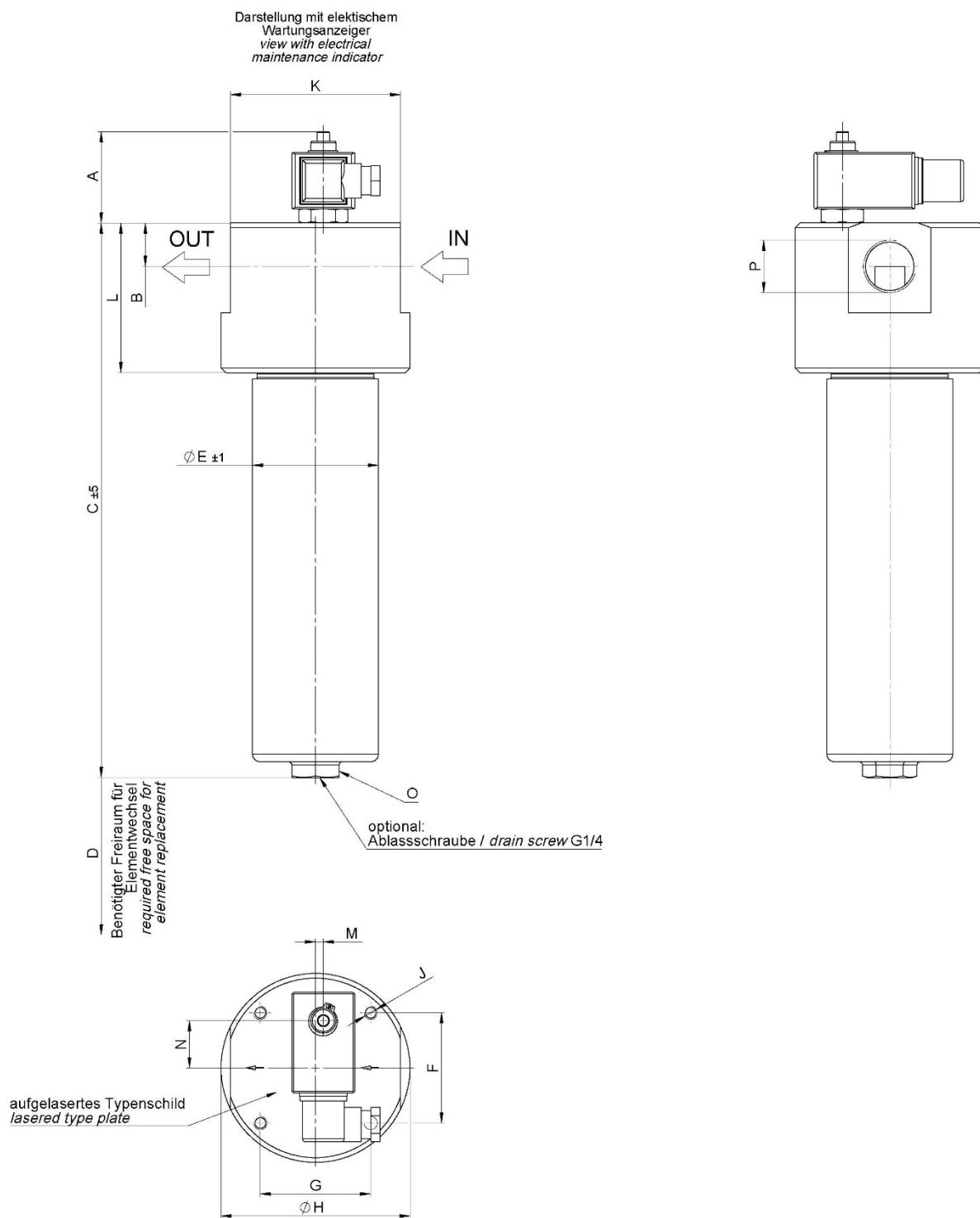


Fig. 8: Assembly drawing

## 15 Options table

Model	NG	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P*
Pi 48004	40	60	27.5	202	100	80	70	70	120	M8	108	95	5	30	a/f 30	G1
Pi 48006	63	60	27.5	262	100	80	70	70	120	M8	108	95	5	30	a/f 30	G1
Pi 48010	100	60	27.5	352	100	80	70	70	120	M8	108	95	5	30	a/f 30	G1
Pi 48016	160	60	42	310	130	120	78	78	150	M10	134	145	-	35.5	a/f 36	G1 1/2
Pi 48025	250	60	42	400	130	120	78	78	150	M10	134	145	-	35.5	a/f 36	G1 1/2

\* Standard, other connections on request

## 16 Spare parts drawing

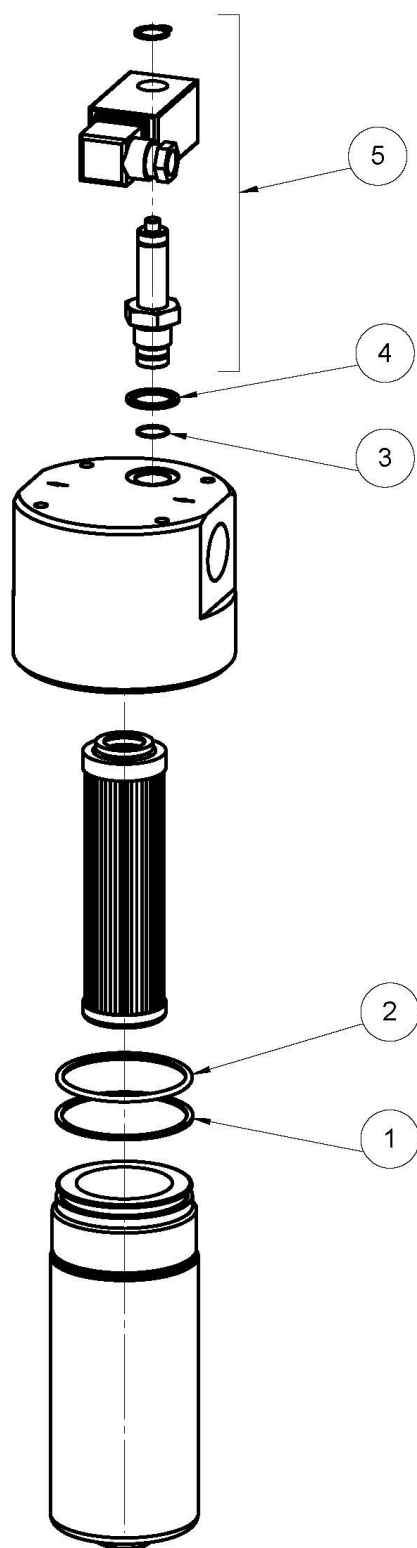



Fig. 9: Spare parts drawing

## 17 Recommended spare parts and accessories

No.	Benennung	Material no.	Designation
1-2	Dichtungssatz für Pi 48004-48010		Seal kit for Pi 48004-48010
	NBR	79767443	NBR
	FKM	70315096	FKM
	EPDM	70303334	EPDM
	Dichtungssatz für Pi 48016-48025		Seal kit for Pi 4816-48025
	NBR	70315097	NBR
	FKM	70315098	FKM
	EPDM	70368303	EPDM
3-4	Dichtungssatz für Wartungsanzeiger		Seal kit for maintenance indicator
	NBR	77760275	NBR
	FKM	77760283	FKM
	EPDM	77760291	EPDM
5	Wartungsanzeiger		Maintenance indicator
	Optisch PiS 3193/5.0	78308538	Visual PiS 3193/5.0
	Elektrisch PiS 3192	78308546	Electrical PiS 3192
	Nur elektrisches Oberteil	77536550	Only electrical cover
 Please request a separate spare parts drawing and list of spare parts for special versions.			

Negativerklärung  
Negative declaration  
Déclaration négative



Der Hersteller  
The manufacturer  
Le producteur

Filtration Group GmbH  
Schleifbachweg 45  
74613 Öhringen  
Telefon 07941 6466-0  
Telefax 07941 6466-429

erklärt hiermit, dass das folgende Produkt  
hereby declares that the following product  
déclare que le produit suivant

**Produktbezeichnung:**  
**Product designation:**  
**Désignation du produit :**  
**Typenbezeichnung:**  
**Type designation:**  
**Désignation du type :**  
**Funktionsbeschreibung:**  
**Machine description:**  
**Description du fonctionnement :**

**Hochdruckfilter**  
**High pressure filter**  
**Filtre à haute pression**  
  
**Pi 480**

**Filtration von Hydraulik- und Schmieröl**  
**Filtration of hydraulic- and lubricating oil**  
**Filtration d'huile hydraulique d'huile lubrifiante**

Diese Geräte sind zum Einbau bzw. Zusammenbau in eine Maschine oder Anlage bestimmt, deren Inbetriebnahme solange untersagt ist, bis festgestellt wurde, dass die Maschine oder Anlage, in die diese Filter eingebaut werden sollen, den Bestimmungen der Richtlinien 2014/68/EU und 2014/34/EU entspricht. Gemäß den Kriterien der Richtlinien 2014/68/EU und 2014/34/EU dürfen wir hier kein CE-Zeichen anbringen und keine Einbau- oder Konformitätserklärung ausstellen. Bei Anwendung der Richtlinie 2014/68/EU ist eine Zündquellenanalyse im Rahmen der gesamten Anlage vom Betreiber zu erstellen.

These devices is intended to be incorporated into machinery or assembled with other machinery to constitute machinery covered by this directive and must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the directive 2014/68/EU and 2014/34/EU corresponds incl. all alterations. Is according to the criteria of the directive 2014/68/EU and 2014/34/EU outside the scope of this directive. According to the legal guidelines we must not put a CE-mark on this product. When using Directive 2014/68/EU, an ignition source analysis shall be drawn up by the operator within the framework of the entire installation.

Est destinée à être incorporée dans une machine à être assemblée avec d'autres machines afin de constituer une machine et que sa mise en service est interdite avant que la machine dans laquelle elle sera incorporée n'ait été déclarée conforme aux dispositions de la directive, libellée 2014/68/UE et 2014/34/UE correspond toutes modifications inclus. Est en conformité avec les critères de la directive 2014/68/UE et 2014/34/UE en dehors du champ d'application de la présente directive. Conformément aux dispositions légales, nous n'avons donc pas le droit d'appliquer un marquage CE ni de délivrer de déclaration d'incorporation ou de déclaration de conformité. En employant la directive 2014/68/UE une analyse des sources d'inflammation pour l'unité entière doit être effectuée par l'opérateur.

Die Auslegung erfolgt gemäß 2014/68/EU Art. 4, Abs. 3

- für Fluide deren Dampfdruck bei der zulässigen Temperatur um höchstens 0,5 bar über dem normalen Atmosphärendruck (1013 mbar) liegt (Art. 4/1a/ii)  
- Fluiden der Gruppe 2 Art. 13

The design is done according to 2014/68/EU art. 4, section 3

- for fluids having a vapor pressure at the maximum allowable temperature 0,5 bar above normal atmospheric pressure (1013 mbar) is (art. 4/1a/ii)  
- fluids group 2 art. 13

La conception est réalisée selon 2014/68/UE art.4, paragraph 3

- pour des fluides dont la pression de Vapeur, à la température maximale autorisée, 0,5 bar au dessus de la pression atmosphérique normale (1013 mbar) est (art. 4/1a/ii)  
- les fluides du groupe 2 art. 13

Wir bestätigen, dass die von uns gelieferten Produkte den Anforderungen der Europäischen Gemeinschaft entsprechen. Sie erhalten ein einwandfreies Produkt nach Filtration Group-Standards.

We confirm that our products comply with the requirements of the European Community. You get a correct product according to Filtration Group standards.

Nous confirmons que les produits fournis par nous répondent aux exigences de la Communauté européenne. Vous recevez un produit conforme aux normes Filtration Group.

Unterzeichner:  
Signatory:  
Signataire :

Wolfram Zuck  
Dipl.-Ing. (FH) Industrial Engineering  
Managing Director, Plant Manager Öhringen

Öhringen,

m/Date/Date

Unterschrift/Signature/Signature

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