Filter elements for installation in old EPE filter housing

Type 1.; 2. and 3. filter elements

RE 51507
Edition: 2019-12

Filter_51_P_sw_MN

- Sizes according to Bosch Rexroth standard:
  1.0004 ... 1.0270C; 1.10 ... 1801
  2.0003 ... 2.0145; 2.10 ... 2.900; 2.Z30 ... 2.Z180
  3.0003
- Differential pressure resistance up to 330 bar [to 4786 psi]
- Filter rating: 1 to 800 µm
- Filter area: to 4.68 m^2 [7.254 in^2]
- Operating temperature: –10 °C ... +100 °C [+14 °F ... +212 °F]

Features

- Filter media for numerous application ranges made of glass fiber material (water-absorbing optional), filter paper, wire mesh, fleece material and metal fiber fleece
- Cleanable wire mesh filter media
- Attainable oil cleanliness up to ISO 10/6/4 (ISO 4406)
- High dirt holding capacity and filtration performance due to multi-layer glass fiber technology and simultaneously a low initial pressure differential (ISO 3968)
- Extended product range for non-mineral oil based fluids
- Filter elements with high pressure differential stability

Contents

Ordering codes filter element

Filter element type 1.(E) size 10 ... 225/450

01	02	03		04	05	06		07		08
			–	A			–	0	–	0

Filter element [1)]

01	Design **with** valve in the filter housing	**1.**
	Design **without** valve in the filter housing	**1.E**

Size

02	According to **Bosch Rexroth standard**	**10** **18** **32** **56** **90** **140** **225** **225/360** **225/450**

Filter rating in µm

03	**Nominal**	Stainless steel wire mesh, cleanable	**G10** **G25** **G40** **G60** **G100** **G200** **G500** **G800**
		Filter paper, one-way (not cleanable)	**P10** **P25**
		Non-woven fabric, one-way (not cleanable)	**VS25** **VS40** **VS60**
	Absolute (ISO 16889; $\beta_{x(c)} \geq 200$)	Glass fiber material H...XL, not reusable, not cleanable Only available in combination with stainless steel material	**H1XL** **H3XL** **H6XL** **H10XL** **H20XL**
		Glass fiber material PWR... Generation 5, not reusable, not cleanable Not available in combination with stainless steel material	**PWR1** **PWR3** **PWR6** **PWR10** **PWR20**
	Water absorbing	One-way (not cleanable)	**AS3** **AS6** **AS10** **AS20**

Pressure differential

04	Max. admissible pressure differential of the filter element of 30 bar *[435 psi]*	**A**

Element design

05	Standard adhesive	**0**
	Special adhesive	**H** [2)]

Ordering codes filter element

Filter element type 1.(E) size 10 ... 225/450

01	02	03		04	05	06		07		08
			–	**A**			–	**0**	–	**0**

Element design

06	Standard material	**0**
	Stainless steel 1.4571	**V** [3]

Bypass valve

07	**Without** bypass valve	**0**

Seal

08	**Without** seal	**0**

[1] Permissible temperature range: see chapter “Technical data”
[2] Improved resistance to temperature and media
[3] Only in connection with special adhesive “H”

Order example:
1.32 H10XL-A00-0-0

Material no.: R928045217

Further models on request.

Ordering codes filter element

Filter element type 1. size 0004 ... 0012

01	02	03		04	05	06		07		08
1.			**–**	**A**			**–**	**5**	**–**	

Filter element [1)]

01	Design	**1.**

Size

02	According to **Bosch Rexroth standard**	**0004** [2)] **0006** **0010** **0012**

Filter rating in µm

03	**Nominal**	Stainless steel wire mesh, cleanable	**G10** **G25** **G40** **G60** **G100** **G200** **G500** **G800**
		Filter paper, one-way (not cleanable)	**P10** **P25**
		Non-woven fabric, one-way (not cleanable)	**VS25** **VS40** **VS60**
	Absolute (ISO 16889; $\beta_{x(c)} \geq 200$)	Glass fiber material H...XL, not reusable, not cleanable Only available in combination with stainless steel material	**H1XL** **H3XL** **H6XL** **H10XL** **H20XL**
		Glass fiber material PWR... Generation 5, not reusable, not cleanable Not available in combination with stainless steel material	**PWR1** **PWR3** **PWR6** **PWR10** **PWR20**
	Water absorbing	One-way (not cleanable)	**AS3** **AS6** **AS10** **AS20**

Pressure differential

04	Max. admissible pressure differential of the filter element of 30 bar *[435 psi]*	**A**

Element design

05	Standard adhesive	**0**
	Special adhesive	**H** [3)]

Ordering codes filter element

Filter element type 1. size 0004 ... 0012

01	02	03		04	05	06		07		08
1.			**–**	**A**			**–**	**5**	**–**	

Element design

06	Standard material	**0**
	Stainless steel 1.4571	**V** [4]

Bypass valve

07	**With** bypass valve – release pressure 2.5 bar *[36.3 psi]*	**5**

Seal

08	NBR seal	**M**
	FKM seal	**V**

1) Permissible temperature range: see chapter “Technical data”
2) Only configurable with seal material NBR “M”
3) Improved temperature and media resistance, only in conjunction with seal FKM “V”
4) Only in conjunction with special adhesive “H” and seal FKM “V”

Order example:
1.0006 H10XL-A00-5-M

Material no.: R928025249

Further models on request.

Ordering codes filter element

Filter element type 1. size 0005; 0013 ... 0270C

01	02	03		04	05	06		07		08
1.			**–**	**A**			**–**	**0**	**–**	

Filter element [1)]

01	Design	**1.**

Size

02	According to **Bosch Rexroth standard**	**0005** **0008** **0013** **0015** **0018** **0020** **0030** **0045** **0055** **0059** **0060** **0061** **0095** **0145** **0145C** [2)] **0200C** [2)] **0270C** [2)]

Filter rating in µm

03	**Nominal**	Stainless steel wire mesh, cleanable	**G10** **G25** **G40** **G60** **G100** **G200** **G500** **G800**
		Filter paper, one-way (not cleanable)	**P10** **P25**
		Non-woven fabric, one-way (not cleanable)	**VS25** **VS40** **VS60**
	Absolute (ISO 16889; $\beta_{x(c)} \geq 200$)	Glass fiber material H...XL, not reusable, not cleanable Only available in combination with stainless steel material	**H1XL** **H3XL** **H6XL** **H10XL** **H20XL**
		Glass fiber material PWR... Generation 5, not reusable, not cleanable Not available in combination with stainless steel material	**PWR1** **PWR3** **PWR6** **PWR10** **PWR20**
	Water absorbing	One-way (not cleanable)	**AS3** **AS6** **AS10** **AS20**

Pressure differential

04	Max. admissible pressure differential of the filter element of 30 bar *[435 psi]*	**A**

Ordering codes filter element

Filter element type 1. size 0005; 0013 ... 0270C

01	02	03		04	05	06		07		08
1.			**–**	**A**			**–**	**0**	**–**	

Element design

05	Standard adhesive	**0**
	Special adhesive	**H** [3]

Element design

06	Standard material	**0**
	Stainless steel 1.4571	**V** [4]

Bypass valve

07	**Without** bypass valve	**0**

Seal

08	NBR seal	**M**
	FKM seal	**V**

[1] Permissible temperature range: see chapter “Technical data”

[2] Only configurable with glass fiber material “H ... XL”, not configurable with special adhesive “H” and element design stainless steel “V”

[3] Improved temperature and media resistance, only in conjunction with seal FKM “V”

[4] Only in conjunction with special adhesive “H” and seal FKM “V”

Order example:
1.0013 H10XL-A00-0-M

Material no.: R928005513

Further models on request.

Ordering codes filter element

Filter element type 1. size 360 ... 1801

01	02	03		04	05	06		07		08
1.			**–**				**–**	**0**	**–**	

Filter element [1)]

01	Design	**1.**

Size

02	According to **Bosch Rexroth standard**	**360** **361** **560** **561** **900** **901** **1400** **1401** **1800** **1801**

Filter rating in µm

03	**Nominal**	Stainless steel wire mesh, cleanable	**G10** **G25** **G40** **G60** **G100** **G200** **G500** **G800**
		Filter paper, one-way (not cleanable)	**P10** **P25**
		Non-woven fabric, one-way (not cleanable)	**VS25** **VS40** **VS60**
	Absolute (ISO 16889; $\beta_{x(c)} \geq 200$)	Glass fiber material H...XL, not reusable, not cleanable Only available in combination with stainless steel material	**H1XL** **H3XL** **H6XL** **H10XL** **H20XL**
		Glass fiber material PWR... Generation 5, not reusable, not cleanable Not available in combination with stainless steel material	**PWR1** **PWR3** **PWR6** **PWR10** **PWR20**
		Metal fiber fleece, one-way (not cleanable)	**M5** **M10**
	Water absorbing [2)]	One-way (not cleanable)	**AS3** **AS6** **AS10** **AS20**

Pressure differential

04	Max. admissible pressure differential of the filter element of 30 bar *[435 psi]*	**A**
	Max. admissible pressure differential of the filter element of 160 bar *[2321 psi]*	**C**
	Max. admissible pressure differential of the filter element of 60 bar *[870 psi]*	**D**

Ordering codes filter element

Filter element type 1. size 360 ... 1801

01	02	03		04	05	06		07		08
1.			**–**				**–**	**0**	**–**	

Element design

05	Standard adhesive	**0**
	Special adhesive	**H** [3]

Element design

06	Standard material	**0**
	Stainless steel 1.4571	**V** [4]

Bypass valve

07	**Without** bypass valve	**0**

Seal

08	NBR seal	**M**
	FKM seal	**V**

[1] Permissible temperature range: see chapter “Technical data”

[2] Only configurable with differential pressure A = 30 bar *[435 psi]*

[3] Improved temperature and media resistance, only in conjunction with seal FKM “V”

[4] Only in conjunction with special adhesive “H” and seal FKM “V”

Order example:
1.560 H10XL-A00-0-M

Material no.: R928028040

Further models on request.

Ordering codes filter element

Filter element type 2. size 10 ... 900

01	02	03		04	05	06		07		08
2.			**–**				**–**	**0**	**–**	

Filter element [1)]

01	Design	**2.**

Size

02	According to **Bosch Rexroth standard**	**10** **18** **32** **56** **90** **140** **180** [2)] **225** **360** **460** **560** **900**

Filter rating in µm

03	**Nominal**	Stainless steel wire mesh, cleanable	**G10** **G25** **G40** **G60** **G100** **G200** **G500** **G800**
		Filter paper, one-way (not cleanable)	**P10** **P25**
		Non-woven fabric, one-way (not cleanable)	**VS25** **VS40** **VS60**
	Absolute (ISO 16889; $\beta_{x(c)} \geq 200$)	Glass fiber material H...XL, not reusable, not cleanable Only available in combination with stainless steel material	**H1XL** **H3XL** **H6XL** **H10XL** **H20XL**
		Glass fiber material PWR... Generation 5, not reusable, not cleanable Not available in combination with stainless steel material	**PWR1** **PWR3** **PWR6** **PWR10** **PWR20**
		Metal fiber fleece, one-way (not cleanable)	**M5** **M10**
	Water absorbing [3)]	One-way (not cleanable)	**AS3** **AS6** **AS10** **AS20**

Ordering codes filter element

Filter element type 2. size 10 ... 900

01	02	03		04	05	06		07		08
2.			**–**				**–**	**0**	**–**	

Pressure differential

04	Max. admissible pressure differential of the filter element of 30 bar *[435 psi]*	**A**
	Max. admissible pressure differential of the filter element of 330 bar *[4786 psi]*	**B**
	Max. admissible pressure differential of the filter element of 160 bar *[2321 psi]*	**C**
	Max. admissible pressure differential of the filter element of 60 bar *[870 psi]*	**D**

Element design

05	Standard adhesive	**0**
	Special adhesive	**H** [4]

Element design

06	Standard material	**0**
	Stainless steel 1.4571	**V** [5]

Bypass valve

07	**Without** bypass valve	**0**

Seal [2]

08	NBR seal	**M**
	FKM seal	**V**

1) Permissible temperature range: see chapter “Technical data”
2) Only configurable with differential pressure A = 30 bar *[435 psi]* and element design stainless steel “V”
3) Only configurable with differential pressure A = 30 bar *[435 psi]*
4) Improved temperature and media resistance, only in conjunction with seal FKM “V”
5) Only in conjunction with special adhesive “H” and seal FKM “V”

Order example:
2.32 H10XL-A00-0-M

Material no.: R928019015

Further models on request.

Ordering codes filter element

Filter element type 2. size 0003 ... 0145

01	02	03		04	05	06		07		08
2.			**–**				**–**	**0**	**–**	

Filter element [1)]

01	Design	**2.**

Size

02	According to **Bosch Rexroth standard**	**0003** **0004** **0005** **0008** **0013** **0014** [2)] **0015** **0018** **0019** [2)] **0020** **0030** **0045** **0055** **0095** **0145**

Filter rating in µm

03	**Nominal**	Stainless steel wire mesh, cleanable	**G10** **G25** **G40** **G60** **G100** **G200** **G500** **G800**
		Filter paper, one-way (not cleanable)	**P10** **P25**
		Non-woven fabric, one-way (not cleanable)	**VS25** **VS40** **VS60**
	Absolute (ISO 16889; $\beta_{x(c)} \geq 200$)	Glass fiber material H...XL, not reusable, not cleanable Only available in combination with stainless steel material	**H1XL** **H3XL** **H6XL** **H10XL** **H20XL**
		Glass fiber material PWR... Generation 5, not reusable, not cleanable Not available in combination with stainless steel material	**PWR1** **PWR3** **PWR6** **PWR10** **PWR20**
		Metal fiber fleece, one-way (not cleanable)	**M5** **M10**
	Water absorbing [3)]	One-way (not cleanable)	**AS3** **AS6** **AS10** **AS20**

Ordering codes filter element

Filter element type 2. size 0003 ... 0145

01	02	03		04	05	06		07		08
2.			**–**				**–**	**0**	**–**	

Pressure differential

04	Max. admissible pressure differential of the filter element of 30 bar *[435 psi]*	**A**
	Max. admissible pressure differential of the filter element of 330 bar *[4786 psi]*	**B** [4]
	Max. admissible pressure differential of the filter element of 160 bar *[2321 psi]*	**C** [4]

Element design

05	Standard adhesive	**0**
	Special adhesive	**H** [5]

Element design

06	Standard material	**0**
	Stainless steel 1.4571	**V** [6]

Bypass valve

07	**Without** bypass valve	**0**

Seal [2]

08	NBR seal	**M**
	FKM seal	**V**

[1] Permissible temperature range; see chapter “Technical data”
[2] Only configurable with element design stainless steel “V”
[3] Only configurable with differential pressure A = 30 bar *[435 psi]*
[4] Not in connection with size 0003
[5] Improved temperature and media resistance, only in conjunction with seal FKM “V”
[6] Only in conjunction with special adhesive “H” and seal FKM “V”

Order example:
2.0008 H10XL-A00-0-M

Material no.: R928006161

Further models on request.

Ordering codes filter element

Filter element type 2.Z for sandwich plate filter 250 ZH

01	02	03		04		05		06
2.Z			**–**		**–**	**0**	**–**	

Filter element [1)]

01	Design	**2.Z**

Size

02	According to **Bosch Rexroth standard**	**30** **90** **120** **180** **220**

Filter rating in µm

03	**Absolute (ISO 16889; $\beta_{x(c)} \geq 200$)**	Glass fiber material H...XL, not reusable, not cleanable Only available in combination with stainless steel material	**H3XL** **H6XL** **H10XL** **H20XL**
		Glass fiber material PWR... Generation 5, not reusable, not cleanable Not available in combination with stainless steel material	**PWR1** **PWR3** **PWR6** **PWR10** **PWR20**

Pressure differential

04	Max. admissible pressure differential of the filter element of 330 bar *[4786 psi]*	**B00**
	Max. admissible pressure differential of the filter element of 160 bar *[2321 psi]*	**C00**

Bypass valve

05	**Without** bypass valve	**0**

Seal [1)]

06	NBR seal	**M**
	FKM seal	**V**

1) Permissible temperature range: see chapter “Technical data”

Order example:
2.Z90 H10XL-C00-0-M

Material no.: R928036119

Ordering codes filter element

Filter element type 3.0003 for return line filter 10 FRE 0003

01	02	03		04		05		06
3.	**0003**		**–**	**A00**	**–**	**7**	**–**	

Filter element [1)]

01	Design	**3.**

Size

02	According to **Bosch Rexroth standard**	**0003**

Filter rating in µm

03	**Nominal**	Stainless steel wire mesh, cleanable	**G10** **G25** **G40** **G60** **G100**
		Filter paper, one-way (not cleanable)	**P10** **P25**
	Absolute (ISO 16889; $\beta_{x(c)} \geq 200$)	Glass fiber material H...XL, not reusable, not cleanable Only available in combination with stainless steel material	**H1XL** **H3XL** **H6XL** **H10XL** **H20XL**
		Glass fiber material PWR... Generation 5, not reusable, not cleanable Not available in combination with stainless steel material	**PWR1** **PWR3** **PWR6** **PWR10** **PWR20**

Pressure differential

04	Max. admissible pressure differential of the filter element of 30 bar *[435 psi]*	**A00**

Bypass valve

05	**With** bypass valve – release pressure 3.5 bar *[50.8 psi]*	**7**

Seal

06	NBR seal	**M**
	FKM seal	**V**

[1)] Permissible temperature range: see chapter “Technical data”

Order example:
3.0003 H10XL-A00-7-M

Material no. R928025675

Assignment of filter elements to filter series

Element type (Type)	Series	Application
1.10 - 225/450	16 RA 10 - 225/450 with valve	Return line filter
1.E10 - 225/450	16 RA 10 - 225/450 without valve	
1.360(1) - 1800(1)	16 RL/DR 360(1) - 1800(1)	
	25/100 L/D 360(1) - 1800(1)	Inline filter
1.0004 - 0012	10 RE	Return line filter
1.0005; 1.0008; 0013 - 0120	10 FRE/FRD 0005-0120; 40 FLDK 0008-0120; 40/100 FLE/FLD 0020-0120; 16 FLD 0190-0300	Return line filter; Duplex return line filter; Inline filter; duplex filters
1.0145(C) - 0270 (C)	40 FLE 0145(C) - 0270(C); 40 FLD 0146(C) - 0274(C)	Inline filter; Duplex filter

2.10 - 900	25/100 - 250/400 D/ED	Duplex filter
	250/450 L /EL/F	Inline filter
2.180	10 DLW	
2.Z30 - 180	250 ZH	Sandwich plate filter
2.0003 (without valve)	10 FRE 0003	Return line filter
3.0003 (with valve)		
2.0004 - 0145	40/160/250/450 LE/LD 0003 - 0145; 250 FE 0003 - 0055; 450 FE 0003 - 0145 40/100 EL 0004-0045; 450 EL 0004 - 0145; 690 EL 0004 - 0014; 1000 EL 0004: 40/100 ED 0004 - 0019	Inline filter; duplex filters

Filter design

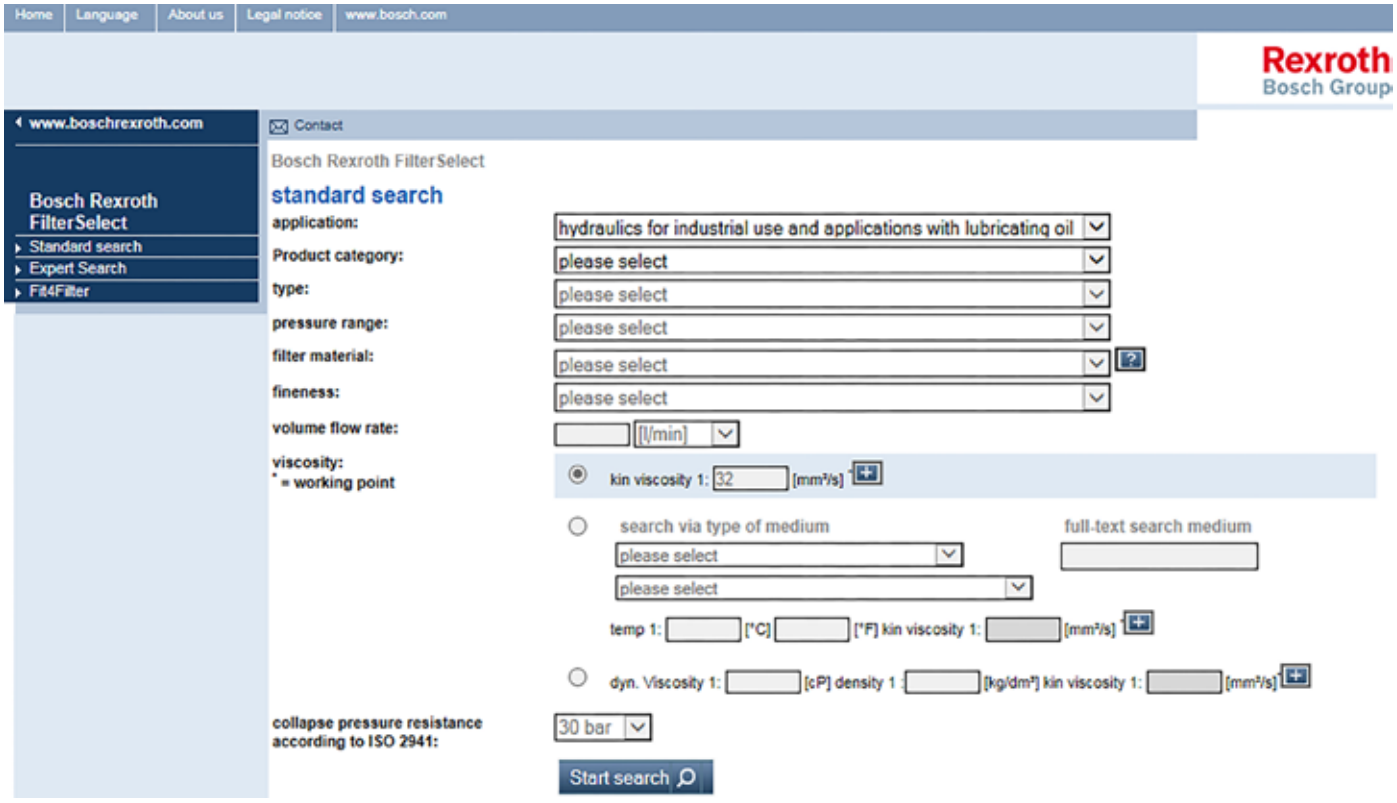
Easy selection of the filter size is made possible by the FilterSelect online tool. The filter can be designed using the operating pressure, flow and fluid system parameters. The required filter rating is based on the application,
the sensitivity to contamination of the components and the environmental conditions.

The program leads you through the menu on a step-by-step basis.

A documentation of the filter selection can finally be created in the form of a PDF file. This file contains the entered parameters, the designed filter with material number including spare parts, and the pressure loss curves.

Link FilterSelect:
http://filterselect.boschrexroth.com/rexfilter/

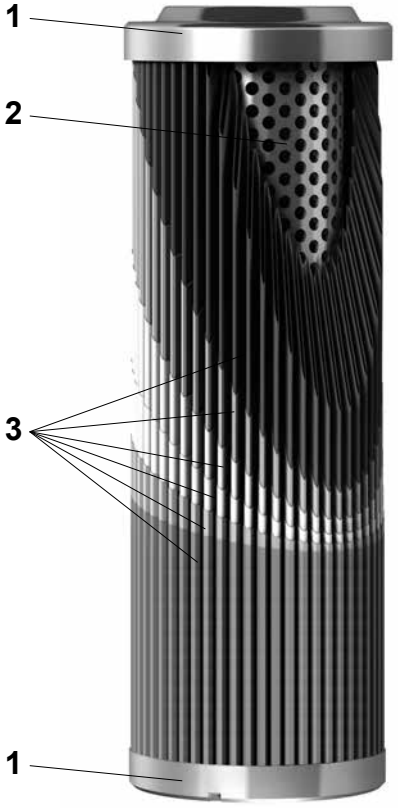
Other languages can be selected using the page navigation.



Function, section

The filter element is the central component of industrial filters. The actual filtration process takes part in the filter element. The main filter variables, such as size range of particle retention, dirt holding capacity and pressure loss are determined by the filter elements and the filter media used to construct them. Rexroth filter elements are used for the filtration of hydraulic fluids in the hydraulic system as well as for the filtration of lubricants, industrial fluids and gases.

Filter elements consist of a combination of radially pleated filter media (3) which are laid around a perforated supporting tube (2). The filter element is vertically sealed with a two-component adhesive and the supporting tube and filter mat are connected to both end plates (1). One or two seal rings are provided between the filter element and the filter housing as a sealing.
The seal is part of the filter housing in sizes 1.(E)10 to 1.(E)225/460.
The flow is generally from outside to inside.

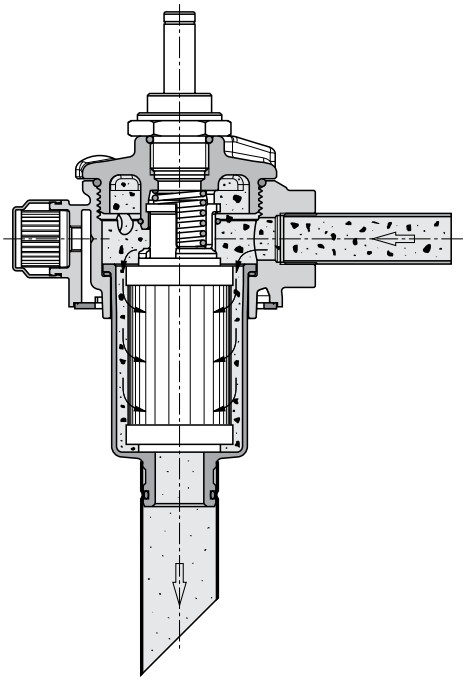


Filter variables

Filter rating and attainable oil cleanliness
The main goal when using industrial filters is not only the direct protection of machine components but to attain the required oil cleanliness. Oil cleanliness is defined on the basis of oil cleanliness classes which classify how the amount of particles of the existing contamination is distributed in the operating liquid.

Filtration performance

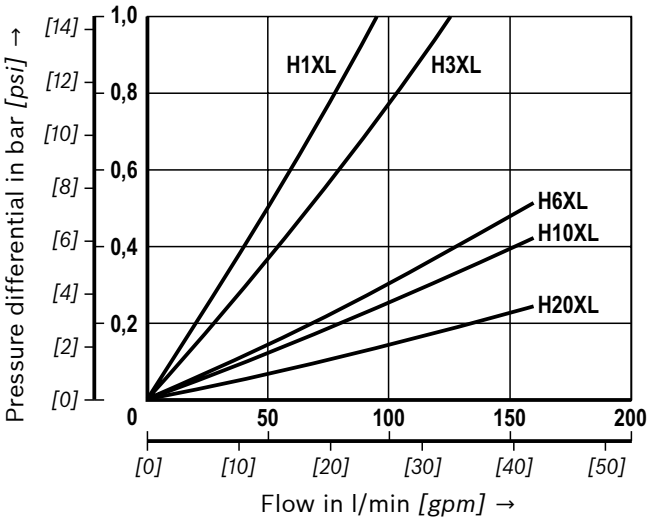
Filtration quotient $\beta_{x(c)}$ (β value)
The retention capacity of hydraulic filters against pollution in a hydraulic system is characterized by the filtration ratio $\beta_{x(c)}$. This variable is the most important performance characteristic of a hydraulic filter. It is measured in the multipass test, and is the average value of the specified initial and final pressure differential according to ISO 16889 using ISOMTD test dust.
The filtration quotient $\beta_{x(c)}$ is defined as the quotient of the particle count of the respective particle size on both sides of the filter.



Dirt holding capacity
It is also measured using the multipass test and determines the amount of test dust ISOMTD which is fed to the filter medium until a specified pressure differential increase has been reached.

Pressure loss (also pressure differential or delta p)
The pressure loss of the filter element is the relevant characteristic value for the determination of the filter size. Here it concerns the filter manufacturer's recommendations or the filter user's specifications. This characteristic value depends on many factors. These include for example: the rating of the filter media, its geometry and arrangement in the filter element, the filter area, the operating viscosity of the fluid and the flow.
The term “delta p” is often also expressed with the symbol: “Δp”.

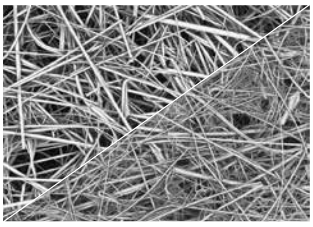
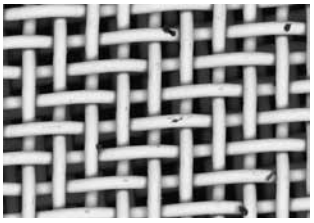
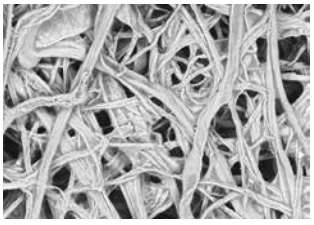
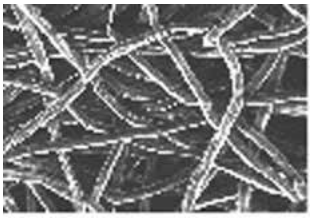
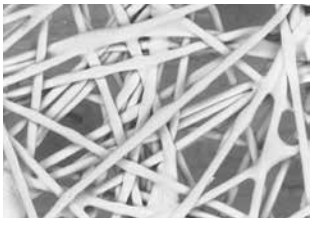
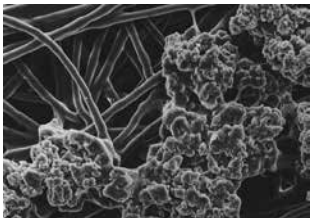
The following diagram shows the typical pressure loss behavior of filter elements with different material ratings at different flow rates.



Filter variables

Overview

For the separation of particles different filter media in various ratings are used according to application and requirement.

Filter medium/set-up	electron microscope image
H...XL, Glass fiber material Depth filter, combination of inorganic micro glass filter medium High dirt holding capacity due to multi-layer technology.	
G..., stainless steel wire mesh **material 1.4401 or 1.4571** Surface filter made of stainless steel wire mesh with supporting tissue.	
P..., Filter paper Inexpensive depth filter made of filter paper with supporting tissue. Made of specially impregnated cellulose fiber preventing humidity and swelling.	
M..., Metal fiber fleece **material 1.4404** Depth filter made of stainless steel fibers with supporting mesh.	
VS..., Fleece material Surface filter made of extremely solid fiber composite materials in the form of polyethylene-coated polypropylene fibers.	
AS..., water absorbing Depth filter, fleece material with water absorbing material, combined with micro glass filter media.	

Technical data preferred program
(for applications outside these parameters, please consult us!)

General			
Filtration direction			From the outside to the inside
Ambient temperature range		°C *[°F]*	–10 ... +65 *[+14...+149]* (short periods down to –30 *[–22]*)
Storage conditions	▶ NBR seal	°C *[°F]*	–40 ... +65 *[-40 ... +149]*; max. relative air humidity 65%
	▶ FKM seal	°C *[°F]*	–20 ... +65*[-4 ... +149]*; max. relative air humidity 65%
Material	▶ Cover/Base		Galvanized steel / aluminum / polyamide
	▶ support tube		Steel galvanized/tin coated
	▶ Seals		NBR or FKM

Hydraulic		
Minimum conductivity of the medium	pS/m	300

Permissible operating temperature range, depending on the material combination

Materials	**Code letter**	**Operating temperature range °C** *[°F]*
Seal		
NBR	M	–40 ... +100 *[–40 ... +212]*
FKM	V	–20 ... +210 *[–4 ... +410]*
Filter element adhesive		
Standard	0	–40 ... +100 *[–40 ... +212]*
Special	H	–55 ... +170 *[–67 ... +338]*
Filter element material (cover, base, support tube)		
Standard	0	–40 ... +100 *[–40 ... +212]*
Stainless steel	V	–55 ... +170 *[–67 ... +338]*
Filter element material (Filter material)		
Aquasorb	AS...	0 ... +160 *[32 ... +320]*
Stainless steel wire mesh	G...	–55 ... +500 *[–67 ... +932]*
glass fiber material	H...XL	to +160 *[to +320]*
Metal fiber fleece	M...	–55 ... +250 *[–67 ... +482]*
Filter paper	P...	to +130 *[to +266]*
Fleece material	VS...	to +80 *[to +176]*

Compatibility with permitted hydraulic fluids

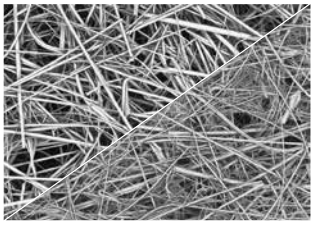
Hydraulic fluid		**Classification**		**Suitable sealing materials**	**Standards**
Mineral oil		HLP		NBR	DIN 51524
Bio-degradable	▶ Insoluble in water	HETG	Material Stainless steel necessary	NBR	VDMA 24568
		HEES		FKM	
	▶ Soluble in water	HEPG		FKM	VDMA 24568
Flame-resistant	▶ Water free	HFDU, HFDR		FKM	VDMA 24317
	▶ Containing water	HFAS		NBR	DIN 24320
		HFAE		NBR	
		HFC		NBR	VDMA 24317

☞ **Important information about hydraulic fluids:**

- ▶ For more information and data on the use of other hydraulic fluids, please refer to data sheet 90220 or contact us!
- ▶ Flame-resistant – containing water: Due to possible chemical reactions with materials or surface coatings of machine and system components, the service life with these hydraulic fluids may be less than expected.

  Filter materials made of filter paper (cellulose) may not be used, filter elements with glass fiber material have to be used instead.
- ▶ Bio-degradable: If filter materials made of filter paper are used, the filter life may be shorter than expected due to material incompatibility and swelling.

Filter media

Technical data	H...XL
Glass fiber fleece, H...XL The filter medium achieves the best possible degree of purity compared to other filter media. It is suitable for fluids such as hydraulic oils, lubricants, chemical and industrial liquids. Due to its designed retention capacity (ISO 16889), it offers therefore highly effective protection for machine and system components which are sensitive to contamination. ▶ H...XL depth filter made of inorganic glass fiber material ▶ Absolute filtration/defined retention capacity according to ISO 16889 ▶ High dirt holding capacity due to multi-layer set-up ▶ Non-reusable filter (not cleanable due to the depth filtration effect)	
Filter rating and attainable oil cleanliness The following table provides recommendations for the selection of a filter medium in dependency of the application and indicates the average oil cleanliness class attainable according to ISO 4406 or SAE-AS 4059.	

glass fiber material

oil cleanliness class ISO 4406	to be achieved with filter			Hydraulic system	
	$\beta_{x(c)} = 200$	Materials	Possible arrangement		
10/6/4 - 14/8/6	1 µm	Glass fiber material H...XL	Return flow or pressure filters	--------	Special applications
13/10/8 - 17/13/10	3 µm			--------	Servo valves
15/12/10 - 19/14/11	6 µm			------	High-response valves
17/14/10 - 21/16/13	10 µm			---	Proportional valves
19/16/12 - 22/17/14	20 µm			-	General pumps and valves

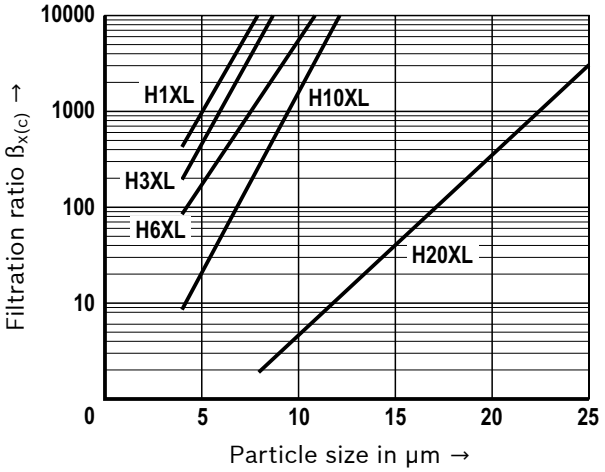
Achievable filtration ratio $\beta_{x(c)}$ (β value)

Typical β values of up to 2.2 bar *[31.9 psi]* Δ*p* pressure increase at the filter element [1)]

Filter medium	Particle size "x" for different β values, measurement according to ISO 16889		
	$\beta_{x(c)} \geq 75$	$\beta_{x(c)} \geq 200$	$\beta_{x(c)} \geq 1000$
H1XL	< 4.0 µm(c)	< 4.0 µm(c)	< 4.0 µm(c)
H3XL	4.0 µm(c)	< 4.5 µm(c)	5.0 µm(c)
H6XL	4.8 µm(c)	5.5 µm(c)	7.5 µm(c)
H10XL	6.5 µm(c)	7.5 µm(c)	9.5 µm(c)
H20XL	18.5 µm(c)	20.0 µm(c)	22.0 µm(c)

1) Filtration ratio $\beta_{x(c)}$ for other filter media upon request

Filtration ratio $\beta_{x(c)}$ as a function of the particle size µm(c)

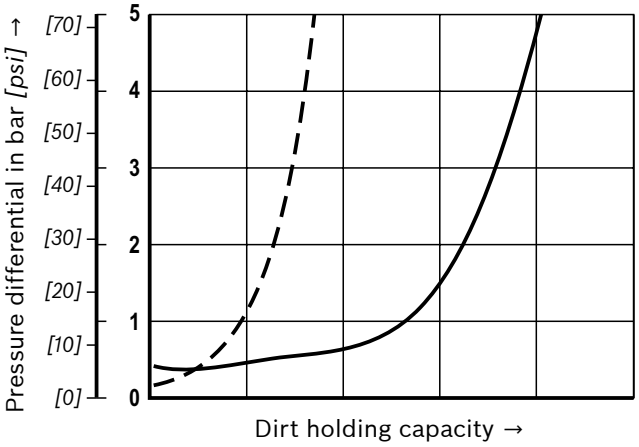


Filter media

Technical data	H...XL

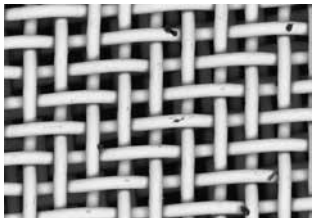
Dirt holding capacity
Compared to conventional filter media with insertion technology, the filter material H...XL features a high dirt holding capacity because it is made of two separate filter layers connected in series.

Superior dirt holding capacity of H...XL filter elements



Conventional filter element
(single-layer glass fiber material)
Rexroth H...XL filter element
(multi-layer glass fiber material)

Filter media

Technical data	**G...**
Stainless steel wire mesh, G... There is a comprehensive field of applications for wire mesh filter media. Not only pre-filtration is possible, but also the filtration of lubricating oils, hydraulic oils, coolants and water-like fluids. **Wire mesh G10 ... G40** As surface filters, these materials are generally cleanable. Due to their fine mesh, however, cleaning is more difficult than with coarser filter mesh. Therefore, we recommend cleaning the filters in an ultrasonic bath. **Wire mesh G60 ... G800** Due to their coarser mesh size, the cleaning of these filters media is easier. ▶ Surface filter made of stainless steel wire mesh ▶ Reusable, cleanable ▶ Pleated version: single, two or three-layer design	

Filter medium	Version	Mesh size
G10	Special Dutch weave	10 µm nom.
G25	woven mesh	25 µm nom.
G40		40 µm nom.
G60 ... G800	Plain woven cloth	60 ... 800 µm nom.

Stainless steel wire mesh

oil cleanliness class ISO 4406	to be achieved with filter			Fluid system	
	Nominal	Materials	Possible arrangement		
20/18/13 - 21/20/15	10 µm	Stainless steel wire mesh, G...	Return line filter, pressure filter or suction filter	--------	For production facilities (hydraulic) and as a protection filter (G10, G25) All fluids e.g.: ▶ Lubricants ▶ Petrochemical ▶ Water filter ▶ Refrigeration/thermo oil
Not applicable for wire mesh > 10 µm	25 ... 800 µm				

Filter media

Technical data	G...

Cleaning of filter elements

Cleaning or replacement
Before cleaning a G...- element, the filter element has to be dismantled first and then checked whether it makes sense to clean the element. For example, if the cloth contains many fibrous substances and consists of a material finer than G40, effective and complete cleaning is not possible in many cases. Filter mesh which has visible defects due to frequent cleaning must be replaced. In general, the following applies: The finer the cloth, the thinner the wire. Therefore, especially fine mesh must be cleaned gently to protect the material. Cracks in the folds of the wire mesh and the metal fiber fleece are to be avoided. Otherwise, the filter capacity will be insufficient.

Cleaning frequency
Experience has shown that filter elements made of G10, G25 and G40 can be cleaned up to ten times.
Filter mesh > 60 µm can usually be cleaned more than ten times. Reusability, however, very much depends on the type of contamination as well as on pressurization (final Δp before dismantling the filter element). For maximum reusability, we therefore recommend replacing in particular the fine mesh and the M material at a final Δp of 2.2 bar *[31.9 psi]* at the latest. Due to the given reasons, the aforementioned values must be regarded as reference values for which we do not assume any liability.

Recommendations for cleaning

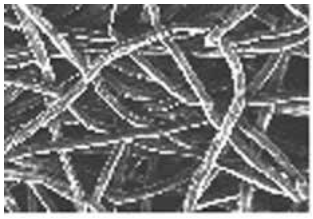
Manual and simple cleaning method for G... elements

Procedure	Wire mesh G10, G25, G40	Wire mesh G60 ... G800
Chemical pre-cleaning	Let the filter element drain for approx. 1 hour after disassembly. Bathe in solvent afterwards.	
Mechanical pre-cleaning	Remove rough dirt with a brush or scrubber. Do not use hard or pointed objects which could damage the filter medium.	
Mechanical/ chemical main cleaning	Put pre-cleaned element in an ultrasonic bath with special solvent. Clean the element in the ultrasonic bath until any visible contamination is removed.	Evaporate with hot washing solution (water with corrosion protection agent)
Inspection	Visually inspect the material for damage. Replace the filter element if you identify obvious damages.	
Preservation	After drying, you must spray the cleaned element with preservative agents and store it sealed against dust in a plastic foil.	

Automated cleaning for G... elements

Procedure	Wire mesh G10, G25, G40, G60 ... G800
Chemical pre-cleaning	Let the filter element drain for approx. 1 hour after disassembly. Bathe in solvent afterwards.
Mechanical/ chemical main cleaning	By means of special cleaning systems for filter elements. Most of these systems are provided with a fully automated and combined cleaning mechanism including ultrasound as well as mechanical and chemical cleaning processes. This allows for best possible cleaning results with gentle cleaning processes.

Filter media

Technical data	M...
Metal fiber fleece, M... Metal fiber fleece is used to achieve high purity levels for special fluids or high operating temperatures. It provides effective protection for dirt-sensitive machine parts through absolute filtration. Since this material is made from stable and tightly bound interwoven stainless steel fibres, it counts as a depth filter media and is classified as not cleanable. ▶ Absolute filtration, measurement according to ISO 16889 ▶ Depth filter made of stainless steel fibers ▶ non-reusable filter ▶ Pleated version: two or three-layer design ▶ Supporting mesh: Epoxy or stainless steel wire mesh	

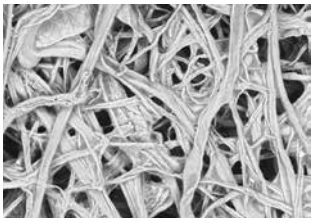
Filter medium	Particle size for filtration ratio > 75 [1]
M5	5 µm
M10	10 µm

[1] according to ISO 16889

Metal fiber fleece

oil cleanliness class ISO 4406	to be achieved with filter			Hydraulic system	
	$ß_{x(c)} = 75$	Materials	Possible arrangement		
16/13/10 - 20/15/11	5 µm	Metal fiber fleece M...	Return line or pressure filters	--------	Filter material for special applications
18/14/10 - 21/17/13	10 µm				

Filter media

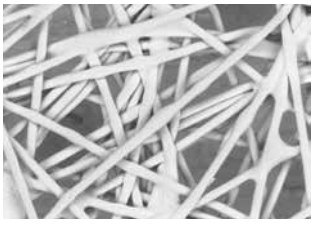
Technical data	P...
Filter paper, P... Filter paper is used for the filtration of lubricating oil and for pre-filtration. Filter paper has the following features: ▶ Depth filter made of cellulose fibers ▶ Specially impregnated against swelling caused by humidity ▶ Pleated version: single, two or three-layer design ▶ Non-reusable filter (not cleanable due to the depth filtration effect)	

Filter medium	Nominal filter rating	Filtration ratio β values [1]	Retention rate at 10 µm [1]
P10	10 µm	$\beta_{10(c)} > 2.0$	50%
P25	25 µm	$\beta_{10(c)} > 1.25$	20%

[1] according to ISO 16889

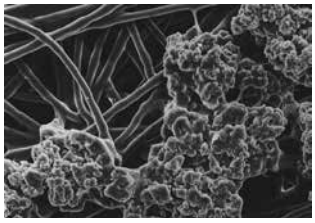
Filter paper

oil cleanliness class ISO 4406	to be achieved with filter			Hydraulic system	
	$ß_{x(c)} = 200$	Materials	Possible arrangement		
20/19/14 - 22/20/15	10 µm	Paper P...	Return line or pressure filters	--------	For production facilities
21/20/15 - 22/21/16	25 µm				

Technical data	VS...
Fleece material, VS... The fleece material VS... serves for filtration of coolants, water and aqueous media. It is also possible to use this filter media for the filtration of emulsions or generally for pre-filtration. ▶ Depth filter material made of polyolefin fibers ▶ Binder-free ▶ Thermofixed ▶ Extremely resistant ▶ Pleated version: single or two-layer design ▶ Supporting mesh: epoxy-coated or stainless steel wire mesh ▶ Non-reusable filter (not cleanable due to the depth filtration effect)	

Filter medium	Nominal filter rating
VS 25	25 µm
VS 40	40 µm
VS 60	60 µm

Filter media

Technical data	AS...
Water absorbing, AS... AS ... **Aquasorb** Filter elements adsorb humidity from ventilation filters as well as free water in hydraulic fluids and lubricating oils. Even at low concentration above the saturation point of the oil water can accelerate oil aging through oxidation. This results in increased corrosion and increased wear and tear. In certain oil additives it can also cause a change or a failure in the form of solid, mucus-like substances which then prematurely clog the pores of the filter Because it is combined with non-woven glass fiber filter media, there is also a highly effective separation of dirt. ▶ Absolute filtration ISO 16889 ▶ Surface filter made of water absorbent filter fleece ▶ Combined with glass fiber ▶ Non-reusable filter (not cleanable due to the depth filtration effect) ▶ Pleated version: multi layer design	

Filter medium	Particle size $\beta_{x(c)} = 200$ [1]	Particle size $\beta_{x(c)} = 1000$ [1]
AS3	4.5 µm(c)	5.0 µm(c)
AS6	5.5 µm(c)	7.5 µm(c)
AS10	7.5 µm(c)	9.5 µm(c)
AS20	20 µm(c)	22 µm(c)

[1] according to ISO 16889

Aquasorb

oil cleanliness class ISO 4406	to be achieved with filter			Hydraulic system	
	$\beta_{x(c)} = 200$	Materials	Possible arrangement		
13/10/8 - 17/13/10	3 µm	AS...	Return flow, bypass or ventilation filters.	--------	Servo valves
15/12/10 - 19/14/11	6 µm			------	High-response valves
17/14/10 - 21/16/13	10 µm			---	Proportional valves
19/16/12 - 22/17/14	20 µm			-	General pumps and valves

Functional principle

Rexroth Aquasorb filter elements are pleated just as Rexroth industrial filter elements, however, contain a layer of fleece material on a water-binding fabric is in the form of a fine granulate. The corresponding glass fiber is combined behind this fleece material, depending on the filter rating.

Effectiveness

The effectiveness of the Rexroth Aquasorb elements has been proven through internal testing and by a scientific study in an independent institute. The water content (free water) can be reduced to the saturation point of the oil. The effectiveness and the water absorption are dependent on the load on filter area, the viscosity of the oil and the oil temperature.

Design and area of application

Rexroth Aquasorb filter elements are to be dimensioned so that an initial pressure drop of 0.2 bar *[2.9 psi]* is not exceeded. They should be preferably used as a bypass filter in the low pressure range < 5 bar *[72.5 psi]*. The change of the filter element is to be carried out at a pressure differential of at least 2.2 bar *[31.9 psi]*.
Rexroth Aquasorb can only be used in HLP and HEES.

Assembly, commissioning, maintenance

When has the filter element to be replaced or cleaned?
As soon as the dynamic pressure or the pressure differential set at the maintenance indicator is reached, the red push button of the optical-mechanical maintenance indicator pops out. In addition an electrical signal is given if an electronic switching element is present. In this case, the filter element must be replaced or cleaned.
If the filter does not have a maintenance indicator, we recommend replacing or cleaning the filter elements after no more than six months.

Filter element exchange
- For single filters:
  Switch off the system and discharge the filter on the pressure side.
- For installed duplex switch filters:
  Refer to the relevant maintenance instructions according to the data sheet.

Detailed instructions with regard to the exchange of filter elements can be found on the data sheet of the relevant filter series.

⚠ WARNING!

- Filters are containers under pressure. Before opening the filter housing, check whether the system pressure in the filter has been decreased to ambient pressure. Only then may the filter housing be opened for maintenance.

☞ **Note:**
- From a cold start the preset optical maintenance indicator signal may be exceeded due to the high viscosity.
  After reaching the operating temperature the mechanical optical display can be acknowledged manually. The electrical signal will go out after the operating temperature has been reached.
  If the maintenance indicator signal is ignored, the disproportionately increasing pressure differential may damage the filter element causing it to collapse.
- Warranty becomes void if the delivered item is changed by the ordering party or third parties or improperly mounted, installed, maintained, repaired, used or exposed to environmental conditions that do not comply with the installation conditions.

Directives and standardization

Product validation
Rexroth filter elements are tested and quality-monitored according to different ISO test standards:

Filtration performance test (multipass test)	ISO 16889:2008-06
Δp (pressure loss) characteristic curves	ISO 3968:2001-12
Compatibility with hydraulic fluid	ISO 2943:1998-11
Collapse pressure test	ISO 2941:2009-04
Fluid Technology; Hydraulic Filter – Part 2; Assessment Criteria and Requirements	DIN 24550-2:2006-09

The development, manufacture and assembly of Rexroth industrial filters and Rexroth filter elements is carried out within the framework of a certified quality management system in accordance with ISO 9001:2000.

Notes

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