

# Side mounted, flanged manifold filter with filter element according to DIN 24550

Type 450FEN0040 to 1000

**RE 51467**

Edition: 2021-04



- ▶ Sizes according to DIN 24550: 0040 to 1000
- ▶ Component series 2X
- ▶ Nominal pressure 450 bar [6526 psi]
- ▶ Connection up to DN50
- ▶ Operating temperature -10 °C ... +100 °C [14 °F ... 212 °F]

## Features

Side mounted, flanged manifold filters are used in hydraulic systems for separating solid materials from fluids and lubricating oils. They are intended for side mounting on manifold blocks.

They distinguish themselves by the following:

- ▶ Filter for manifold mounting, outlet below inlet
- ▶ High filtration performance due to the tangential cyclone-effect flow path
- ▶ Special highly efficient filter materials
- ▶ Filtration of very fine particles and high dirt holding capacity across a broad pressure differential range
- ▶ High collapse resistance of the filter elements
- ▶ By default equipped with mechanical optical maintenance indicator with memory function
- ▶ Various, optional electronic switching elements, modular design
- ▶ Measurement port drilled and closed by default

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## Ordering code filter

01	02	03	04	05	06	07	08	09	09
<b>450FE</b>	<b>N</b>		<b>-</b>	<b>2X</b>	<b>/</b>	<b>B00</b>	<b>-</b>		<b>-</b>

**Series**

01	Block mounting filter 450 bar [6526 psi]	<b>450FE</b>
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**Filter element**

02	with filter element according to <b>DIN 24550</b>	<b>N</b>
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**Size**

03	FEN... (Filter element according to <b>DIN 24550</b> )	<b>0040</b> <b>0063</b> <b>0100</b> <b>0160</b> <b>0250</b> <b>0400</b> <b>0630</b> <b>1000</b>
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04	<b>Component series</b> 20 ... 29 (20 ... 29: unchanged installation and connection dimensions)	<b>2X</b>
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**Filter rating in µm**

05	<b>Absolute</b> (ISO 16889; $\beta_x(c) \geq 200$ )	Glass fiber material, not cleanable	<b>PWR3</b> <b>PWR6</b> <b>PWR10</b> <b>PWR20</b>
	<b>Nominal</b>	Stainless steel wire mesh, cleanable	<b>G10</b> <b>G25</b> <b>G100</b>

**Pressure differential**

06	Max. permissible pressure differential of the filter element 330 bar [4786 psi], filter <b>without</b> bypass valve	<b>B00</b>
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**Maintenance indicator**

07	Maintenance indicator, mech./optical, switching pressure 2.2 bar [32 psi]	<b>V2.2</b>
	Maintenance indicator, mech./optical, switching pressure 5.0 bar [72.5 psi]	<b>V5.0</b>
	Maintenance indicator, mech./optical, switching pressure 8.0 bar [116 psi]	<b>V8.0</b>

**Seal**

08	NBR seal	<b>M</b>
	FKM seal	<b>V</b>

**Supplementary information**

09	additional threaded couplings, G 1/4, at the inlet and outlet	<b>M</b>
	Manufacturer's inspection certificate M according to DIN 55350 T18	<b>Z1</b>

**Order example:****450FEN0040-2X/PWR10B00-V5,0-M****Further versions are available on request.****Material no. R928054175****Ports**

Port	Frame size		
	<b>0040-0100</b>	<b>0160-0400</b>	<b>0630-1000</b>
DN18	●		
DN32		●	
DN50			●

 = Standard port

## Preferred types

NBR seal, without bypass, flow specifications for 30 mm<sup>2</sup>/s [143 SUS]

### Inline filter 450FEN, filter rating 3 µm

Type	Flow in l/min [US gpm] with $v = 30 \text{ mm}^2/\text{s}$ [143 SUS] and $\Delta p = 1.5 \text{ bar}$ [21.75 psi] <sup>1)</sup>	Material no. Filters	Material no. replacement filter element
450FEN0040-2X/PWR3B00-V5,0-M	31 [8.2]	R928054159	R928006654
450FEN0063-2X/PWR3B00-V5,0-M	45 [11.9]	R928054160	R928006708
450FEN0100-2X/PWR3B00-V5,0-M	57 [15.1]	R928054161	R928006762
450FEN0160-2X/PWR3B00-V5,0-M	182 [48.1]	R928054162	R928006816
450FEN0250-2X/PWR3B00-V5,0-M	250 [66.0]	R928054163	R928006870
450FEN0400-2X/PWR3B00-V5,0-M	305 [80.6]	R928054164	R928006924
450FEN0630-2X/PWR3B00-V5,0-M	382 [100.9]	R928054165	R928006978
450FEN1000-2X/PWR3B00-V5,0-M	462 [122.0]	R928054166	R928007032

### Inline filter 450FEN, filter rating 6 µm

Type	Flow in l/min [US gpm] with $v = 30 \text{ mm}^2/\text{s}$ [143 SUS] and $\Delta p = 1.5 \text{ bar}$ [21.75 psi] <sup>1)</sup>	Material no. Filters	Material no. replacement filter element
450FEN0040-2X/PWR6B00-V5,0-M	38 [10.0]	R928054167	R928006655
450FEN0063-2X/PWR6B00-V5,0-M	55 [14.5]	R928054168	R928006709
450FEN0100-2X/PWR6B00-V5,0-M	60 [15.9]	R928054169	R928006763
450FEN0160-2X/PWR6B00-V5,0-M	215 [56.8]	R928054170	R928006817
450FEN0250-2X/PWR6B00-V5,0-M	270 [71.3]	R928054171	R928006871
450FEN0400-2X/PWR6B00-V5,0-M	337 [89.0]	R928054172	R928006925
450FEN0630-2X/PWR6B00-V5,0-M	430 [113.6]	R928054173	R928006979
450FEN1000-2X/PWR6B00-V5,0-M	501 [132.4]	R928054174	R928007033

### Inline filter 450FEN, filter rating 10 µm

Type	Flow in l/min [US gpm] with $v = 30 \text{ mm}^2/\text{s}$ [143 SUS] and $\Delta p = 1.5 \text{ bar}$ [21.75 psi] <sup>1)</sup>	Material no. Filters	Material no. replacement filter element
450FEN0040-2X/PWR10B00-V5,0-M	51 [13.5]	R928054175	R928006656
450FEN0063-2X/PWR10B00-V5,0-M	62 [16.4]	R928054176	R928006710
450FEN0100-2X/PWR10B00-V5,0-M	68 [18.0]	R928054177	R928006764
450FEN0160-2X/PWR10B00-V5,0-M	246 [65.0]	R928054072	R928006818
450FEN0250-2X/PWR10B00-V5,0-M	300 [79.3]	R928054073	R928006872
450FEN0400-2X/PWR10B00-V5,0-M	346 [91.4]	R928054074	R928006926
450FEN0630-2X/PWR10B00-V5,0-M	465 [122.8]	R928053894	R928006980
450FEN0100-2X/PWR10B00-V5,0-M	518 [136.8]	R928053895	R928007034

<sup>1)</sup> An appropriate differential pressure via the filter and measuring device according to ISO 3968. The differential pressure measured on the maintenance indicator is lower.

**Ordering code**  
**accessories**  
 (dimensions in mm [*inch*])

**Electronic switching element for maintenance indicators**

01	02	03
WE	-	-

**Maintenance indicator**

01	electronic switching element	WE
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**Type of signal**

02	1 switching point	1SP
	2 switching points, 3 LED	2SP
	2 switching points, 3 LED and signal suppression up to 30 °C [86 °F]	2SPSU

**Connector**

03	Round plug-in connection M12x1, 4-pole	M12x1
	Rectangular plug-in connection, 2-pole, design A according to EN-175301-803	EN175301-803

**Material numbers of the electronic switching elements**

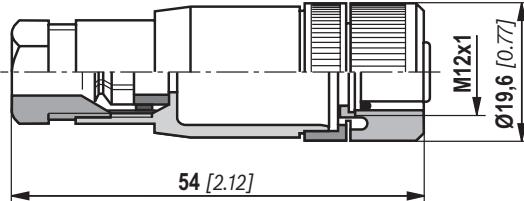
Material no.	Type	Signal	Switching points	Connector	LED
R928028409	WE-1SP-M12x1	Changeover	1	M12x1	without
R928028410	WE-2SP-M12x1	Normally open (at 75%) / normally closed contact (at 100%)	2		3 pieces
R928028411	WE-2SPSU-M12x1				
R928036318	WE-1SP-EN175301-803	Normally closed contact	1	EN 175301-803	without

**Mating connectors according to IEC 60947-5-2**

for electronic switching element with round plug-in connection M12x1

Mating connector suitable for K24 4-pole, M12x1 with screw connection, cable gland Pg9.

**Material no. R900031155**

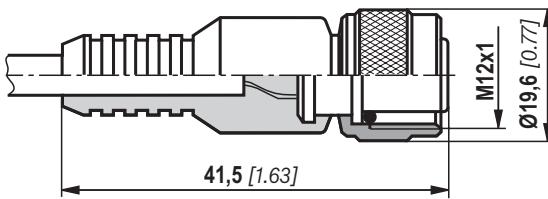


Mating connector suitable for K24-3m 4-pole, M12x1 with potted-in PVC cable, 3 m long.

Line cross-section: 4 x 0.34 mm<sup>2</sup>

Core marking: 1 brown 2 white  
3 blue 4 black

**Material no. R900064381**



For more round plug-in connections refer to data sheet 08006.

**Order example:**

Block mounting filter with mechanical optical maintenance indicator for  $p_{\text{nominal}} = 450$  bar [6526 psi] size 0160, with filter element 10 µm and electronic switching element M12x1 with one switching point.

**Filter with mech. optical**

**maintenance indicator:**

450FEN0160-2X/PWR10B00-V5,0-M

**Material no. R928054072**

**Electronic switching element:**

WE-1SP-M12x1

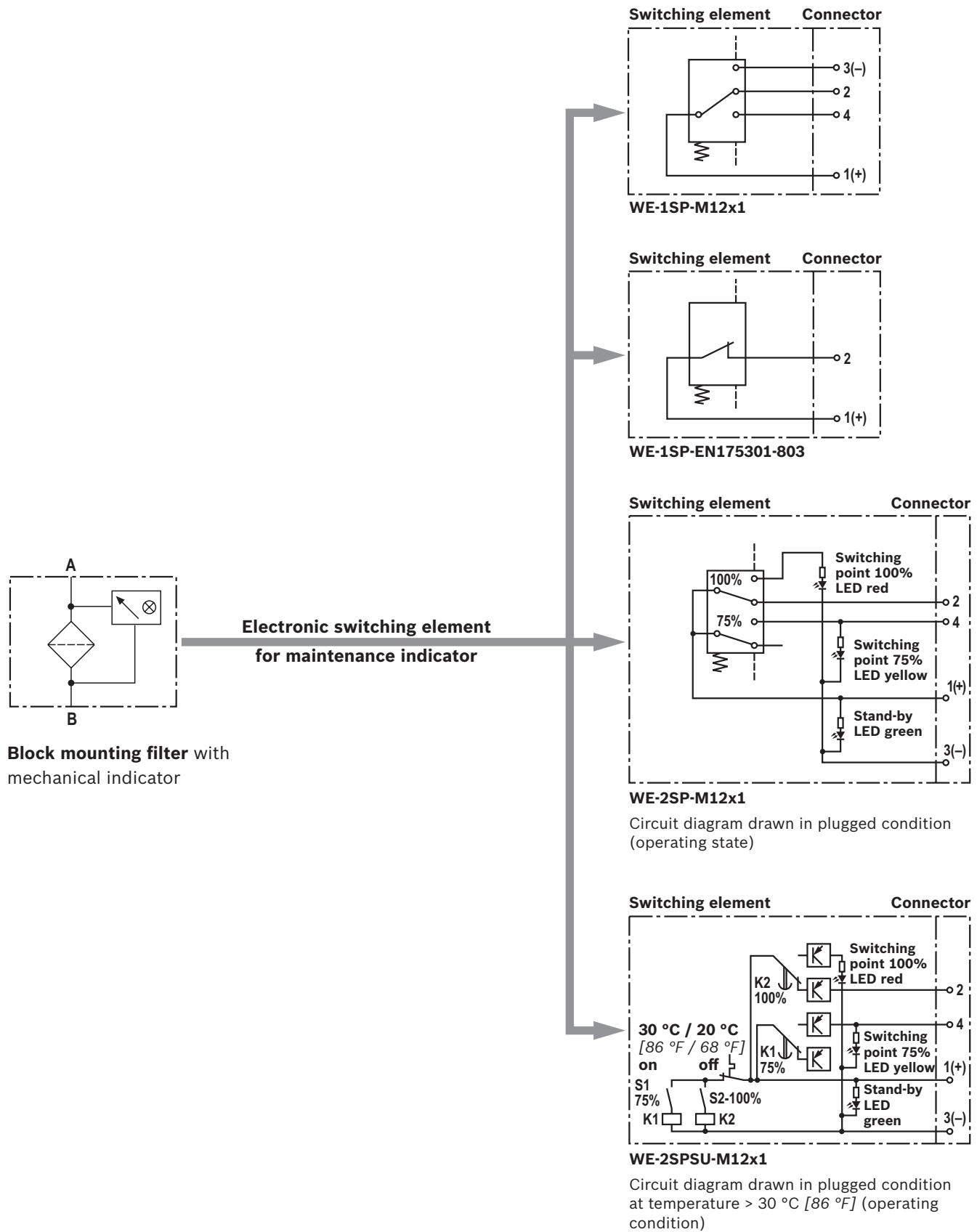
**Material no. R928028409**

**Mating connector:**

Mating connector suitable for K24 4-pole, M12x1

**Material no. R900031155**

## Symbols



## Function, section

The block mounting filter 450FEN is suitable for direct mounting on manifold blocks.

The filter basically consists of filter head (1), a threaded filter bowl (2), filter element (3) as well as a mechanical optical maintenance indicator (4).

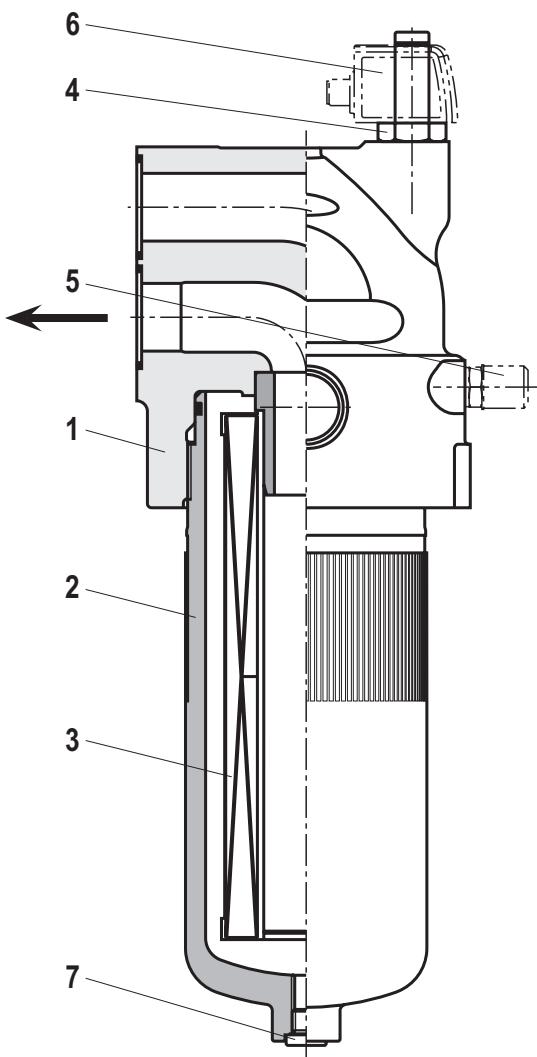
Via the inlet, the hydraulic fluid reaches the filter element (3) where it is cleaned. The dirt particles filtered out collect in the filter element (3). Via the outlet, the filtered hydraulic fluid enters the hydraulic circuit.

The filter housing and all associated elements are designed so that pressure peaks – as they may occur in case of abrupt opening of large control valves due to the accelerated fluid quantity – can be securely absorbed. For sizes 0160 and larger, the standard equipment comprises a drain screw (7). A two-piece filter bowl is standard for size 1000.

By default, measuring ports are drilled at the inlet and outlet and closed with VSTI plug screws. A pressure differential measurement or venting of the filter is possible via the optional threaded coupling – order supplementary option “M”.

By default, the filter is equipped with mechanical optical maintenance indicator (4). The electronic switching element (6) which has to be ordered separately is attached to the mechanical optical maintenance indicator (4) and held by means of a locking ring.

The electronic switching elements with 1 or 2 switching points are connected via a mating connector according to IEC-60947-5-2 or via a cable connection according to EN17301-803.



**Type 450FEN0160**

**Technical data**

(For applications outside these parameters, please consult us!)

<b>General</b>							
Installation position	vertical						
Ambient temperature range	°C [°F] -10 ... +65 [14 ... +149] (shortly up 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%						
Mass filter	NS	<b>0040</b>	<b>0063</b>	<b>0100</b>	<b>160</b>		
	kg [lbs]	5,7 [12.56]	6,4 [14.11]	7,25 [15.98]	18,5 [40.77]		
	NS	<b>0250</b>	<b>0400</b>	<b>0630</b>	<b>1000</b>		
	kg [lbs]	20,5 [45.18]	24,5 [54.00]	56 [123.42]	92 [202.77]		
Volume	NS	<b>0040</b>	<b>0063</b>	<b>0100</b>	<b>0160</b>		
	l [US gal]	0,32 [0.08]	0,47 [0.12]	0,68 [0.18]	1,68 [0.44]		
	NS	<b>0250</b>	<b>0400</b>	<b>0630</b>	<b>1000</b>		
	l [US gal]	2,25 [0.59]	3,25 [0.86]	4,9 [1.29]	6,9 [1.82]		
Mass filter bowl	NS	<b>0040</b>	<b>0063</b>	<b>0100</b>	<b>160</b>		
	kg [lbs]	1,33 [2.93]	1,33 [2.93]	2,1 [4.63]	5,52 [12.17]		
	NS	<b>0250</b>	<b>0400</b>	<b>0630</b>	<b>1000</b>		
	kg [lbs]	8,02 [17.68]	12,21 [26.91]	21,36 [47.08]	45,34 [99.93]		
Material	– Filter head	Ductile Iron					
	– Filter bowl	Steel					
	– Seals	NBR or FKM					
	– Visual maintenance indicator	Brass					
	– Electronic switching element	Plastic PA6					
Surface requirement	– Roughness depth $R_z$ max.	µm	4				
tank hydraulic block	– Levelness $t_E$ max.	mm	0,05				
<b>Hydraulic</b>							
Maximum operating pressure	bar [psi]		450 [6526]				
Hydraulic fluid temperature range	°C [°F]		-10 ... +100 [+14 ... +212]				
Minimum conductivity of the medium	pS/m		300				
Fatigue strength according to ISO 10771	Load cycles		> 10 <sup>6</sup> at rated operating pressure				
Type of pressure measurement of the maintenance indicator	Pressure differential						
Assignment: Response pressure of the maintenance indicator/cracking pressure of the bypass valve	Response pressure of the maintenance indicator			Cracking pressure of the bypass valve			
	bar [psi]			Bypass valve not possible			
	2,2 ± 0,3 [31.9 ± 4.4]						
	5,0 ± 0,5 [72.5 ± 7.3]						
Filtration direction	From the outside to the inside						

## Technical data

(For applications outside these parameters, please consult us!)

Electric (electronic switching element)				
Electrical connection	Version	Round plug-in connection M12x1, 4-pole		
		WE-1SP-M12x1	WE-2SP-M12x1	WE-2SPSU-M12x1
Contact load, direct voltage	A <sub>max.</sub>	1		Standard connection EN 175301-803
Voltage range	V <sub>max.</sub>	150 (AC/DC)	10-30 (DC)	
max. switching power with resistive load	W	20		70
Switching type	– 75% signal	–	Normally open contact	–
	– 100% signal	Changeover	Normally closed contact	Normally closed contact
	– 2SPSU		Signal interconnection at 30 °C [86 °F], return switching at 20 °C [68 °F]	
Display via LEDs in the electronic switching element 2SP...			Stand-by (LED green); 75% switching point (LED yellow) 100% switching point (LED red)	
Protection class according to EN 60529		IP 67		IP 65
Ambient temperature range	°C [°F]	–25 ... +85 [-13 ... +185]		
For direct voltage above 24 V, spark extinguishing is to be provided for protecting the switching contacts.				
Weight – electronic switching element:		0,1 [0.22]		

## Filter element

Glass fiber material PWR..		
		Single-use element on the basis of inorganic fiber
		Filtration ratio according to ISO 16889 up to $\Delta p = 5 \text{ bar} [72.5 \text{ psi}]$
	PWR20	$\beta_{20}(c) \geq 200$
	PWR10	$\beta_{10}(c) \geq 200$
	PWR6	$\beta_6(c) \geq 200$
	PWR3	$\beta_5(c) \geq 200$
Pressure difference	– B00	bar [psi] 330 [4785]

## Compatibility with permitted hydraulic fluids

Hydraulic fluid	Classification	Suitable sealing materials	Standards
Mineral oil	HLP	NBR	DIN 51524
Bio-degradable	– insoluble in water	HETG	VDMA 24568
	– soluble in water	HEES	
Flame-resistant	– water-free	HEPG	VDMA 24568
	– containing water	HFDU, HFDR	
		FKM	VDMA 24317
		NBR	
	HFAS	NBR	DIN 24320
	HFAE	NBR	
	HFC	NBR	VDMA 24317

### Important information on 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 P 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.

## Characteristic curves PWR3

(measured with mineral oil HLP46 according to DIN 51524)

Spec. weight: < 0.9 kg/dm<sup>3</sup>

$\Delta p$ -Q characteristic curves for complete filters recommended initial  $\Delta p$  for version = 1.5 bar [21.75 psi]

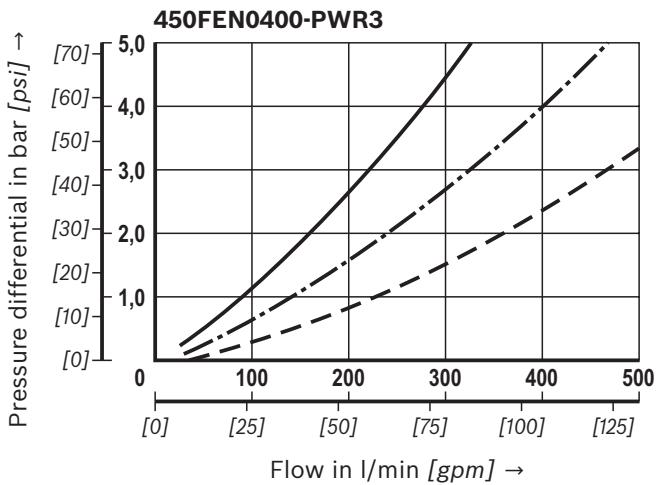
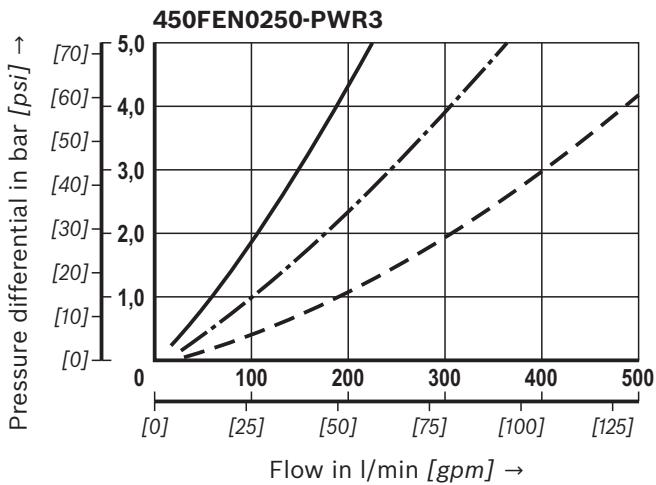
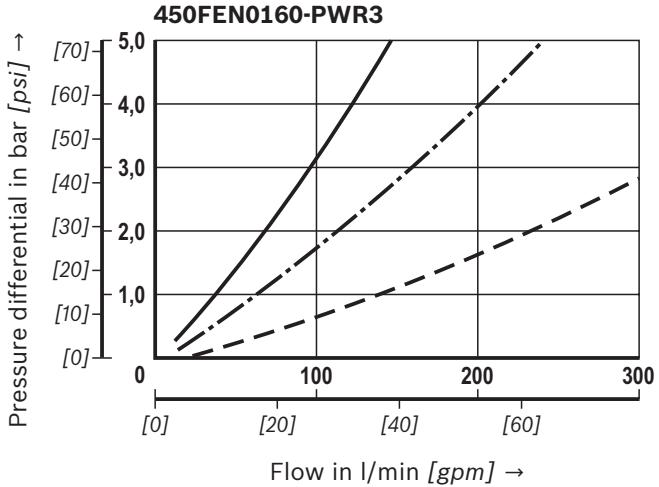
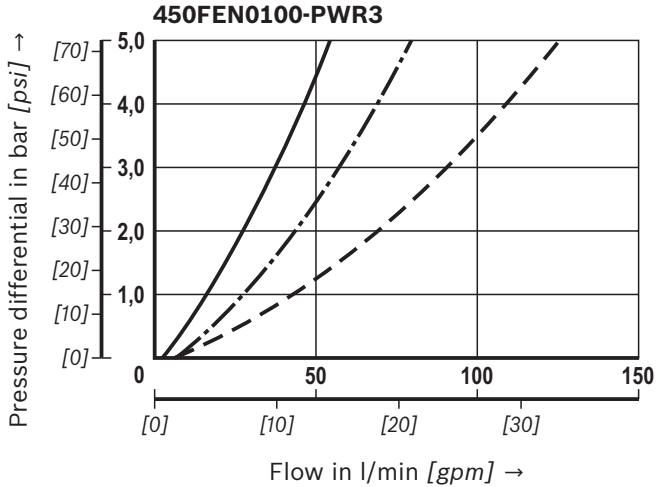
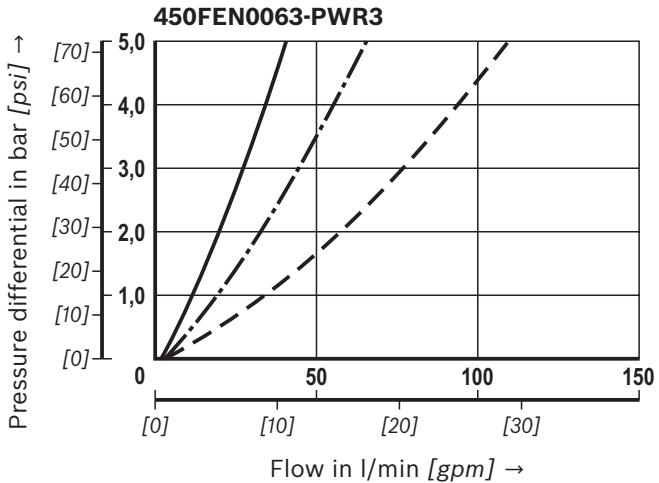
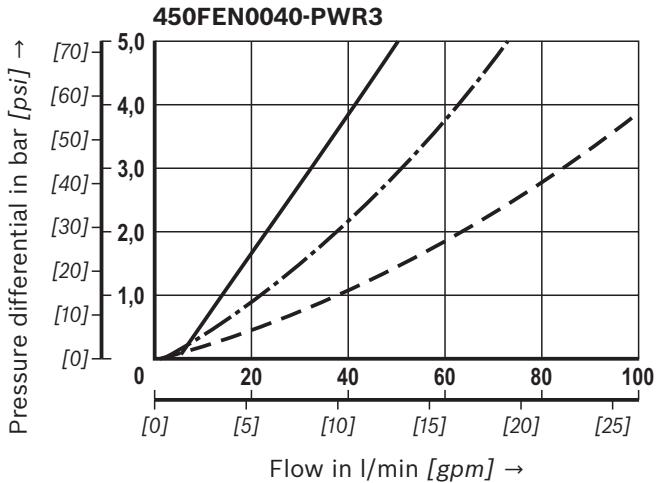
Selection of the correct filter is made possible by our online "FilterSelect" design software.

— 140 mm<sup>2</sup>/s [649 SUS]

— 68 mm<sup>2</sup>/s [315 SUS]

— 30 mm<sup>2</sup>/s [143 SUS]

Oil viscosity:



**Characteristic curves PWR3, PWR6**

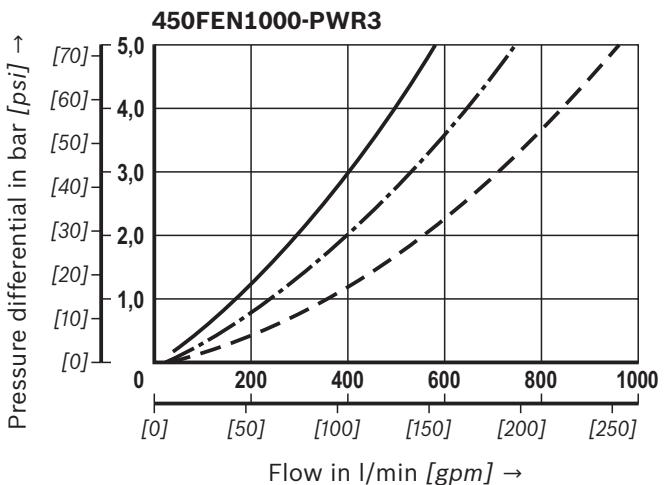
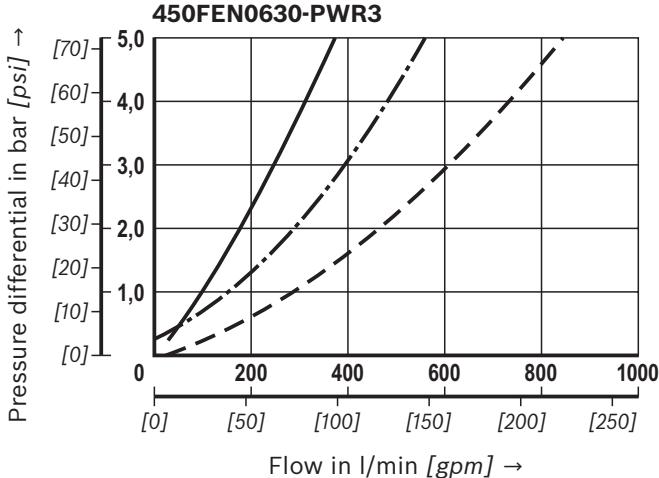
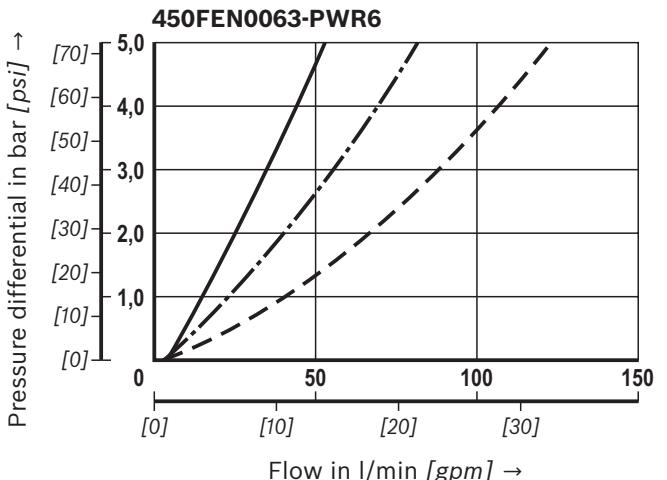
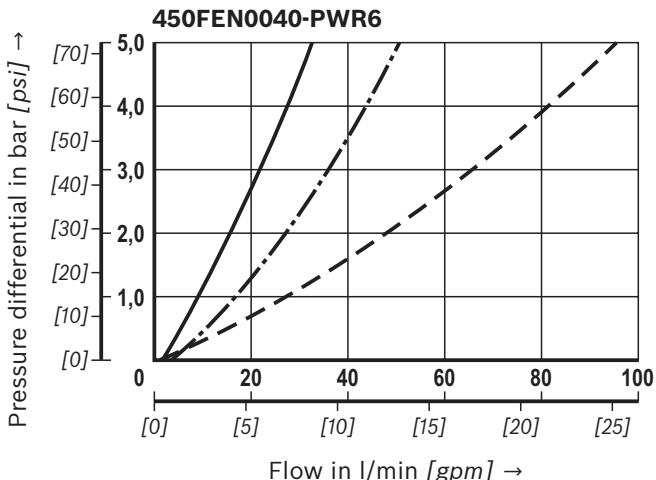
(measured with mineral oil HLP46 according to DIN 51524)

Spec. weight: < 0.9 kg/dm<sup>3</sup> $\Delta p$ -Q characteristic curves for complete filters recommended initial  $\Delta p$  for version = 1.5 bar [21.75 psi]

Selection of the correct filter is made possible by our online “FilterSelect” design software.

— 140 mm<sup>2</sup>/s [649 SUS]  
 - - - 68 mm<sup>2</sup>/s [315 SUS]  
 - - - 30 mm<sup>2</sup>/s [143 SUS]

Oil viscosity:

**PWR3****PWR6**

## Characteristic curves PWR6

(measured with mineral oil HLP46 according to DIN 51524)

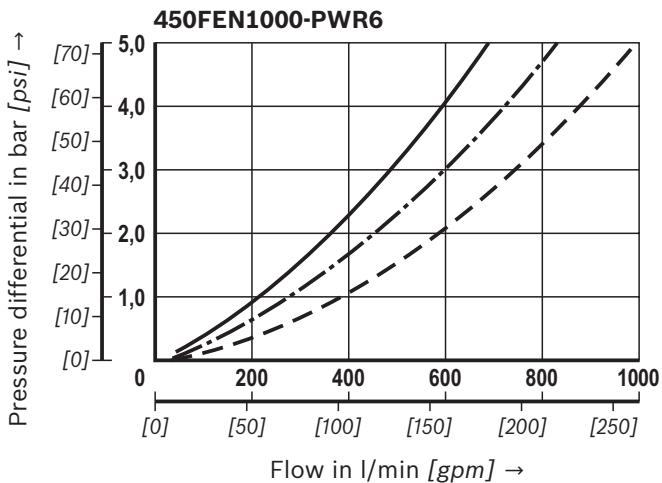
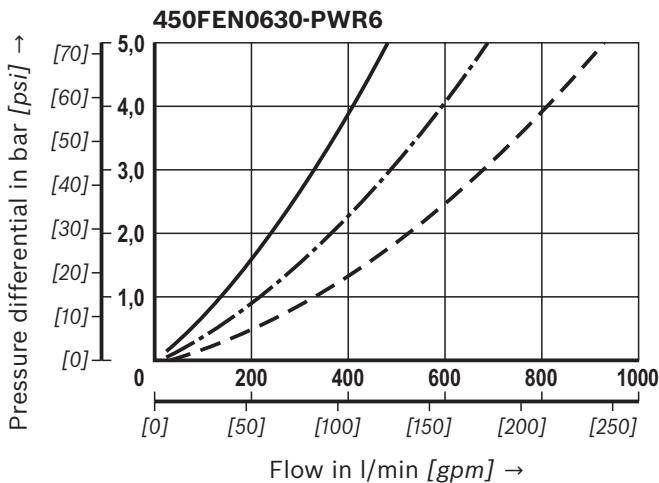
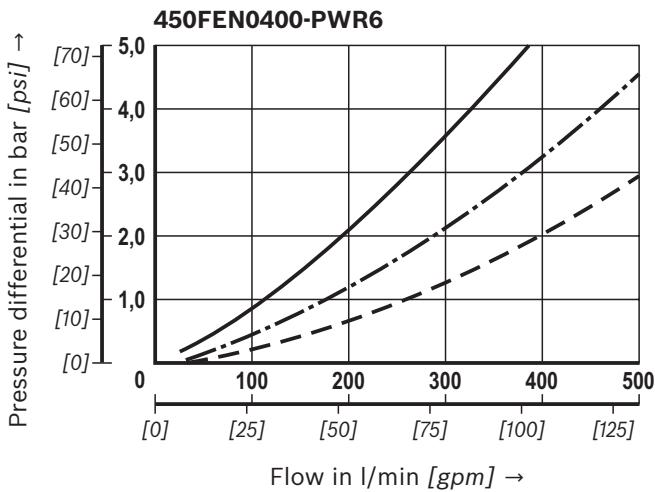
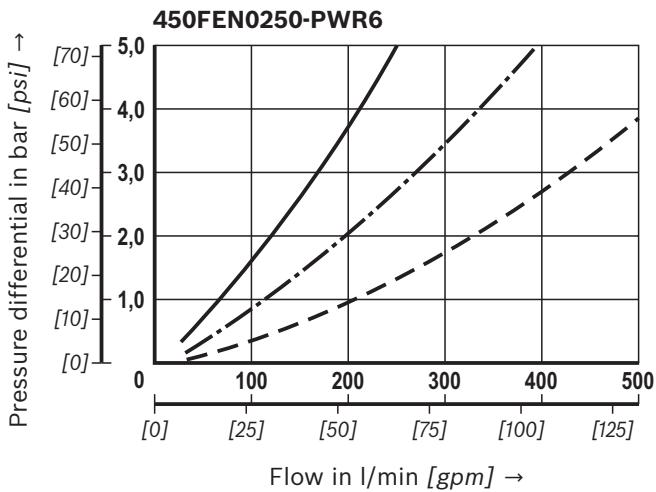
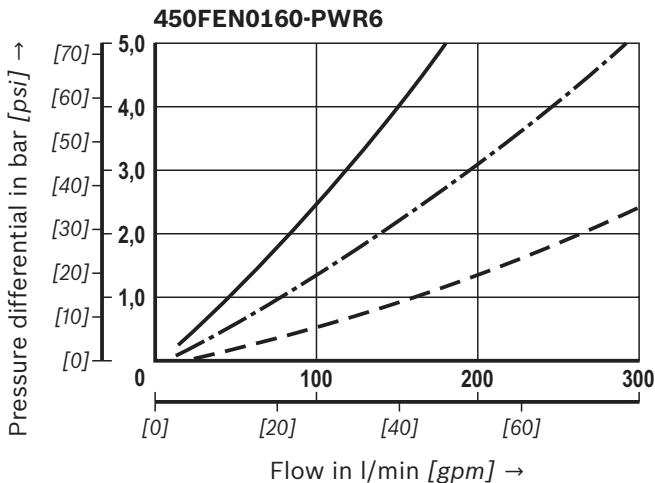
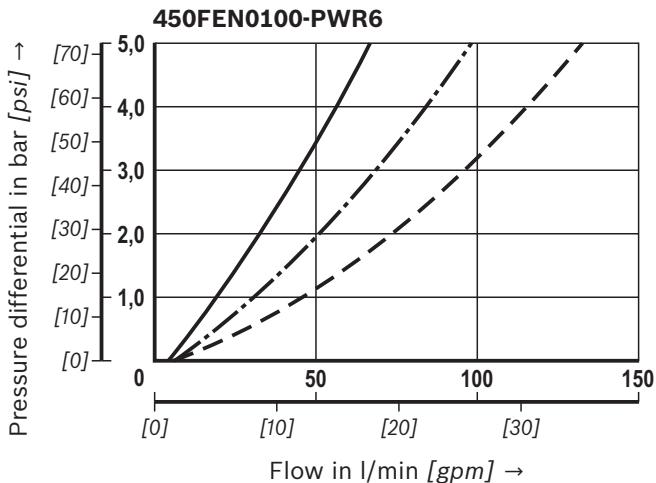
Spec. weight: < 0.9 kg/dm<sup>3</sup>

$\Delta p$ -Q characteristic curves for complete filters recommended initial  $\Delta p$  for version = 1.5 bar [21.75 psi]

Selection of the correct filter is made possible by our online "FilterSelect" design software.

— 140 mm<sup>2</sup>/s [649 SUS]  
- - - 68 mm<sup>2</sup>/s [315 SUS]  
- - - 30 mm<sup>2</sup>/s [143 SUS]

Oil viscosity:



## Characteristic curves PWR10

(measured with mineral oil HLP46 according to DIN 51524)

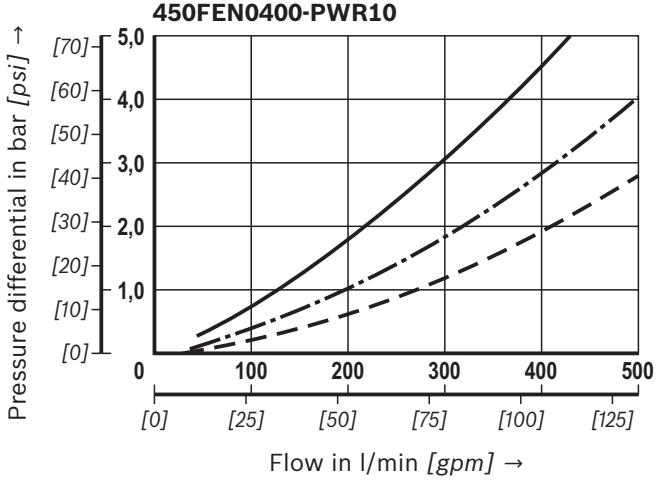
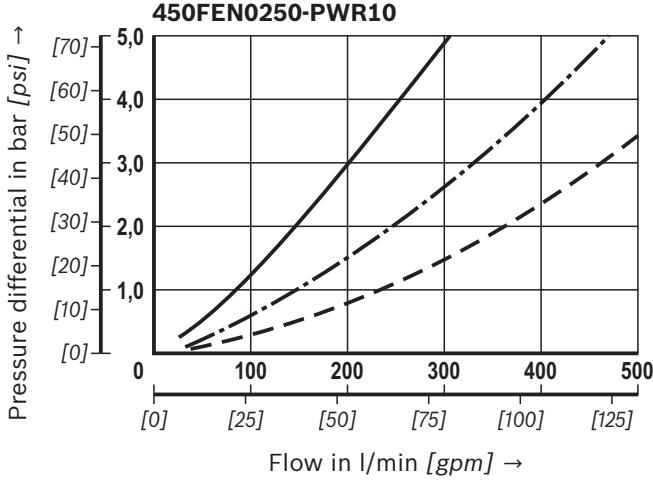
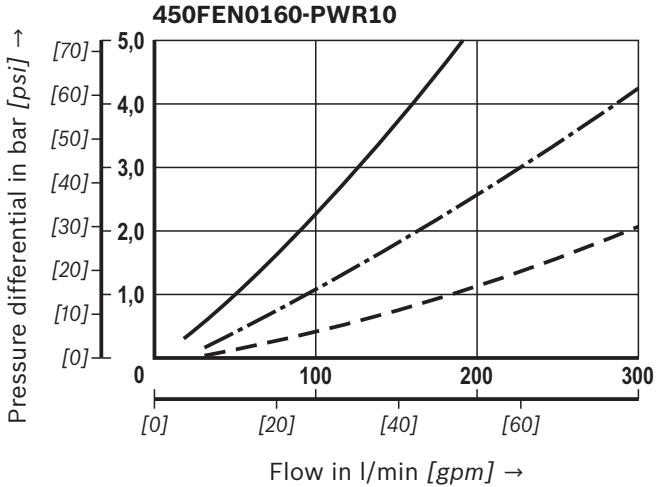
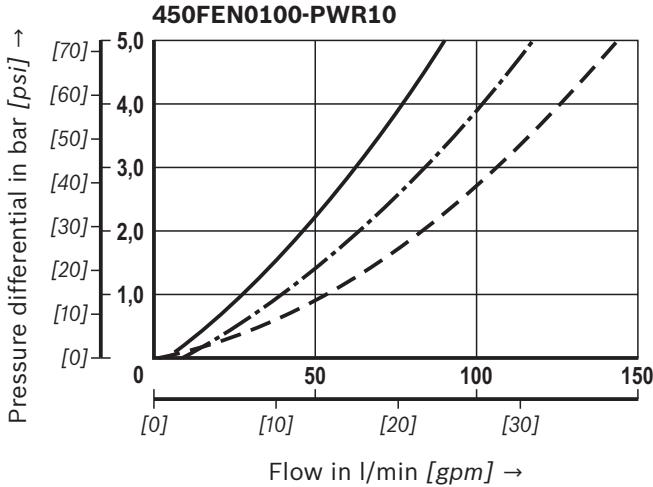
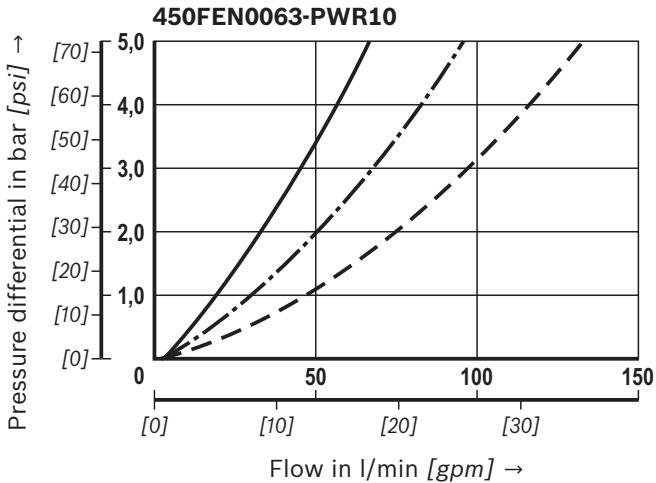
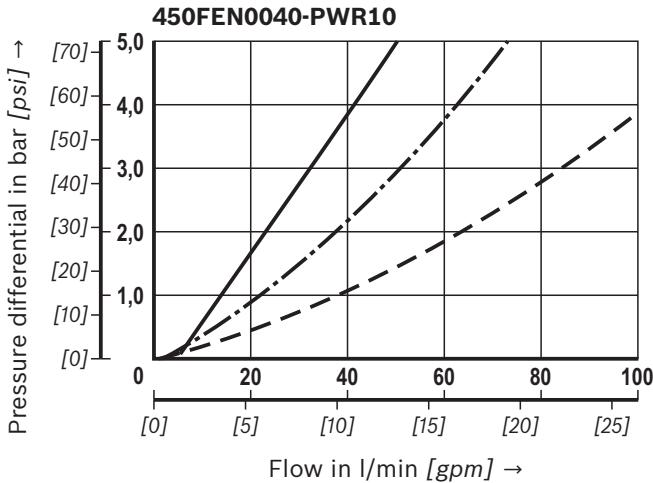
Spec. weight: < 0.9 kg/dm<sup>3</sup>

$\Delta p$ -Q characteristic curves for complete filters recommended initial  $\Delta p$  for version = 1.5 bar [21.75 psi]

Selection of the correct filter is made possible by our online “FilterSelect” design software.

— 140 mm<sup>2</sup>/s [649 SUS]  
 - - - 68 mm<sup>2</sup>/s [315 SUS]  
 - - - 30 mm<sup>2</sup>/s [143 SUS]

Oil viscosity:



## Characteristic curves PWR10

(measured with mineral oil HLP46 according to DIN 51524)

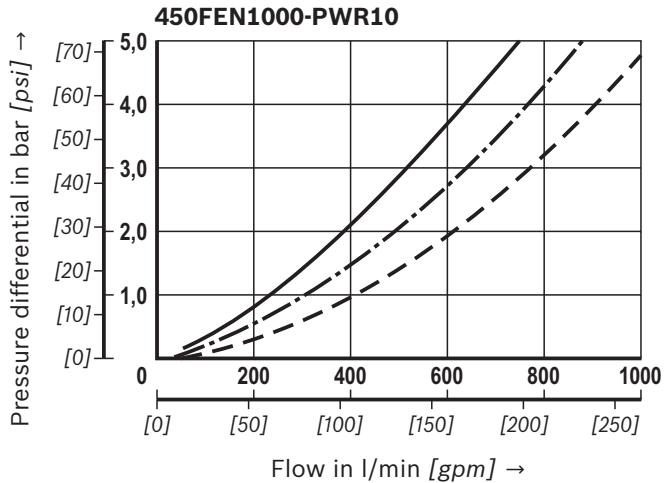
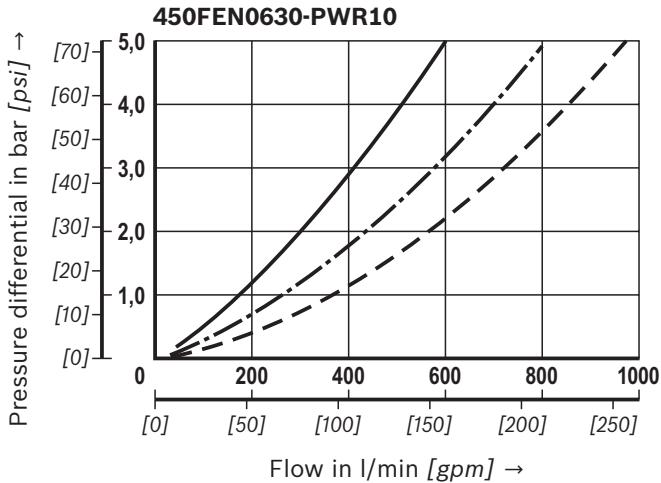
Spec. weight: < 0.9 kg/dm<sup>3</sup>

$\Delta p$ -Q characteristic curves for complete filters recommended initial  $\Delta p$  for version = 1.5 bar [21.75 psi]

Selection of the correct filter is made possible by our online "FilterSelect" design software.

— 140 mm<sup>2</sup>/s [649 SUS]  
 - - - 68 mm<sup>2</sup>/s [315 SUS]  
 - - - 30 mm<sup>2</sup>/s [143 SUS]

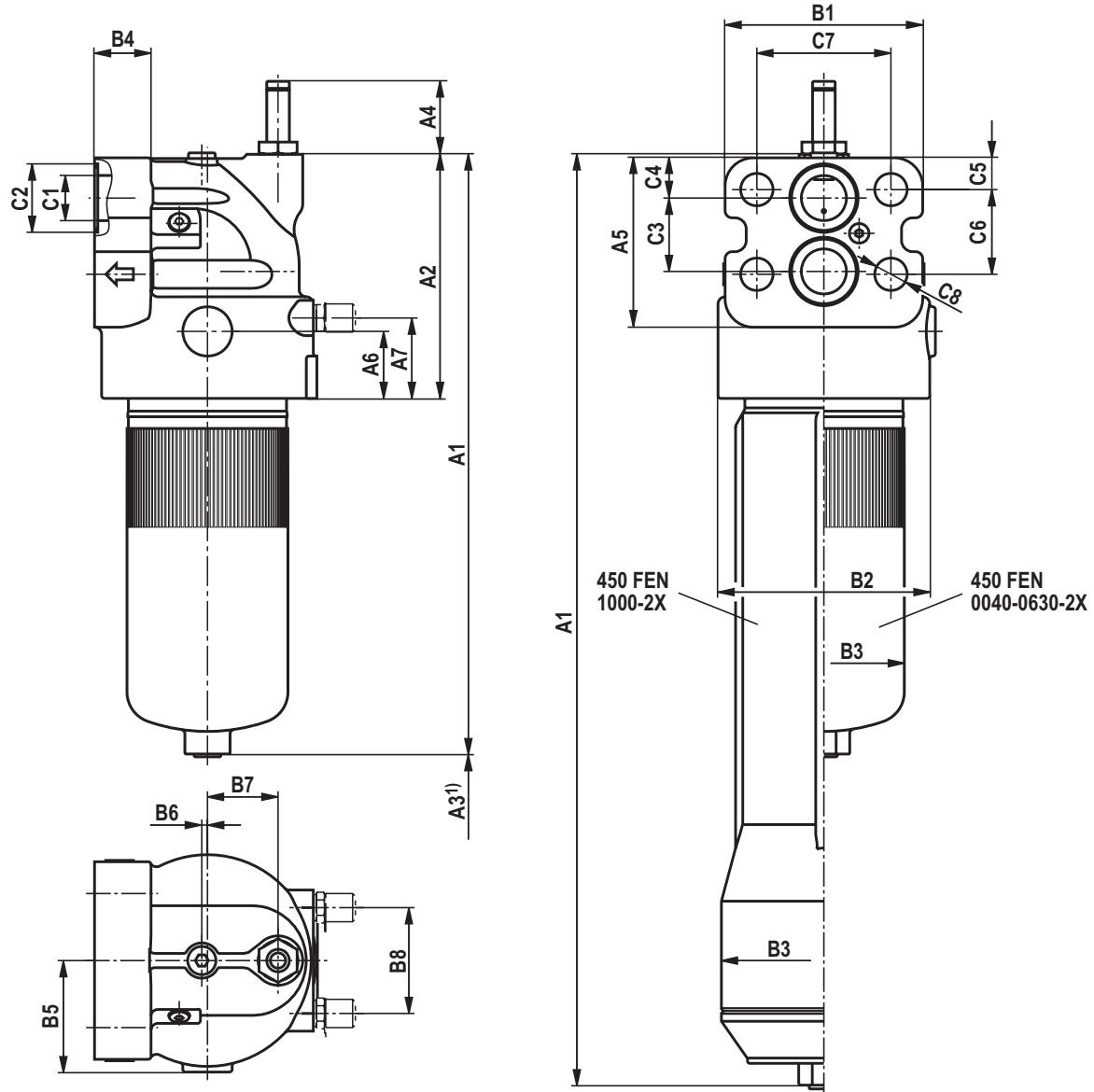
Oil viscosity:



**Dimensions: Size 0040 – size 1000**

(dimensions in mm [inch])

**450FEN0040-1000**



**Dimensions: Size 0040 – size 1000**(dimensions in mm [*inch*])**Filter housing for filter elements in accordance with DIN 24550**

Type	A1	A2	A3 <sup>1)</sup>	A4	A5	A6	A7
<b>450FEN0040</b>	216 [8.50]						
<b>450FEN0063</b>	279 [10.98]	130 [5.12]	80 [3.15]		80 [3.15]	42,5 [1.67]	47 [1.85]
<b>450FEN0100</b>	369 [14.53]						
<b>450FEN0160</b>	335 [13.19]						
<b>450FEN0250</b>	425 [16.73]	173 [6.81]	140 [5.51]	51,7 [2.04]	120 [4.72]	47,5 [1.87]	57 [2.24]
<b>450FEN0400</b>	575 [22.64]						
<b>450FEN0630</b>	653 [25.71]	239 [9.41]	140 [5.51]		160 [6.30]	75 [2.95]	86 [3.39]
<b>450FEN1000</b>	886 [34.88]		630 [24.80]				

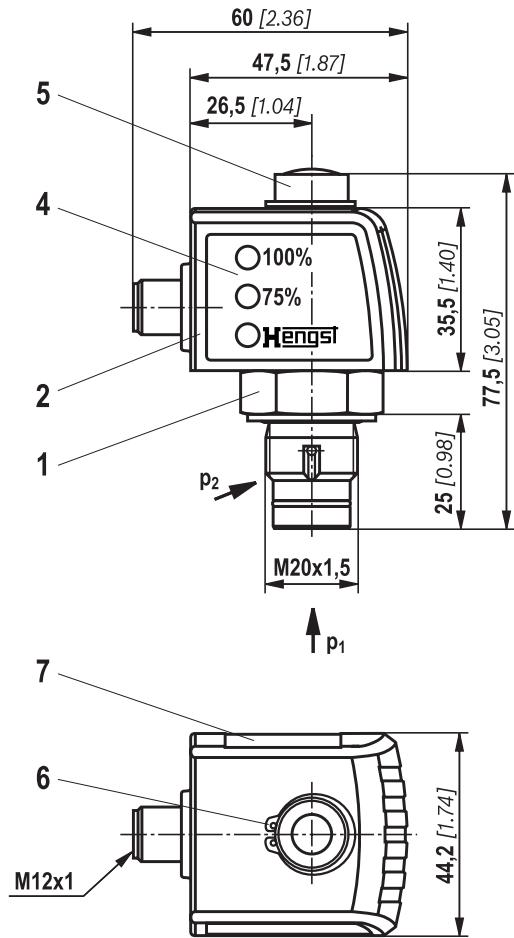
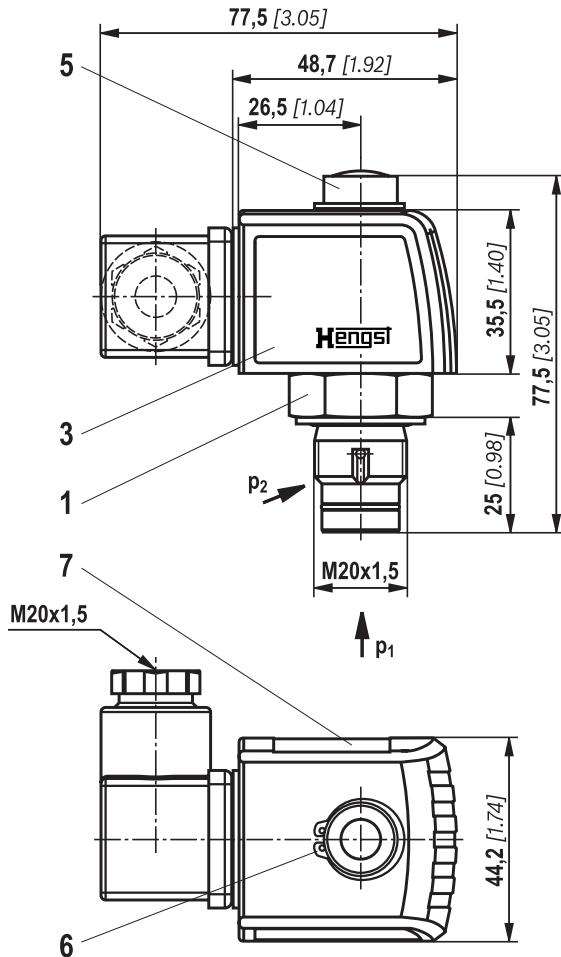
Type	B1	ØB2	ØB3	B4	B5	B6	B7	B8
<b>450FEN0040</b>								
<b>450FEN0063</b>	80 [3.15]	90 [3.54]	64 [2.52]	24 [0.94]	49 [1.93]	8 [0.31]	30 [1.18]	55 [2.17]
<b>450FEN0100</b>								
<b>450FEN0160</b>								
<b>450FEN0250</b>	140 [5.51]	150 [5.91]	114 [4.49]	39 [1.54]	79 [3.11]	4 [0.16]	50 [1.97]	75 [2.95]
<b>450FEN0400</b>								
<b>450FEN0630</b>	190 [7.48]	195 [7.68]	141 [5.55]	41 [1.61]	101,5 [4.00]	4 [0.16]	65 [2.56]	100 [3.94]
<b>450FEN1000</b>			188 [7.40]					

Type	ØC1	ØC2	C3	C4	C5	C6	C7	ØC8	SW
<b>450FEN0040</b>									
<b>450FEN0063</b>	14 [0.55]	23 [0.91]	28 [1.10]	27 [1.06]	12 [0.47]	45 [1.77]	57 [2.24]	14 [0.55]	24 [0.94]
<b>450FEN0100</b>									
<b>450FEN0160</b>									
<b>450FEN0250</b>	32 [1.26]	47,5 [1.87]	52 [2.05]	28,5 [1.12]	22,5 [0.89]	60 [2.36]	95 [3.74]	23 [0.91]	32 [1.26]
<b>450FEN0400</b>									
<b>450FEN0630</b>	50 [1.97]	60 [2.36]	67 [2.64]	41 [1.61]	25 [0.98]	86 [3.39]	140 [5.51]	27 [1.06]	41 [1.61]
<b>450FEN1000</b>									

<sup>1)</sup> Servicing height for filter element exchange

**Maintenance indicator**

(dimensions in mm [inch])

**Pressure differential indicator with mounted switching element M12x1****Pressure differential indicator with mounted switching element EN-175301-803**

- 1 Mechanical optical maintenance indicator; max. tightening torque  $M_{A\ max} = 50 \text{ Nm} [36.88 \text{ lb-ft}]$
- 2 Switching element with locking ring for electrical maintenance indicator (rotatable by 360°); round plug-in connection M12x1, 4-pole
- 3 Switching element with locking ring for electrical maintenance indicator (rotatable by 360°); rectangular plug-in connection EN175301-803
- 4 Housing with three LEDs: 24 V =
  - green: Stand-by
  - yellow: Switching point 75%
  - red: Switching point 100%
- 5 Visual indicator with memory function
- 6 Locking ring DIN 471-16x1, material no. **R900003923**
- 7 Name plate

**Notices:**

Representation contains mechanical optical maintenance indicator (1) and electronic switching element (2) (3).

## Ordering code spare parts

### Filter element

01	02	03	04	05	06
<b>2.</b>			<b>B00</b>	<b>0</b>	<b>-</b>

### Filter element

01	Design	<b>2.</b>
----	--------	-----------

### Size

02	FEN... (Filter elements according to <b>DIN 24550</b> )	0040 0063 0100 0160 0250 0400 0630 1000
----	--	--

### Filter rating in $\mu\text{m}$

03	<b>Absolute</b> (ISO 16889; $\beta_x(c) \geq 200$ )	Glass fiber material, not cleanable	PWR3 PWR6 PWR10 PWR20
	<b>Nominal</b>	Stainless steel wire mesh, cleanable	G10 G25 G100

### Pressure differential

04	Max. permissible pressure differential of the filter element 330 bar [4786 psi], filter <b>without</b> bypass valve	<b>B00</b>
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### Bypass valve

05	<b>without</b> bypass valve	<b>0</b>
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### Seal

06	NBR seal	<b>M</b>
	FKM seal	<b>V</b>

### Order example:

**2.0100 PWR3-B00-0-M**

For detailed information on Hengst filter elements please refer to data sheet **51420**.

### Preferred program replacement filter element

Replacement filter element 3 micron		Replacement filter element 6 micron		Replacement filter element 10 micron	
R928006654	2.0040 PWR3-B00-0-M	R928006655	2.0040 PWR6-B00-0-M	R928006656	2.0040 PWR10-B00-0-M
R928006708	2.0063 PWR3-B00-0-M	R928006709	2.0063 PWR6-B00-0-M	R928006710	2.0063 PWR10-B00-0-M
R928006762	2.0100 PWR3-B00-0-M	R928006763	2.0100 PWR6-B00-0-M	R928006764	2.0100 PWR10-B00-0-M
R928006816	2.0160 PWR3-B00-0-M	R928006817	2.0160 PWR6-B00-0-M	R928006818	2.0160 PWR10-B00-0-M
R928006870	2.0250 PWR3-B00-0-M	R928006871	2.0250 PWR6-B00-0-M	R928006872	2.0250 PWR10-B00-0-M
R928006924	2.0400 PWR3-B00-0-M	R928006925	2.0400 PWR6-B00-0-M	R928006926	2.0400 PWR10-B00-0-M
R928006978	2.0630 PWR3-B00-0-M	R928006979	2.0630 PWR6-B00-0-M	R928006980	2.0630 PWR10-B00-0-M
R928007032	2.1000 PWR3-B00-0-M	R928007033	2.1000 PWR6-B00-0-M	R928007034	2.1000 PWR10-B00-0-M

## Ordering code spare parts

### Mechanical optical maintenance indicator

01	02	03	04	05	06
<b>W</b>	<b>O</b>	<b>-</b>	<b>D01</b>	<b>-</b>	

01	<b>Maintenance indicator</b>	<b>W</b>
02	<b>Mechanical optical indicator</b>	<b>O</b>

### Version

03	Pressure difference, modular design	<b>D01</b>
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### Switching pressure

04	2.2 bar [32 psi]	<b>2,2</b>
	5.0 bar [72.5 psi]	<b>5,0</b>
	8.0 bar [116 psi]	<b>8,0</b>

### Seal

05	NBR seal	<b>M</b>
	FKM seal	<b>V</b>

### Max. operating pressure

06	Switching pressure 2.2 bar [31.9 psi], 450 bar [6527 psi]	<b>450</b>
	Switching pressure 5.0 bar [72.5 psi], 450 bar [6527 psi]	
	Switching pressure 8.0 bar [116 psi], 450 bar [6527 psi]	

### Mechanical optical maintenance indicator

Material no.	Description
<b>R928038783</b>	WO-D01-2,2-M-450
<b>R928038782</b>	WO-D01-2,2-V-450
<b>R901025313</b>	WO-D01-5,0-M-450
<b>R901066235</b>	WO-D01-5,0-V-450
<b>R928038785</b>	WO-D01-8,0-M-450
<b>R928038784</b>	WO-D01-8,0-V-450

## Ordering code spare parts

### Seal kit

01	02	03	04	05
<b>D</b>	<b>450FEN</b>		<b>2X</b>	<b>/</b>

01	<b>Seal kit</b>	<b>D</b>
02	<b>Series 450FEN</b>	<b>450FEN</b>

### Size

03	0040-0100	<b>0040-0100</b>
	0160-0400	<b>0160-0400</b>
	0630-1000	<b>0630-1000</b>

04	<b>Component series</b> 20 ... 29 (20 ... 29: unchanged installation and connection dimensions)	<b>2X</b>
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### Seal

05	NBR seal	<b>M</b>
	FKM seal	<b>V</b>

### Seal kit

Material no.	Description
<b>R961010375</b>	D450FEN0040-0100-2X/-M
<b>R961010376</b>	D450FEN0160-0400-2X/-M
<b>R961010377</b>	D450FEN0630-1000-2X/-M
<b>R961010378</b>	D450FEN0040-0100-2X/-V
<b>R961010379</b>	D450FEN0160-0400-2X/-V
<b>R961010380</b>	D450FEN0630-1000-2X/-V

## Assembly, commissioning, maintenance

### Assembly

- ▶ The max. operating pressure of the system must not exceed the max. permissible operating pressure of the filter (see type plate).
- ▶ During assembly of the filter (see also chapter "Tightening torques"), the flow direction (direction arrows) and the required servicing height of the filter element (see chapter "Dimensions") are to be considered.
- ▶ Filter element exchange is made easiest when the filter bowl is oriented downward. The maintenance indicator must be arranged so it is easily viewed in operation.
- ▶ Remove the plastic plugs from the filter inlet and outlet.
- ▶ Ensure that the system is assembled without tension stress.
- ▶ The optional electronic maintenance indicator is connected via the electronic switching element with one or two switching points, which is attached to the mechanical optical maintenance indicator and held by means of the locking ring.

### Commissioning

- ▶ Commission the system.

#### **Notice:**

There is no bleeding provided at the filter. However, all sizes have optional threaded couplings which may also be used for bleeding.

### Maintenance

- ▶ If at operating temperature, the red indicator pin reaches out of the mechanical optical maintenance indicator and/or if the electronic switching element opens / closes the circuit, the filter element is contaminated and needs to be replaced or cleaned respectively.
- ▶ The material number of the corresponding replacement filter element is indicated on the name plate of the complete filter. It must correspond to the material number on the filter element.

#### **WARNING!**

<ul style="list-style-type: none"> <li>▶ Assemble and disassemble only with depressurized system!</li> <li>▶ Filter is under pressure!</li> </ul>	<ul style="list-style-type: none"> <li>▶ Remove the filter bowl only if it is not under pressure!</li> <li>▶ Do not exchange the mechanical-optical maintenance indicator while the filter is under pressure!</li> </ul>
---	--

#### **Notices:**

- ▶ All maintenance of the filter should be performed by trained specialists.
- ▶ Functioning and safety are only guaranteed if original Hengst filter elements and spare parts are used.

- ▶ Decommission the system.
- ▶ The operating pressure is to be released on the system side.

#### **Notice:**

There is no bleeding provided at the filter. However, all sizes have optional threaded couplings which may also be used for bleeding.

- ▶ Using the drain plug (for sizes 0160 and larger) drain the oil from the filter bowl.
- ▶ Unscrew filter bowl (or base with size 1000).
- ▶ Remove the filter element from the spigot by rotating it slightly.
- ▶ Clean the filter components, if necessary.
- ▶ Check the seals at the filter bowl for damage and replace them, if necessary.
- ▶ For suitable seal kits refer to chapter "Spare parts".
- ▶ Filter elements made of wire mesh can be cleaned. For detailed cleaning instructions refer to data sheet 51420.
- ▶ Install the new or cleaned filter element on the spigot again by slightly rotating it.
- ▶ The filter is to be assembled in reverse order. Please note:  
Screw in the filter bowl to the stop, unscrew the filter bowl again by 1/8 to 1/2 rotation so that the filter bowl does not get stuck due to the pressure pulsation and can be loosened easily during maintenance work.
- ▶ The torque specifications ("Tightening torques" chapter) are to be observed.
- ▶ Commission the system.

- ▶ 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.

## Tightening torques

(dimensions in mm [*inch*])

### Mounting

Series 450 ...	<b>FEN0040</b>	<b>FEN0063</b>	<b>FEN0100</b>	<b>FEN0160</b>	<b>FEN0250</b>	<b>FEN0400</b>	<b>FEN0630</b>	<b>FEN1000</b>
Screw/tightening torque with $\mu_{\text{total}} = 0.14$	M12x35/75 Nm $\pm 12\%$ [8.9 lb-ft +/- 12%]	M20x60/400 Nm $\pm 5\%$ [296 lb-ft +/- 5%]	M24x65/700 Nm $\pm 4\%$ [518 lb-ft +/- 4%]					
Quantity				4				
Recommended property class of screw				8.8				

### Maintenance indicator

Series 450 ...	<b>FEN0040</b>	<b>FEN0063</b>	<b>FEN0100</b>	<b>FEN0160</b>	<b>FEN0250</b>	<b>FEN0400</b>	<b>FEN0630</b>	<b>FEN1000</b>
Maintenance indicator				50 Nm [37 lb-ft]				
Cubic connector screw switching element EN-175301-803				max. 50 Nm [37 lb-ft]				

## Directives and standardization

### Product validation

Hengst filters, the filter elements built into them and filter accessories are tested and quality-monitored according to different ISO test standards:

Pressure pulse test	ISO 10771:2015-08
Filtration performance test (multipass test)	ISO 16889:2008-06
$\Delta p$ (pressure loss) characteristic curves	ISO 3968:2001-12
Compatibility with hydraulic fluid	ISO 2943:1998-11
Collapse pressure test	ISO 2941:2009-04

The development, manufacture and assembly of Hengst industrial filters and Hengst filter elements is carried out within the framework of a certified quality management system in accordance with ISO 9001:2015.

## Classification according to the Pressure Equipment Directive

### Directive

The block mounting filter for hydraulic applications according to 51467 are pressure holding equipment according to article 1, section 2.1.4 of the Pressure Equipment Directive 97/23/EC (PED). However, based on the exception in article 1, section 3.6 of the PED, hydraulic filters are

exempt from the PED if they are not classified higher than category I (guideline 1/19).

The fluids from the chapter "Compatibility with approved pressure fluids" were considered for the classification. They do not receive a CE mark.

## Use in potentially explosive areas according to directive 94/9/EC (ATEX)

The block mounting filter according to 51467 are not equipment or components in the sense of directive 94/9/EC and are not provided with a CE mark. It has been proven with the ignition risk analysis that these inline filters do not have own ignition sources acc. to DIN EN 13463-1:2009.

According to DIN EN 60079-11:2012, electronic maintenance indicators with a switching point:

WE-1SP-M12x1 **R928028409**

WE-1SP-EN175301-803 **R928036318**

are simple, electronic operating equipment that do not have an own voltage source. This simple, electronic operating

equipment may – according to DIN EN 60079-14:2012 – in intrinsically safe electric circuits (Ex ib) be used in systems without marking and certification.

The block mounting filters and the electronic maintenance indicators described here can be used for the following explosive areas

	Zone suitability	
	1	2
Gas	1	2
Dust	21	22

## Directives and standardization

### Complete filter with mech./opt. Maintenance indicator

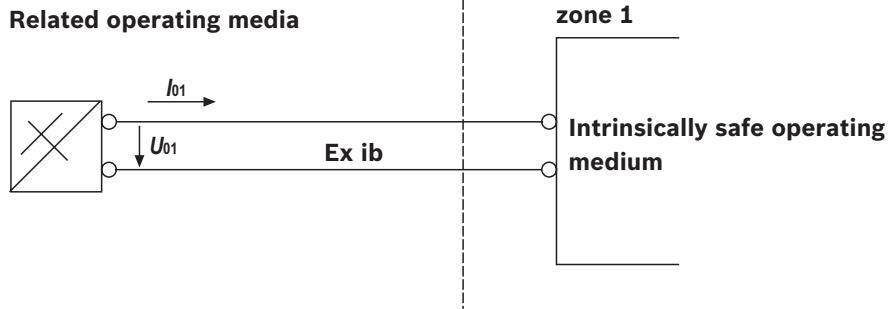
Use/assignment	Gas 2G	Dust 2D
Assignment	Ex II 2G c IIC TX	Ex II 2D c IIC TX
Conductivity of the medium pS/m	min 300	
Dust accumulation	max –	0.5 mm

### Electronic switching element in the intrinsically safe electric circuit

Use/assignment	Gas 2G	Dust 2D
Assignment	Ex II 2G Ex ib IIB T4 Gb	Ex II 2D Ex ib IIIC T100 °C Db
Perm. intrinsically safe electric circuits	Ex ib IIC, Ex ic IIC	Ex ib IIIC
Technical data	Values only for intrinsically safe electric circuit	
Switching voltage $U_i$	max	150 V AC/DC
Switching current $I_i$	max	1.0 A
Switching power $P_i$	max	1.3 W $T_{max}$ 40 °C
	max	1.0 W $T_{max}$ 80 °C
Surface temperature <sup>1)</sup>	max	– 100 °C
Inner capacity $C_i$		negligible
Inner inductivity $L_i$		negligible
Dust accumulation	max	0.5 mm

<sup>1)</sup> The temperature depends on the temperature of the medium in the filter and must not exceed the value specified here.

Possible circuit according to DIN EN 60079-14



### ⚠ WARNING!

- ▶ Explosion hazard due to high temperature! The temperature depends on the temperature of the medium in the hydraulic circuit and must not exceed the value specified here. Measures are to be taken so that in the potentially explosive area, the max. permissible ignition temperature is not exceeded.
- ▶ When using the block mounting filters according to 51467 in explosive areas, sufficient potential equaliza-

- tion has to be ensured. The filter is preferably to be grounded via the mounting screws.
- ▶ It has to be noted in this connection that painted and oxidized protective layers are not electrically conductive.
- ▶ During filter element exchanges, the packaging material is to be removed from the replacement element outside the explosive area

### ☞ Notices:

- ▶ All maintenance of the filter should be performed by trained specialists, instruction by the machine end-user acc. to DIRECTIVE 1999/92/EC appendix II, section 1.1

- ▶ Functional and safety warranty only applicable when using genuine Hengst spare parts