HARLEX

Block mounting filter, for lateral flange-mounting

Type 245PSFN0040 to 0400; 245PSF0130, 0150

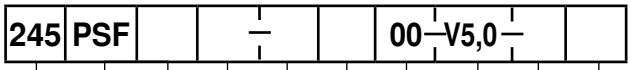
Size according to **DIN 24550**: 0040 to 0400
Additional sizes: 0130, 0150
Nominal pressure 250 bar *[3626 psi]*
Connection up to DN 40
Operating temperature –10 °C to 100 °C *[14 °F to 212 °F]*

Features

- Special highly efficient filter media
- Adsorption of very fine particles across a broad pressure differential range
- High dirt holding capacity thanks to large specific filter area
- Good chemical resistance of the filter elements
- High collapse resistance of the filter elements (e.g. in case of cold start)
- Filter ratings of 3 µm to 100 µm
- By default equipped with mechanical optical maintenance indicator with memory function
- Flow-optimized design due to 3D computer-supported design

Ordering code

Of the filter



Pressure
250 bar *[3626 psi]* **= 245**

Block mounting filter,
for lateral flange-mounting **= PSF**

Filter element
according to DIN 24550 **= N**

Size
PSFN… **= 0040 0063 0100 0160 0250 0400**
PSF… **= 0130 0150**

Filter rating in µm
nominal
Stainless steel wire mesh, cleanable
G10, G25, G40, G100 **= G…**
absolute (ISO 16889)
Micro glass, not cleanable
H3XL, H6XL, H10XL, H20XL **= H…XL**

Pressure differential
Max. admissible pressure differential of the filter element
30 bar *[435 psi]*, with bypass valve 7 bar *[102 psi]* **= A**
330 bar *[4786 psi]*, without bypass valve **= B**

Element design
Standard adhesive T = 100 °C *[212 °F]* **= 0…**
Standard material **= …0**

Complementary details
without = No additional details
– M = size 0040 – 0150
1 Minimess connection
(on the dirt side)
size 0160 – 0400
2 Minimess connections

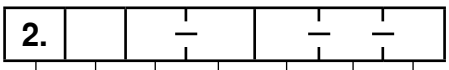
Seal
M = NBR seal
V = FKM seal

Maintenance indicator
V5,0 = Maintenance indicator, optical specify switching pressure 5.0 bar *[72.5 psi]*

Order example:
245PSFN0063-H10XLB00-V5,0-M

Further versions (filter materials, ...) available at request

Of the filter element



Filter element
Design **= 2.**

Size
PSFN… **= 0040 0063 0100 0160 0250 0400**
PSF… **= 0130 0150**

Filter rating in µm
nominal
Stainless steel wire mesh, cleanable
G10, G25, G40, G100 **= G…**
Absolute (ISO 16889)
Micro glass, not cleanable
H3XL, H6XL, H10XL, H20XL **= H…XL**

Pressure differential
Max. admissible pressure differential of the filter element
30 bar *[435 psi]* **= A**
330 bar *[4786 psi]* **= B**

Seal
M = NBR seal
V = FKM seal

Bypass valve
0 = at filter element always 0

Element design
0… = Standard adhesive T = 100 °C *[212 °F]*
…0 = Standard material

Order example:
2.0063 H3XL-B00-0-M0

Standard types

NBR seal, without bypass, flow specifications for ν = 30 mm²/s

Block mounting filter 245 PSF(N), filter rating **3 µm**

Type	**Flow in l/min** *[gpm]* **with Δp = 1.5 bar** *[21.8 psi]* [1)]
245PSFN0040-H3XLB00-V5,0-M	28
245PSFN0063-H3XLB00-V5,0-M	50
245PSFN0100-H3XLB00-V5,0-M	68
245PSF0130-H3XLB00-V5,0-M	104
245PSF0150-H3XLB00-V5,0-M	130
245PSFN0160-H3XLB00-V5,0-M	150
245PSFN0250-H3XLB00-V5,0-M	250
245PSFN0400-H3XLB00-V5,0-M	305

Block mounting filter 245 PSF(N), filter rating **6 µm**

Type	**Flow in l/min** *[gpm]* **with Δp = 1.5 bar** *[21.8 psi]* [1)]
245PSFN0040-H6XLB00-V5,0-M	35
245PSFN0063-H6XLB00-V5,0-M	55
245PSFN0100-H6XLB00-V5,0-M	72
245PSF0130-H6XLB00-V5,0-M	135
245PSF0150-H6XLB00-V5,0-M	175
245PSFN0160-H6XLB00-V5,0-M	200
245PSFN0250-H6XLB00-V5,0-M	280
245PSFN0400-H6XLB00-V5,0-M	325

Block mounting filter 245 PSF(N), filter rating **10 µm**

Type	**Flow in l/min** *[gpm]* **with Δp = 1.5 bar** *[21.8 psi]* [1)]
245PSFN0040-H10XLB00-V5,0-M	50
245PSFN0063-H10XLB00-V5,0-M	70
245PSFN0100-H10XLB00-V5,0-M	75
245PSF0130-H10XLB00-V5,0-M	180
245PSF0150-H10XLB00-V5,0-M	220
245PSFN0160-H10XLB00-V5,0-M	260
245PSFN0250-H10XLB00-V5,0-M	310
245PSFN0400-H10XLB00-V5,0-M	350

[1)] Measured pressure differential across filter and measuring equipment according to ISO 3968. The measured pressure differential at the maintenance indicator is lower.

Codification: Electronic switching element for maintenance indicator

ABZ	F	V –	– 1X / – DIN

plant construction accessories

Filter

Maintenance indicator

Electronic switching element with 1 switching point (changeover) round plug-in connection M12x1 **= E1SP-M12X1**

Electronic switching element with 2 switching points (normally open/ normally closed), 75 %, 100 %, round plug-in connection M12x1, 3 LED **= E2SP-M12X1**

Electronic switching element with 2 switching points (normally open/ normally closed), 75 %, 100 %, signal suppression until 30 °C round plug-in connection M12x1, 3 LED **= E2SPSU-M12X1**

–DIN = Mark for DIN model

Component series

1X = Component series 10 to 19 (10 to 19; identical installation and connection dimensions)

Electronic switching element	Material no.
ABZFV-E1SP-M12X1-1X/-DIN	R901025339
ABZFV-E2SP-M12X1-1X/-DIN	R901025340
ABZFV-E2SPSU-M12X1-1X/-DIN	R901025341

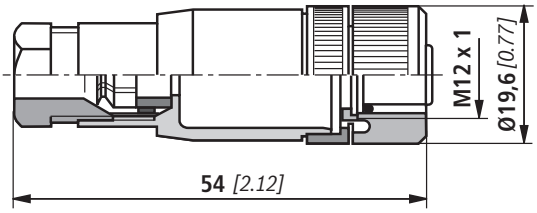
Order example: Block mounting filter with mechanical optical maintenance indicator for $p_{nom.}$ = 250 bar *[3626 psi]* without by-pass valve, size 0063, with filter element 10 µm and electronic switching element M12x1 with 1 switching point for hydraulic fluid mineral oil HLP according to DIN 51524.

Filter: **245PSFN0063-H10XLB00-V5,0-M**
Maintenance indicator: **ABZFV-E1SP-M12X1-1X/-DIN**

Mating connectors according to IEC 60947-5-2 (dimensions in mm *[inch]*)

For electronic switching element with round plug-in connection M12 x 1

Mating connector for K24 4-pin, M12 x 1 with screw connection, cable gland Pg9.

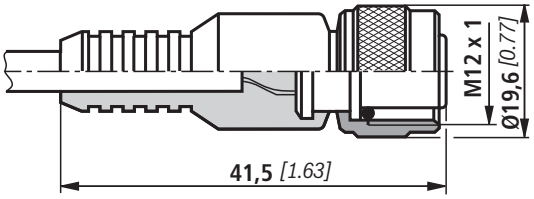


Mating connector for K24-3m 4-pin, M12 x 1 with potted-in PVC cable, 3 m long.

Line cross-section: 4 x 0.34 mm²

Core marking:

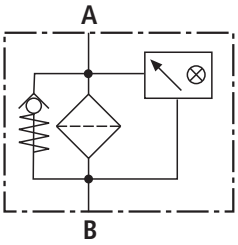
1 Brown
2 White
3 Blue
4 Black

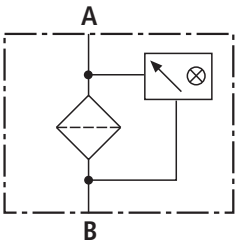


For more round plug-in connections, see data sheet.

Symbols

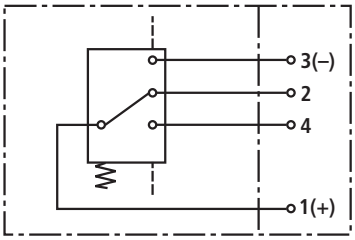
Block mounting filter





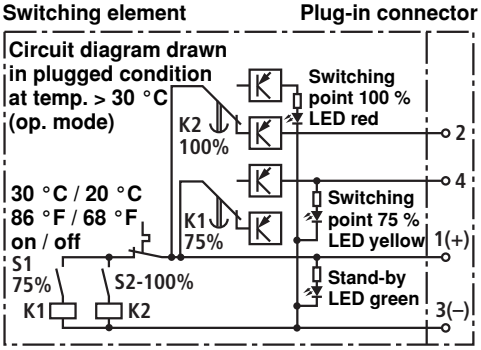
Electronic switching element
for maintenance indicator

Switching element Plug-in connector



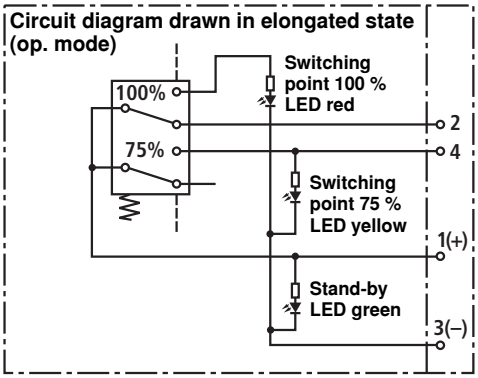
ABZFV-E1SP-M12X1-1X/-DIN

Switching element Plug-in connector



ABZFV-E2SPSU-M12X1-1X/-DIN

Switching element Plug-in connector



ABZFV-E2SP-M12X1-1X/-DIN

Function, section

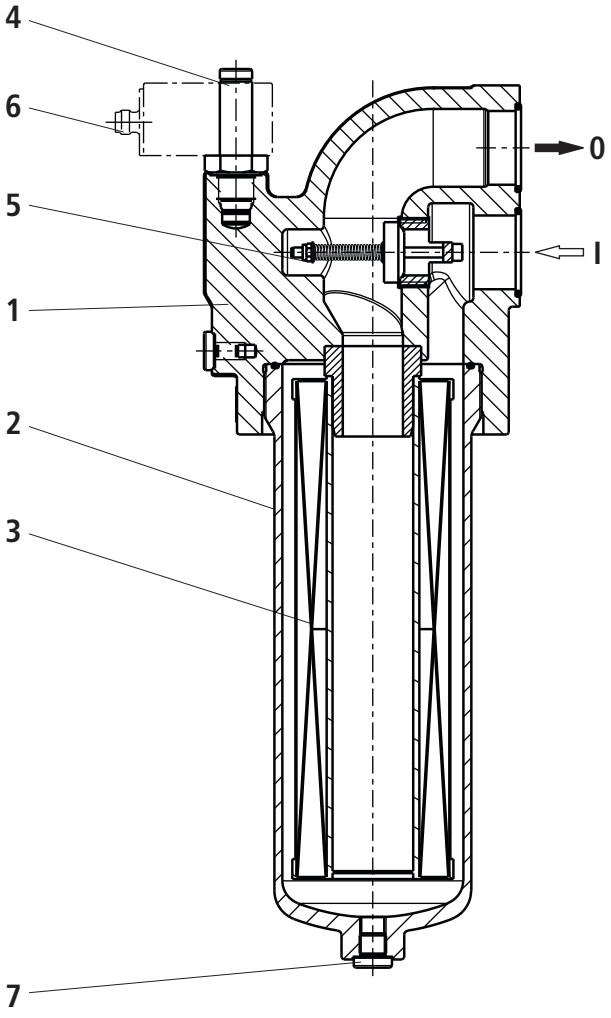
Block mounting filters are suitable for direct attachment to pump and control blocks. They are installed upstream open-loop or closed-loop control units to be protected.

They basically consist of filter head (1), a screwable filter bowl (2), filter element (3) as well as mechanical optical maintenance indicator (4). In case of filters with low-pressure-differential-stable filter elements (= code letter pressure differential A), there is also an assembled bypass valve (5).

Via port I, the hydraulic fluid reaches the filter element (3) where it is cleaned. The dirt particles filtered out settle in the filter bowl (2) and in the filter element (3). Via port 0, the filtered hydraulic fluid enters the pump or control block and thus the hydraulic circuit.

The filter housing and all connection elements are designed so that pressure peaks – as they may e.g. occur in case of the abrupt opening of large control valves due to the accelerated fluid weight – can be securely absorbed. As of size 0160, the standard equipment comprises an oil drain plug (7).

Basically, the filter is equipped with mechanical optical maintenance indicator (4). The electronic maintenance indicator is connected via the electronic switching element with 1 or 2 switching points (6), which has to be ordered separately. The electronic switching element is attached to the mechanical optical maintenance indicator and held by means of a locking ring.



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

general

Installation position			Lateral			
Ambient temperature range		°C *[°F]*	–30 to +100 *[–22 to +212]*			
Weight [1]		Size	**0040**	**0063**	**0100**	**0130**
		kg *[lbs]*	4.6 *[10.14]*	5.0 *[11.02]*	5.8 *[12.78]*	8.8 *[19.40]*
Weight [1]		Size	**0150**	**0160**	**0250**	**0400**
		kg *[lbs]*	9.2 *[20.28]*	13.5 *[29.76]*	14.3 *[31.52]*	16.0 *[35.26]*
Material	Filter head		GGG			
	Filter bowl		Steel			
	Optical maintenance indicator		Brass			
	Electronic switching element		Plastic PA6			

hydraulic

Maximum operating pressure	bar *[psi]*	250 *[3626]*
Hydraulic fluid temperature range	°C *[°F]*	–10 to +100 *[+14 to +212]*
Fatigue strength according to ISO 10771	Load cycles	> 10^6 with Max. operating pressure
Cracking pressure of the bypass valve	bar *[psi]*	7 ± 0.5 *[100 ± 7]*
Type of pressure measurement of the maintenance indicator		Pressure differential
Response pressure of the maintenance indicator	bar *[psi]*	5 ± 0.5 *[72 ± 7]*

electrical (electronic switching element)

Electrical connection			Round plug-in connection M12 x 1, 4-pin
Contact load, direct voltage		A	Max. 1
Voltage range	E1SP-M12x1	V DC/AC	Max. 150
	E2SP	V DC	10 to 30
Max. switching power with resistive load			20 VA; 20 W; (70 VA)
Switching type	E1SP-M12x1		Changeover
	E2SP-M12x1		Normally open contact at 75 % of the response pressure, Normally closed contact at 100 % of the response pressure
	E2SPSU-M12x1		Normally open contact at 75 % of the response pressure, Normally closed contact at 100 % of the response pressure Signal interconnection at 30 °C *[86 °F]*, Return switching at 20 °C *[68 °F]*
Display via LEDs in the electronic switching element E2SP...			Stand-by (LED green); 75 % switching point (LED yellow) 100 % switching point (LED red)
Protection class according to EN 60529			IP 65
For direct voltage above 24 V, spark extinguishing is to be provided for protecting the switching contacts.			
Weight	Electronic switching element: – with round plug-in connection M12 x 1	kg *[lbs]*	0.1 *[0.22]*

[1] Weight including standard filter element and maintenance indicator

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

Filter element

Glass fiber paper H..XL			Single-use element on the basis of inorganic fiber	
			Filtration ratio according to ISO 16889 up to Δp = 5 bar *[72.5 psi]*	Achievable oil cleanliness according to ISO 4406 *[SAE-AS 4059]*
		H20XL	$\beta_{20}(c) \geq 200$	19/16/12 – 22/17/14
		H10XL	$\beta_{10}(c) \geq 200$	17/14/10 – 21/16/13
		H6XL	$\beta_{6}(c) \geq 200$	15/12/10 – 19/14/11
		H3XL	$\beta_{5}(c) \geq 200$	13/10/8 – 17/13/10
Admissible pressure differential	A	bar *[psi]*	30 *[435]*	
	B	bar *[psi]*	330 *[4786]*	

Seal material for hydraulic fluids

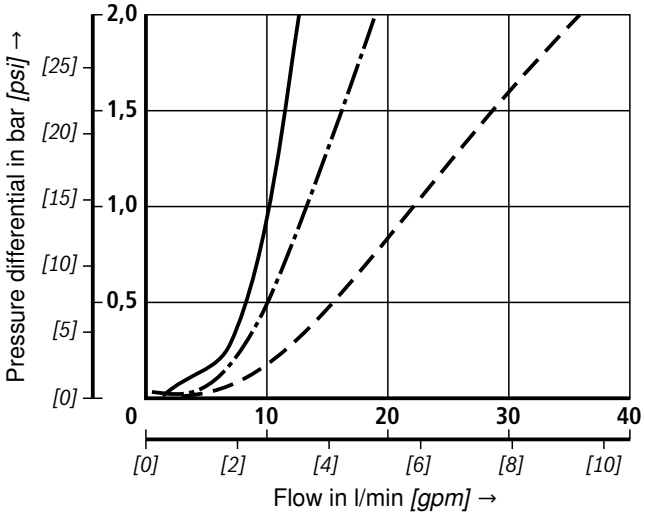
Mineral oil			Ordering code
Mineral oil	HLP	according to DIN 51524	M
Flame-resistant hydraulic fluids			Ordering code
Emulsions	HFA-E	according to DIN 24320	M
Synthetic water solutions	HFA-S	according to DIN 24320	M
Water solutions	HFC	according to VDMA 24317	M
Phosphoric acid esters	HFD-R	according to VDMA 24317	V
Organic esters	HFD-U	according to VDMA 24317	V
Fast biodegradable hydraulic fluid			Ordering code
Triglycerides (rape seed oil)	HETG	according to VDMA 24568	M
Synthetic esters	HEES	according to VDMA 24568	V
Polyglycols	HEPG	according to VDMA 24568	V

Characteristic curves (measured with HLP46, according to ISO 3968) **H3XL...**

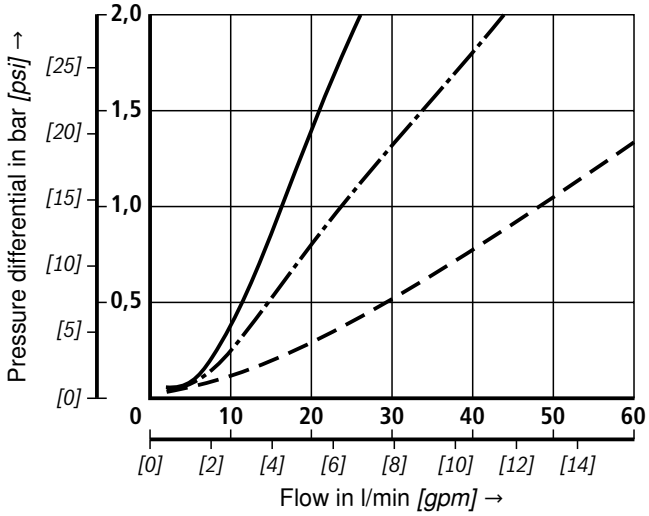
Specific weight: < 0.9 kg/dm³
Δ*p*-Q characteristic curves for complete filters recommended
initial Δ*p* for design = 1.5 bar

Oil viscosity: 140 mm²/s *[649 SUS]*, 68 mm²/s *[315 SUS]*, 30 mm²/s *[142 SUS]*

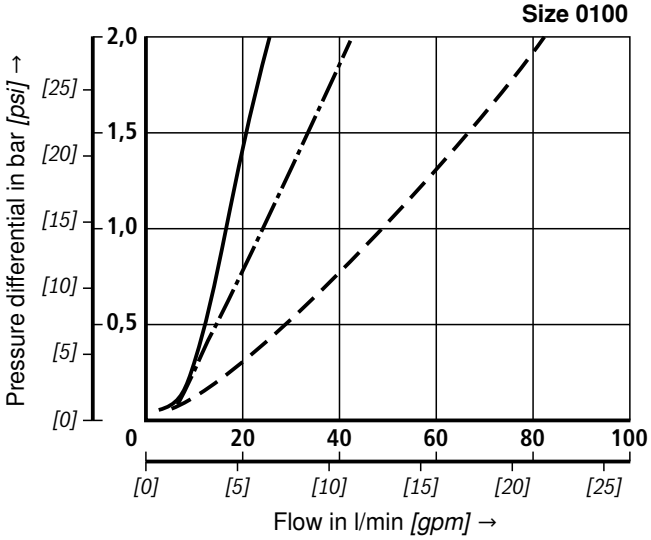
Size 0040



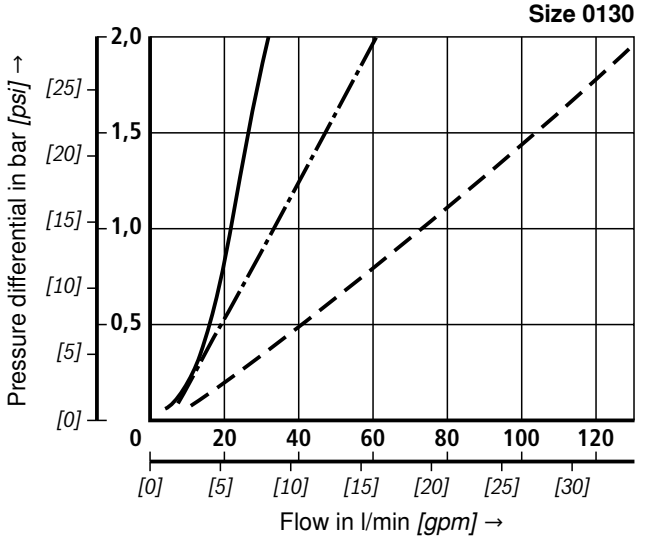
Size 0063



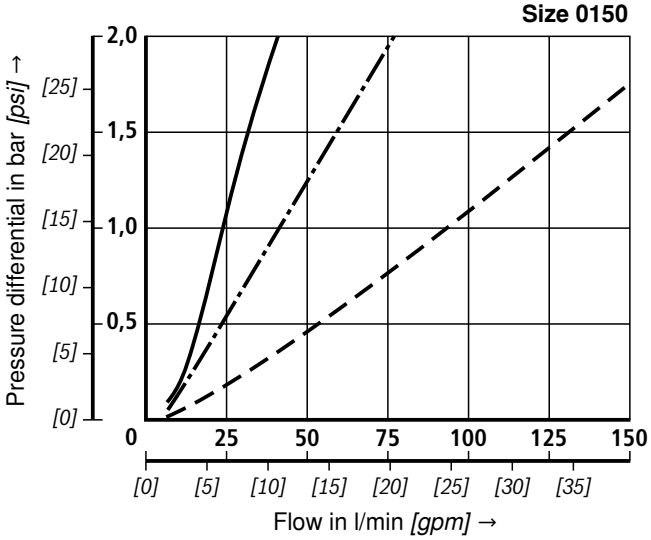
Size 0100



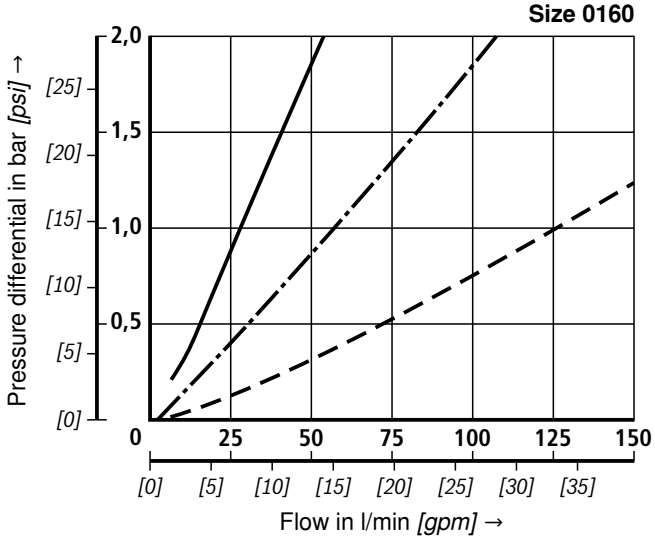
Size 0130



Size 0150



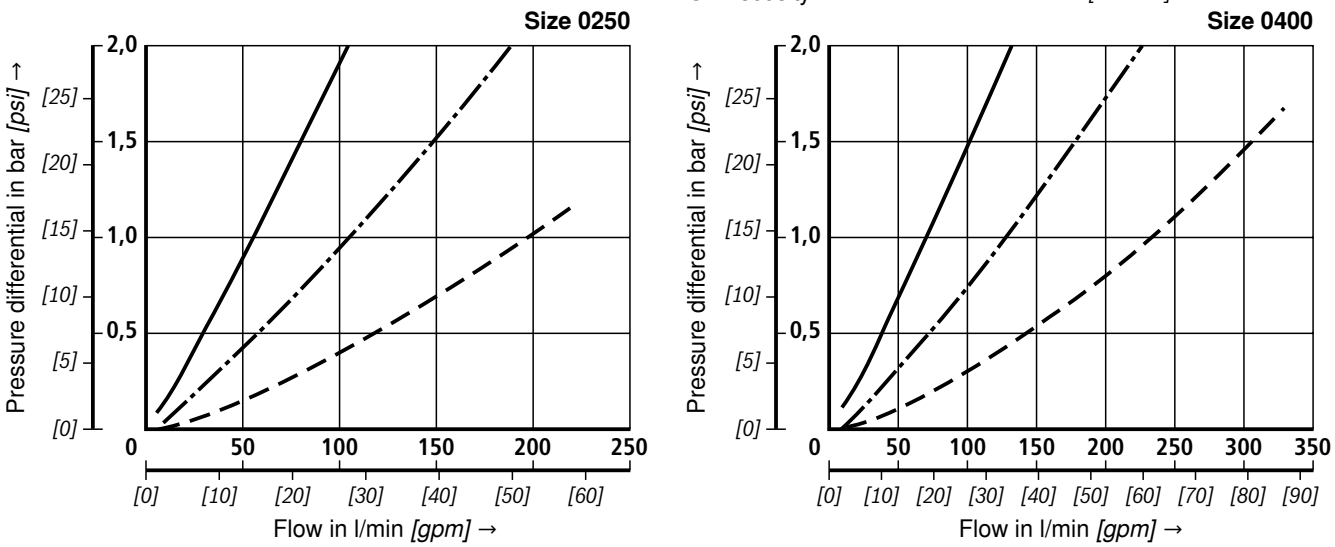
Size 0160



Characteristic curves (measured with HLP46, according to ISO 3968) **H3XL...**

Specific weight: < 0.9 kg/dm³
Δ*p*-Q characteristic curves for complete filters recommended
initial Δ*p* for design = 1.5 bar

Oil viscosity: 140 mm²/s *[649 SUS]*, 68 mm²/s *[315 SUS]*, 30 mm²/s *[142 SUS]*

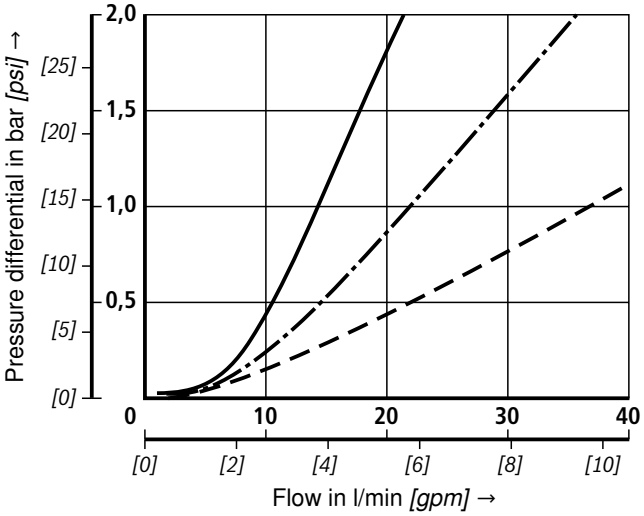


Characteristic curves (measured with HLP46, according to ISO 3968) **H10XL...**

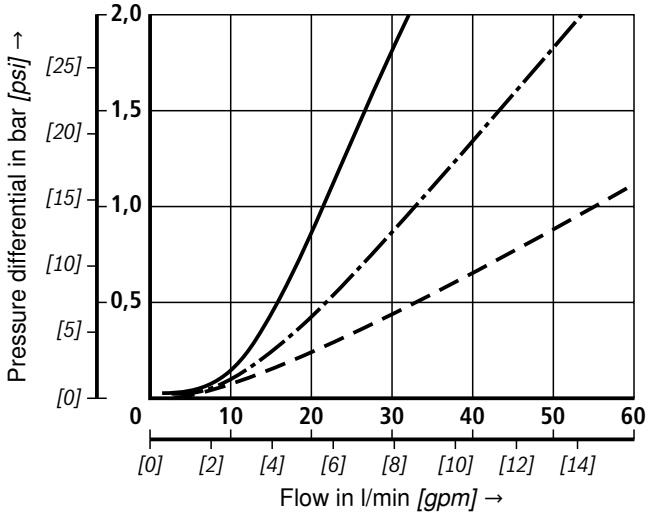
Specific weight: < 0.9 kg/dm³
Δ*p*-Q characteristic curves for complete filters recommended
initial Δ*p* for design = 1.5 bar

Oil viscosity: 140 mm²/s [649 SUS] — 68 mm²/s [315 SUS] — 30 mm²/s [142 SUS]

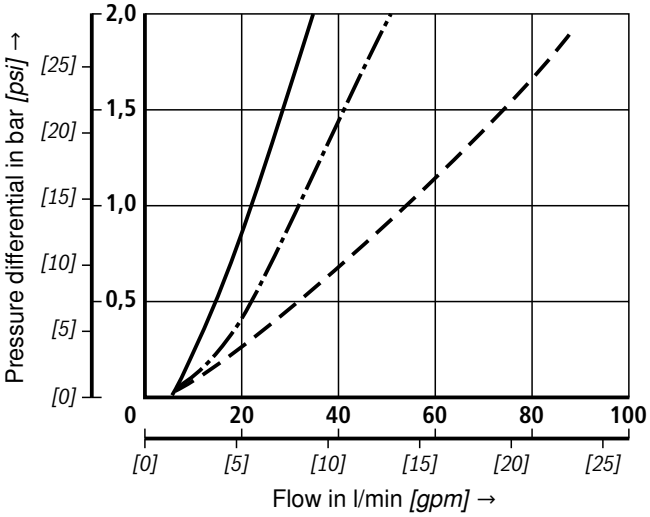
Size 0040



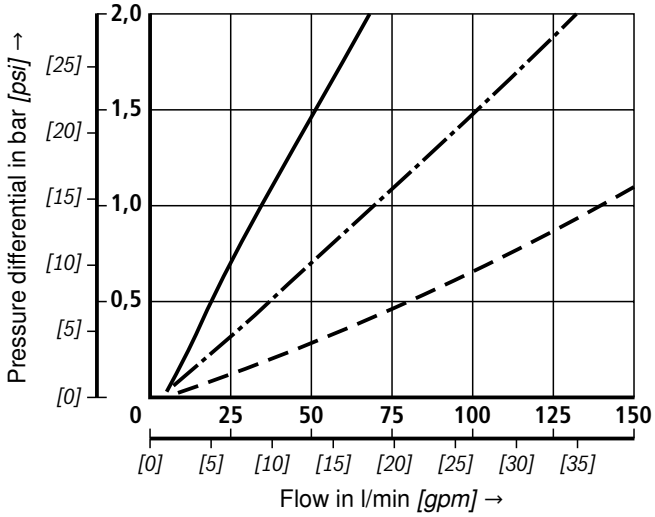
Size 0063



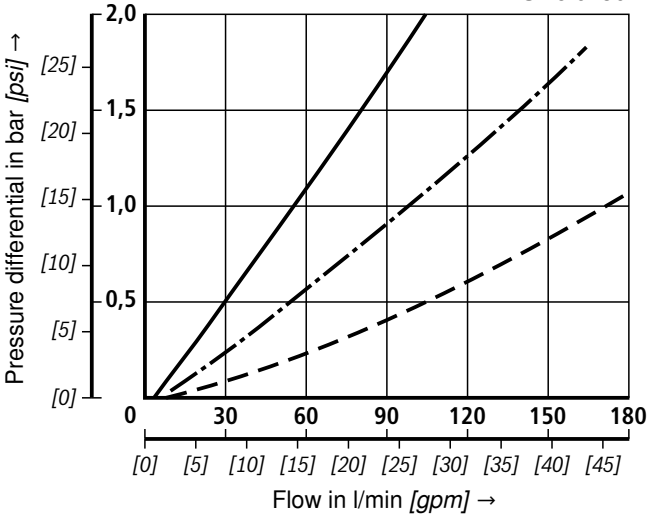
Size 0100



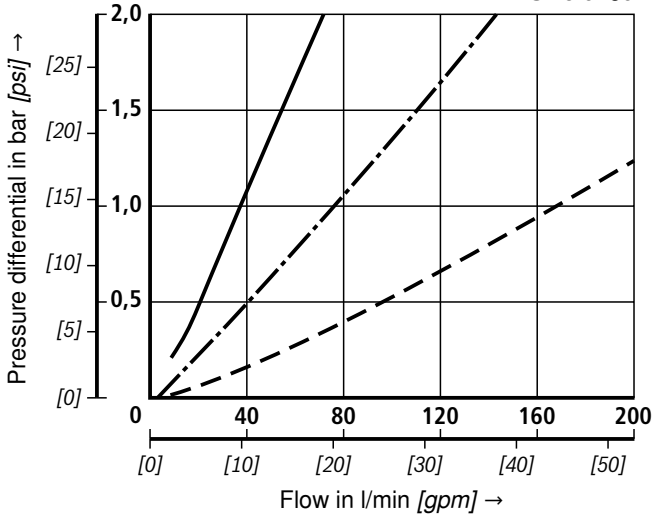
Size 0130



Size 0150



Size 0160

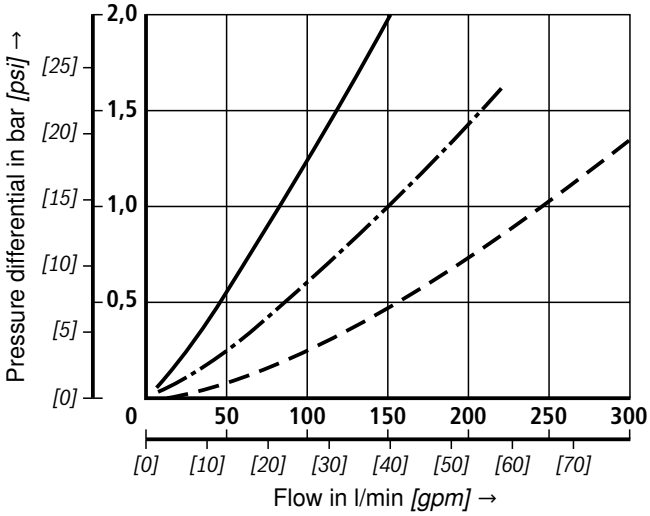


Characteristic curves (measured with HLP46, according to ISO 3968) **H10XL...**

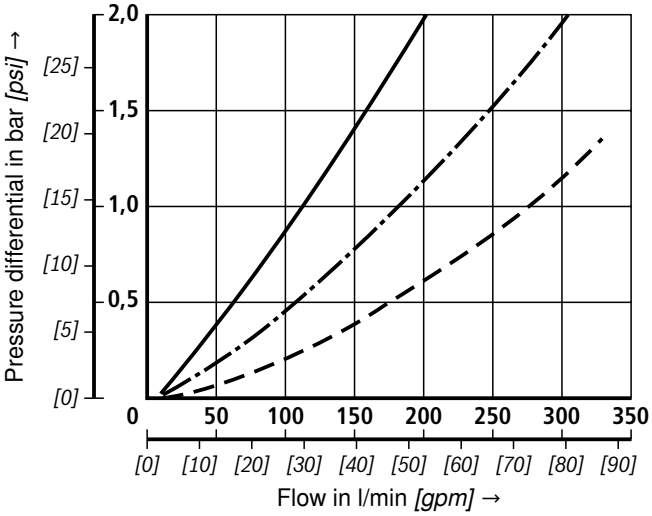
Specific weight: < 0.9 kg/dm³
Δ*p*-Q characteristic curves for complete filters recommended
initial Δ*p* for design = 1.5 bar

Oil viscosity: **140 mm²/s** *[649 SUS]*, **68 mm²/s** *[315 SUS]*, **30 mm²/s** *[142 SUS]*

Size 0250

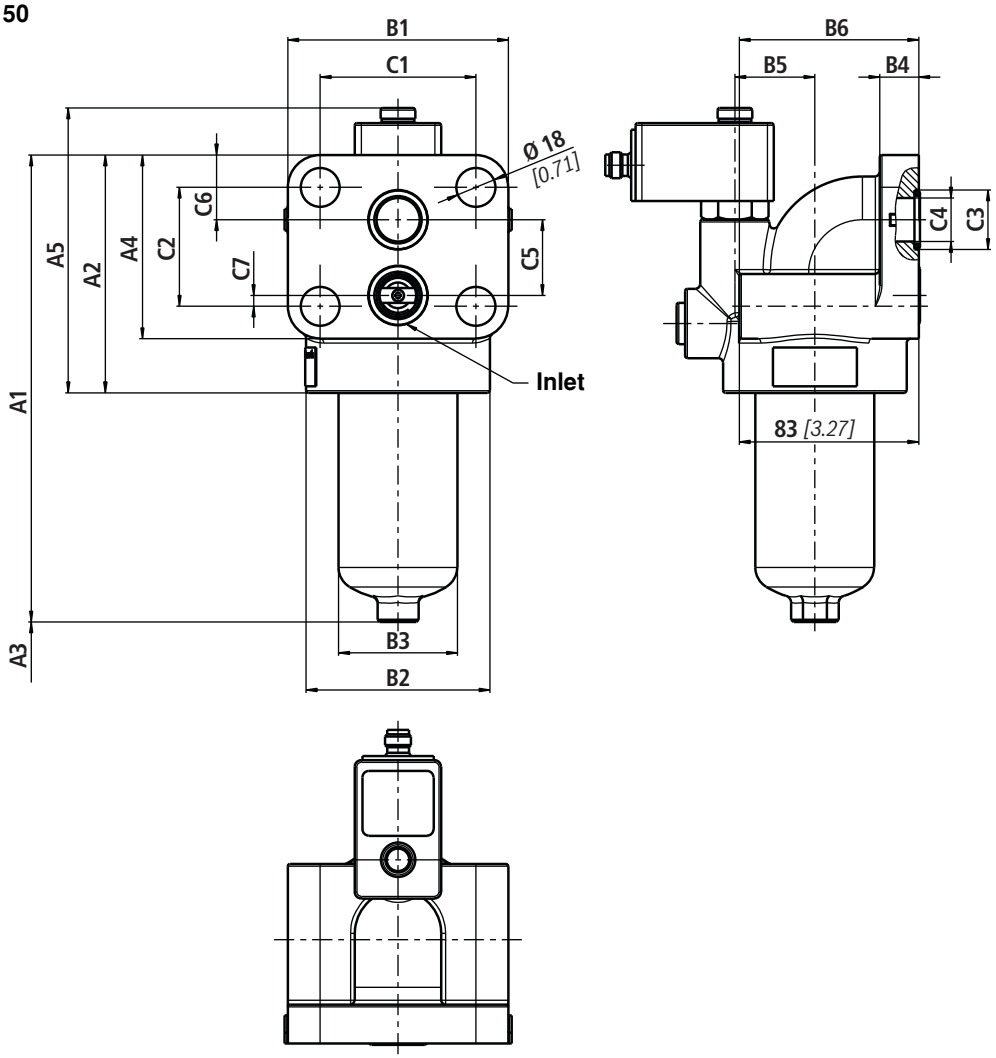


Size 0400



Unit dimensions size 0040 to size 0150 (dimensions in mm *[inch]*)

Size 0040 to 0150



Filter housing for filter elements in accordance with DIN 24550 and according to BRFS standard

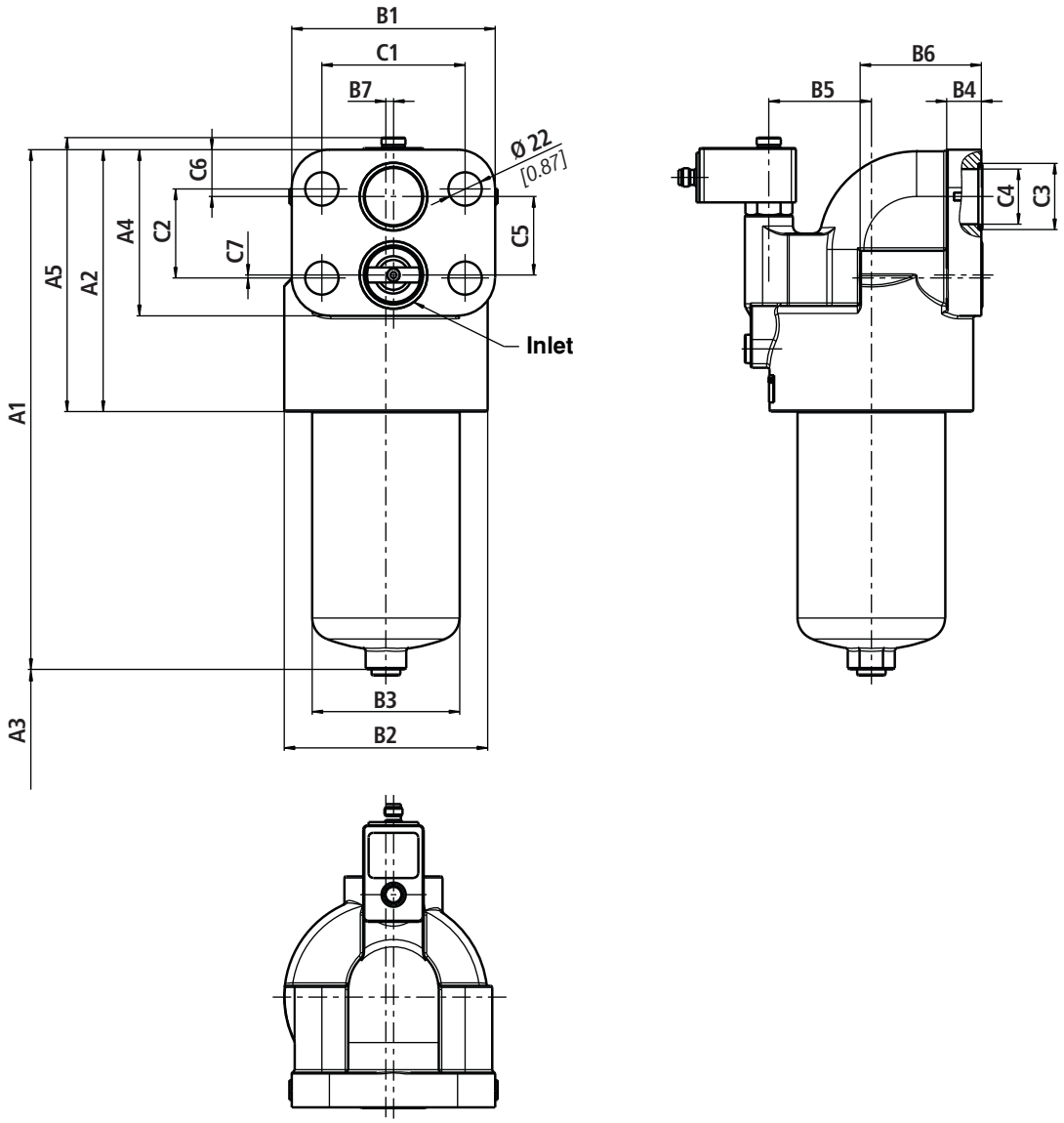
Type 245 PSF(N)...	Content in l *[US gal]*	A1	A2	A3 [1)]	A4	A5	B1	B2	B3
0040	0.25 *[0.07]*	216 *[8.50]*	110 *[4.33]*	100 *[3.94]*	85 *[3.35]*	132 *[5.20]*	102 *[4.02]*	Ø85 *[3.35]*	Ø55 *[2.17]*
0063	0.4 *[0.11]*	280 *[11.02]*							
0100	0.6 *[0.16]*	370 *[14.57]*							
0130	0.8 *[0.21]*	349 *[13.74]*	146 *[5.75]*	120 *[4.72]*	110 *[4.33]*	147 *[5.79]*	135 *[5.31]*	Ø116 *[4.57]*	Ø77 *[3.03]*
0150	0.98 *[0.26]*	399 *[15.71]*							

Type 245 PSF(N)...	B4	B5	B6	C1	C2	C3	C4	C5	C6	C7
0040	18 *[0.71]*	37 *[1.46]*	83 *[3.27]*	72 *[2.83]*	55 *[2.17]*	Ø27.5 *[1.08]*	Ø20 *[0.79]*	35 *[1.38]*	30 *[1.18]*	5 *[0.20]*
0063										
0100										
0130	20 *[0.79]*	52.5 *[2.07]*	75 *[2.95]*	95 *[3.74]*	59 *[2.32]*	Ø40 *[1.57]*	Ø32 *[1.26]*	52 *[2.05]*	31 *[1.22]*	2 *[0.08]*
0150										

[1)] Servicing height for filter element replacement

Unit dimensions size 0160 to size 0400 (dimensions in mm *[inch]*)

Size 0160 to 0400



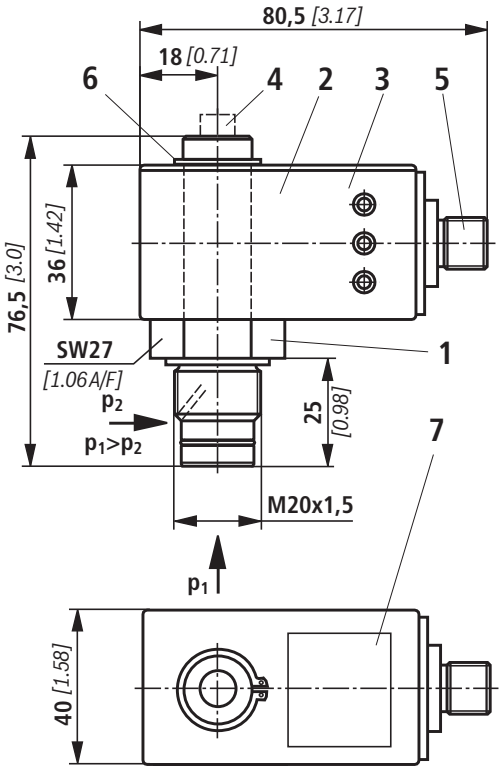
Filter housing for filter elements in accordance with DIN 24550 and according to BRFS standard

Type 245 PSF(N)...	Content in l *[US gal]*	A1	A2	A3 [1]	A4	A5	B1	B2	B3
0160	1.5 *[0.40]*	345 *[13.58]*	174 *[6.85]*	120 *[4.72]*	110 *[4.33]*	182 *[7.17]*	135 *[5.31]*	Ø135 *[5.31]*	Ø98 *[3.86]*
0250	2.1 *[0.55]*	433 *[17.05]*							
0400	3.2 *[0.85]*	583 *[22.95]*							

Type 245 PSF(N)...	B4	B5	B6	B7	C1	C2	C3	C4	C5	C6	C7
0160	23 *[0.91]*	68 *[2.68]*	80.5 *[3.17]*	5 *[0.20]*	95 *[3.74]*	59 *[2.32]*	Ø45 *[1.77]*	Ø38 *[1.5]*	52 *[2.05]*	31 *[1.22]*	2 *[0.08]*
0250											
0400											

[1] Servicing height for filter element replacement

Maintenance indicator (dimensions in mm *[inch]*)



1 Mechanical optical maintenance indicator; Max. tightening torque $M_{A\,max}$ = 50 Nm *[36.88lb-ft]*

2 Switching element with locking ring for electrical maintenance indicator (can be rotated by 360°); plug-in connection M12x1 or according to DIN EN 175201-804

3 Housing with three LEDs: 24 V =
Green: Stand-by
Yellow: Switching point 75 %
Red: Switching point 100 %

4 Optical indicator bistable

5 Round connector M12x1, 4-pin

6 Locking ring

7 Nameplate

Notes:

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

Round plug-in connection M12x1 (5)
For connection e.g. to ABZFV-E1SP-M12x1-1X/-DIN
(see page 17).

Switching elements with increased switching power at request.

Spare parts

Mechanical optical maintenance indicator

plant construction accessories

Filter

Maintenance indicator

Mechanical optical maintenance indicator
for high-pressure filters
switching point 5 bar *[72 psi]* **= HV5**

DIN = Mark for DIN model

Seal material

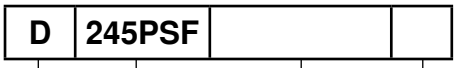
M = NBR seal
V = FKM seal

1X = **Component series**
Component series 10 to 19
(10 to 19; identical installation
and connection dimensions)

Mechanical optical maintenance indicator

ABZFV-HV5-1X/M-DIN

Seal kit



Seal kit

Type 245PSF

Size

Size 0040-0100 **= N0040-0100**
Size 0130-0150 **= 0130-0150**
Size 0160-0400 **= N0160-0400**

Seal

M = NBR seal
V = FKM seal

Seal kit

D245PSFN0040-0100-M

D245PSF0130-0150-M

D245PSFN0160-0400-M

Installation, commissioning and maintenance

Installation of the filter

Verify operating pressure with name plate information. Remove dust protection plugs from filter inlet and outlet, mount filter at the control block without tension stress considering flow direction (direction arrows) and servicing height of the filter element. The filter must preferably be installed with the filter bowl (2) downward. The maintenance indicator must be arranged in a well visible way.

Connection of the electrical maintenance indicator

Basically, the filter is equipped with mechanical optical maintenance indicator (4). The electronic maintenance indicator is connected via the switching element (6) with 1 or 2 switching points, which is attached to the mechanical optical maintenance indicator and held by means of the locking ring.

When must the filter element be exchanged or cleaned respectively?

Upon start-up in cold condition, the red pushbutton of the optical maintenance indicator (4) may jump out and an electrical signal is output via the switching element (6). Only push the red pushbutton in again after the operating temperature has been reached. If it jumps out again immediately or if the electrical signal has not gone out at operating temperature, the filter element must be exchanged or cleaned respectively after the end of the shift.

Element exchange

- Switch off the system and discharge the filter on the pressure side.
- Screw off the filter bowl (2) by anticlockwise rotation. Clean the filter housing in a suitable medium.
- Remove the filter element (3) from the centering spigot in the filter head by turning it slightly
- Check the seal ring and the support ring in the filter bowl for position and damage. If necessary, these parts are to be renewed.
- Replace filter elements H…XL, clean the filter element G….
- The efficiency of the cleaning process depends on the characteristics of contamination and the amount of the pressure differential before the filter element exchange. If the differential pressure after the filter element exchange exceeds 50 % of the value before the filter element exchange, the G… element also needs to be replaced.
- Check whether the type designation or material number on the replacement element corresponds to the type designation/material number on the nameplate of the filter.
- Install replaced or cleaned filter element on the spigot again by slightly turning it.
- Now screw in the filter bowl or floor to stop. Then turn out the filter bowl by 1/8 to 1/2 turn so that the filter bowl is not stuck due to the pressure pulsation and can be easily loosened in case of maintenance works.

Quality and standardization

The pressure filters for hydraulic applications according to are pressure holding equipment according to article 1, section 2.1.4 of the pressure equipment directive 97/23/EC (PED) However, on the basis of the exception in article 1, section 3.6 of the PED hydraulic filters are exempt from the PED, if there are not classified higher than category I (guideline 1/19). They do not receive a CE mark.

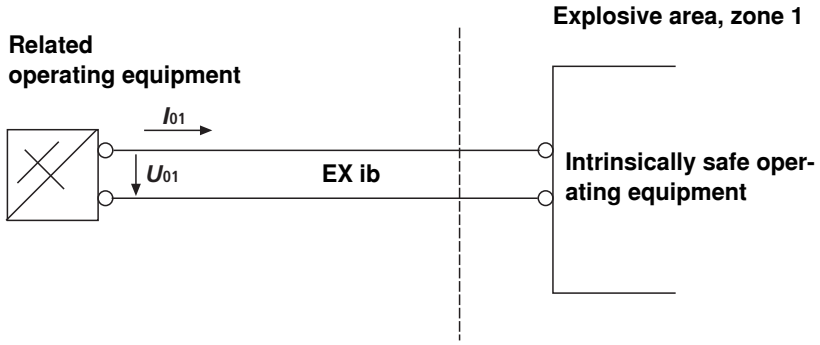
Use in explosive areas according to directive 94/9/EC (ATEX)

The pressure filters according to are no equipment or components in the sense of directive 94/9/EC and are not provided with a CE mark.

When using the pressure filters according to 51418 in explosive areas, potential equalization has to be ensured.

According to DIN EN 50020, the electrical maintenance indicators are simple, electrical operating equipment not having own voltage sources. This simple, electrical operating equipment may - according to DIN EN 60079-14 - in intrinsically safe electrical circuits (EEx ib] be used in systems for device group II, category 2G (zone 1) and category 3G (zone 2) without marking and certification. The operating equipment is assigned to explosion group II B and temperature class T5.

Possible circuit according to DIN EN 60079-14



With electrical maintenance indicators with two switching points, switching units with two intrinsically safe input circles must be used.