

Duplex filter with filter element according to DIN 24550

Type 400LDN0040 to 1000; 400LD0130, 0150

RE 51429

Edition: 2012-07

Replaces: 02.11



- ▶ Size **according to DIN 24550**: 0040 to 1000
- ▶ Additional sizes: 0130, 0150
- ▶ Nominal pressure 400 bar [5714 psi]
- ▶ Connection with SAE 2" 6000 psi
- ▶ Operating temperature -10 °C to 100 °C [14 °F to 212 °F];

Features

Duplex filters are used in hydraulic systems for separating solid materials from the hydraulic fluids and lubricating oils. They are intended for installation into piping. They allow for the exchange of the filter element without operational interruption.

They distinguish themselves by the following:

- ▶ Filtration of very fine particles and high dirt holding capacity across a broad pressure differential range
- ▶ High dirt holding capacity thanks to large specific filter surface
- ▶ Good chemical resistance of the filter elements
- ▶ High collapse resistance of the filter elements (e.g. in case of cold start)
- ▶ Filter ratings of $3\text{ }\mu\text{m}$ to $100\text{ }\mu\text{m}$
- ▶ By default equipped with mechanical optical maintenance indicator with memory function

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Ordering code**of the filter**

01	02	03	04	05	06	07	08	09	10
400	LD			-	B	00	-	-	-

Pressure

01	400 bar [5714 psi]	400
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Design

02	Duplex filter	LD
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Filter element

03	according to DIN 24550 (only with frame size 0040 ... 0100 + 0160 ... 1000)	N
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Size

04	LDN...	0040 0063 0100 0160 0250 0400 0630 1000
	LD...	0130 0150

Filter rating in µm

05	Nominal Stainless steel wire mesh, cleanable	G10 G25 G40 G100
	Absolute (ISO 16889) Micro glass, not cleanable	H3XL H6XL H10XL H20XL

Pressure differential

06	max. admissible pressure differential of the filter element 330 bar [4786 psi], without bypass valve	B
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Element design

07	Standard adhesive T = 100 °C [212 °F]	0...
	Standard material tinned	...0

Maintenance indicator

08	Maintenance indicator, visual, specify switching pressure: 5.0 bar [72.5 psi]	V5,0
	Maintenance indicator, visual, specify switching pressure: 8.0 bar [116 psi]	V8,0

Seal

09	NBR seal	M
	FKM seal	V

Ordering code**of the filter**

01	02	03	04	05	06	07	08	09	10
400	LD			-	B	00	-	-	-

Connection

10	Frame size	0040 ... 0100	0130 ... 0150	0160 ... 0400	0630 ... 1000		
	Connection						
	G 1/2	●				Pipe thread according to ISO 228	R2
	SAE 10	X				Pipe thread according to SAE J1926	U3
	SAE 1"		●			SAE flange 6000 psi	S4
	SAE 1 1/2"			●			S6
	SAE 2"				●		S8
			<input checked="" type="checkbox"/> Standard connection <input type="checkbox"/> additional connection possibility				

Order example:**400LDN0160-H3XLB00-V5,0-M-S6****Further versions (filter materials, connections,...) are available on request.**

Ordering code**of the filter element**

01	02	03	04	05	06
2.		-	B00	-	0

Filter element

01	Design	2.
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Size

02	LDN...	0040 0063 0100 0160 0250 0400 0630 1000
	LD...	0130 0150

Filter rating in µm

03	Nominal Stainless steel wire mesh, cleanable	G10 G25 G40 G100
	Absolute (ISO 16889) Micro glass, not cleanable	H3XL H6XL H10XL H20XL

Pressure differential

04	Max. admissible pressure differential of the filter element 330 bar [4786 psi]	B00
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Bypass valve

05	at filter element always 0	0
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Seal

06	NBR seal	M
	FKM seal	V

Order example:**2.0160 H3XL-B00-0-M**

Preferred types

400LD(N) preferred types, NBR seal, flow specification for 30 mm²/s [142 SUS]

Duplex filter, filter rating 3 µm

Type	Flow in l/min [US gpm] with $v = 30 \text{ mm}^2/\text{s}$ and $\Delta p = 1.5 \text{ bar}$ [21.75 psi] ¹⁾	Material no. Filter				Material no. Replacement element
		..R2	R928039411	..U3	R928039437	
400LDN0040-H3XLB00-V5,0-M-..	27 [7.13]	..R2	R928039411	..U3	R928039437	R928006654
400LDN0063-H3XLB00-V5,0-M-..	33 [8.72]	..R2	R928039412	..U3	R928039438	R928006708
400LDN0100-H3XLB00-V5,0-M-..	42 [11.10]	..R2	R928039413	..U3	R928039439	R928006762
400LD0130-H3XLB00-V5,0-M-..	73 [19.28]	..S4	R928039415			R928022310
400LD0150-H3XLB00-V5,0-M-..	92 [24.30]	..S4	R928039416			R928022319
400LDN0160-H3XLB00-V5,0-M-..	159 [42.00]	..S6	R928039417			R928006816
400LDN0250-H3XLB00-V5,0-M-..	202 [53.36]	..S6	R928039418			R928006870
400LDN0400-H3XLB00-V5,0-M-..	238 [62.87]	..S6	R928039419			R928006924
400LDN0630-H3XLB00-V5,0-M-..	300 [79.36]	..S8	R928039420			R928006978
400LDN1000-H3XLB00-V5,0-M-..	375 [99.21]	..S8	R928039421			R928007032

Duplex filter, filter rating 6 µm

Type	Flow in l/min [US gpm] with $v = 30 \text{ mm}^2/\text{s}$ and $\Delta p = 1.5 \text{ bar}$ [21.75 psi] ¹⁾	Material no. Filter				Material no. Replacement element
		..R2	R928039422	..U3	R928039441	
400LDN0040-H6XLB00-V5,0-M-..	30 [7.93]	..R2	R928039422	..U3	R928039441	R928006655
400LDN0063-H6XLB00-V5,0-M-..	40 [10.57]	..R2	R928039423	..U3	R928039442	R928006709
400LDN0100-H6XLB00-V5,0-M-..	45 [11.89]	..R2	R928039424	..U3	R928039443	R928006763
400LD0130-H6XLB00-V5,0-M-..	88 [23.25]	..S4	R928039426			R928022311
400LD0150-H6XLB00-V5,0-M-..	100 [26.42]	..S4	R928039427			R928022320
400LDN0160-H6XLB00-V5,0-M-..	188 [49.66]	..S6	R928039429			R928006817
400LDN0250-H6XLB00-V5,0-M-..	215 [56.80]	..S6	R928039430			R928006871
400LDN0400-H6XLB00-V5,0-M-..	258 [68.16]	..S6	R928039431			R928006925
400LDN0630-H6XLB00-V5,0-M-..	340 [89.95]	..S8	R928039432			R928006979
400LDN1000-H6XLB00-V5,0-M-..	525 [138.89]	..S8	R928039433			R928007033

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

Preferred types

400LD(N) preferred types, NBR seal, flow specification for 30 mm²/s [142 SUS]

Duplex filter, filter rating 10 µm

Type	Flow in l/min [US gpm] with $v = 30 \text{ mm}^2/\text{s}$ and $\Delta p = 1.5 \text{ bar}$ [21.75 psi] ¹⁾	Material no. Filter			Material no. Replacement element	
400LDN0040-H10XLB00-V5,0-M-..	31 [8.19]	..R2	R928038630	..U3	R928039444	R928006656
400LDN0063-H10XLB00-V5,0-M-..	43 [11.36]	..R2	R928038632	..U3	R928039445	R928006710
400LDN0100-H10XLB00-V5,0-M-..	46 [12.15]	..R2	R928038550	..U3	R928039446	R928006764
400LD0130-H10XLB00-V5,0-M-..	99 [26.15]	..S4	R928038549			R928022312
400LD0150-H10XLB00-V5,0-M-..	105 [27.74]	..S4	R928039285			R928022321
400LDN0160-H10XLB00-V5,0-M-..	208 [54.95]	..S6	R928039283			R928006818
400LDN0250-H10XLB00-V5,0-M-..	223 [58.91]	..S6	R928039436			R928006872
400LDN0400-H10XLB00-V5,0-M-..	268 [70.80]	..S6	R928038551			R928006926
400LDN0630-H10XLB00-V5,0-M-..	450 [119.95]	..S8	R928038848			R928006980
400LDN1000-H10XLB00-V5,0-M-..	545 [144.18]	..S8	R928038849			R928004034

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

Ordering code: Electronic switching element for maintenance indicator

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 connector, 2-pin, 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	No
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	No

Order example:

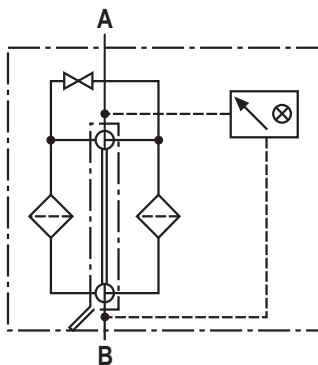
Duplex filter with mechanical visual maintenance indicator for $p_{Nominal} = 400 \text{ bar}$ [5714 psi] without bypass valve, size 0160, with filter element 3 µm and electronic switching element M12x1 with 1 switching point for hydraulic fluid mineral oil HLP according to DIN 51524.

Filter with mech.-visual maintenance indicator: **400LDN0160-H3XLB00-V5,0-M-S6** **Material no. R928039417**
Electr. switching element: **WE-1SP-M12x1** **Material no. R928028409**

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

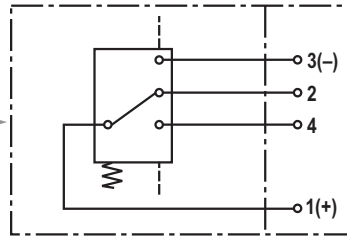
Symbols

Duplex filter
without bypass and
with mechanical indicator



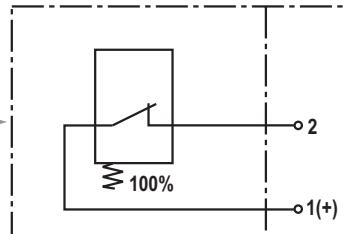
Electronic switching element
for maintenance indicator

Switching element Connector



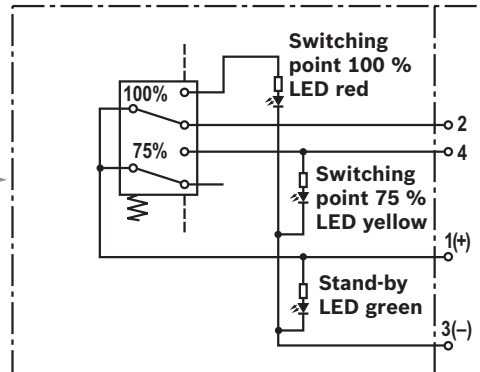
WE-1SP-M12x1

Switching element Connector



WE-1SP-EN175301-803

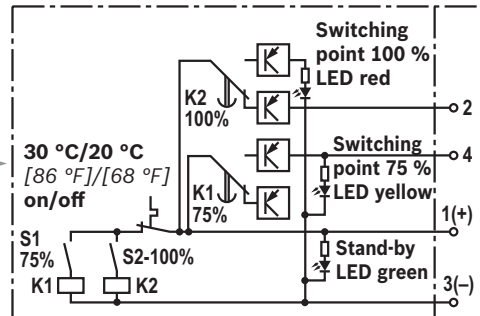
Switching element Connector



WE-2SP-M12x1

Circuit diagram drawn in plugged condition (operating state)

Switching element Connector



WE-2SPSU-M12x1

Circuit diagram drawn in plugged condition at temperature > 30 °C [86 °F] (operating state)

Function, section

The 400LD(N) duplex filters are suitable for direct installation into pressure lines. They are mostly installed upstream open-loop or closed-loop control units to be protected. They basically comprise of a filter head with switch-over fitting (1), a screwable filter bowl (2), a filter element (3) and a mechanical-visual maintenance indicator (4).

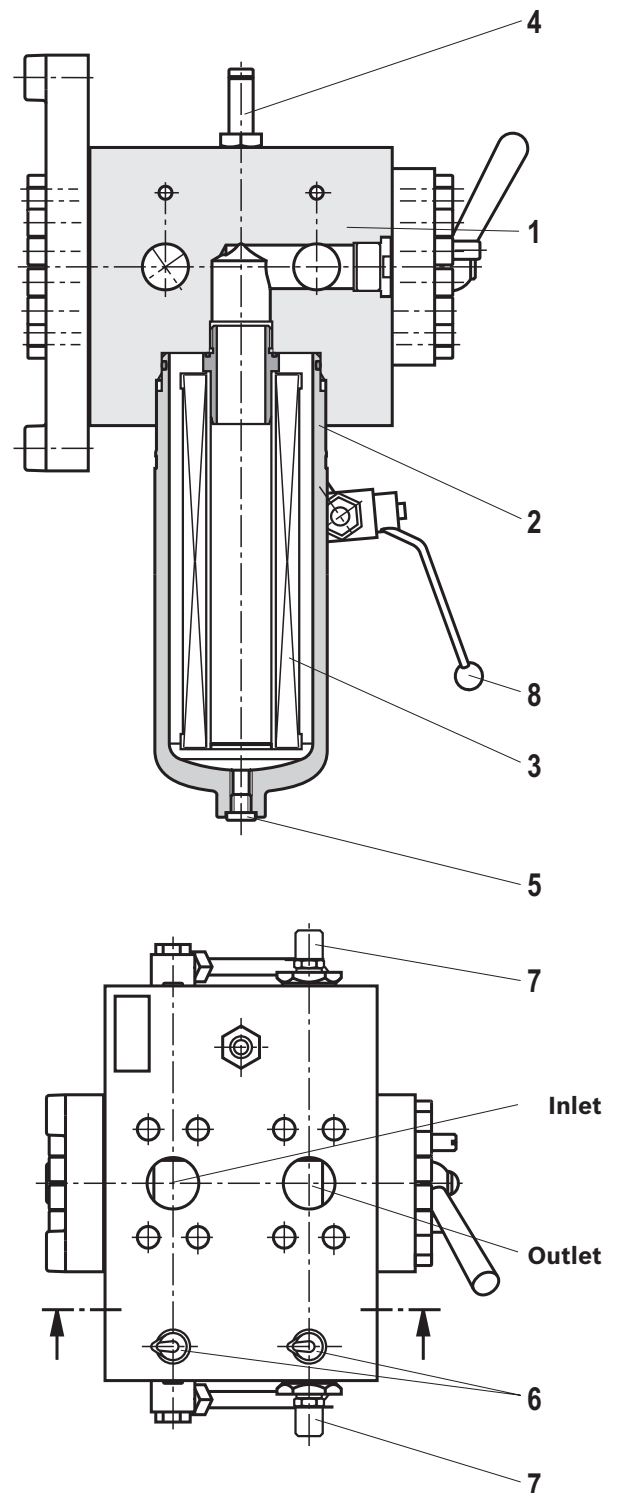
Via the inlet, the hydraulic fluid reaches the filter element (3) where it is cleaned. The dirt particles filtered out settle in the filter bowl (2) and in the filter element (3). Via the outlet, the filtered hydraulic fluid enters the hydraulic circuit.

The filter housing and all connection elements are designed so that pressure peaks - as they may e.g. occur in case of abrupt opening of large control valves due to the accelerated fluid weight - can be securely absorbed. All filters have one Minimes connection (6) each as measuring port at the inlet and the outlet. By default, the bleeding is effected via lateral Minimes connections (7). As of size 0160, the standard equipment comprises an oil drain plug (5).

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

Notice!

Size 1000 is equipped with a divided filter bowl (2). See device dimensions page 16. This enlarges the servicing height as shown in the measurement chart.



Type 400LDN0250...

Technical data

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

general			
Duplex filter: Filter bowls			
Filter type	Filter bowl	Weight in kg [<i>lbs</i>]	Volume in l [<i>gal</i>]
400 LDN 0040	450 LE 0003	1.33 [2.93]	2 x 0.2 [2 x 0.05]
400 LDN 0063	450 LE 0005	1.33 [2.93]	2 x 0.3 [2 x 0.08]
400 LDN 0100	450 LE 0008	2.10 [4.63]	2 x 0.5 [2 x 0.13]
400 LD 0130	450 LE 0015	3.76 [8.29]	2 x 0.9 [2 x 0.24]
400 LD 0150	450 LE 0018	4.65 [10.25]	2 x 1.1 [2 x 0.29]
400 LDN 0160	450 LE 0020	5.52 [12.17]	2 x 1.3 [2 x 0.34]
400 LDN 0250	450 LE 0030	8.02 [17.68]	2 x 1.9 [2 x 0.50]
400 LDN 0400	450 LE 0045	12.21 [26.91]	2 x 3.0 [2 x 0.79]
400 LDN 0630	450 LE 0095	21.36 [47.08]	2 x 4.5 [2 x 1.19]
400 LDN 1000	445 LEN 1000	Filter bowl 45.34 [99.93]	2 x 6.2 [2 x 1.64]
		Cover 12.08 [26.62]	
Installation position		vertical	
Ambient temperature range		°C [°F]	-30 ... +100 [-22 ... +212]
Material	- Filter head	Spheroidal graphite iron	
	- Filter bowl	Steel	
	- Visual maintenance indicator	Brass	
	- Electronic switching element	Plastic PA6	
hydraulic			
Maximum operating pressure		bar [<i>psi</i>]	400 [5714]
Hydraulic fluid temperature range		°C [°F]	-10 ... +100 [+14 ... +212] (short-time -30 [-22])
Minimum conductivity of the medium		pS/m	300
Fatigue strength according to ISO 10771		Load cycles	> 10 ⁶ with max. operating pressure
Cracking pressure of the bypass valve		bar [<i>psi</i>]	Not available
Type of pressure measurement of the maintenance indicator		Pressure differential	
Response pressure of the maintenance indicator		bar [<i>psi</i>]	5 ± 0.5 [72 ± 7] alternatively 8 ± 0.8 [115 ± 12]

Technical data

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

electric (electronic switching element)				
Electrical connection		Round plug-in connection M12x1, 4-pole		Standard connection EN 175301-803
	Version	1SP-M12x1	2SP-M12x1	2SPSU-M12x1
				1SP-EN175301-803
Contact load, direct voltage	A_{max}	1		
Voltage range	V_{max}	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	
	- 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: - with round plug-in connection M12x1	kg [lbs]	0.1 [0.22]	

Filter element				
Glass fiber paper H..XL		Single-use element on the basis of inorganic fiber		
		Filtration ratio according to ISO 16889 up to $\Delta p = 5 \text{ bar [72.5 psi]}$	Achievable oil cleanliness according to ISO 4406 [SAE-AS 4059]	
Particle separation	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	B	bar [psi]	330 [4785]	

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 bio-degradable hydraulic fluids				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 mineral oil HLP46 according to ISO 3968)

H3XL

Spec. weight: < 0.9 kg/dm³

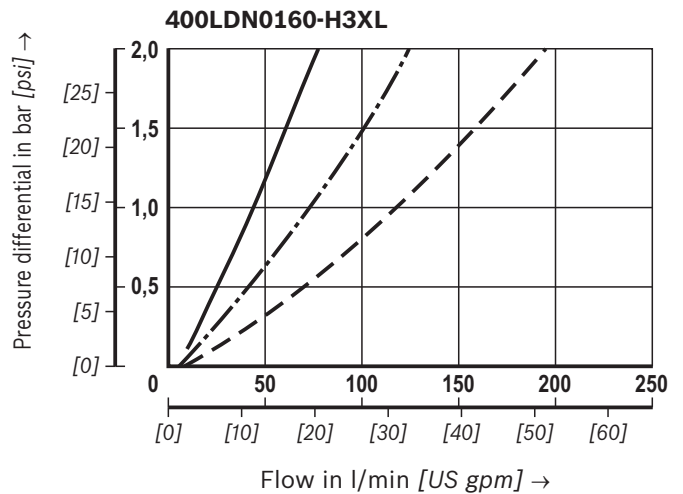
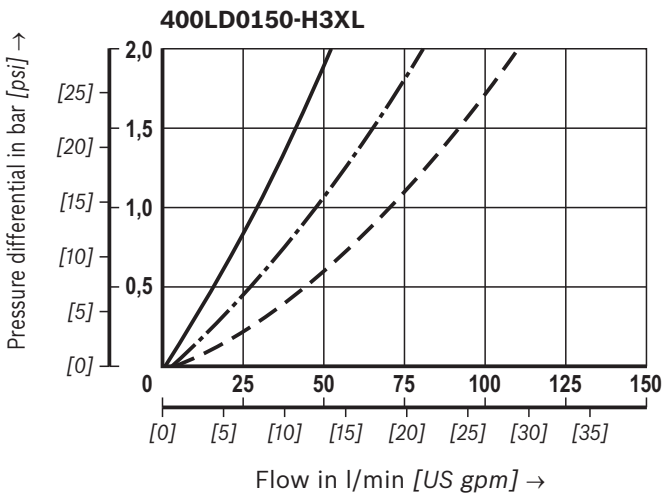
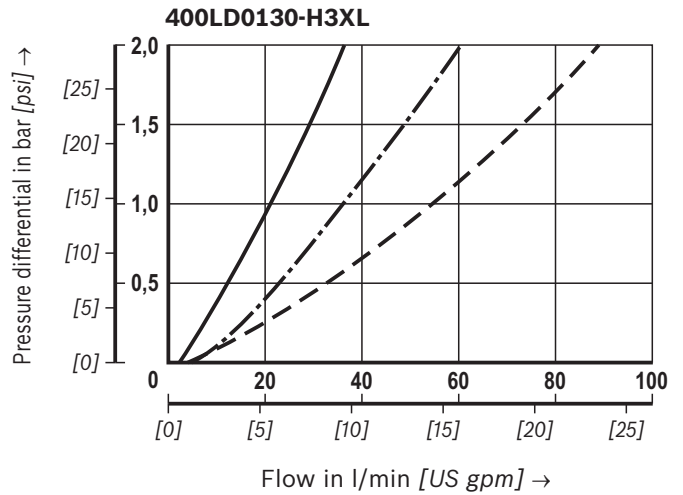
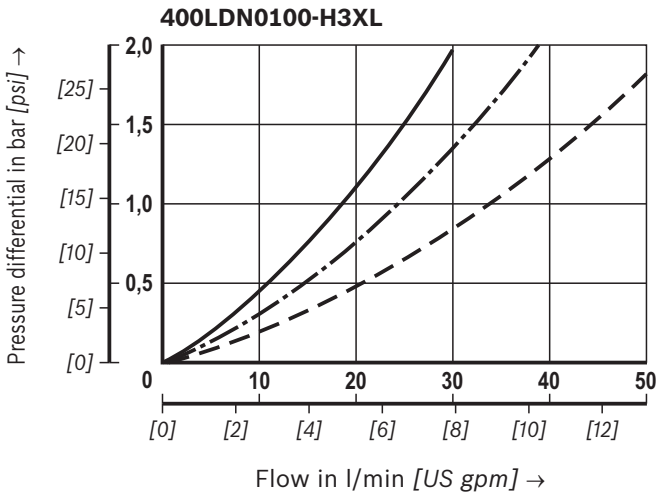
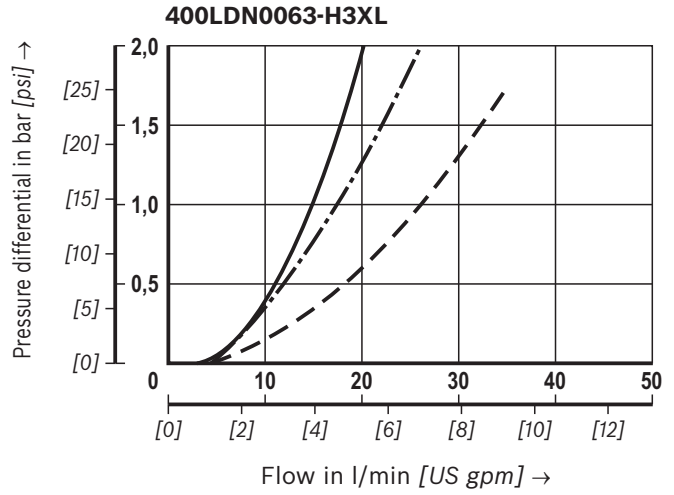
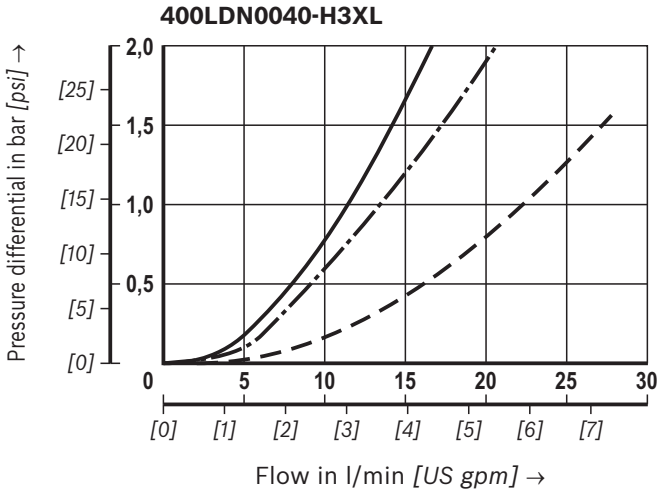
Δp -Q characteristic curves for complete filter

recommended initial Δp for design = 1.5 bar [21.75 psi]

A proper filter design is enabled by our computer program "BRFilterSelect".

Oil viscosity:

- 140 mm²/s [649 SUS]
- · - 68 mm²/s [315 SUS]
- - - 30 mm²/s [142 SUS]



Characteristic curves (measured with mineral oil HLP46 according to ISO 3968)

H3XL

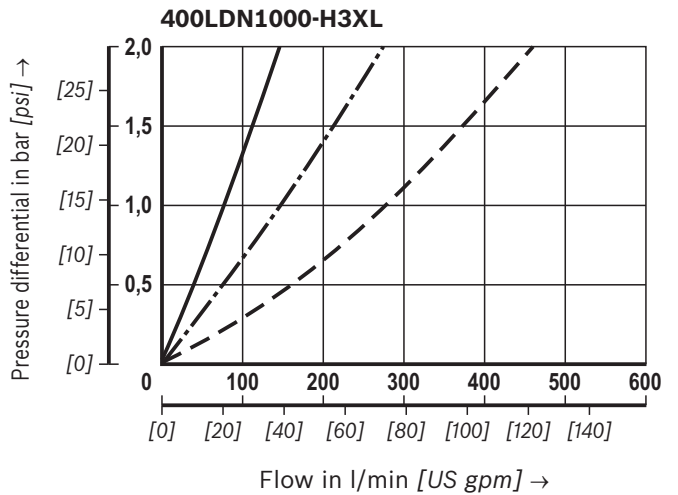
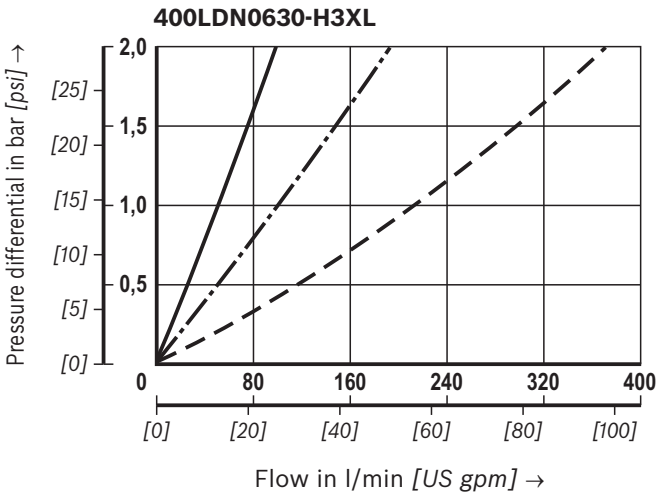
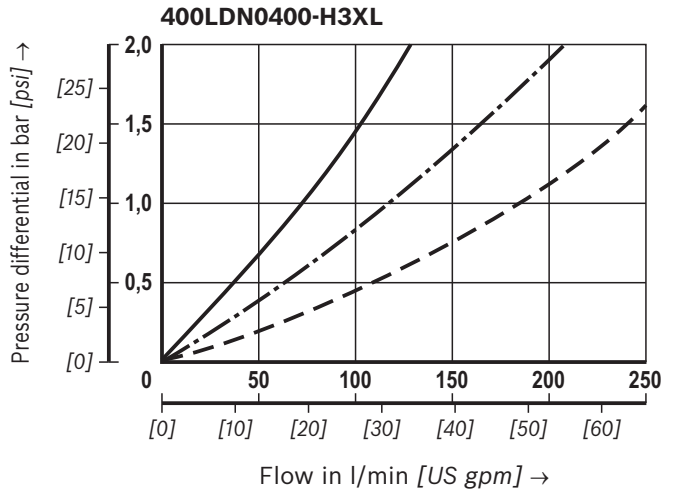
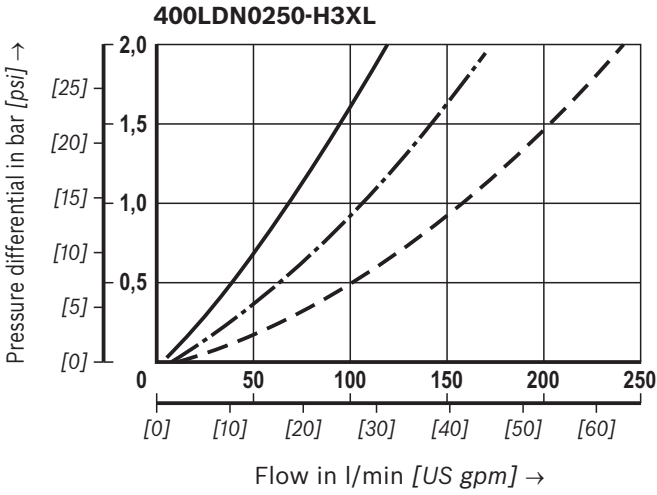
Spec. weight: < 0.9 kg/dm³

Δp -Q characteristic curves for complete filter

recommended initial Δp for design = 1.5 bar [21.75 psi]

A proper filter design is enabled by our computer program "BRFilterSelect".

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



Characteristic curves (measured with mineral oil HLP46 according to ISO 3968)

H10XL

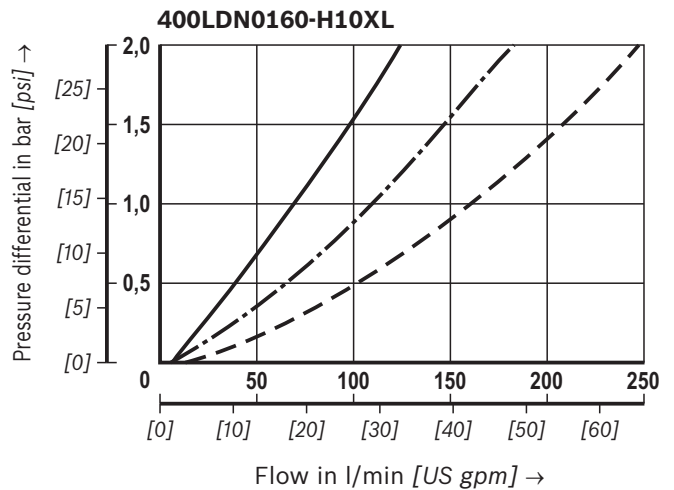
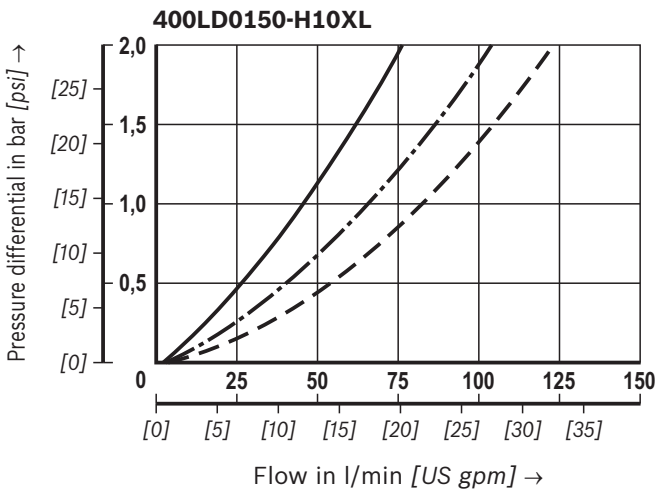
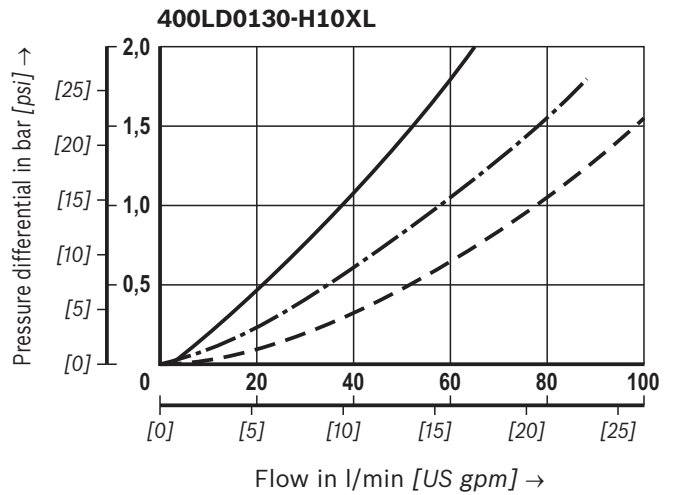
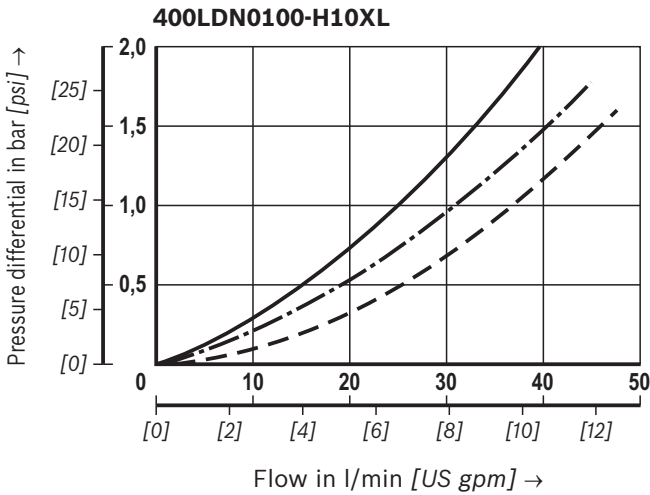
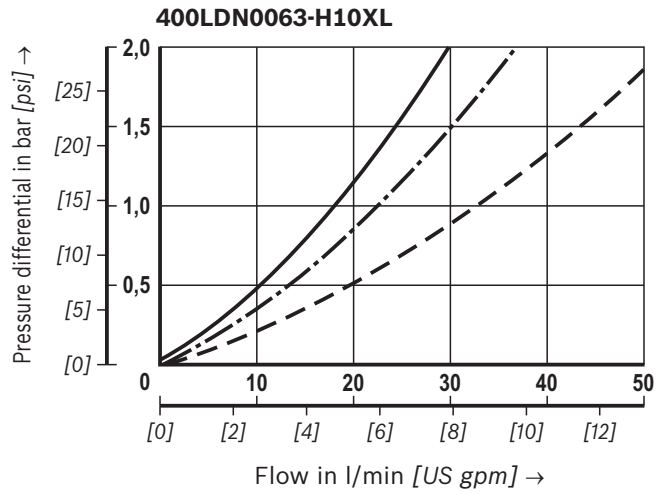
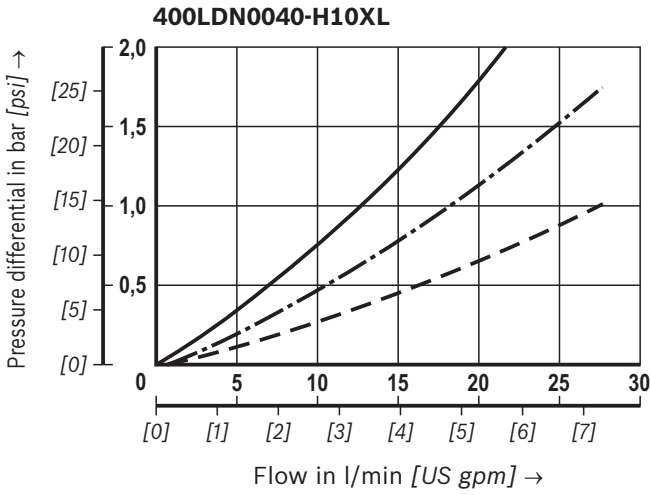
Spec. weight: < 0.9 kg/dm³

Δp -Q characteristic curves for complete filter

recommended initial Δp for design = 1.5 bar [21.75 psi]

A proper filter design is enabled by our computer program "BRFilterSelect".

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



Characteristic curves (measured with mineral oil HLP46 according to ISO 3968)

H10XL

Spec. weight: < 0.9 kg/dm³

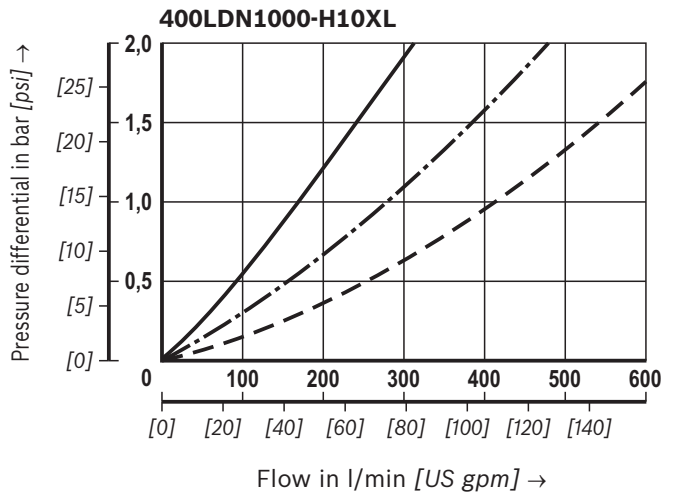
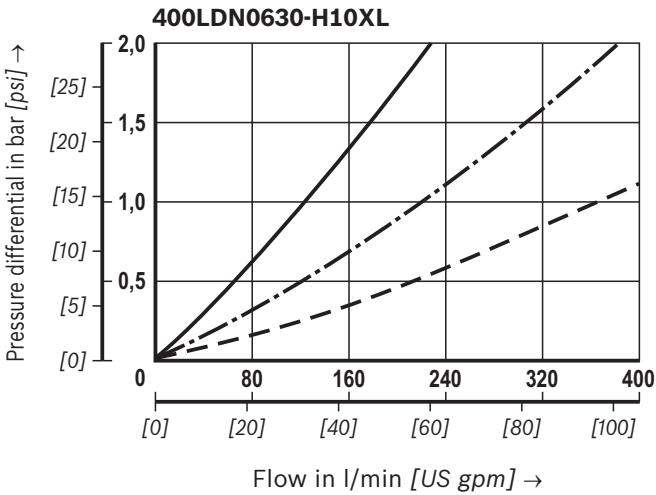
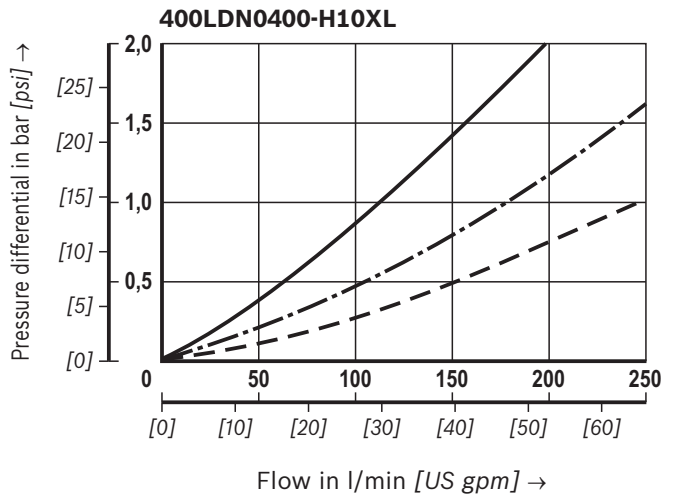
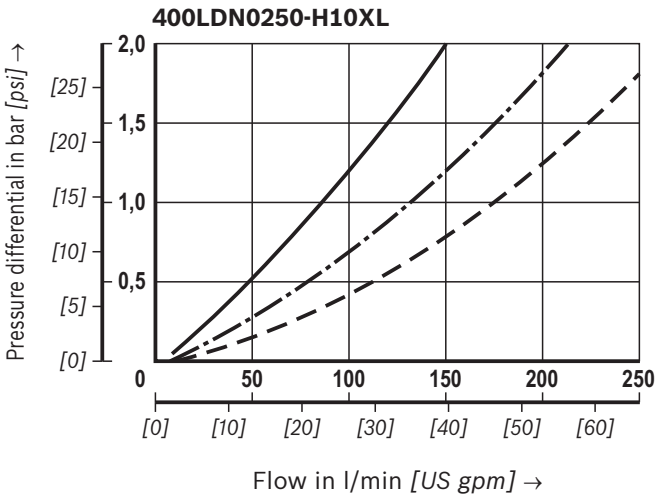
Δp -Q characteristic curves for complete filter

recommended initial Δp for design = 1.5 bar [21.75 psi]

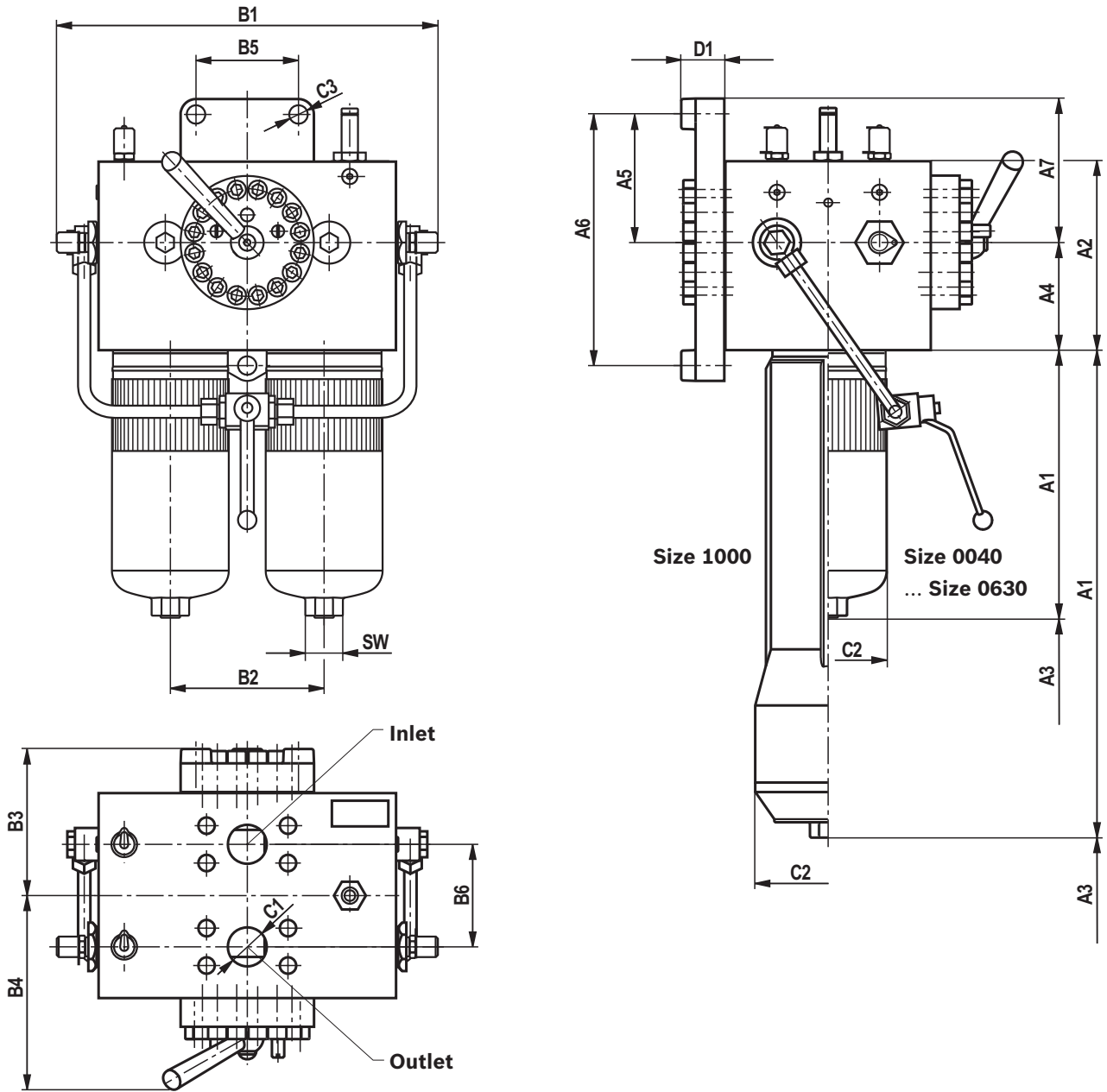
A proper filter design is enabled by our computer program "BRFilterSelect".

Oil viscosity:

- 140 mm²/s [649 SUS]
- · - 68 mm²/s [315 SUS]
- - - 30 mm²/s [142 SUS]



Device dimensions size 0040 ... size 1000 (dimensions in mm [inch])



Device dimensions size 0040 ... size 0400 (dimensions in mm [inch])**Filter housing for filter elements according to DIN 24550 and according to Rexroth standard**

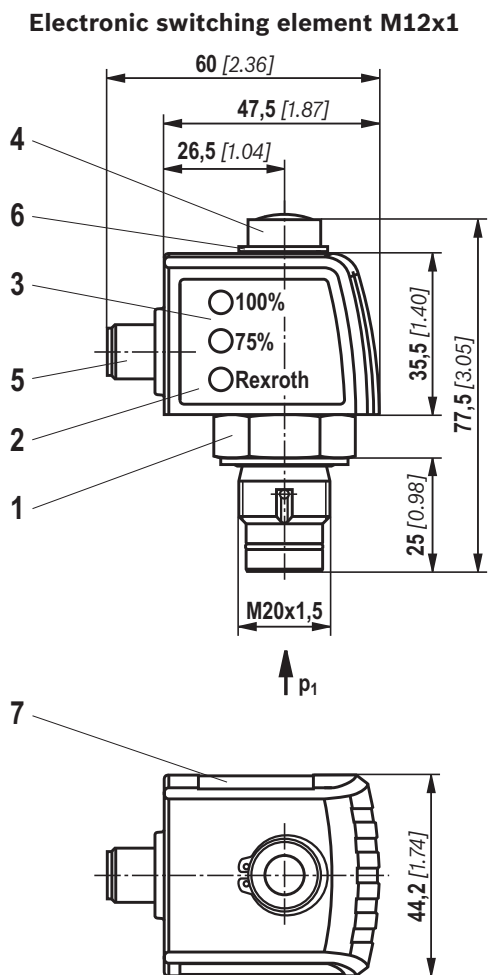
Type 400 LD(N)	A1	A2	A3 ¹⁾	A4	A5	A6	A7	B1	B2	B3
0040	100 [3.94]	101 [3.98]	110 [4.33]	52 [2.05]	60 [2.36]	120 [4.72]	72 [2.83]	240 [9.45]	90 [3.54]	85 [3.35]
0063	163 [6.42]									
0100	253 [9.96]									
0130	191 [7.52]	130 [5.12]	120 [4.72]	74 [2.91]	72.5 [2.85]	170 [6.69]	85 [3.35]	350 [13.78]	120 [4.72]	111 [4.37]
0150	241 [9.49]			105 [4.13]	125 [4.92]	245 [9.65]	140 [5.51]	372 [14.65]	150 [5.91]	144 [5.67]
0160	169 [6.65]	184 [7.24]	120 [4.72]	108 [4.25]	110 [4.33]	240 [9.45]	130 [5.11]	530 [20.87]	200 [7.87]	166 [6.54]
0250	259 [10.20]									
0400	409 [16.10]									
0630	420 [16.54]	190 [7.48]	160 [6.30]	108 [4.25]	110 [4.33]	240 [9.45]	130 [5.11]	530 [20.87]	200 [7.87]	166 [6.54]
1000	650 [25.59]		550 [21.65]							

Type 400 LD(N)	B4	B5	B6	C1	C2 Ø	C3 Ø	D1	SW
0040	118 [4.65]	56 [2.20]	40 [1.57]	G 1/2	64 [2.52]	9 [0.35]	33 [1.30]	24 [0.94]
0063								
0100								
0130	160 [6.30]	80 [3.15]	75 [2.95]	SAE 1" 6000 psi	92 [3.62]	14 [0.55]	35 [1.38]	32 [1.26]
0150								
0160	188 [7.40]	100 [3.94]	100 [3.94]	SAE 1 1/2" 6000 psi	114 [4.49]	18 [0.71]	42 [1.65]	
0250								
0400	242 [9.53]	110 [4.33]	120 [4.72]	SAE 2" 6000 psi	141 [5.55]	23 [0.91]	40 [1.57]	41 [1.61]
0630					188 [7.40]			
1000								

¹⁾ Servicing height for filter element exchange

Filter bowl weight and contents see technical data!

Maintenance indicator (dimensions in mm [inch])



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

Notices!

Representation contains mechanical visual maintenance indicator (1) and electronic switching element (2).
Switching elements with increased switching power upon request.

Spare parts

Electronic switching element

01	02	03	04	05	06
W	O	-	D01	-	-

01	Maintenance indicator	W
02	mechanical visual indicator	O
03	Design pressure differential M20x1.5	D01

Switching pressure

04	5.0 bar [72.5 psi]	5.0
	8.0 bar [116 psi]	8.0

Seal

05	NBR seal	M
	FKM seal	V

Max. nominal pressure

06	450 bar [6527 psi]	450
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Mechanical visual maintenance indicator	Material no.
WO-D01-5,0-M-450	R901025313
WO-D01-8,0-M-450	R928038785

Seal kit

01	02	03	04
D	400LD		

01	Seal kit	D
02	Series	400LD

Size

03	Size 0040 ... 0100	N0040 ... 0100
	Size 0130 ... 0150	0130 ... 0150
	Size 0160 ... 0400	N0160 ... 0400
	Size 0630	N0630
	Size 1000	N1000

Seal

04	NBR seal	M
	FKM seal	V

Seal kit	Material no.
D400LDN0040 ... 0100-M	R928039584
D400LD0130 ... 0150-M	R928039585
D400LDN0160 ... 0400-M	R928039586
D400LDN0630-M	R928039587
D400LDN1000-M	R928039588

Installation, commissioning and maintenance

Installation of the filter

Verify operating overpressure with name plate information. Screw the filter head item 1 to the mounting device considering flow direction (direction arrows) and servicing height of the filter element item 3.

Remove the blanking plugs from filter inlet and outlet, screw filter in pipeline without tension stress. The filter housing must be grounded via the mounting.

Bring the conical handle item 8 into central position in order to fill both filter sides. Open the ball valve of the compensation line (lever item 12 horizontal). Switch on system pump. Bleed filter by opening the bleed valves item 9; close them again when operating liquid escapes. Switch the filter into the operating position. The conical handle item 8 must rest against the stop and close the pressure compensation (lever item 12) again (lever vertical).

Connection of the electronic maintenance indicator

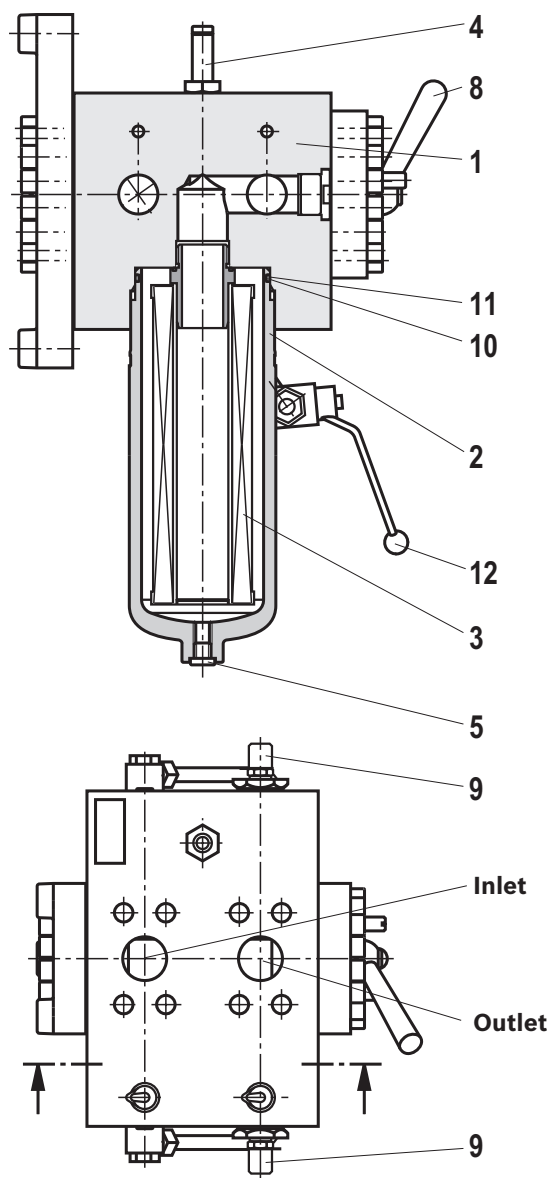
Basically, the filter is equipped with mechanical optical maintenance indicator (4). The electronic maintenance indicator is connected via the switching element with 1 or 2 switching points, which is attached to the mechanical optical maintenance indicator and held by means of the locking ring.

When must the filter element be exchanged or cleaned respectively?

After initial start-up of the system, the filter element is to be exchanged.

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. Only push the red pushbutton in again after the operating temperature has been reached. If it jumps out again immediately or if the electric signal has not gone out at operating temperature, the filter element must be exchanged or cleaned respectively.

The filter element should be replaced or cleaned after max. 6 months. Cleaning of the filter element see data sheet 51420.



Recommended mounting screws according to ISO 4762

Friction coefficient $\mu_{\text{total}} = 0.14$

Size		Tightening torque
0040 ... 0100	3 pieces M8 x 45 - 8.8	20 Nm + 5 Nm
0130 ... 0150	3 pieces M12 x 55 - 8.8	80 Nm + 8 Nm
0160 ... 0400	3 pieces M16 x 70 - 8.8	190 Nm ± 10 Nm
0630 ... 1000	3 pieces M20 x 80 - 8.8	250 Nm ± 15 Nm

Installation, commissioning and maintenance

Element exchange

- ▶ Open the shut-off cock item 12 in order to compensate the pressure in both filter halves.
- ▶ Operate the conical handle item 8 and select the second filter. The conical handle (item 8) always points at the filter side which is in operation.
- ▶ Close the shut-off cock item 12 again.
- ▶ At the decommissioned filter side, reduce the operating pressure by opening the bleed valve item 9.
- ▶ Drain the filter bowl via the drain screw (item 5) if available.
- ▶ Screw off the filter bowl item 2 and/or the base (size 1000) and pull off the filter element item 3 from the spigot in the filter head item 1 by turning it slightly. Check the filter bowl item 2 for cleanliness and clean it if necessary. Replace the filter element H...-XL. Clean the filter element with material G
- ▶ The efficiency of the cleaning process depends on the type of dirt and the amount of the pressure differential before the filter element exchange. If the pressure differential after the filter element exchange exceeds 50 % of the value before the filter element exchange, the G... element also needs to be replaced.
- ▶ Install cleaned or replaced filter element by slightly turning it back on its spigot.
- ▶ Check seal ring item 10+11 in the filter bowl item 2 and replace when damaged or worn.
- ▶ Screw the filter bowl item 2 and/or the base (size 1000) to the stop and rotate it back by 1/4 rotation.
- ▶ Open the shut-off cock item 12, bleed the filter by opening the valve item 9; close it again when operating liquid escapes.
- ▶ Close the shut-off cock item 12 again.

Quality and standardization

The duplex filters for hydraulic applications according to 51429 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 they 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)

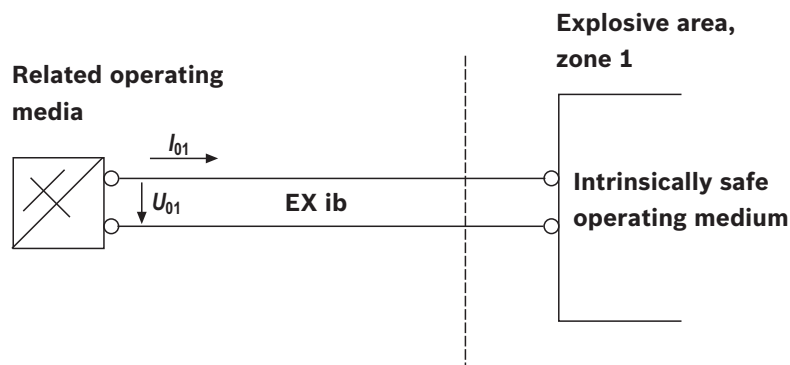
When using the inline filters according to 51429 in explosive areas, appropriate equipotential bonding has to be ensured.

According to DIN EN 60079-11, the electronic maintenance indicators WE-1SP-M12x1 and WE-1SP-EN175301-803 are simple, electronic operating equipment not having an own voltage source. This simple, electronic operating equipment may - according to DIN EN 60079-14 - in intrinsically safe electric circuits (EEx ib) be used in systems without marking and certification.

Use / assignment	Gas 2G		Dust 2D
Assignment	Ex II 2G Ex ib IIB T4 Gb		Ex II 2D Ex ib IIIC T100°C Db
Zone suitability	Zone 1, zone 2		Zone 21, zone 22
Adm. intrinsically safe electric circuits	Ex ia IIC, Ex ib IIC, Ex ic IIC		Ex ia IIIC, Ex ib IIIC

Technical data			
Switching voltage	$U_{i\max}$	V AC/DC	150
Switching current	$I_{i\max}$	A	1.0
Switching power	$P_{i\max}$		1.3 W T4 T _{max} 40 °C
Max. switching power			750 mW T _{max} 40 °C
			1.0 W T4 T _{max} 80 °C
Surface temperature		°C [°F]	550 mW T _{max} 100 °C
			Max 100 [212]
Inner capacity	C_i		Neglectable
Inner inductivity	L_i		Neglectable
Dust accumulation		mm [inch]	0.5 [0.02]

Possible circuit according to DIN EN 60079-14



Planner/operator documentation:

R928028899 = Declaration of Incorporation according to DIN EN 13463 for components not subject to approval.

Notes

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