HARLEX

Duplex filter with filter element according to DIN 24550

Type 50LDN0040 to 0400; 50LD0130, 0150

- Size according to **DIN 24550**: 0040 to 0400
- Additional sizes: 0130, 0150
- Nominal pressure 50 bar *[725 psi]*
- Connection up to 1 1/2"
- 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 fluids and lubricating oils. They are intended for installation into piping and allow for the exchange of the filter element without operational interruption.

They distinguish themselves by the following:

- Filters for inline installation
- Special highly efficient filter materials
- Filtration of very fine particles and high dirt holding capacity across a broad pressure differential range
- High collapse rating of the filter elements
- By default equipped with mechanical optical maintenance indicator with memory function
- Various, optional electronic switching elements, modular design
- Optional bypass valve integrated in the filter housing
- Pressure equalization function integrated in the switch-over valve
- Optional measuring port

Ordering code
Filter

01	02	03		04	05		06		07		08		09		09		09		09	
50LD			–			–		–		–		–		–		–		–		

Series

01	Duplex filter 50 bar *[725 psi]*	**50LD**

Filter element

02	With filter element according to **DIN 24550**	**N**

Size

03	LDN... (filter element according to **DIN 24550**)	**0040** **0063** **0100** **0160** **0250** **0400**
	LD... (fil ter elements according to **standard**)	**0130** **0150**

Filter rating in µm

04	**Nominal**	Stainless steel wire mesh, cleanable	**G10** **G25** **G40** **G60** **G100**
	Nominal	Filter paper, not cleanable	**P10** **P25**
	Absolute **(ISO 16889 ; $\beta_x(c) \geq 200$)**	Non-woven glass fiber media, not cleanable	**H3XL** **H6XL** **H10XL** **H20XL**

Pressure differential

05	Max. admissible pressure differential of the filter element 30 bar *[435 psi]*, with bypass valve	**A00**
	Max. admissible pressure differential of the filter element 330 bar *[4785 psi]*, without bypass valve	**B00**

Maintenance indicator, mechanical optical

06	Maintenance indicator, mech./optical, switching pressure 0.8 bar *[11.6 psi]* – bypass cracking pressure 2.5 bar *[36 psi]*	**V0,8**
	Maintenance indicator, mech./optical, switching pressure 1.5 bar *[21.8 psi]* – bypass cracking pressure 2.5 bar *[36 psi]*	**V1,5**
	Maintenance indicator, mech./optical, switching pressure 2.2 bar *[32 psi]* – bypass cracking pressure 3.5 bar *[51 psi]*	**V2,2**
	Maintenance indicator, mech./optical, switching pressure 5.0 bar *[72.5 psi]* – bypass cracking pressure 7 bar *[102 psi]*	**V5,0**

Seal

07	NBR seal	**M**
	FKM seal	**V**

Ordering code
Filter

01	02	03		04	05		06		07		08		09		09		09		09
50LD			–			–		–		–		–		–		–		–	

Connection

08	**Frame size** / **Connection**	**0040 ... 0100**	**0130 ... 0150**	**0160 ... 0250**		
	G 1	●			Pipe thread according to ISO 228	**R4**
	G 1 1/4		●			**R5**
	G 1 1/2			●		**R6**
	SAE 12	X			Pipe thread according to SAE J1926	**U4**
	SAE 1 1/4"		X		SAE flange 3000 psi	**S5**
	SAE 1 1/2"			X		**S6**
		● Standard connection X Alternative connection				

Supplementary information (multiple specifications possible)

09		
	Bleed valve instead of bleed screw	**E**
	Additional threaded couplings, G1/4 top clean and dirt side	**M**
	Without bypass valve (only possible in connection with filter element version "A00") [1]	**NB**
	Manufacturer's inspection certificate M according to DIN 55350 T18	**Z1**

[1] **Attention:** If this option is selected and the maintenance indicator is not observed, the filter element may collapse in case of pressure differentials of more than 30 bar *[435 psi]*.

Order example:
50LDN0160-H3XLA00-V2,2-M-R6

Further versions (filter materials, connections,...) are available on request.

Preferred types

50LD(N) preferred types, NBR seal, flow information for 30 mm²/s *[143 SUS]* duplex filter, filter rating 3 µm

Type	Flow in l/min *[US gpm]* with Δ*p* = 1 bar *[14.5 psi]* [1]	Filter			
50LDN0040-H3XLA00-V2,2-M-..	25 *[6.60]*	..R4		..U4	
50LDN0063-H3XLA00-V2,2-M-..	35 *[9.25]*	..R4		..U4	
50LDN0100-H3XLA00-V2,2-M-..	42 *[11.10]*	..R4		..U4	
50LD0130-H3XLA00-V2,2-M-..	62 *[16.38]*	..R5		..S5	
50LD0150-H3XLA00-V2,2-M-..	80 *[21.13]*	..R5		..S5	
50LDN0160-H3XLA00-V2,2-M-..	85 *[22.45]*	..R6		..S6	
50LDN0250-H3XLA00-V2,2-M-..	100 *[26.42]*	..R6		..S6	
50LDN0400-H3XLA00-V2,2-M-..	125 *[33.02]*	..R6		..S6	

50LD(N) preferred types, NBR seal, flow information for 30 mm²/s *[143 SUS]* duplex filter, filter rating 6 µm

Type	Flow in l/min *[US gpm]* with Δ*p* = 1 bar *[14.5 psi]* [1]	Filter			
50LDN0040-H6XLA00-V2,2-M-..	32 *[8.45]*	..R4		..U4	
50LDN0063-H6XLA00-V2,2-M-..	39 *[10.30]*	..R4		..U4	
50LDN0100-H6XLA00-V2,2-M-..	50 *[13.20]*	..R4		..U4	
50LD0130-H6XLA00-V2,2-M-..	88 *[23.24]*	..R5		..S5	
50LD0150-H6XLA00-V2,2-M-..	95 *[25.09]*	..R5		..S5	
50LDN0160-H6XLA00-V2,2-M-..	102 *[26.94]*	..R6		..S6	
50LDN0250-H6XLA00-V2,2-M-..	110 *[29.05]*	..R6		..S6	
50LDN0400-H6XLA00-V2,2-M-..	122 *[32.22]*	..R6		..S6	

50LD(N) preferred types, NBR seal, flow information for 30 mm²/s *[143 SUS]* duplex filter, filter rating 10 µm

Type	Flow in l/min *[US gpm]* with Δ*p* = 1 bar *[14.5 psi]* [1]	Filter			
50LDN0040-H10XLA00-V2,2-M-..	33 *[8.72]*	..R4		..U4	
50LDN0063-H10XLA00-V2,2-M-..	41 *[10.83]*	..R4		..U4	
50LDN0100-H10XLA00-V2,2-M-..	53 *[14.00]*	..R4		..U4	
50LD0130-H10XLA00-V2,2-M-..	90 *[23.78]*	..R5		..S5	
50LD0150-H10XLA00-V2,2-M-..	103 *[27.20]*	..R5		..S5	
50LDN0160-H10XLA00-V2,2-M-..	112 *[29.59]*	..R6		..S6	
50LDN0250-H10XLA00-V2,2-M-..	125 *[33.02]*	..R6		..S6	
50LDN0400-H10XLA00-V2,2-M-..	135 *[35.66]*	..R6		..S6	

[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
Accessories
(dimensions in mm *[inch]*)

Electronic switching element for maintenance indicators

01		02		03
WE	–		–	

Maintenance indicator

01	Electronic switching element	**WE**

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-pole, design A according to EN-175301-803	**EN175301-803**

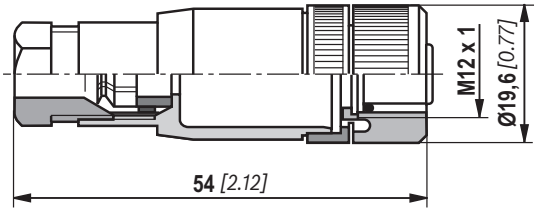
Material numbers of the electronic switching elements

Type	Signal	Switching points	Connector	LED
WE-1SP-M12x1	Changeover	1	M12x1	No
WE-2SP-M12x1 WE-2SPSU-M12x1	Normally open (at 75 %) / normally closed contact (at 100 %)	2		3 pieces
WE-1SP-EN175301-803	Normally closed contact	1	EN 175301-803	No

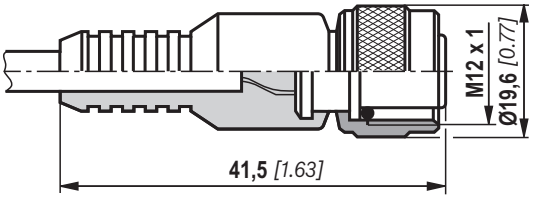
Mating connectors according to IEC 60947-5-2

For electronic switching element with round plug-in connection M12x1

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



Mating connector suitable for K24-3m 4-pole, M12x1 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



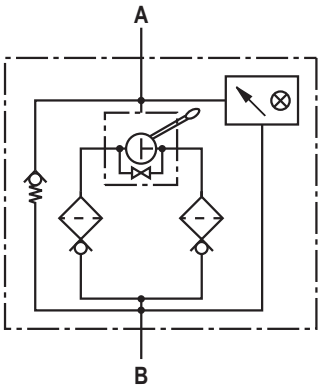
For more round plug-in connections and technical data refer to data sheet.

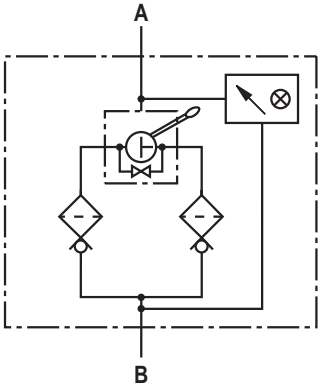
Order example:
Duplex filter with mechanical optical maintenance indicator for $p_{Nominal}$ = 50 bar *[725 psi]* with bypass valve, size 0160, with filter element 3 µm and electronic switching element M12x1 with 1 switching point for hydraulic fluid mineral oil HLP according to DIN 51524.

Filter with mech. optical maintenance indicator:	**50LDN0160-H3XLA00-V2,2-M-R6**
Electr. switching element:	**WE-1SP-M12x1**
Mating connector:	**Mating connector suitable for K24 4-pole, M12x1 with screw connection, cable gland Pg9.**

Symbols

Duplex filter with bypass and mechanical indicator

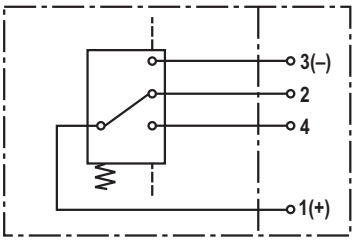




Duplex filter without bypass and with mechanical indicator

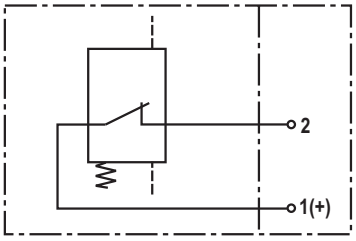
Electronic switching element for maintenance indicator

Switching element **Connector**



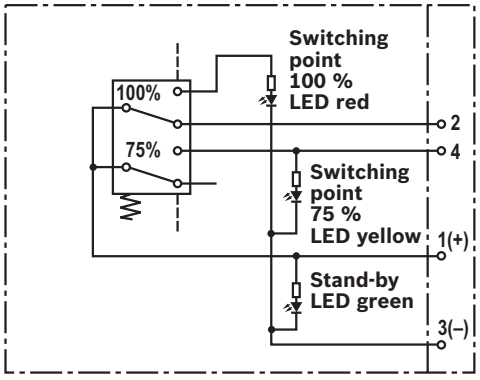
WE-1SP-M12x1

Switching element **Connector**



WE-1SP-EN175301-803

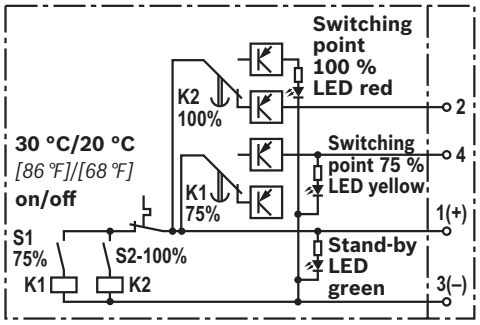
Switching element **Connector**



WE-2SP-M12x1

Circuit diagram drawn in plugged condition (operating state)

Switching element **Connector**



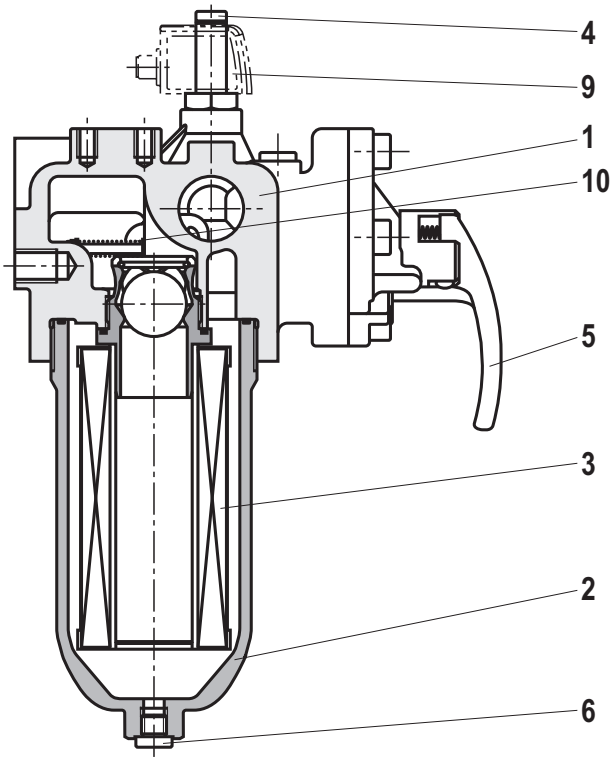
WE-2SPSU-M12x1

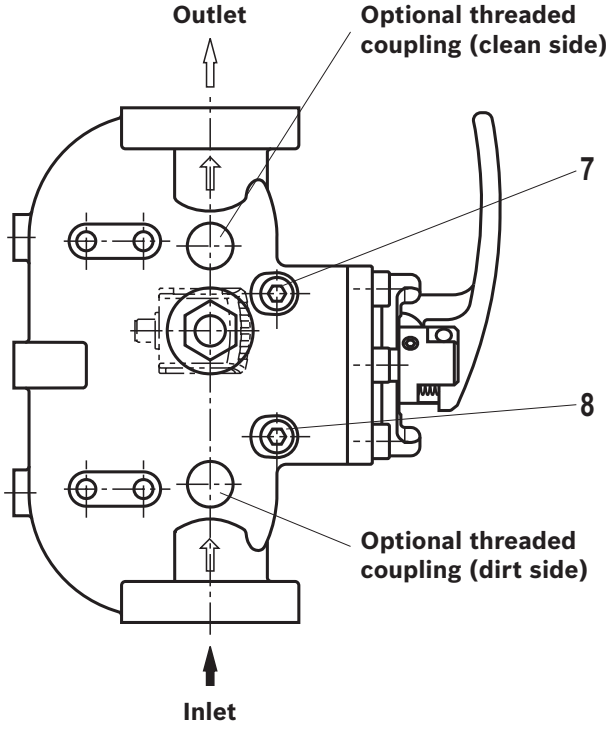
Circuit diagram drawn in plugged condition at temperature > 30 °C *[86 °F]* **(operating condition)**

Function, section

The 50LD(N) duplex filter is suitable for direct installation into pressure lines. It is installed upstream of the components to be protected. Any use in the suction area is not admissible.
It basically consists of a filter head (1) with switch-over fitting (5) and integrated pressure equalization function, two screwable filter bowls (2), two filter elements (3) as well as a mechanical optical maintenance indicator (4).
In case of filters with low collapse filter elements (= code letter pressure differential A), there is also an integrated bypass valve (10).
Via the inlet, the 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 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.
For sizes 0160 and larger the filter bowl is equipped with a drain plug (6).
Via the bleed screws and/or the optional bleed valves – supplementary information E – (7, 8), the filter side to be maintained can be bled.
Measuring ports in the form of threaded couplings on clean and dirt side are available in the type key under the supplementary information "M".
By default, the filter is equipped with mechanical optical maintenance indicator (4). The electronic switching element (9) 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.

☞ **WARNING!**
If the maintenance indicator is ignored when an element change is required, there is the possibility the filter will go into bypass and contaminated oil will pass to the clean side of the filter outlet. Therefore the filtration effectiveness is no longer guaranteed.





Type 50LDN0160

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

general						
Weight		Size	**0040**	**0063**	**0100**	**0130**
		kg *[lbs]*	6.8 *[15.0]*	7.2 *[15.8]*	8.5 *[18.7]*	11.5 *[25.3]*
		Size	**0150**	**0160**	**0250**	**0400**
		kg *[lbs]*	14.6 *[32.1]*	19.0 *[41.8]*	20.0 *[44.0]*	21.5 *[47.3]*
Volume		Size	**0040**	**0063**	**0100**	**0130**
		l *[US gal]*	2 x 0.35 2 x *[0.09]*	2 x 0.45 2 x *[0.12]*	2 x 0.7 2 x *[0.18]*	2 x 0.82 2 x *[0.22]*
		Size	**0150**	**0160**	**0250**	**0400**
		l *[US gal]*	2 x 0.98 2 x *[0.26]*	2 x 1.25 2 x *[0.33]*	2 x 1.95 2 x *[0.51]*	2 x 2.9 2 x *[0.77]*
Installation position			Vertical			
Ambient temperature range		°C *[°F]*	–10 ... +100 *[14 ... +212]* (shortly up to –30 *[–22]*)			
Material	– Filter head		Ductile Iron			
	– Filter bowl		Aluminum			
	– Bypass valve		Aluminum / steel / POM			
	– Seals		NBR or FKM			
	– Optical maintenance indicator	V0,8; V1,5; V2,2	Aluminum			
		V5,0	Brass			
	– Electronic switching element		Plastic PA6			

hydraulic				
Maximum operating pressure	bar *[psi]*	50 *[725]*		
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	> 10^6 with 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]*		0.8 ± 0.15 *[11.6 ± 2.2]*	2.5 ± 0.25 *[36.3 ± 3.6]*
			1.5 ± 0.2 *[21.8 ± 2.9]*	2.5 ± 0.25 *[36.3 ± 3.6]*
			2.2 ± 0.3 *[31.9 ± 4.4]*	3.5 ± 0.35 *[50.8 ± 5.1]*
			5.0 ± 0.5 *[72.5 ± 7.3]*	7.0 ± 0.5 *[101.5 ± 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			Round plug-in connection M12x1, 4-pole			Standard connection EN 175301-803
		Version	WE-1SP-M12x1	WE-2SP-M12x1	WE-2SPSU-M12x1	WE-1SP-EN175301-803
Contact load, direct voltage		$A_{max.}$	1			
Voltage range		$V_{max.}$	150 (AC/DC)	10 ... 30 (DC)		250 (AC)/200 (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: – With round plug-in connection M12x1	kg *[lbs]*	0.1 *[0.22]*			

Filter element				
Non-woven glass fiber media 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]*
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	$\beta_{3(c)} \geq 200$	13/10/8 ... 17/13/10
Admissible pressure differential	– A	bar *[psi]*	30 *[435]*	
	– B	bar *[psi]*	330 *[4785]*	

Compatibility with hydraulic fluids

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

☞ **Important information on hydraulic fluids!**

- For more information and data on the use of other hydraulic fluids, please refer to data sheet 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... (cellulose) may not be used, filter elements with filter materials made of glass fiber (HydroClean H...XL or wire mesh G) 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

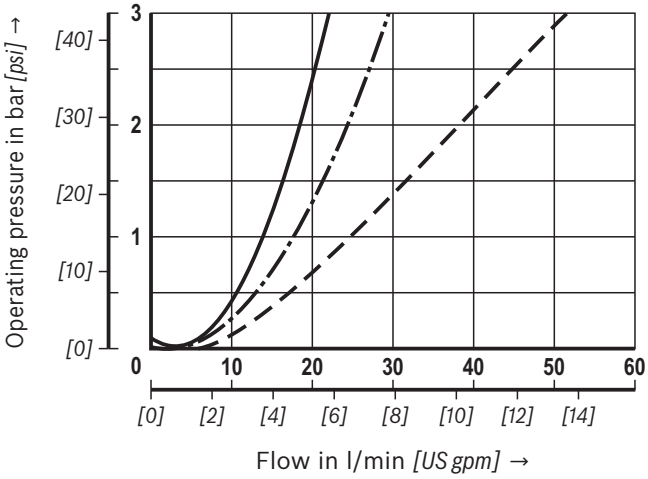
H3XL

(measured with mineral oil HLP46 according to DIN 51524 at T = 40 °C) *[104 °F]*)

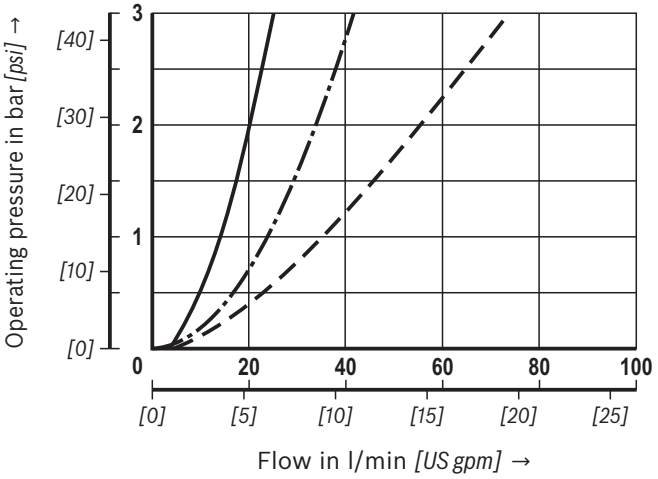
Spec. weight: < 0.9 kg/dm³
Δ*p*-Q characteristic curves for complete filter
recommended initial Δ*p* for design = 0.5 bar *[7.2 psi]*

Oil viscosity: **140 mm²/s** *[649 SUS]*, **68 mm²/s** *[315 SUS]*, **30 mm²/s** *[143 SUS]*

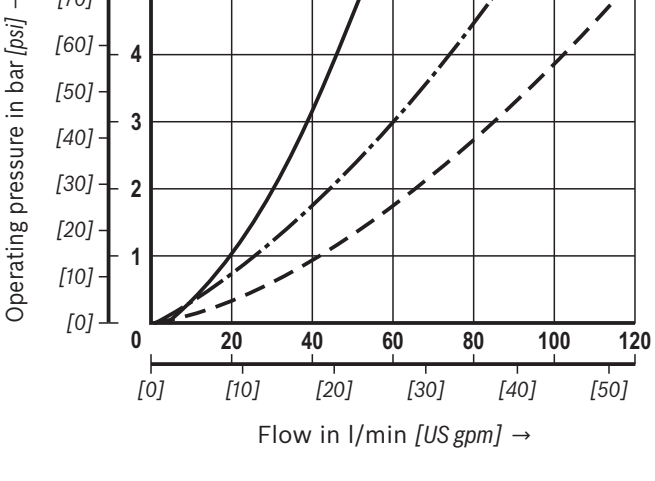
50LDN0040-H3XLA00-...-R4



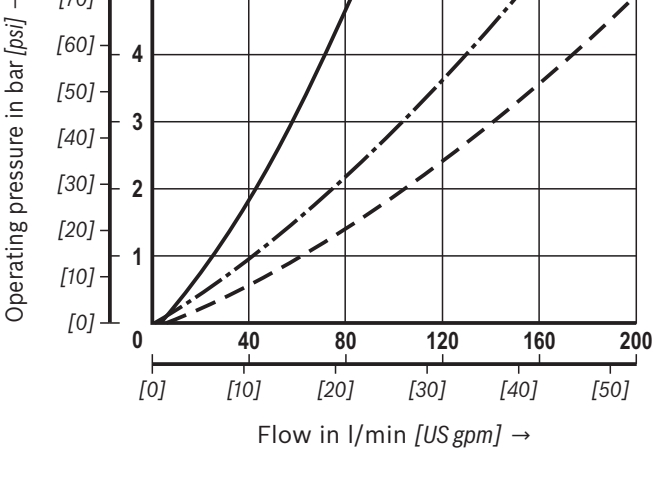
50LDN0063-H3XLA00-...-R4



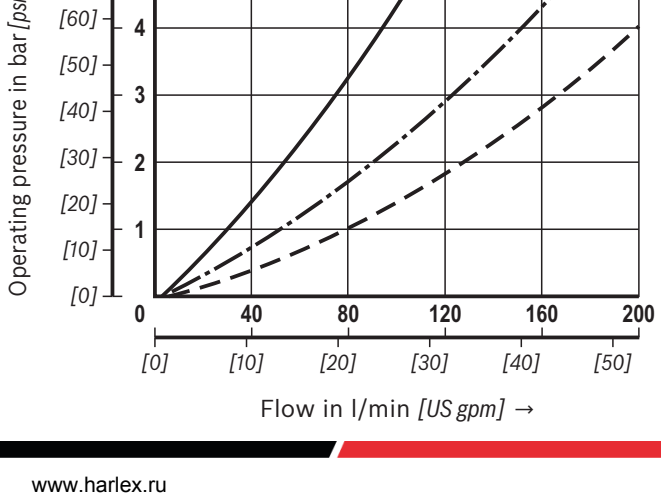
50LDN0100-H3XLA00-...-R4



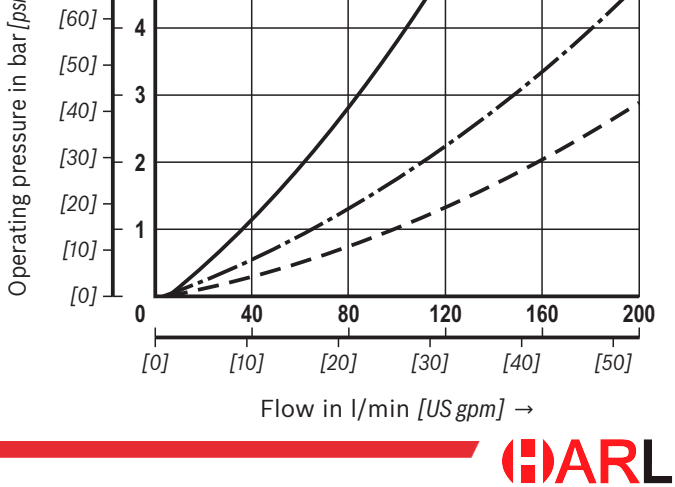
50LD0130-H3XLA00-...-R5



50LD0150-H3XLA00-...-R5



50LDN0160-H3XLA00-...-R6



Characteristic curves

H3XL; H10XL

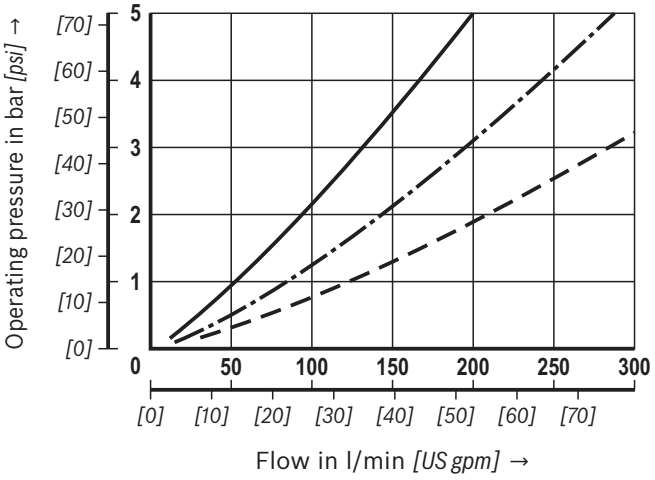
(measured with mineral oil HLP46 according to DIN 51524 at T = 40 °C) *[104 °F]*)

Spec. weight: < 0.9 kg/dm³
Δ*p*-Q characteristic curves for complete filter
recommended initial Δ*p* for design = 0.5 bar *[7.2 psi]*

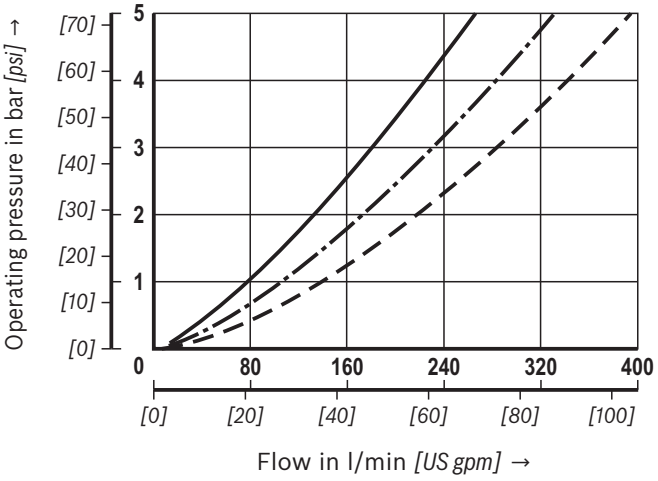
Oil viscosity:
- **140 mm²/s** *[649 SUS]*
- **68 mm²/s** *[315 SUS]*
- **30 mm²/s** *[143 SUS]*

H3XL

50LDN0250-H3XLA00-...-R6

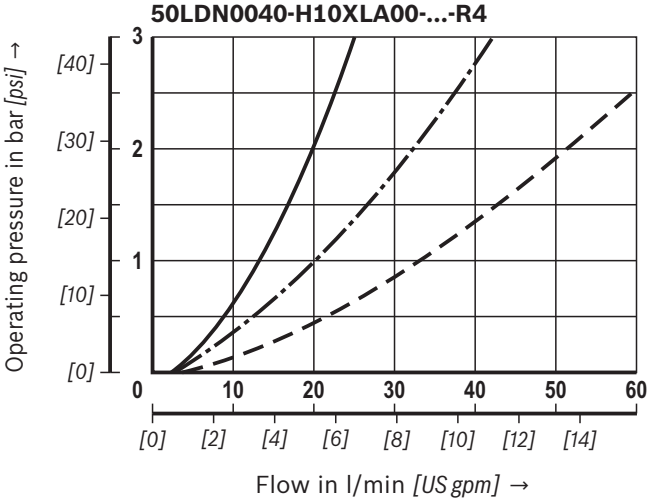


50LDN0400-H3XLA00-...-R6

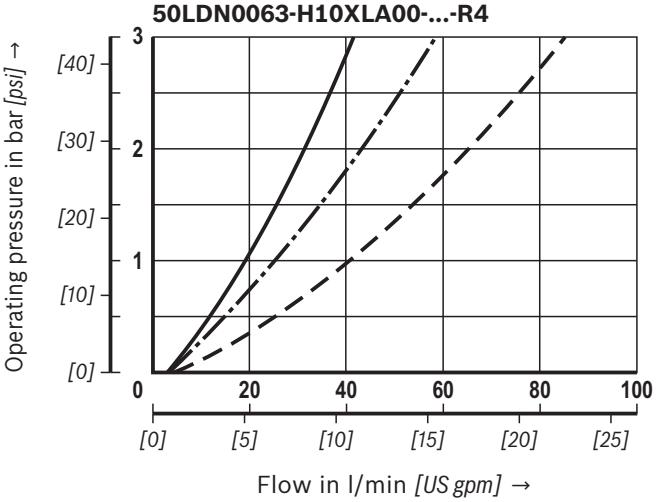


H10XL

50LDN0040-H10XLA00-...-R4



50LDN0063-H10XLA00-...-R4



Characteristic curves

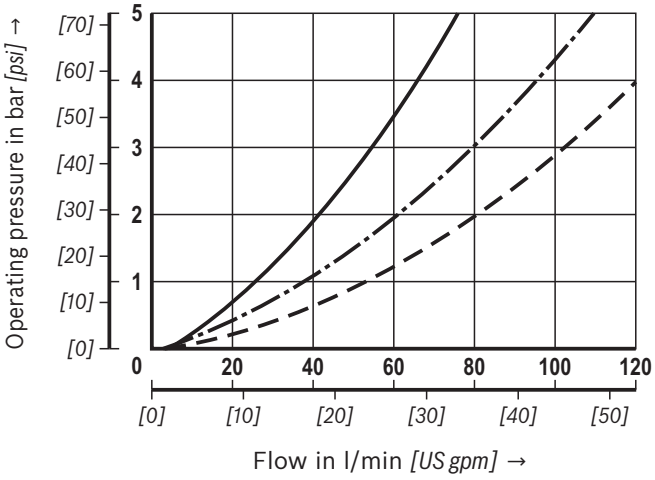
H10XL

(measured with mineral oil HLP46 according to DIN 51524 at T = 40 °C) *[104 °F]*)

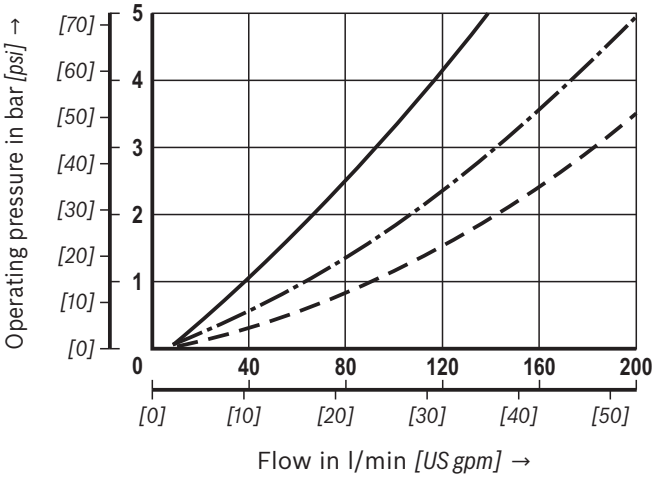
Spec. weight: < 0.9 kg/dm³
Δ*p*-Q characteristic curves for complete filter
recommended initial Δ*p* for design = 0.5 bar *[7.2 psi]*

Oil viscosity: **140 mm²/s** *[649 SUS]*, **68 mm²/s** *[315 SUS]*, **30 mm²/s** *[143 SUS]*

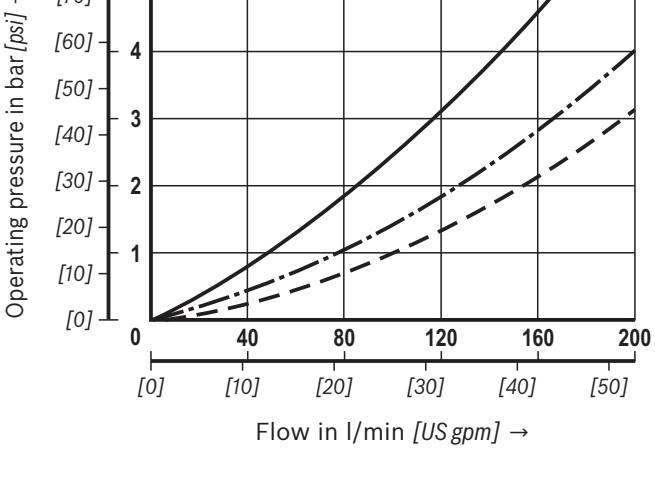
50LDN0100-H10XLA00-...-R4



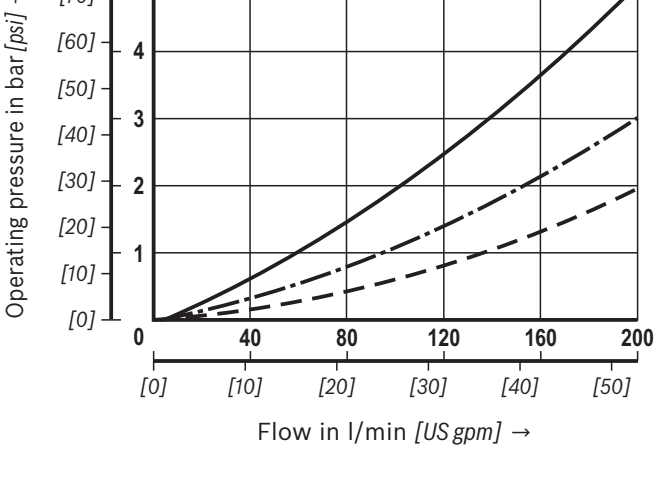
50LD0130-H10XLA00-...-R5



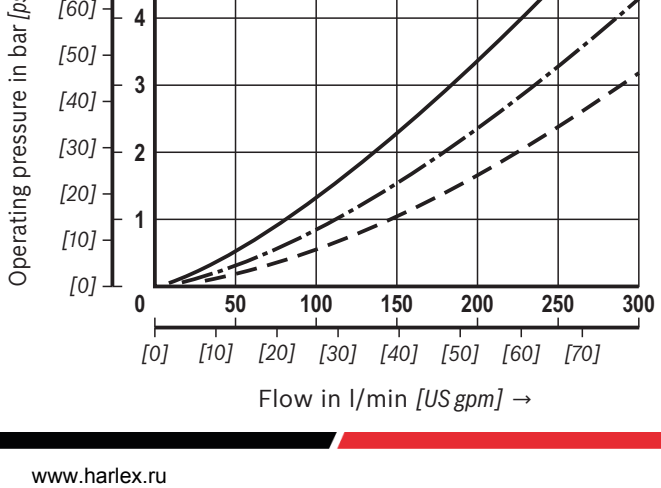
50LD0150-H10XLA00-...-R5



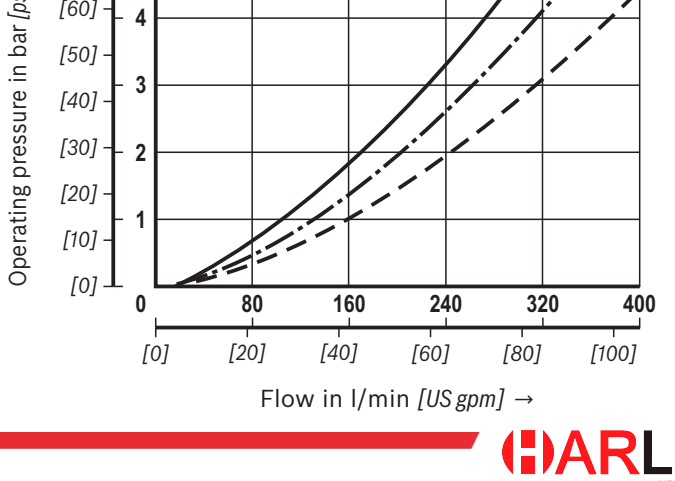
50LDN0160-H10XLA00-...-R6



50LDN0250-H10XLA00-...-R6

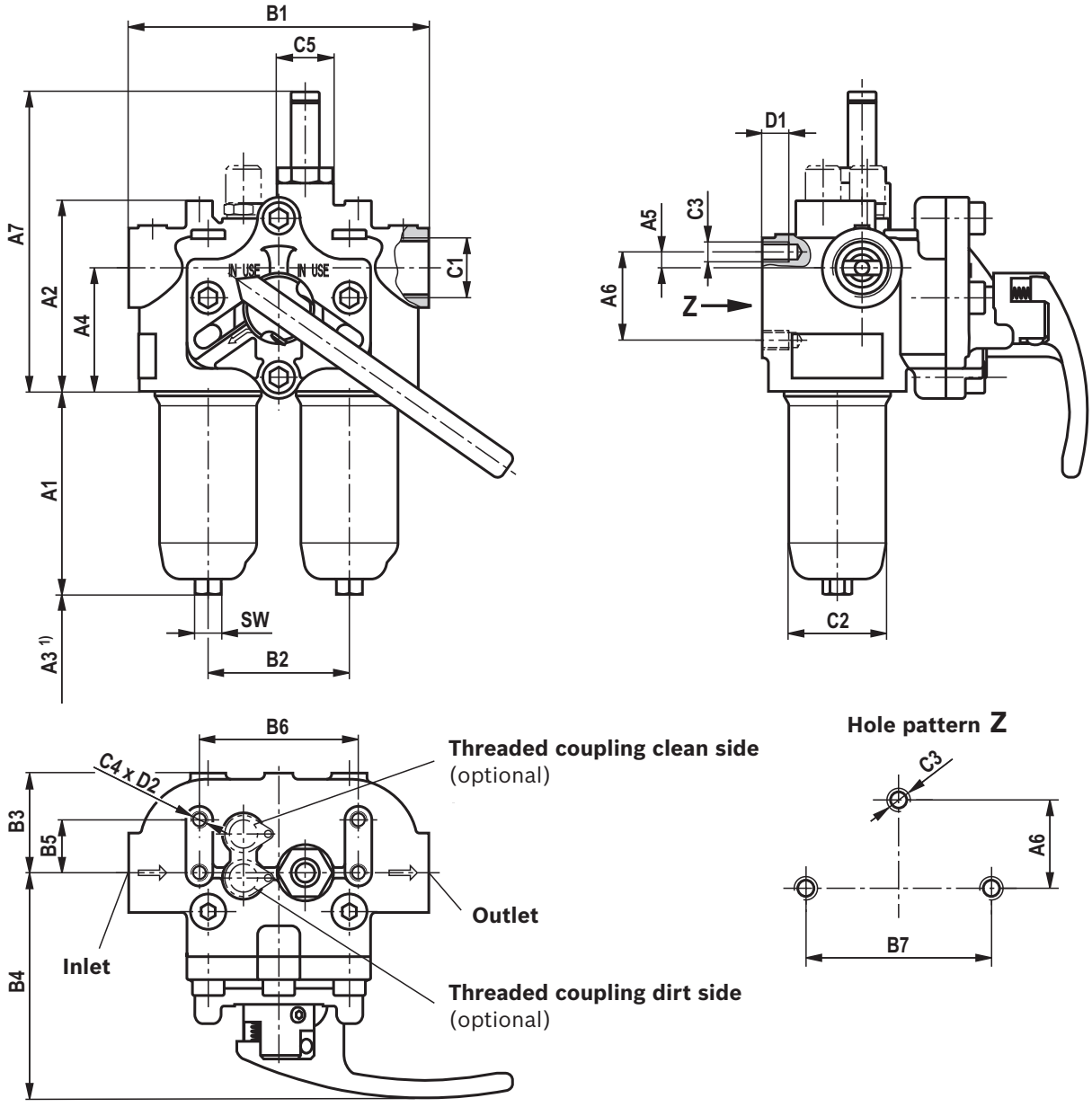


50LDN0400-H10XLA00-...-R6



Dimensions: Size 0040 ... size 0100
(dimensions in mm *[inch]*)

50LDN0040-0100



Filter housing for filter elements in accordance with DIN 24550

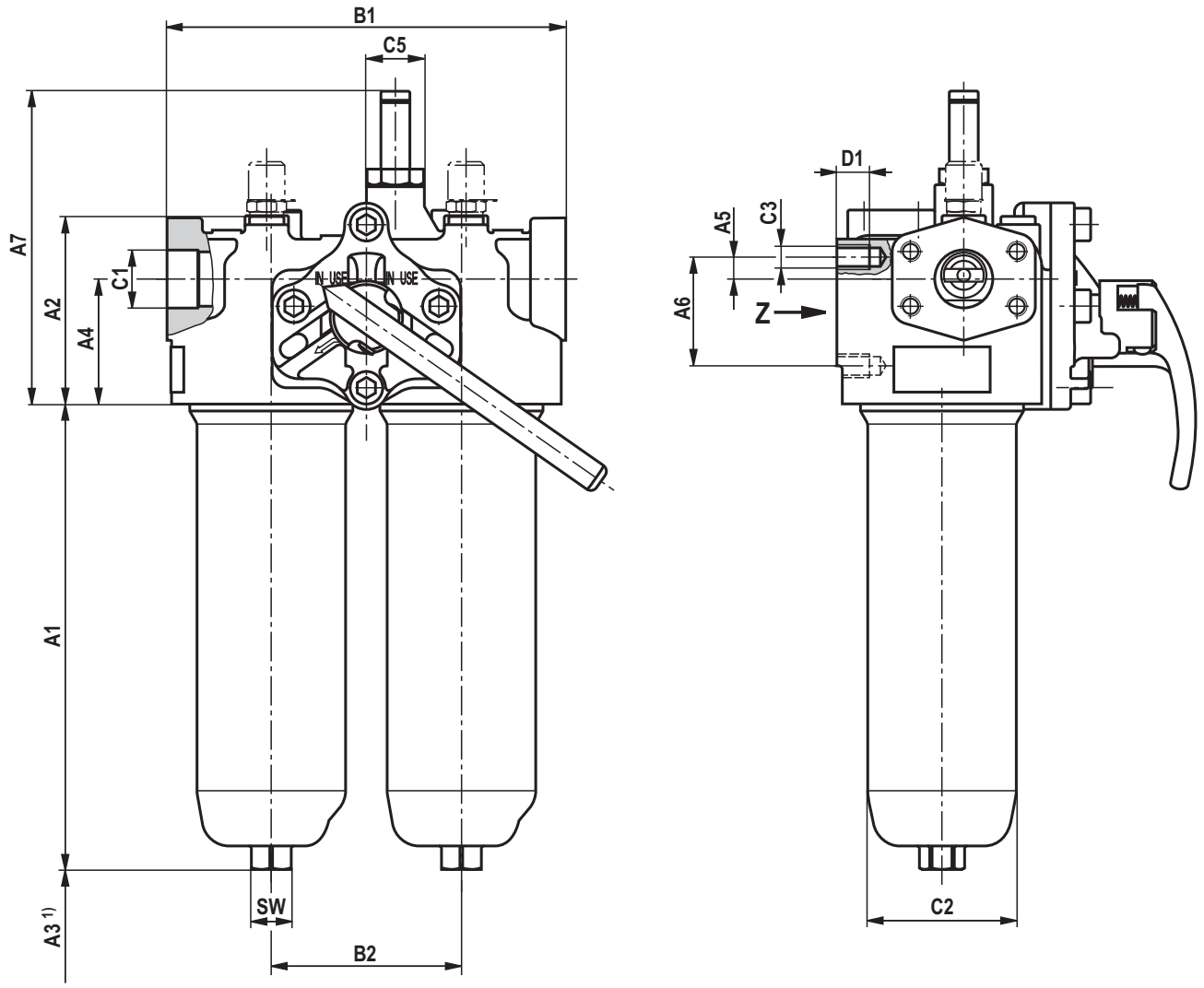
Type	A1	A2	A3 1)	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7
50 LDN 0040	126 *[4.96]*	108 *[4.25]*	80 *[3.15]*	70 *[2.76]*	9 *[0.35]*	50 *[1.97]*	170 *[6.69]*	170 *[6.69]*	80 *[3.15]*	56.5 *[2.22]*	127 *[5.00]*	30 *[1.18]*	90 *[3.54]*	80 *[3.15]*
50 LDN 0063	186 *[7.32]*													
50 LDN 0100	276 *[10.87]*													

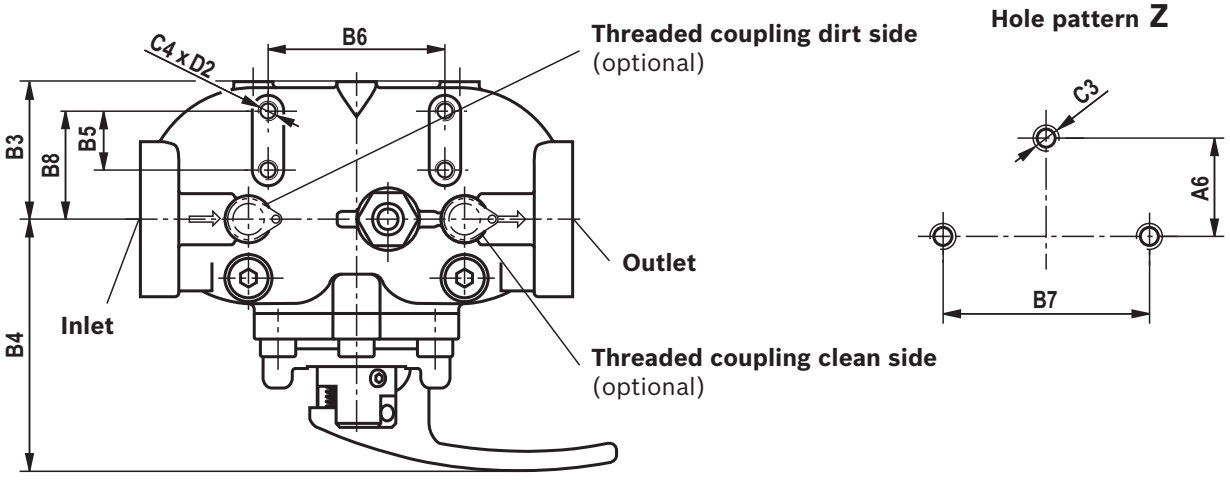
Type	C1 connection			ØC2	C3	C4	ØC5	D1	D2	SW
	R standard	U (SAE J1926)	S (SAE flange 3000 psi)							
50 LDN 0040	G 1	SAE 12 1 1/16-12 UN-2B	–	58 *[2.28]*	M10x1.5	M8x1.25	32 *[1.26]*	15 *[0.59]*	15 *[0.59]*	19 *[0.75]*
50 LDN 0063										
50 LDN 0100										

1) Servicing height for filter element exchange

Dimensions: Size 0130 ... size 0400
(dimensions in mm *[inch]*)

50LD(N)0130-0400





1) Servicing height for filter element exchange

Dimensions: Size 0130 ... size 0400
(dimensions in mm *[inch]*)

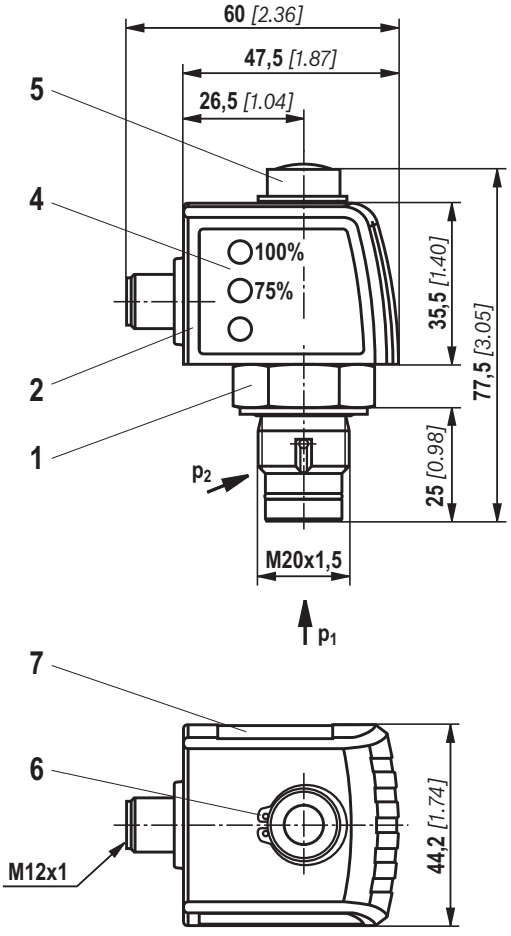
Filter housing for filter elements according to DIN 24550 and according to standard

Type	A1	A2	A3 [1)]	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6
50LD0130	213 *[8.39]*	99 *[3.90]*	140 *[5.51]*	69 *[2.72]*	12 *[0.47]*	50 *[1.97]*	173 *[6.81]*	220 *[8.66]*	105 *[4.13]*	70 *[2.76]*	128 *[5.04]*	30 *[1.18]*	90 *[3.54]*
50LD0150	257 *[10.12]*												
50LDN0160	184 *[7.24]*	115 *[4.53]*		80 *[3.15]*	25 *[0.98]*	55 *[2.17]*	184 *[7.24]*	270 *[10.63]*	134 *[5.28]*	103 *[4.06]*	152 *[5.98]*		130 *[5.12]*
50LDN0250	274 *[10.79]*												
50LDN0400	425 *[16.73]*												

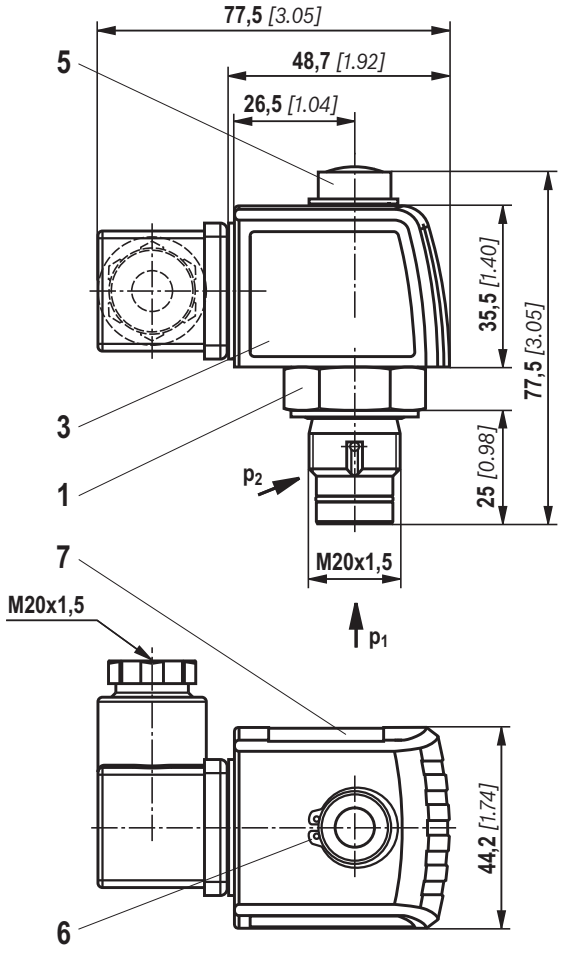
Type	B7	B8	C1 connection			ØC2	C3	C4	ØC5	D1	D2	SW
			R standard	U (SAE J1926)	S (SAE flange 3000 psi)							
50LD0130	105 *[4.13]*	65 *[2.56]*	G 1 1/4	SAE 12 1 5/16-12 UN-2B	SAE 1 1/4"	82 *[3.23]*	M12	M8	32 *[1.26]*	18 *[0.71]*	12 *[0.47]*	22 *[0.87]*
50LD0150												
50LDN0160	134 *[5.28]*		G 1 1/2	SAE 20 1 5/8-12 UN-2B"	SAE 1 1/2"	98 *[3.86]*	M16	M10		22 *[0.87]*	15 *[0.59]*	27 *[1.06]*
50LDN0250												
50LDN0400												

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

Pressure differential indicator with assembled switching element M12x1



Pressure differential indicator with assembled switching element EN-175301-803



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

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
2.			**–**		**–**	**0**	**–**	

Filter element

01	Design	**2.**

Size

02	LDN... (filter element according to **DIN 24550)**	**0040** **0063** **0100** **0160** **0250** **0400**
	LD... (fil ter elements according to **standard)**	**0130** **0150**

Filter rating in µm

03	**Nominal**	Stainless steel wire mesh, cleanable	**G10** **G25** **G40** **G60** **G100**
	Nominal	Filter paper, not cleanable	**P10** **P25**
	Absolute **(ISO 16889 ; $\beta_x(c) \geq 200$)**	Non-woven glass fiber media, not cleanable	**H3XL** **H6XL** **H10XL** **H20XL**

Pressure differential

04	Max. admissible pressure differential of the filter element 30 bar *[435 psi]*	**A00**
	Max. admissible pressure differential of the filter element 330 bar *[4785 psi]*	**B00**

Bypass valve

05	Without bypass valve	**0**

Seal

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

Order example:
2.0100 H3XL-A00-0-M

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

Preferred program replacement filterelement

Replacement filter element 3 micron	Replacement filter element 6 micron	Replacement filter element 10 micron
2.0040 H3XL-A00-0-M	2.0040 H6XL-A00-0-M	2.0040 H10XL-A00-0-M
2.0063 H3XL-A00-0-M	2.0063 H6XL-A00-0-M	2.0063 H10XL-A00-0-M
2.0100 H3XL-A00-0-M	2.0100 H6XL-A00-0-M	2.0100 H10XL-A00-0-M
2.0130 H3XL-A00-0-M	2.0130 H6XL-A00-0-M	2.0130 H10XL-A00-0-M
2.0150 H3XL-A00-0-M	2.0150 H6XL-A00-0-M	2.0150 H10XL-A00-0-M
2.0160 H3XL-A00-0-M	2.0160 H6XL-A00-0-M	2.0160 H10XL-A00-0-M
2.0250 H3XL-A00-0-M	2.0250 H6XL-A00-0-M	2.0250 H10XL-A00-0-M
2.0400 H3XL-A00-0-M	2.0400 H6XL-A00-0-M	2.0400 H10XL-A00-0-M

Ordering code
Spare parts

Mechanical optical maintenance indicator

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	0.8 bar *[11.6 psi]*	**0.8**
	1.5 bar *[21.8 psi]*	**1.5**
	2.2 bar *[31.9 psi]*	**2.2**
	5.0 bar *[72.5 psi]*	**5.0**

Seal

05	NBR seal	**M**
	FKM seal	**V**

Max. nominal pressure

06	Switching pressure 0.8 bar *[11.6 psi]*, 160 bar *[2321 psi]*	**160**
	Switching pressure 1.5 bar *[21.8 psi]*, 160 bar *[2321 psi]*	**160**
	Switching pressure 2.2 bar *[31.9 psi]*, 160 bar *[2321 psi]*	**160**
	Switching pressure 5.0 bar *[72.5 psi]*, 450 bar *[6527 psi]*	**450**

Mechanical optical maintenance indicator

Description
WO-D01-0,8-M-160
WO-D01-0,8-V-160
WO-D01-1,5-M-160
WO-D01-1,5-V-160
WO-D01-2,2-M-160
WO-D01-2,2-V-160
WO-D01-5,0-M-450
WO-D01-5,0-V-450

Ordering code
Spare parts

Seal kit

01	02	03		04
D	**50LD**		**–**	

01	**Seal kit**	**D**
02	**Series**	**50LD**

Size

03	0040-0100	**N0040-0100**
	0130-0150	**0130-0150**
	0160-0400	**N0160-0400**

Seal

04	NBR seal	**M**
	FKM seal	**V**

Seal kit

	Description
	D50LDN0040-0100-M
	D50LD0130-0150-M
	D50LDN0160-0400-M
	D50LDN0040-0100-V
	D50LD0130-0150-V
	D50LDN0160-0400-V

Assembly, commissioning, maintenance

Assembly

The max. operating pressure of the system must not exceed the max. admissible operating pressure of the filter (see name 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.

Proper function is only guaranteed in the installation with the filter bowl vertically downwards. The maintenance indicator must be arranged so it is easily viewed in operation.
Remove the plastic plugs in 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 1 or 2 switching points, which is attached to the mechanical optical maintenance indicator and held by means of the locking ring.

Commissioning

Bring the switching lever into central position in order to fill both filter sides.
Start the system.
Bleed filter by opening the bleed screws or bleed valves, close when operating liquid begins to escape..
Switch the filter into the operating position; to do so, switch the switching lever to one of the two end positions.
The switch-over lever is on the filter side that is out of order.

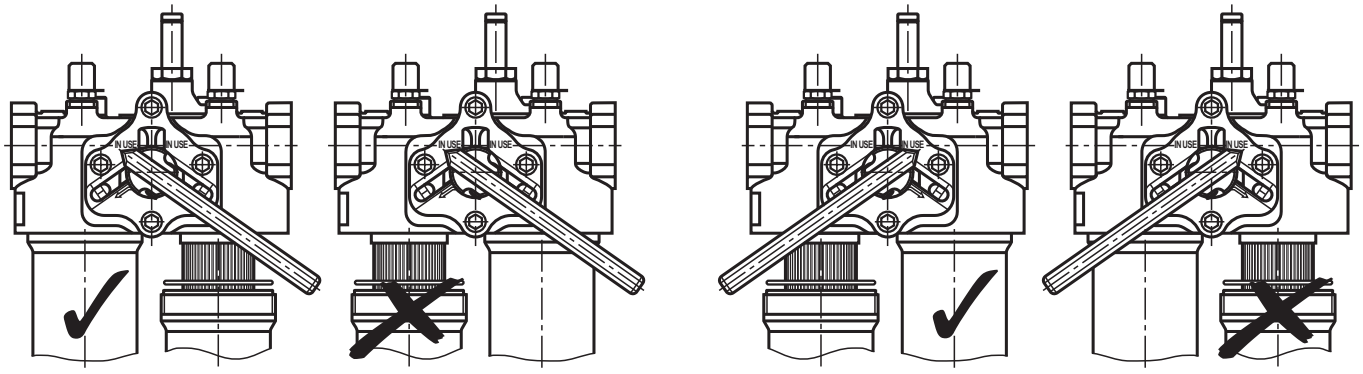
Maintenance

- If at operating temperature, the red indicator pin reaches out of the mechanical optical maintenance indicator and/or if the switching process in the electronic switching element is triggered, 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.
- The switch-over lever is on the filter side that is out of order. Observe the switching symbol on the switching lever and/or the switch-over.
- For pressure equalization and unlocking, pull the switch-over lever and switch to the opposite end position.
- Open the bleed screw or bleed valve at the decommissioned filter side in order to reduce the pressure.
- Via the drain screw (from size 0160 and larger), the oil on the dirt side can be drained.
- Unscrew the filter bowl – see figure assembly aid.
- 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. 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 150 % of the value of a brand-new filter element, the filter element made of wire mesh (G...) also needs to be replaced. For detailed cleaning instructions refer to data sheet.
- Install the new or cleaned filter element on the spigot again by slightly rotating it.
- The filter is to be assembled in reverse order.
- The torque specifications ("Tightening torques" chapter) are to be observed.
- To fill the maintained filter side, pull the switch-over lever.
- The filter is bled via the bled screw or the bleed valve which is still open.
- After fluid escapes, close the bleed screw or the bleed valve again.
- Make sure that the switch-over lever is engaged.

Assembly, commissioning, maintenance

Assembly aid

Correct **Wrong** **Correct** **Wrong**



☞ **WARNINGS!**

- Assemble and disassemble only with depressurized system! For the filter element exchange refer to "Maintenance".
- Tank is pressurized!
- Maintenance only by trained specialists.
- Remove the filter bowl only if it is depressurized !
- Do not exchange the maintenance indicator while the filter is under pressure!
- Do not operate the switching lever during the filter element exchange.
- When disassembling the fi lter, ensure that the down-stream side is depressurized via the system.
- Warranty is only applicable when using genuine spare parts!
- 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 condition that do not comply with the installation conditions.

Tightening torques
(dimensions in mm *[inch]*)

Fastening top

Series 50 ...	**LDN0040**	**LDN0063**	**LDN0100**	**LD0130**	**LD0150**	**LDN0160**	**LDN0250**	**LDN0400**
Screw/tightening torque with μ_{total} = 0.14	M8/10.5 Nm ± 10 % [8 lb-ft +/- 10%]					M10/21 Nm ± 10 % [16 lb-ft +/- 10%]		
Quantity	4							
Recommended property class of screw	8.8							
Minimum screw-in depth	10 mm + 4 mm			10 mm + 1 mm		10 mm + 4 mm		

Fastening back

Series 50 ...	**LDN0040**	**LDN0063**	**LDN0100**	**LD0130**	**LD0150**	**LDN0160**	**LDN0250**	**LDN0400**
Screw/tightening torque with μ_{total} = 0.14	M10/21 Nm ± 10 % [16 lb-ft +/- 10%]			M12/37 Nm ± 10 % [27 lb-ft +/- 10%]		M16/90 Nm ± 10 % [66 lb-ft +/- 10%]		
Quantity	3							
Recommended property class of screw	8.8							
Minimum screw-in depth	10 mm + 4 mm			14 mm + 2 mm		19 mm + 2 mm		

Filter bowl and maintenance indicator

Series 50 ...	**LDN0040**	**LDN0063**	**LDN0100**	**LD0130**	**LD0150**	**LDN0160**	**LDN0250**	**LDN0400**
Tightening torque filter bowl	50 Nm + 10 Nm [37 lb-ft +/- 10%]							
Tightening torque maintenance indicator	50 Nm max [37 lb-ft max]							
Tightening torque cubic connector screw switching element EN-175301-803	M3/0.5 Nm [0.4 lb-ft +/- 10%]							

Directives and standardization

Classification according to the Pressure Equipment Directive

The duplex filters for hydraulic applications according to are pressure holding equipment according to arti-cle 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).
They do not receive a CE mark.

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

The duplex filters according to 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, 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 60079-14:2008 - in intrinsically safe electric circuits (Ex ib) be used in systems without marking and certification.
The duplex filters and the electronic maintenance indicators described here can be used for the following explosive areas:

	Zone suitability	
Gas	1	2
Dust	21	22

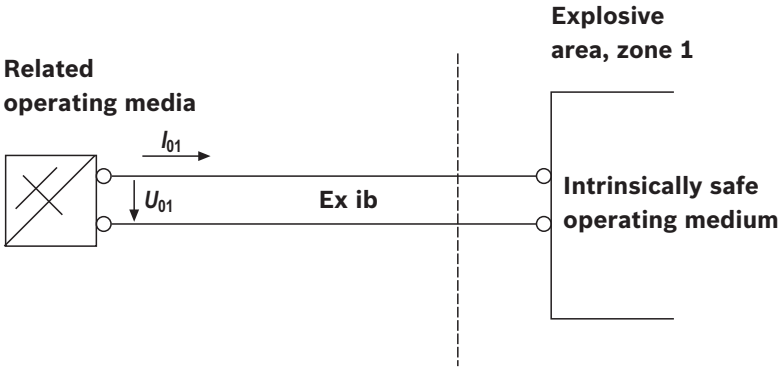
Complete filter with mech./opt. maintenance indicator				
Use /assignment			**Gas 2G**	**Dust 2D**
Assignment			Ex II 2G c IIB TX	Ex II 2D c IIB TX
Conductivity of the medium	pS/m	min	300	
Dust accumulation		max	–	0.5 mm

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
Adm. intrinsically safe electric circuits			Ex ib IIC, Ex ic IIC	Ex ib IIIC
Technical data			**Values only for intrinsically safe electric circuit**	
Switching voltage	Ui	max	150 V AC/DC	
Switching current	Ii	max	1.0 A	
Switching power	Pi	max	1.3 W T4 T_{max} 40 °C	750 mW T_{max} 40 °C
		max	1.0 W T4 T_{max} 80 °C	550 mW T_{max} 100 °C
Surface temperature [1]		max	–	100 °C
Inner capacity	Ci		Neglectable	
Inner inductivity	Li		Neglectable	
Dust accumulation		max	–	0.5 mm

[1] The temperature depends on the temperature of the medium in the filter and must not exceed the value specified here.

Directives and standardization

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 explosive area, the max. admissible ignition temperature is not exceeded.
- When using the inline filter s according to in explosive areas, appropriate potential equalization has to be ensured. The fi lter is preferably to be grounded via the mounting screws.
  It has to be noted in this connection that paintings and oxidic protective layers are not electri-cally conductive.
- Maintenance only by specialists, instruction by the machine end-user acc. to DIRECTIVE 1999/92/EC appendix II, section 1.1.
- During filterelementexchanges,thepackaging mate-rial is to be removed from the replacement element outside the explosive area.
- Functional and safety warranty only applicable when using genuine spare parts.