Duplex filter
with filter element acc. to DIN 24550

Type 400LDN0040 to 1000; 400LD0130, 0150

RE 51429
Edition: 2023-03
Replaced: 2022-05


H7834_d

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

Features

Duplex filters are used in hydraulic systems to separate solids from fluids and allow the filter element to be changed without interrupting operation.

They distinguish themselves by the following:

- Filters for inline installation, switchable
- Size 1000 with 2 piece filter bowl
- Special highly efficient filter media
- Filtration of very fine particles and high dirt holding capacity across a broad pressure differential range
- High collapse resistance of the filter elements
- Standard version equipped with mechanical/visual maintenance indicator with memory function
- Optional equipment with various electrical switching elements, modular design
- Bleeding and measuring port are standard

Contents

Ordering code
Filter

01	02	03		04	05		06		07		08		09
400LD			**–**		**B00**	**–**		**–**		**–**		**–**	

Series

01	Duplex filter 400 bar *[5714 psi]*	**400LD**

Filter element

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

Size

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

Filter rating in µm

04	**Absolute** **(ISO 16889; $\beta_{x(c)}$ ≥200)**	Non-woven glass fiber media, not cleanable	**PWR3** **PWR6** **PWR10** **PWR20**
	Nominal	Stainless steel wire mesh, cleanable	**G10** **G25** **G40** **G60** **G100**

Differential pressure

05	Max. permissible pressure differential of the filter element 330 bar *[4786 psi]*, Filter **without** bypass valve	**B00**

Maintenance indicator

06	Maintenance indicator, mech./optical, switching pressure 5.0 bar *[72.5 psi]*	**V5,0**
	Maintenance indicator, mech./optical, switching pressure 8.0 bar *[116 psi]*	**V8,0**

Seal

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

Connection

08	**Frame size** / **Connection**	**0040 ... 0100**	**0130 ... 0150**	**0160 ... 0400**	**0630 ... 1000**		
	G1/2	●				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**
	● Standard port X Alternative connection possibility						

Ordering code
Filter

01	02	03		04	05	06		07		08		09
400LD			**–**		**B00**	**–**		**–**		**–**		

Supplementary information

09	Manufacturer‘s inspection certificate M according to DIN 55350 T18	**Z1**

Order example:
400LDN0160-PWR10B00-V5,0-M-S6

Material no: R928039283

Other versions available upon request.

Preferred types

400LD(N) Flow specifications for 30 mm²/s *[143 SUS]*

Filter rating 3 µm

Type	Flow in l/min *[US gpm]* at Δ*p* = 1.5 bar *[21.75 psi]* [1)]	Filter material no.				Replacement filter element material no.
400LDN0040-PWR3B00-V5,0-M-..	27 *[7.13]*	..R2	**R928039411**	..U3	**R928039437**	**R928006654**
400LDN0063-PWR3B00-V5,0-M-..	33 *[8.72]*	..R2	**R928039412**	..U3	**R928039438**	**R928006708**
400LDN0100-PWR3B00-V5,0-M-..	42 *[11.10]*	..R2	**R928039413**	..U3	**R928039439**	**R928006762**
400LD0130-PWR3B00-V5,0-M-..	73 *[19.28]*	..S4	**R928039415**			**R928022310**
400LD0150-PWR3B00-V5,0-M-..	92 *[24.30]*	..S4	**R928039416**			**R928022319**
400LDN0160-PWR3B00-V5,0-M-..	159 *[42.00]*	..S6	**R928039417**			**R928006816**
400LDN0250-PWR3B00-V5,0-M-..	202 *[53.36]*	..S6	**R928039418**			**R928006870**
400LDN0400-PWR3B00-V5,0-M-..	238 *[62.87]*	..S6	**R928039419**			**R928006924**
400LDN0630-PWR3B00-V5,0-M-..	300 *[79.36]*	..S8	**R928039420**			**R928006978**
400LDN1000-PWR3B00-V5,0-M-..	375 *[99.21]*	..S8	**R928039421**			**R928007032**

Filter rating 6 µm

Type	Flow in l/min *[US gpm]* at Δ*p* = 1.5 bar *[21.75 psi]* [1)]	Filter material no.				Replacement filter element material no.
400LDN0040-PWR6B00-V5,0-M-..	30 *[7.93]*	..R2	**R928039422**	..U3	**R928039441**	**R928006655**
400LDN0063-PWR6B00-V5,0-M-..	40 *[10.57]*	..R2	**R928039423**	..U3	**R928039442**	**R928006709**
400LDN0100-PWR6B00-V5,0-M-..	45 *[11.89]*	..R2	**R928039424**	..U3	**R928039443**	**R928006763**
400LD0130-PWR6B00-V5,0-M-..	88 *[23.25]*	..S4	**R928039426**			**R928022311**
400LD0150-PWR6B00-V5,0-M-..	100 *[26.42]*	..S4	**R928039427**			**R928022320**
400LDN0160-PWR6B00-V5,0-M-..	188 *[49.66]*	..S6	**R928039429**			**R928006817**
400LDN0250-PWR6B00-V5,0-M-..	215 *[56.80]*	..S6	**R928039430**			**R928006871**
400LDN0400-PWR6B00-V5,0-M-..	258 *[68.16]*	..S6	**R928039431**			**R928006925**
400LDN0630-PWR6B00-V5,0-M-..	340 *[89.95]*	..S8	**R928039432**			**R928006979**
400LDN1000-PWR6B00-V5,0-M-..	525 *[138.89]*	..S8	**R928039433**			**R928007033**

Filter rating 10 µm

Type	Flow in l/min *[US gpm]* at Δ*p* = 1.5 bar *[21.75 psi]* [1)]	Filter material no.				Replacement filter element material no.
400LDN0040-PWR10B00-V5,0-M-..	31 *[8.19]*	..R2	**R928038630**	..U3	**R928039444**	**R928006656**
400LDN0063-PWR10B00-V5,0-M-..	43 *[11.36]*	..R2	**R928038632**	..U3	**R928039445**	**R928006710**
400LDN0100-PWR10B00-V5,0-M-..	46 *[12.15]*	..R2	**R928038550**	..U3	**R928039446**	**R928006764**
400LD0130-PWR10B00-V5,0-M-..	99 *[26.15]*	..S4	**R928038549**			**R928022312**
400LD0150-PWR10B00-V5,0-M-..	105 *[27.74]*	..S4	**R928039285**			**R928022321**
400LDN0160-PWR10B00-V5,0-M-..	208 *[54.95]*	..S6	**R928039283**			**R928006818**
400LDN0250-PWR10B00-V5,0-M-..	223 *[58.91]*	..S6	**R928039436**			**R928006872**
400LDN0400-PWR10B00-V5,0-M-..	268 *[70.80]*	..S6	**R928038551**			**R928006926**
400LDN0630-PWR10B00-V5,0-M-..	450 *[119.95]*	..S8	**R928038848**			**R928006980**
400LDN1000-PWR10B00-V5,0-M-..	545 *[144,18]*	..S8	**R928038849**			**R928007034**

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

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

Electronic switching element for maintenance indicators

01	02		03	
WE	–		–	

Maintenance indicator

01	Electronic switching element	**WE**

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 connector, 2-pole, design A according to EN-175301-803	**EN175301-803**

Material numbers of the electronic switching elements

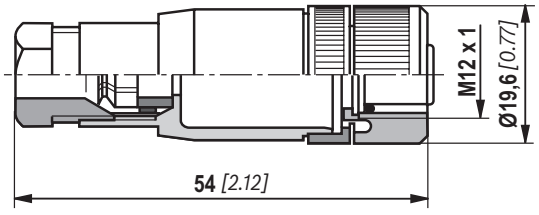
Material no.	Type	Signal	Switching points	Connector	LED
R928028409	WE-1SP-M12x1	Changeover	1	M12x1	none
R928028410	WE-2SP-M12x1	Normally open (at 75%) / normally closed contact (at 100%)	2		3 pieces
R928028411	WE-2SPSU-M12x1				
R928036318	WE-1SP-EN175301-803	Normally closed contact	1	EN 175301-803	none

Mating connectors (max. permissible voltage: 50 V)

for electronic switching element with round plug-in connection M12x1

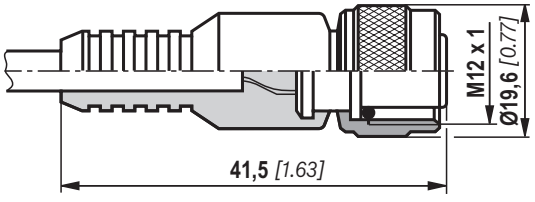
Mating connector suitable for K24 4-pole, M12x1
with screw connection, cable gland Pg9.

Material no. R900031155



Mating connector suitable for K24-3m 4-pole, M12x1
with potted-in PVC cable, 3 m long.
Line cross-section: 4 x 0.34 mm²
Core marking: **1** brown **2** white
3 blue **4** black

Material no. R900064381



Order example:
Duplex filter with mechanical/optical maintenance indicator for $p_{nom.}$ = 450 bar *[6527 psi]* without bypass valve, size 0160, with filter element 10 µm and electronic switching element M12x1 with 1 switching point.

Filter with mech. optical maintenance indicator:	400LDN0160-PWR10B00-V5,0-M-S6	**Material no. R928039283**
Elektronic Switching element:	WE-1SP-M12x1	**Material no. R928028409**
Mating connector:	Mating connector suitable for K24 4-pole, M12x1 with Screw connection, Cable gland Pg9.	**Material no. R900031155**

Filter design

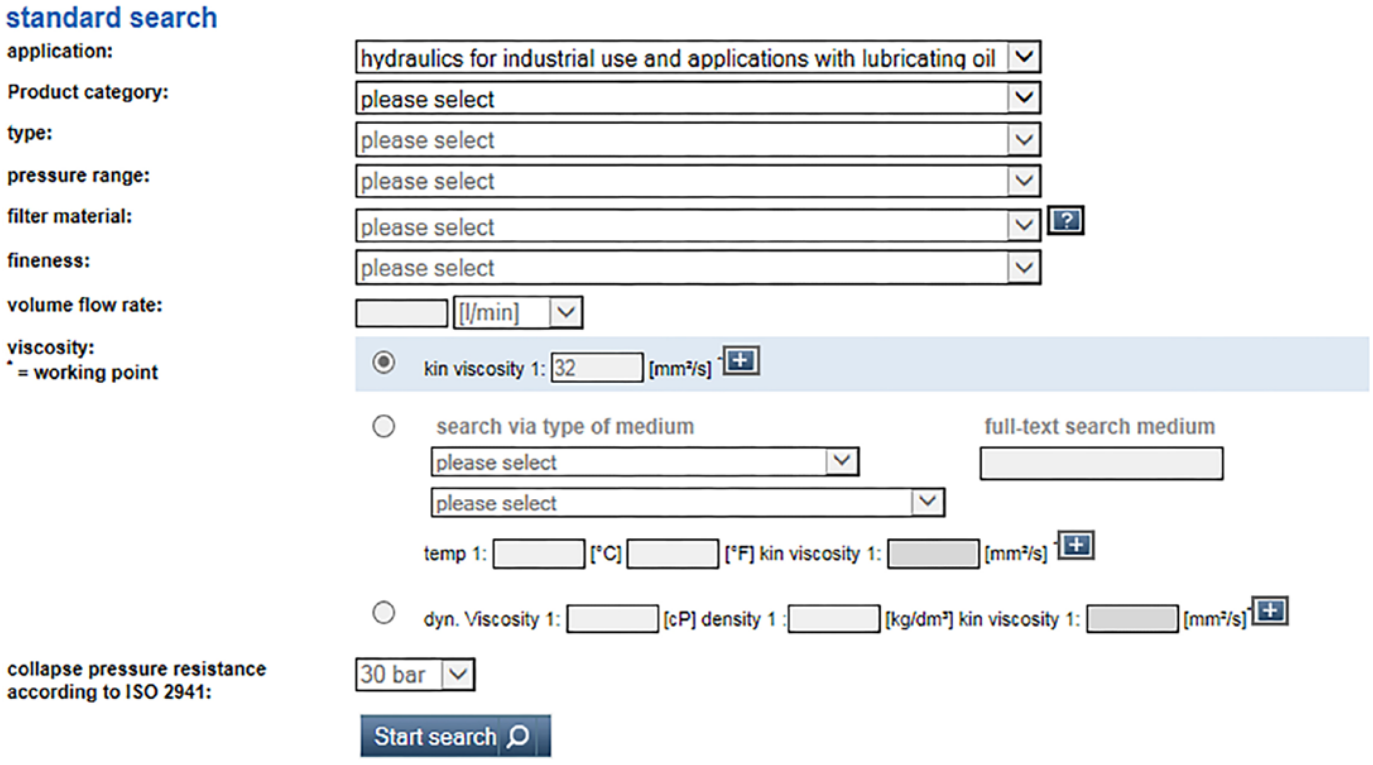
Easy selection of the filter size is made possible by the FilterSelect online tool. The filter can be designed using the operating pressure, flow and fluid system parameters. The required filter rating is based on the application, the sensitivity to contamination of the components and the environmental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

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

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

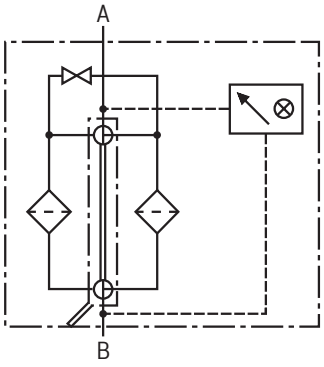
Link FilterSelect:
https://filter-select.com

Other languages can be selected using the page navigation.



Symbols

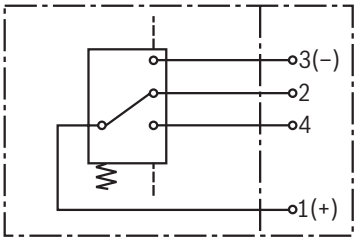
Duplex filter
without bypass and with mechanical indicator



electronic switching element

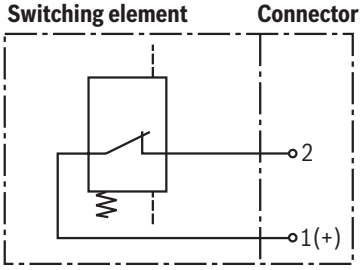
for maintenance indicator

Switching element **Connector**



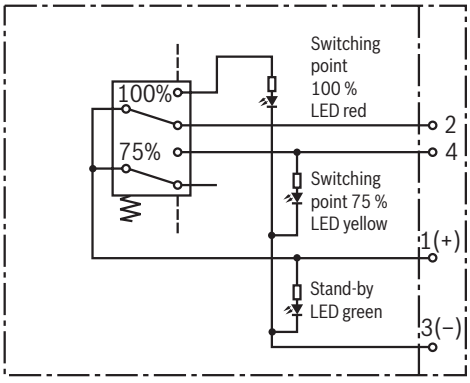
WE-1SP-M12x1

Switching element **Connector**



WE-1SP-EN175301-803

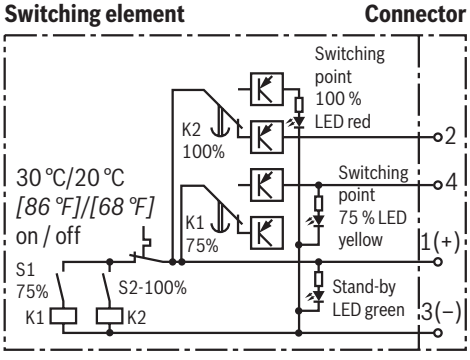
Switching element **Connector**



WE-2SP-M12x1

Circuit diagram drawn in plugged condition (operating state)

Switching element **Connector**



WE-2SPSU-M12x1

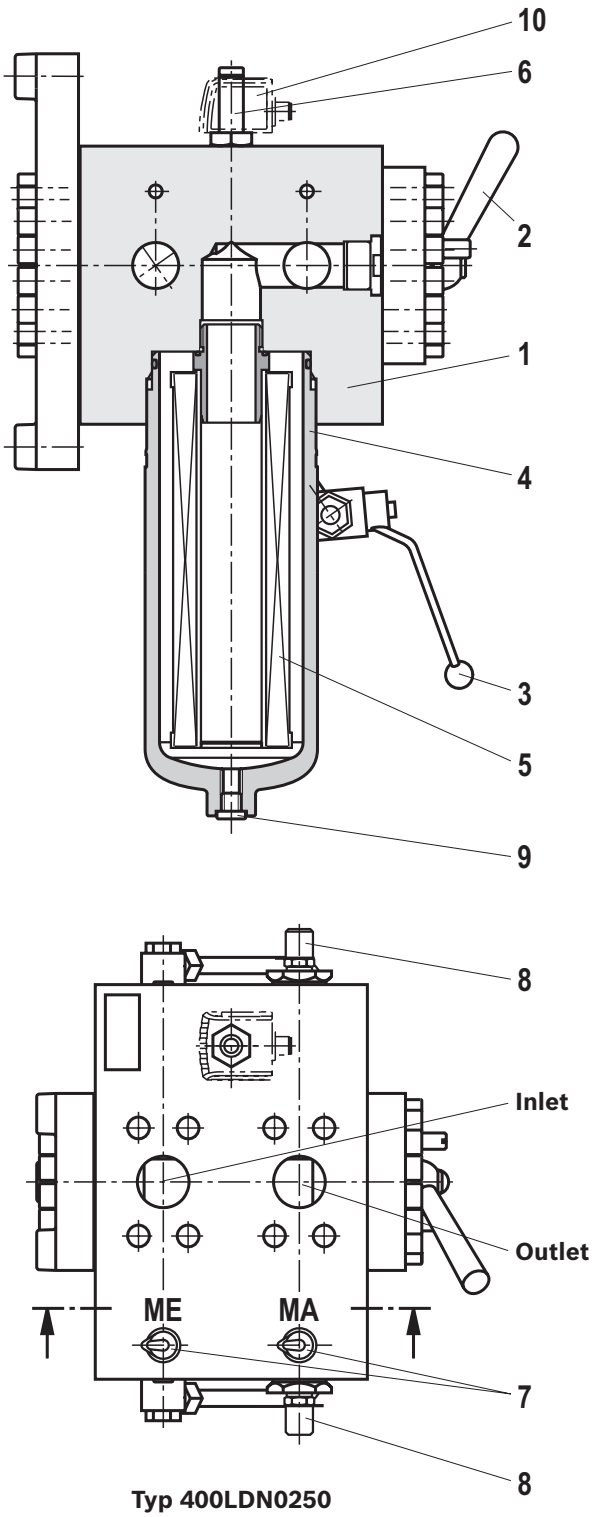
Circuit diagram drawn in plugged condition at temperature > 30 °C *[86 °F]* (operating condition)

Function, section

The 400LD(N) duplex filter is suitable for direct installation into pressure lines. It is installed upstream of the components to be protected.

They basically comprise of a filter head (1) with switchover (2) with pressure equalization (3), a threaded filter bowl (4), filter element (5) as well as mechanical optical maintenance indicator with memory function (6).
Via the inlet, the hydraulic fluid reaches the filter element where it is cleaned. The dirt particles filtered out collect in the filter bowl and in the filter element. Via the outlet, the filtered hydraulic fluid enters the hydraulic circuit.
By means of the switching lever, you can switch between the two filter housings without operational interruption.
The filter housing and all connection elements are designed so that pressure spikes – as they may occur, e.g., due to an accelerated fluid quantity from large control valves opening abruptly – can be safely absorbed.
All filters have one threaded coupling (7) each as measuring port at the inlet and the outlet. By default, the bleeding is effected via lateral threaded couplings (8).
For sizes 0160 and larger, the filter bowl is standard equipped with a drain plug (9).
With size 1000, the filter bowl has a two-part design.
The filter pipe is locked in place in the filter head to prevent unscrewing.

An electronic switching element can be added to the mechanical/optical maintenance indicator in order to integrate the maintenance indicator. The electronic switching element (10) must be attached to the mechanical/optical maintenance indicator (6) and held by means of a locking ring. The electronic switching elements are connected with a mating connector or cable connection.
The electronic switching element must be ordered separately.



Typ 400LDN0250

ME = Measuring port inlet
MA = Measuring port outlet

☞ **Note:**
Size 1000 is equipped with a two piece filter bowl (see chapter “Dimensions”). This increases the required service height as shown in the measurement chart.

Technical data

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

general							
Installation position			Vertical				
Ambient temperature range		°C *[°F]*	–10 ... +65 *[+14 ... +149]*				
Storage conditions	▶ Seal NBR	°C *[°F]*	–40 ... +65 *[–40 ... +149]*; max. relative air humidity 65 %				
	▶ Seal FKM	°C *[°F]*	–20 ... +65 *[–4 ... +149]*; max. relative air humidity 65 %				
Weight	▶ Filter	NG	**0040**	**0063**	**0100**	**0130**	
		kg *[lbs]*	1.3 *[2.9]*	1.3 *[2.9]*	2.1 *[4.6]*	3.8 *[8.3]*	
		NG	**0150**	**0160**	**0250**	**0400**	
		kg *[lbs]*	4.7 *[10.3]*	5.5 *[12.2]*	8.0 *[17.7]*	12.2 *[26.9]*	
		NG	**0630**	**1000** Filter bowl		**1000** Cover	
		kg *[lbs]*	21.4 *[47.1]*	45.3 *[99.9]*		12.1 *[26.6]*	
	▶ Filter bowl	NG	**0040**	**0063**	**0100**	**0130**	
		kg *[lbs]*	1.3 *[2.9]*	1.3 *[2.9]*	2.1 *[4.6]*	3.8 *[8.4]*	
		NG	**0150**	**0160**	**0250**	**0400**	
		kg *[lbs]*	4.7 [*10.4]*	5.5 *[12.2]*	8.0 *[17.7]*	12.2 *[26.9]*	
		NG	**0630**	**1000** Filter pipe [1]		**1000** End cap	
		kg *[lbs]*	21.4 *[47.1]*	45.3 *[99.9]*		2.2 *[4.4]*	

Volume	NG	**0040**	**0063**	**0100**	**0130**	**0150**
	l *[US gal]*	2 x 0.2 *[2 x 0.05]*	2 x 0.3 *[2 x 0.08]*	2 x 0.5 *[2 x 0.13]*	2 x 0.9 *[2 x 0.24]*	2 x 1.1 *[2 x 0.29]*
	NG	**0160**	**0250**	**0400**	**0630**	**1000**
	l *[US gal]*	2 x 1.3 *[2 x 0.34]*	2 x 1.9 *[2 x 0.50]*	2 x 3.0 *[2 x 0.79]*	2 x 4.5 *[2 x 1.19]*	2 x 6.2 *[2 x 1.64]*

Material	▶ Filter head	Ductile iron
	▶ Filter bowl	Steel / Size 1000: Ductile iron
	▶ Optical maintenance indicator	Brass
	▶ Electronic switching element	Plastic PA6
	▶ Seals	NBR or FKM

hydraulic			
Maximum operating pressure	bar *[psi]*	400 *[5714]*	
Hydraulic fluid temperature range	°C *[°F]*	–10 ... +100 *[+14 ... +212]*	
Fatigue strength according to ISO 10771 [2]	Load cycles	> 10^6 at rated operating pressure	
Type of pressure measurement of the maintenance indicator		Differential pressure	
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]*	5.0 ± 0.5 *[72.5 ± 7.3]*	without Bypass valve
		8.0 ± 0.8 *[116 ± 11.6]*	
Filtration direction		From the outside to the inside	

[1] This weight is not relevant to changing the filter element, since only the cap has to be unscrewed.

[2] The life cycle of the components is for example influenced by:

- ▶ The individual load frequency of the application
- ▶ The actually occurring pressure increase speed The technical data apply in compliance with the specified performance limits. Extended operational durability/load cycles upon request.

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

electric (electronic switching element)						
Electrical connection			Round plug-in connection M12x1, 4-pole			Standard connection EN 175301-803
		Version	WE-1SPM12x1	WE-2SPM12x1	WE-2SPSUM12x	WE-1SPEN175301-803
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 in order to protect the switching contacts.						
Weight	electronic switching element	kg *[lbs]*	0.1 *[0.22]*			

Filter element				
Glass fiber material PWR...			Single-use element on the basis of inorganic fiber	
			Filtration ratio according to ISO 16889 up to Δp = 5 bar *[72.5 psi]*	Achievable oil cleanliness according to ISO 4406 *[SAE-AS 4059]*
Particle separation		PWR20	$\beta_{20(c)} \geq 200$	19/16/12 ... 22/17/14
		PWR10	$\beta_{10(c)} \geq 200$	17/14/10 ... 21/16/13
		PWR6	$\beta_{7(c)} \geq 200$	15/12/10 ... 19/14/11
		PWR3	$\beta_{5(c)} \geq 200$	13/10/8 ... 17/13/10
Permissible pressure differential	B00	bar *[psi]*	330 *[4785]*	

Further information about Hengst filter elements can be found in data sheet 51517.

Compatibility with permitted hydraulic fluids

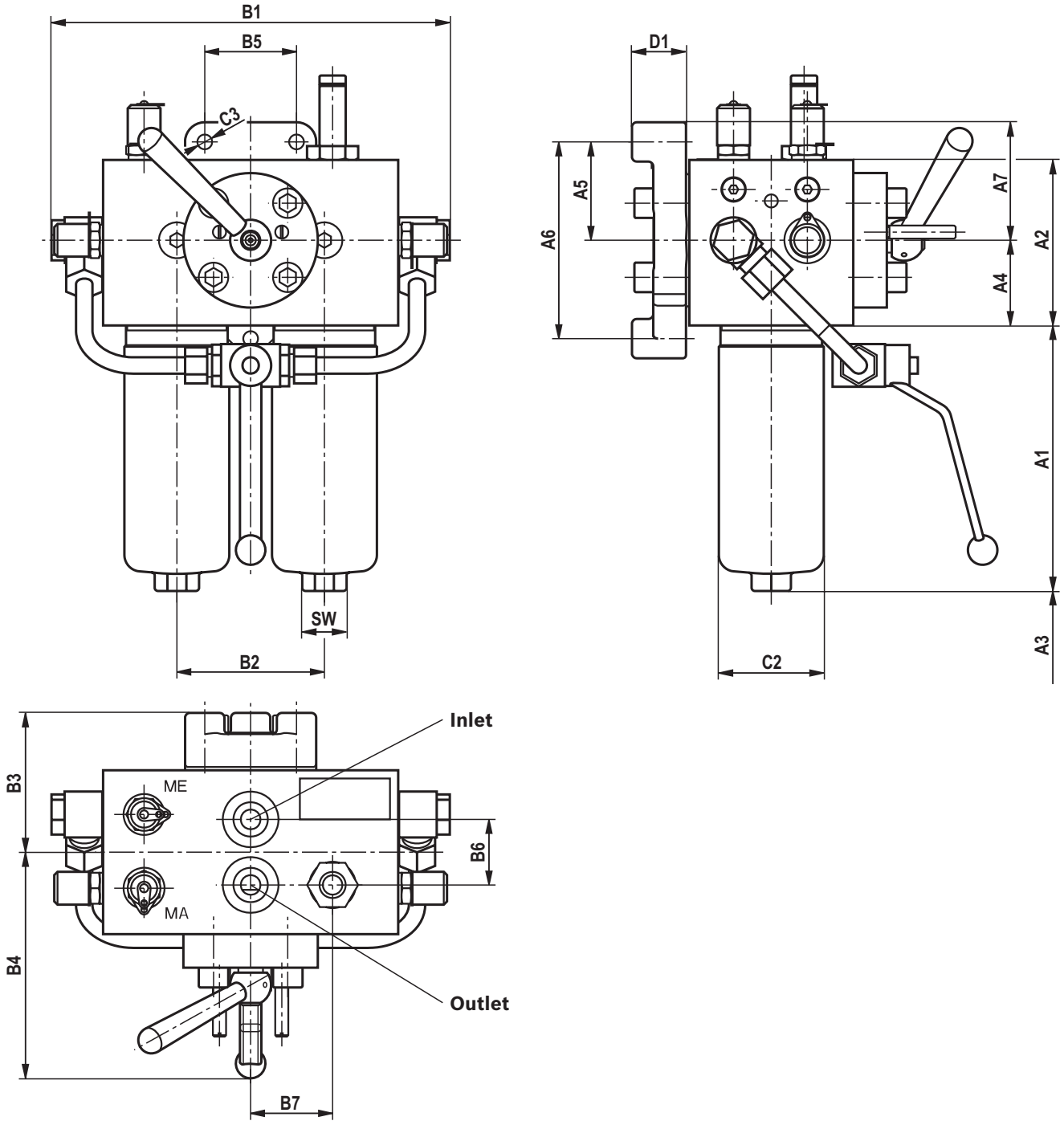
Hydraulic fluid		**Classification**	**Suitable sealing materials**	**Standards**
Mineral oil		HLP	NBR	DIN 51524
Bio-degradable	▶ insoluble in water	HETG	NBR	VDMA 24568
		HEES	FKM	
	▶ soluble in water	HEPG	FKM	VDMA 24568
Flame-resistant	▶ water-free	HFDU, HFDR	FKM	VDMA 24317
	▶ containing water	HFAS	NBR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

☞ **Important information on hydraulic fluids:**
- ▶ For further information and data on the use of other hydraulic fluids, please contact us.
- ▶ Flame-resistant – containing water: adue 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 must not be used, filter elements with glass fiber material have to be used instead.
- ▶ Bio-degradable: If filter materials made of filter paper are used, the filter life may be shorter than expected due to material incompatibility and swelling.

Dimensions 400LDN0040 ... 0100

(dimensions in mm *[inch]*)



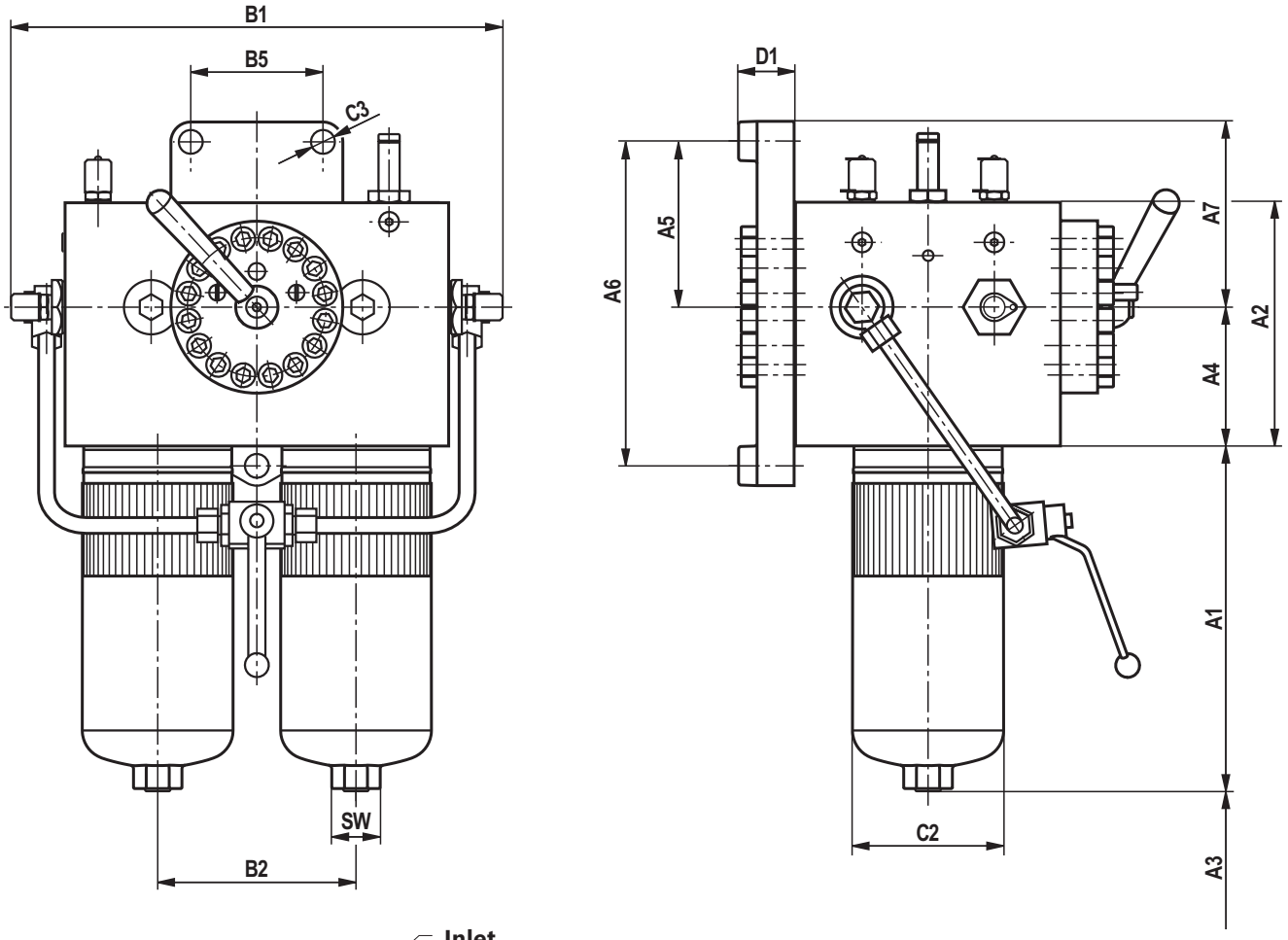
1) Servicing height for filter element exchange

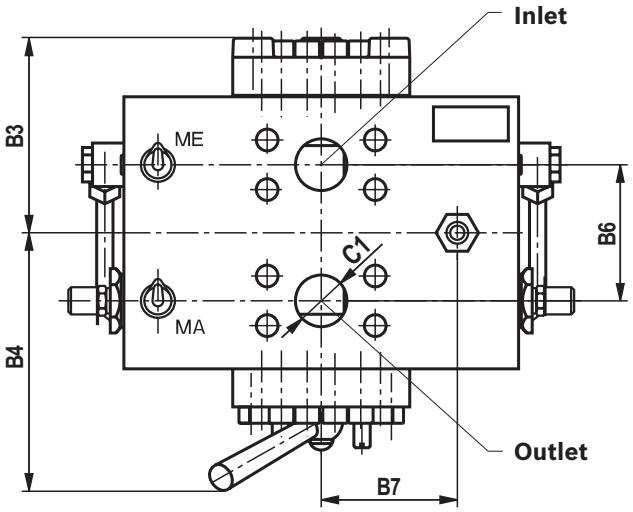
Type	A1	A2	A3 1)	A4	A5	A6	A7	B1	B2	B3
400LDN0040	100 *[3.94]*	101 *[3.98]*	110 *[4.33]*	52 *[2.05]*	60 *[2.36]*	120 *[4.72]*	72 *[2.83]*	240 *[9.45]*	90 *[3.54]*	85 *[3.35]*
400LDN0063	163 *[6.42]*									
400LDN0100	253 *[9.96]*									

Type	B4	B5	B6	B7	C1	ØC2	ØC3	D1	SW
400LDN0040	118 *[4.65]*	56 *[2.20]*	40 *[1.57]*	50 *[1.97]*	G 1/2	64 *[2.52]*	9 *[0.35]*	33 *[1.30]*	24 *[0.94]*
400LDN0063									
400LDN0100									

Dimensions 400LD0130 ... 0150; 400LDN0160 ... 0400

(dimensions in mm *[inch]*)





1) Servicing height for filter element exchange

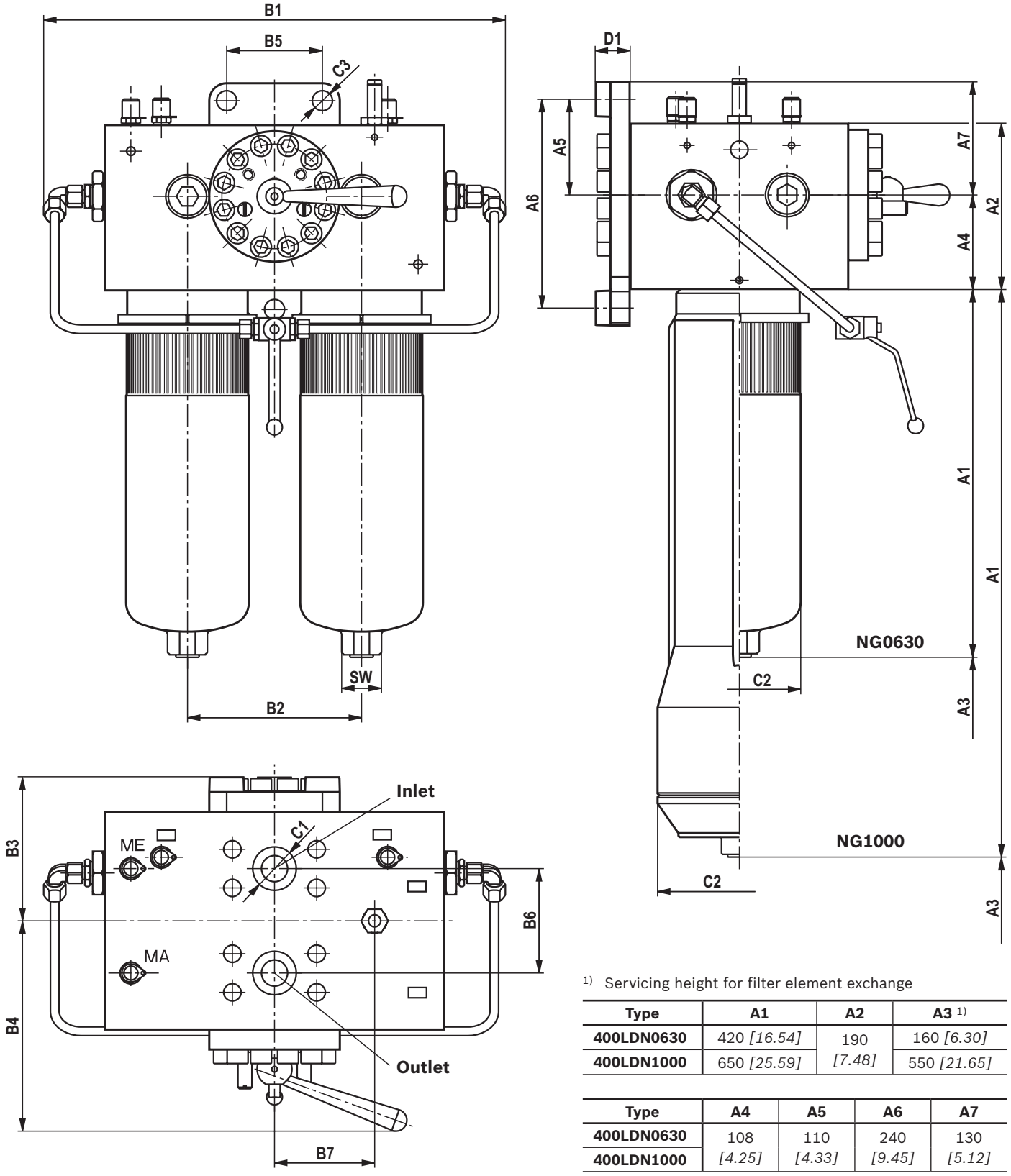
Type	A1	A2	A3 1)	A4
400LD0130	191 *[7.52]*	130 *[5.12]*	120 *[4.72]*	74 *[2.91]*
400LD0150	241 *[9.49]*			
400LDN0160	169 *[6.65]*	184 *[7.24]*	120 *[4.72]*	105 *[4.13]*
400LDN0250	259 *[10.20]*			
400LDN0400	409 *[16.10]*			

Type	A5	A6	A7	B1	B2
400LD0130	72,5 *[2.85]*	170 *[6.69]*	85 *[3.35]*	350 *[13.78]*	120 *[4.72]*
400LD0150					
400LDN0160	125 *[4.92]*	245 *[9.65]*	140 *[5.51]*	372 *[14.65]*	150 *[5.91]*
400LDN0250					
400LDN0400					

Type	B3	B4	B5	B6	B7	C1	ØC2	ØC3	D1	SW
400LD0130	111 *[4.37]*	160 *[6.30]*	80 *[3.15]*	75 *[2.95]*	80 *[3.15]*	SAE 1“ 6000 psi	92 *[3.62]*	14 *[0.55]*	35 *[1.38]*	32 *[1.26]*
400LD0150										
400LDN0160	144 *[5.67]*	188 *[7.40]*	100 *[3.94]*	100 *[3.94]*	100 *[3.94]*	SAE 1 1/2“ 6000 psi	114 *[4.49]*	18 *[0.71]*	42 *[1.65]*	32 *[1.26]*
400LDN0250										
400LDN0400										

Dimensions 400LDN0630 ... 1000

(dimensions in mm *[inch]*)



1) Servicing height for filter element exchange

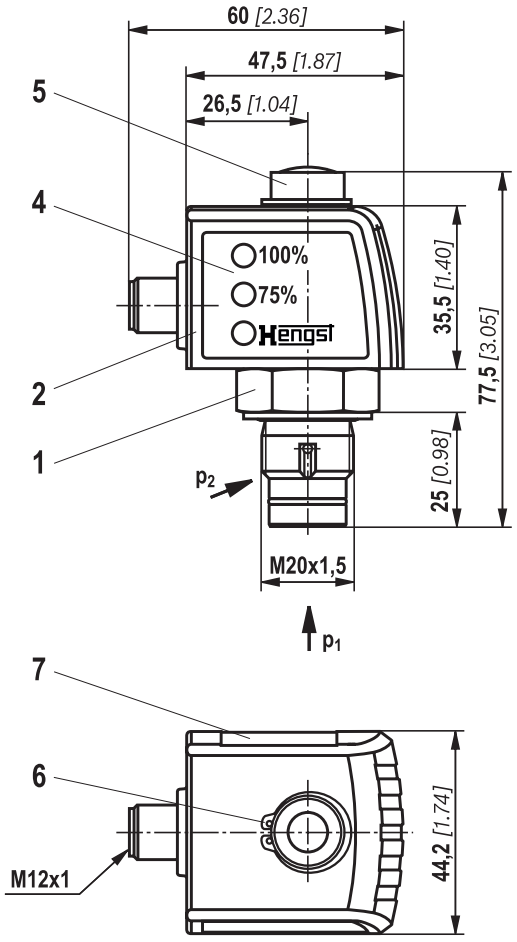
Type	A1	A2	A3 1)
400LDN0630	420 *[16.54]*	190 *[7.48]*	160 *[6.30]*
400LDN1000	650 *[25.59]*		550 *[21.65]*

Type	A4	A5	A6	A7
400LDN0630	108 *[4.25]*	110 *[4.33]*	240 *[9.45]*	130 *[5.12]*
400LDN1000				

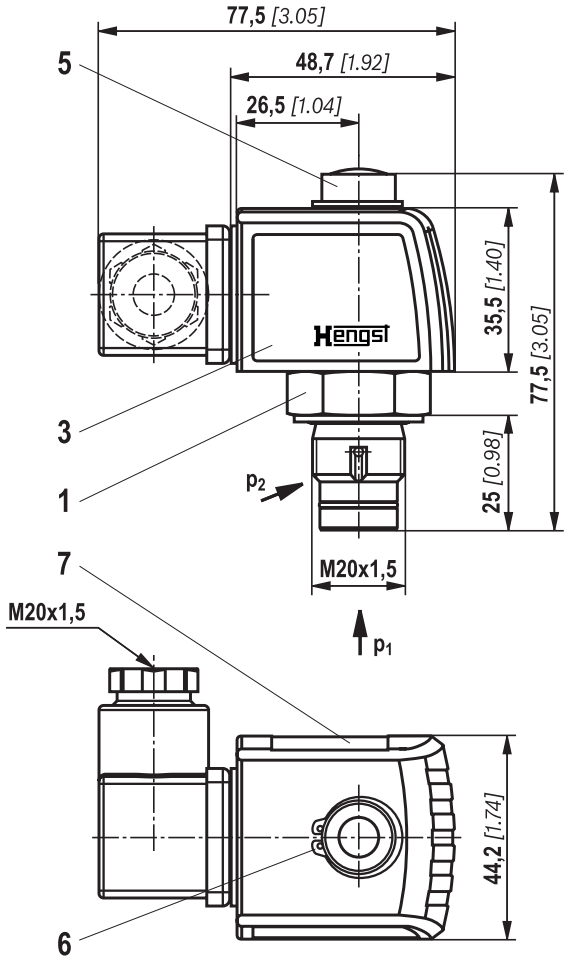
Type	B1	B2	B3	B4	B5	B6	B7	C1	ØC2	ØC3	D1	SW
400LDN0630	530 *[20.87]*	200 *[7.87]*	166 *[6.54]*	242 *[9.53]*	110 *[4.33]*	120 *[4.72]*	115 *[4.53]*	SAE 2“ 6000 psi	141 *[5.55]*	23 *[0.91]*	40 *[1.57]*	41 *[1.61]*
400LDN1000									188 *[7.40]*			

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

Pressure differential indicator with mounted switching element M12x1



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



1 Mechanical optical maintenance indicator; max. tightening torque $M_{A\ max}$ = 50 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 Optical indicator with memory function

6 Locking ring DIN 471-16x1

7 Name plate

☞ **Notes:**
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.			**–**	**B00**	**–**	**0**	**–**	

Filter element

01	Design	**2.**

Size

02	LDN... (Filter element according to **DIN 24550**)	**0040** **0063** **0100** **0160** **0250** **0400** **0630** **1000**
	LD... (Filter element according to **Hengst Standard**)	**0130** **0150**

Filter rating in µm

03	**Absolute** **(ISO 16889; $\beta_{x(c)}$ ≥200)**	Glass fiber material, not cleanable	**PWR3** **PWR6** **PWR10** **PWR20**
	Nominal	Stainless steel wire mesh, cleanable	**G10** **G25** **G40** **G60** **G100**

Differential pressure

04	Max. permissible differential pressure of the filter element 330 bar *[4786 psi]* , filter **without** bypass valve	**B00**

Bypass valve

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

Seal

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

Order example:
2.0160 PWR10 - B00-0-M

Material no.: R928006818

For further information on Hengst filter elements, please refer to data sheet 51517.

Ordering code
Spare parts

Mechanical/optical maintenance indicator

01	02		03		04		05	06
W	**O**	**–**	**D01**	**–**		**–**		**450**

01	**Maintenance indicator**	**W**
02	**mechanical/optical indicator**	**O**

Version

03	Differential pressure, modular design	**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. operating pressure

06	450 bar *[6527 psi]*	**450**

Material no.	Mechanical/optical maintenance indicator
R901025313	WO-D01-5,0-M-450
R901066235	WO-D01-5,0-V-450
R928038785	WO-D01-8,0-M-450
R928038784	WO-D01-8,0-V-450

Seal kit

01	02	03	04
D	**400LD**		

01	**Seal kit**	**D**
02	**Series**	**400LD**

Size

03	0040-0100	**N0040-0100**
	0130-0150	**0130-0150**
	0160-0400	**N0160-0400**
	0630	**N0630**
	1000	**N1000**

Seal

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

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

Assembly, commissioning, maintenance

Assembly

- The max. operating pressure of the system must not exceed the max. permissible operating pressure of the filter (see type plate).
- The assembly is mounted using the rear mounting plate.
- During assembly of the filter the flow direction (direction arrows) and the required servicing height of the filter element (see chapter “Dimensions”) are to be considered.
- Ensure that the system is assembled without tension stress.
- 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.
- 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

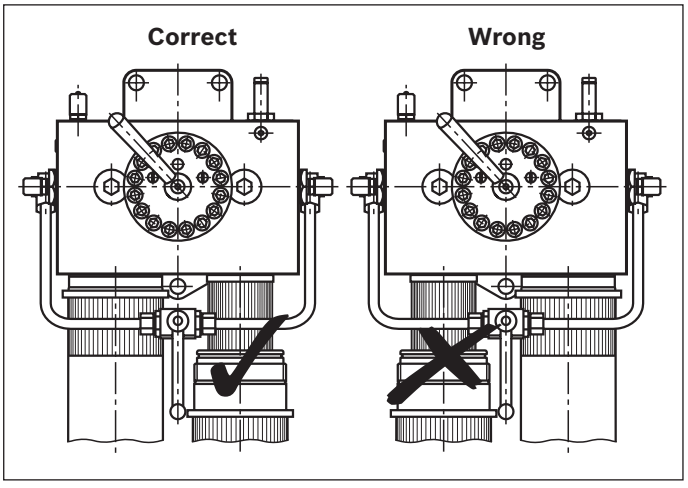
- Bring the switching lever into central position in order to fill both filter sides and open the pressure equalization valve.
- Commission the system.
- Bleed filter by opening the bleed screw, close when fluid escapes.
- Switch the filter into the operating position; to do so, switch the switching lever to one of the two end positions. The switch-over lever is on the filter side that is in operation.
- Close the pressure equalization valve.

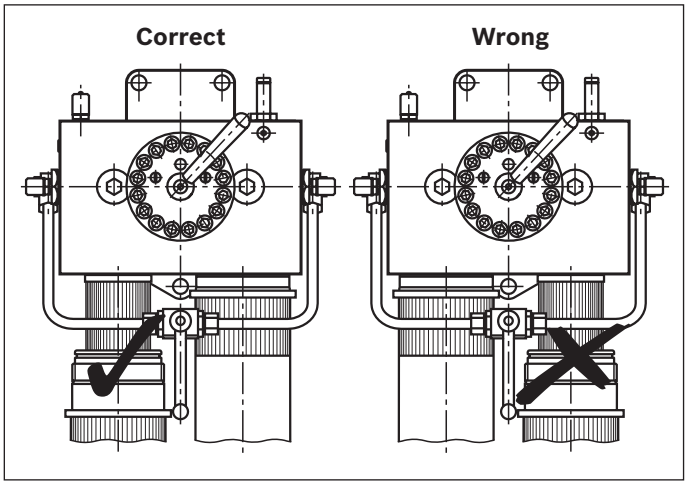
Maintenance

- If at operating temperature, the red indicator pin reaches out of the mechanical optical maintenance indicator and/or if the electronic switching element opens/closes the circuit, the filter element is contaminated and needs to be replaced or cleaned respectively.
- The material number of the correct replacement filter element is on the name plate of the complete filter. Verify that it matches the material number on the filter element. The switch-over lever is on the filter side that is in operation.
- Open the pressure equalization valve.
- Switch the filter using the switching lever.
- Close the pressure equalization valve.
- Open the lateral threaded couplings at the decommissioned filter side in order to reduce the pressure.
- Via the drain screw (standard for size 0160 and larger), the fluid on the dirt side can be drained.
- Unscrew the filter bowl (or end cap if size 1,000).
- Slightly turn the filter element to remove it from the spigot.
- Clean the filter components as needed.
- Check the seals for damage and replace them, if necessary. For suitable seal kits refer to chapter “Spare parts”.
- Filter elements made of wire mesh can be cleaned. For detailed cleaning instructions, see data sheet 51548.
- Install the new or cleaned filter element on the spigot again by slightly rotating it.
- The filter is to be assembled in reverse order.
- To fill the maintained filter side, open the pressure equalization valve.
- The filter is bled via the lateral threaded coupling that is still open.
- After fluid escapes, close the lateral threaded coupling again.
- Ensure correct position of the switch-over lever end position.
- Close the pressure equalization valve.

Assembly, commissioning, maintenance

Correct position of the switching lever during filter element exchange





⚠ WARNING!

- Only install or remove when system is not pressurized.
- Filter is pressurized.
- Only remove filter bowl when it is not pressurized.
- Do not exchange the optical/mechanical maintenance indicator while the filter is under pressure!
- If the flow direction is not considered during assembly, the filter element will be destroyed. Particle contaminates could enter the system and damage the downstream components!
- During removal of the filter, the pressure on the clean and dirt side has to be separately reduced for the pressure differential measurement via the threaded couplings mounted by default. Equipment for bleeding see chapter “Accessories”.

☞ **Notes:**

- Only trained specialists may work on the filter.
- Proper function and safety are only guaranteed if original Hengst filter elements and spare parts are used.
- 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

Series 400LD...		**N0040**	**N0063**	**N0100**	**0130**	**0150**	**N0160**	**N0250**	**N0400**	**N0630**	**N1000**
Screw/tightening torque with μ_{total} = 0.14	Nm *[lbf-ft]*	M8 / 12 *[8.9]* ±10 %			M12 / 40 *[29.5]* ±10 %		M16 / 100 *[73.8]* ±10 %			M22 / 140 *[103.3]* ±10 %	
Quantity		3									
Recommended property class of screw		8.8									
Minimum screw-in depth	mm *[in]*	10 *[0.4]*			12 *[0.5]*		20 *[0.8]*			25 *[1.0]*	

Filter bowl and maintenance indicator

Series		**N0040**	**N0063**	**N0100**	**0130**	**0150**	**N0160**	**N0250**	**N0400**	**N0630**	**N1000**
Filter bowl		Screw in the filter bowl to the stop and screw it out again by 1/8 to 1/2 rotation									
Maintenance indicator	Nm *[lbf-ft]*	max. 50 *[36.9]*									
Cubic connector screw M3 switching element EN-175301-803	Nm *[lbf-ft]*	M3 / 0.5 *[0.4]*									

Accessories

Series		**N0040**	**N0063**	**N0100**	**0130**	**0150**	**N0160**	**N0250**	**N0400**	**N0630**	**N1000**
Threaded coupling	Nm *[lbf-ft]*	max. 40 *[29.5]*									

☞ **Information on torques for fastening the SAE connection flange:**

- Only screws of quality class 8.8 must be used.

The torques are specified in the relevant standard (ISO 6162-2:2012-12, or are as per REXROTH AB22-15 separate flanges).

Directives and standardization

Product validation

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

Pressure pulse test	ISO 10771:2015-08
Filtration performance test (multipass test)	ISO 16889:2022-01
Δ*p* (pressure loss) characteristic curves	ISO 3968:2017-07
Compatibility with hydraulic fluid	ISO 2943:1998-11
Collapse pressure test	ISO 2941:2009-04

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

Classification according to the Pressure Equipment Directive

The filters for hydraulic applications are pressure holding equipment according to article 2, section 5 of the Pressure Equipment Directive 2014/68/EU (PED). However, due to the safety requirements fulfilled in article4, section3, hydraulic filters are exempt from the PED if they are not classified higher than category I.

For the classification, fluids from the chapter ""Compatibility with permitted hydraulic fluids"" have been taken into consideration. The intended use is only permissible with fluids of group 2 and within the specified limitations of use (see chapter ""Technical data"").
Therefore, these filters are not provided with the CE mark.

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

These filters are not equipment or components in terms of Directive 2014/34/EU and are not provided with the CE mark. It has been proven with the ignition risk analysis that these filters do not have own ignition sources acc. to DIN EN 80079-36.

According to DIN EN 60079-11:2012, electronic maintenance indicators with a switching point:
WE-1SP-M12x1 **R928028409**
WE-1SP-EN175301-803 **R928036318**
are, according to DIN EN 60079-11:2012, simple, electronic operating equipment without their own voltage source. According to DIN EN 60079-14:2014, in intrinsically safe electric circuits (Ex ib), this simple, electronic operating equipment may be used in systems without marking and certification.
The filters and electronic maintenance indicators described here can be used for the following potentially explosive areas.

	Zone suitability	
Gas	1	2
Dust	21	22

☞ **Note:**
Maintenance Indicators with EC type examination certificate on request.

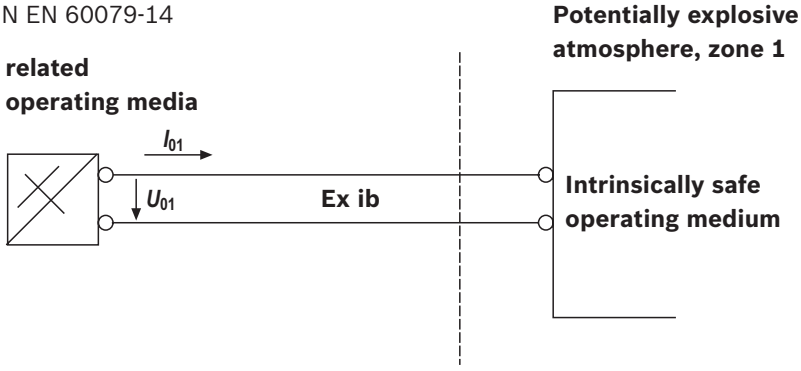
Directives and standardization

Complete filter with mech./opt. maintenance indicator				
	Use/assignment		**Gas 2G**	**Dust 2D**
Assignment			Ex h IIC T6...T1 Gb	Ex h IIC T100°C...T450°C Db
Minimum conductivity of the medium	pS/m	min	300	
Dust accumulation		max	–	0.5 mm

Electronic switching element in the intrinsically safe electric circuit				
	Use/assignment		**Gas 2G**	**Dust 2D**
Assignment			Ex II 2G Ex ib IIB T4 Gb	Ex II 2D Ex ib IIIC T100°C Db
Perm. intrinsically safe electric circuit			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		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.

Possible circuit according to DIN EN 60079-14



Directives and standardization

⚠ WARNING!

- Explosion hazard due to high temperature!
  The temperature depends on the temperature of the medium in the hydraulic circuit and must not exceed the value specified here. Measures are to be taken so that in the potentially explosive area, the max. permissible ignition temperature is not exceeded.
- When using the filters in potentially explosive areas, appropriate equipotential bonding has to be ensured. The filter is preferably to be grounded via the mounting screws. It has to be noted in this connection that painted and oxidized protective layers are not electrically conductive.
- During filter element exchanges, the packaging material is to be removed from the replacement element outside the explosive area.

☞ **Notes:**

- Maintenance by specialist staff only. Instruction by the machine end-user according to DIRECTIVE 1999/92/EC appendix II, section 1.1
- Functional and safety warranty is only valid when using genuine Hengst spare parts.

Use

Intended use

The filters consist of a filter housing, filter element and maintenance indicator, which serve as components in the sense of the EC Machinery Directive 2006/42/EC in hydraulic machinery for the separation of dirt particles. The filters are used under the following boundary conditions and limits:

- Only in systems with fluids of group 2, according to Pressure Equipment Directive 2014/68/EU
- Only according to the application and environmental conditions in the section "Technical data".
- Only in compliance with the specified performance limits in the section “Technical data"; extended operational durability/load cycles on request
- Only with hydraulic fluids and the intended seals according to the section "Compatibility with hydraulic fluids"
- Use in potentially explosive areas according to the section "Directives and standardization".
- The notes regarding the operating modes according to the section "Assembly, commissioning, maintenance" must be observed.
- Compliance with application and environmental conditions according to the technical data.
- Compliance with the specified performance limits.
- Use in the original condition, without damage.
- Maintenance work, such as the replacement of seals, filter elements and optical indicators with original Hengst spare parts, is permissible. Repair by the customer, particularly at pressurized components, is not permissible.
- This filter is exclusively intended for professional use and not for private use.

Improper use

Any use deviating from the intended use is improper and thus not permissible.
Improper use of the filters includes:

- Incorrect storage
- Incorrect transport
- Lack of cleanliness during storage and assembly
- Incorrect installation
- Use of inappropriate/not-permissible hydraulic fluids
- Exceedance of the specified maximum pressures and load cycles
- Operation outside the approved temperature range
- Installation and operation in a not-permissible device group or category
- Operation outside the specified limits for the operating voltage, see the section "Technical data"

Hengst Filtration GmbH does not assume any liability for damage caused by improper use. The user assumes all risks involved with improper use.

Environmental and recycling

- The used filter element should be disposed of in accordance with the respective country-specific legal regulations of environmental protection.
- After completion of the filter life, the components of the filter, in accordance with the respective country-specific legal regulations of environmental protection, are recycled.

Notices

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