

# Duplex filter with filter element acc. to DIN 24550

Type 400LDN0040 to 1000; 400LD0130, 0150

**RE 51429**

Edition: 2021-04

Replaced: -



- ▶ 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

Features	1
Ordering code, filter	2, 3
Preferred types	4
Ordering code, accessories	5
Filter design	6
Symbols	7
Function, section	8
Technical data	9, 10
Compatibility with permitted hydraulic fluids	10
Dimensions	11 ... 14
Ordering code, spare parts	15, 16
Assembly, commissioning, maintenance	17, 18
Tightening torques	19
Directives and standardization	20 ... 22
Environment and recycling	22

## 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 <b>DIN 24550</b>	N
----	---	---

#### Size

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

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

04	<b>Absolute</b> (ISO 16889; $\beta_{x(e)} \geq 200$ )	Non-woven glass fiber media, not cleanable	PWR3 PWR6 PWR10 PWR20
	<b>Nominal</b>	Stainless steel wire mesh, cleanable	G10 G25 G40 G100

#### Differential pressure

05	Max. admissible pressure differential of the filter element 330 bar [4786 psi], Filter <b>without</b> 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	<b>Frame size</b>	<b>0040 ... 0100</b>	<b>0130 ... 0150</b>	<b>0160 ... 0400</b>	<b>0630 ... 1000</b>		
	<b>Connection</b>						
	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 mm<sup>2</sup>/s [143 SUS]

#### Filter rating 3 µm

Type	Flow in l/min [US gpm] at Δp = 1.5 bar [21.75 psi] <sup>1)</sup>	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 Δp = 1.5 bar [21.75 psi] <sup>1)</sup>	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 Δp = 1.5 bar [21.75 psi] <sup>1)</sup>	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			R928004034

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

**Ordering code****Accessories** (dimensions in mm [inch])**Electronic switching element for maintenance indicators**

01	02	03
WE	-	-

**Maintenance indicator**

01	Electronic switching element	WE
----	------------------------------	----

**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

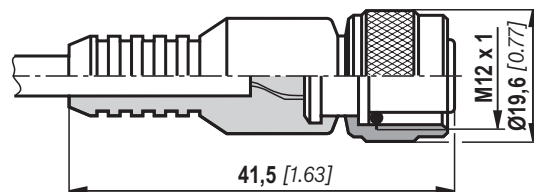
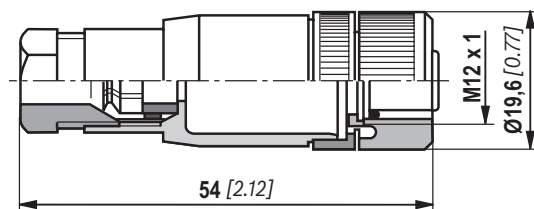
**Mating connectors** (max. admissible voltage: 50 V)

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 mm<sup>2</sup>Core marking:    **1** brown    **2** white  
                      **3** blue     **4** black**Material no. R900064381**

For further round plug-in connections and technical data, refer to data sheet 08006.

**Order example:**Duplex filter with mechanical/optical maintenance indicator for  $p_{nom.} = 450 \text{ bar}$  [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:

<http://www.filterselect.de/>

Other languages can be selected using the page navigation.

### standard search

**application:** hydraulics for industrial use and applications with lubricating oil

**Product category:** please select

**type:** please select

**pressure range:** please select

**filter material:** please select

**fineness:** please select

**volume flow rate:**  [l/min]

**viscosity:**  
 \* = working point

kin viscosity 1:  [mm<sup>2</sup>/s]

search via type of medium full-text search medium  
 please select    
 please select

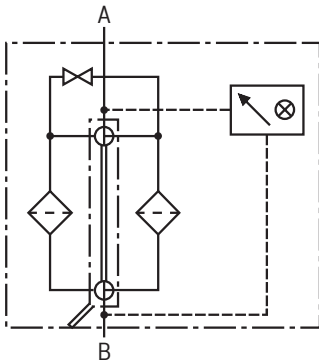
temp 1:  [°C]  [°F] kin viscosity 1:  [mm<sup>2</sup>/s]

dyn. viscosity 1:  [cP] density 1:  [kg/dm<sup>3</sup>] kin viscosity 1:  [mm<sup>2</sup>/s]

**collapse pressure resistance according to ISO 2941:** 30 bar

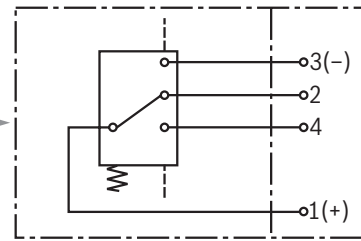
**Symbols**

**Duplex filter**  
without bypass and with  
mechanical indicator



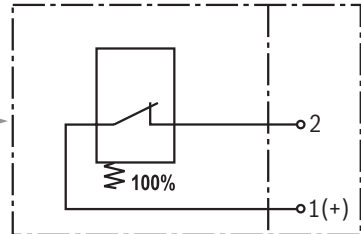
**electronic switching element  
for maintenance indicator**

**Switching element Connector**



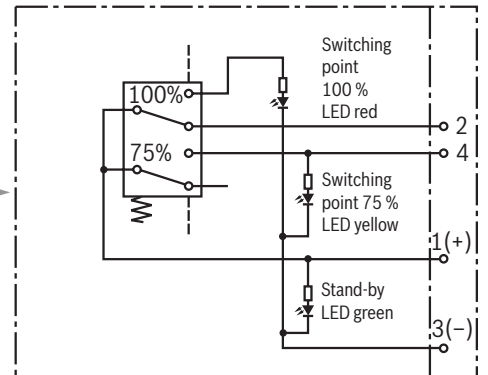
**WE-1SP-M12x1**

**Switching element Connector**



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

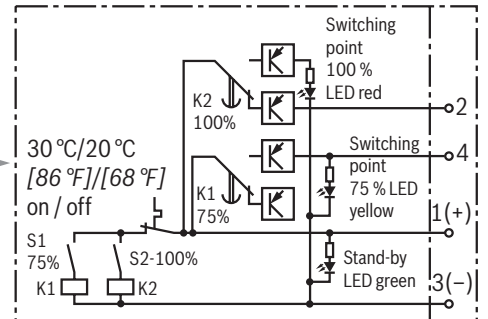
**Switching element Connector**



**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).

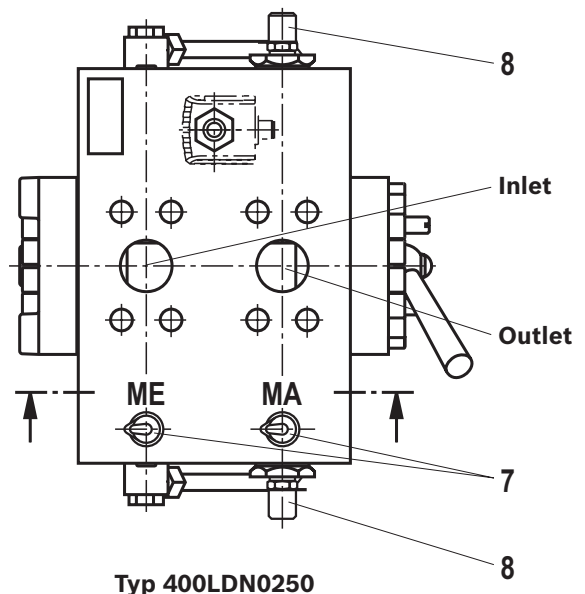
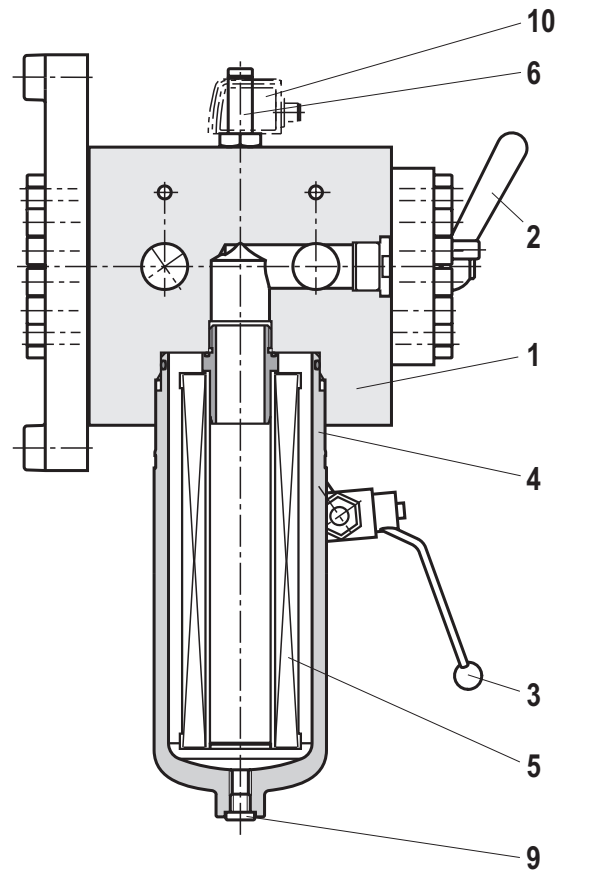
Via the inlet, the hydraulic fluid reaches the filter element where it is cleaned. The dirt particles filtered out collect in the filter bowl and in the filter element. Via the outlet, the filtered hydraulic fluid enters the hydraulic circuit. By means of the switching lever, you can switch between the 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.



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!)

<b>general</b>								
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	<b>0040</b>	<b>0063</b>	<b>0100</b>	<b>0130</b>		
		kg [lbs]	1.3 [2.9]	1.3 [2.9]	2.1 [4.6]	3.8 [8.3]		
		NG	<b>0150</b>	<b>0160</b>	<b>0250</b>	<b>0400</b>		
		kg [lbs]	4.7 [10.3]	5.5 [12.2]	8.0 [17.7]	12.2 [26.9]		
		NG	<b>0630</b>	<b>1000</b> Filter bowl		<b>1000</b> Cover		
		kg [lbs]	21.4 [47.1]	45.3 [99.9]		12.1 [26.6]		
	▶ Filter bowl	NG	<b>0040</b>	<b>0063</b>	<b>0100</b>	<b>0130</b>		
		kg [lbs]	1.3 [2.9]	1.3 [2.9]	2.1 [4.6]	3.8 [8.4]		
		NG	<b>0150</b>	<b>0160</b>	<b>0250</b>	<b>0400</b>		
		kg [lbs]	4.7 [10.4]	5.5 [12.2]	8.0 [17.7]	12.2 [26.9]		
		NG	<b>0630</b>	<b>1000</b> Filter pipe <sup>1)</sup>		<b>1000</b> End cap		
		kg [lbs]	21.4 [47.1]	45.3 [99.9]		2.2 [4.4]		
		Volume	NG	<b>0040</b>	<b>0063</b>	<b>0100</b>	<b>0130</b>	<b>0150</b>
			l	2 x 0.2	2 x 0.3	2 x 0.5	2 x 0.9	2 x 1.1
[US gal]	[2 x 0.05]		[2 x 0.08]	[2 x 0.13]	[2 x 0.24]	[2 x 0.29]		
NG	<b>0160</b>		<b>0250</b>	<b>0400</b>	<b>0630</b>	<b>1000</b>		
l	2 x 1.3		2 x 1.9	2 x 3.0	2 x 4.5	2 x 6.2		
[US gal]	[2 x 0.34]		[2 x 0.50]	[2 x 0.79]	[2 x 1.19]	[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						
<b>hydraulic</b>								
Maximum operating pressure		bar [psi]	400 [5714]					
Hydraulic fluid temperature range		°C [°F]	-10 ... +100 [+14 ... +212]					
Minimum conductivity of the medium		pS/m	300					
Fatigue strength according to ISO 10771		Load cycles	> 10 <sup>6</sup> with 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						

**Technical data**

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

<b>electric</b> (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 in order to protect the switching contacts.					
Weight	electronic switching element	kg [lbs]	0.1 [0.22]		

<b>Filter element</b>				
Glass fiber material PWR...		Single-use element on the basis of inorganic fiber		
		Filtration ratio according to ISO 16889 up to $\Delta p = 5 \text{ bar [72.5 psi]}$		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	$\beta_{6(c)} \geq 200$		15/12/10 ... 19/14/11
	PWR3	$\beta_{5(c)} \geq 200$		13/10/8 ... 17/13/10
Admissible pressure differential	B00	bar [psi]	330 [4785]	

**Further information about Hengst filter elements can be found in data sheet 51420.****Compatibility with permitted hydraulic fluids**

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

**Important information on hydraulic fluids:**

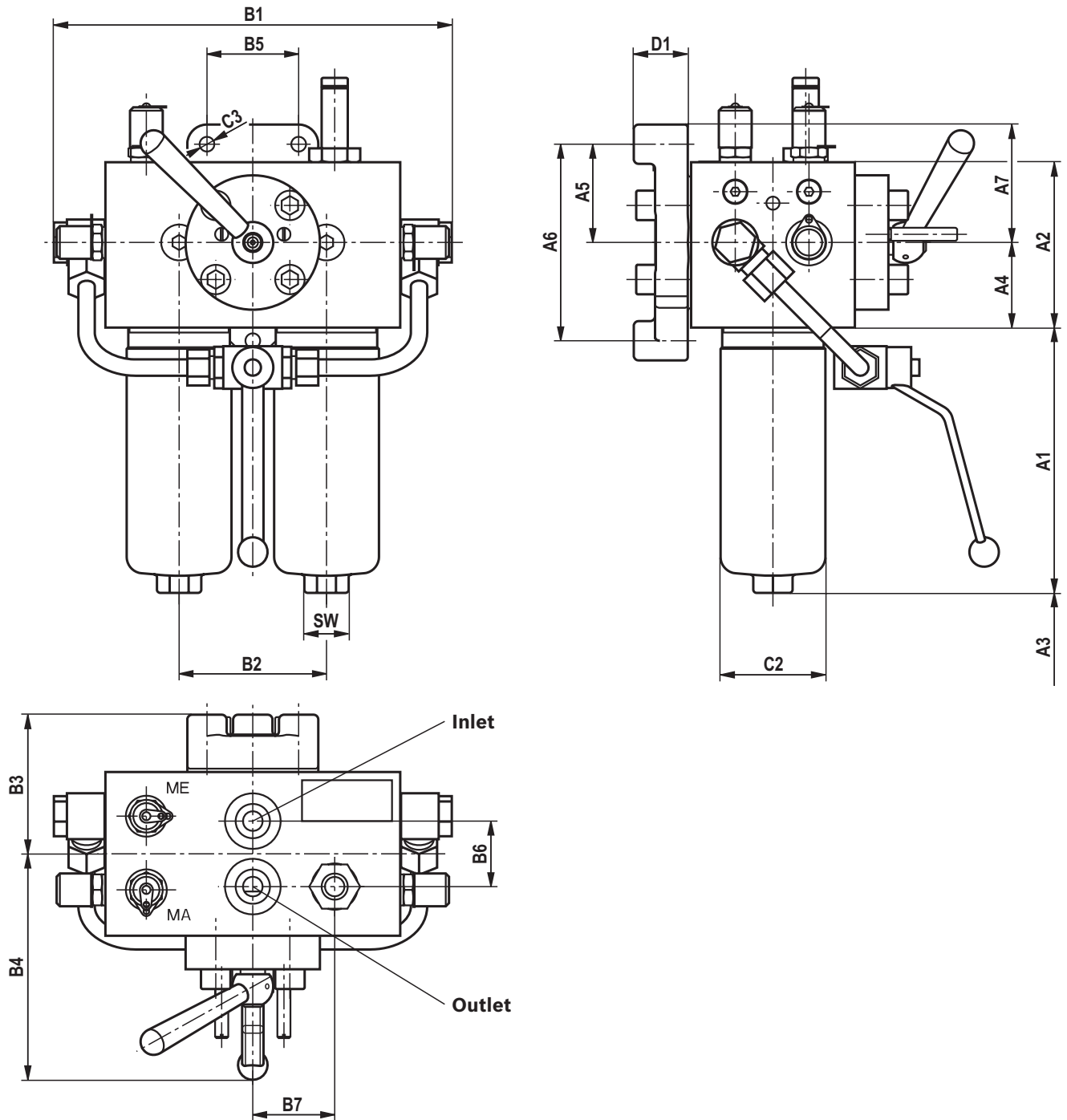
- ▶ For further information and data on the use of other hydraulic fluids please contact us.
- ▶ Flame-resistant – containing water: adue to possible chemical reactions with materials or surface coatings of machine and system components, the service life with these hydraulic fluids may be less than expected. Filter materials made of filter paper

(cellulose) must not be used, filter elements with glass fiber material or wire mesh 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])

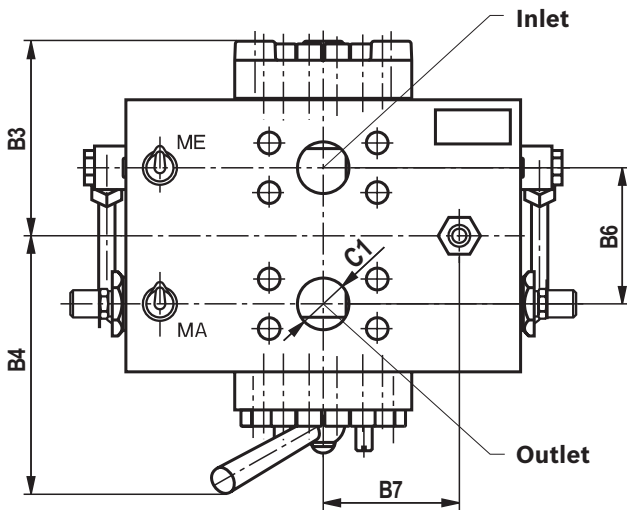
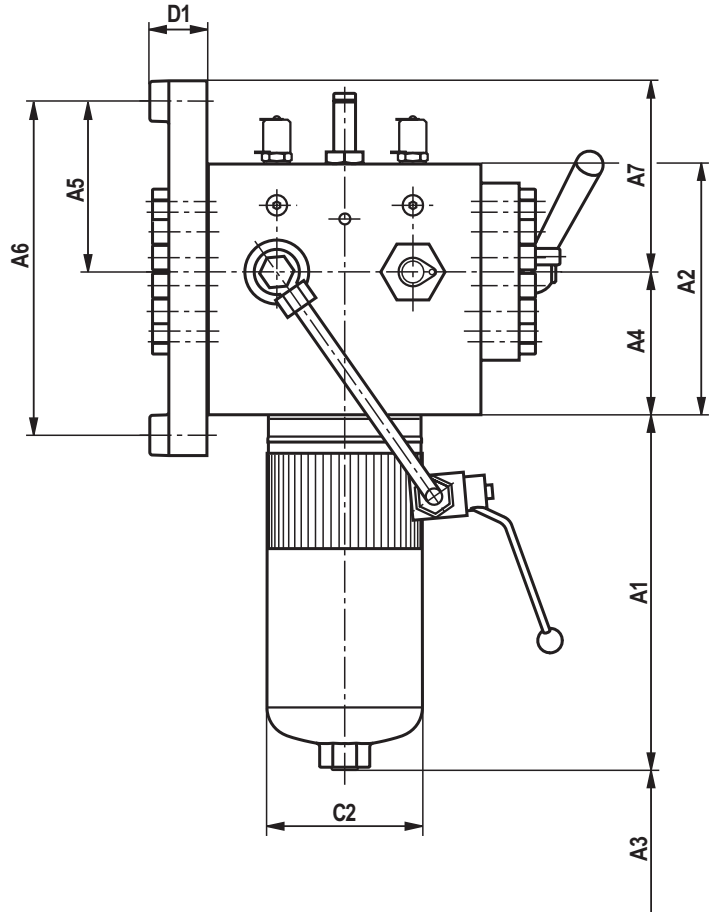
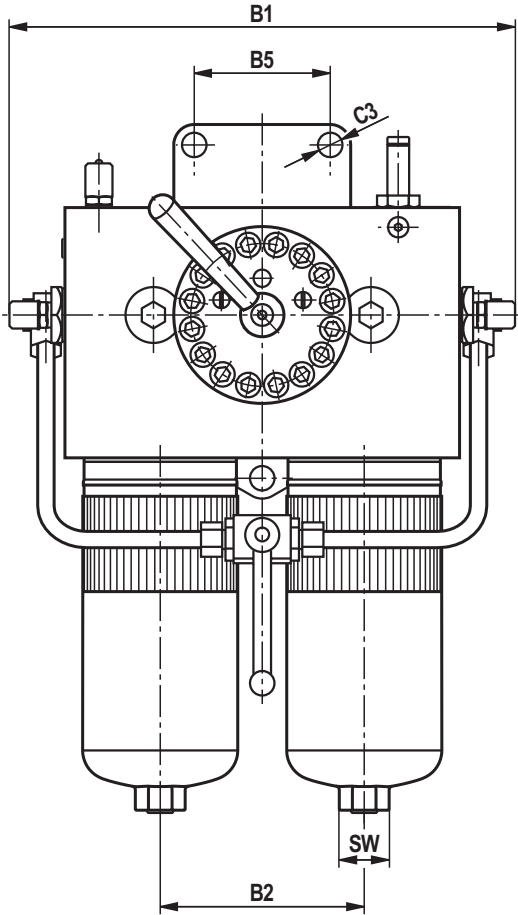


<sup>1)</sup> Servicing height for filter element exchange

Type	A1	A2	A3 <sup>1)</sup>	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]	G1 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])



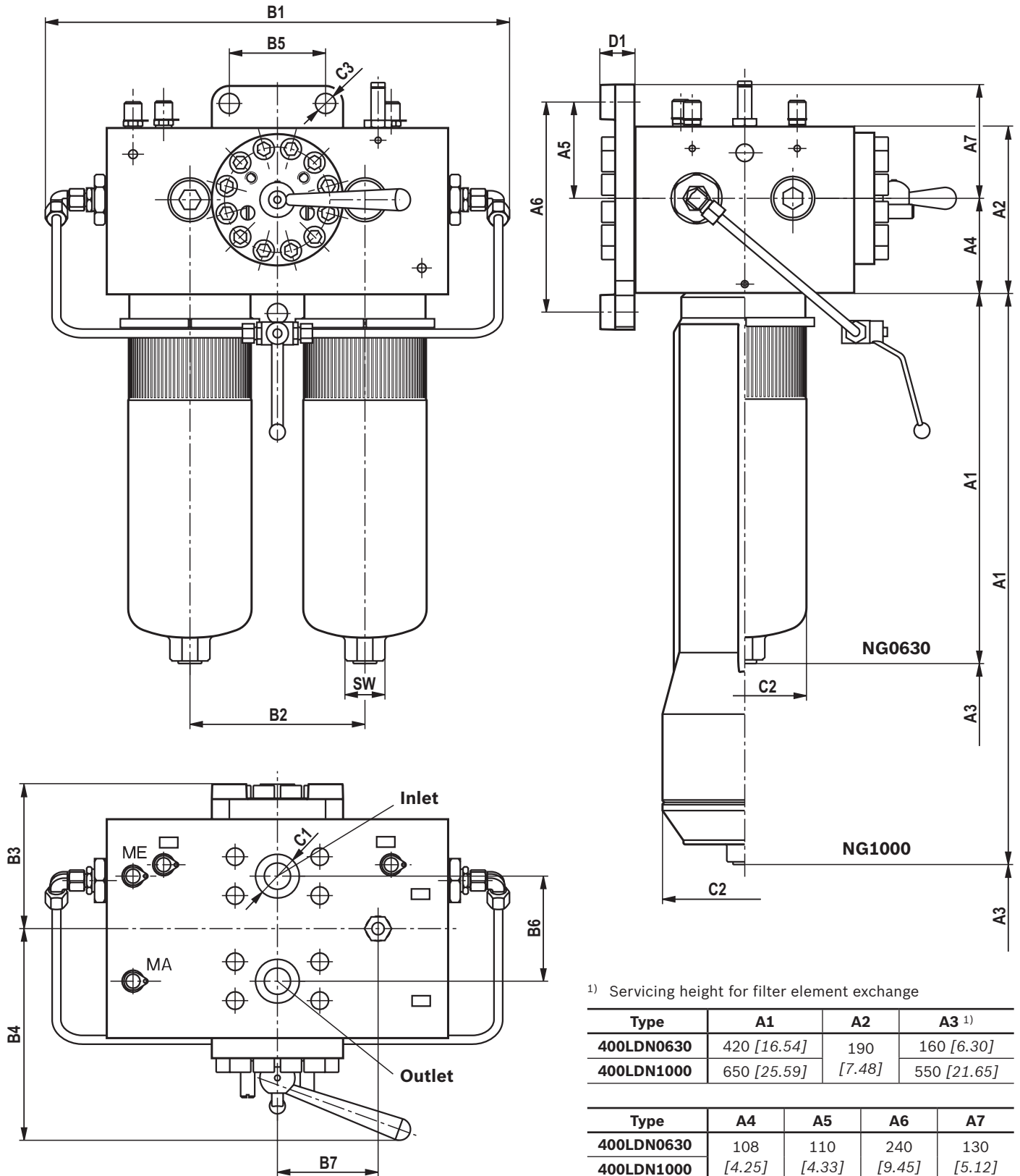
1) Servicing height for filter element exchange

Type	A1	A2	A3 <sup>1)</sup>	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										

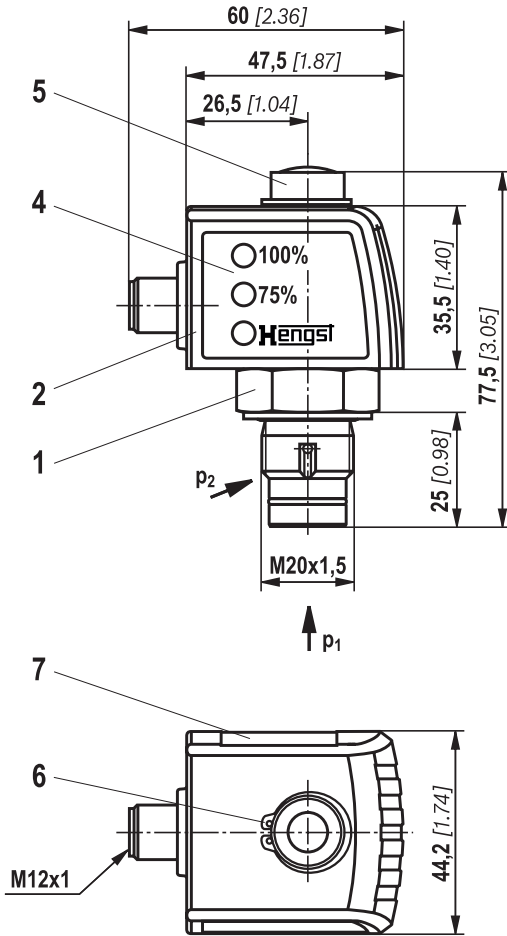
### Dimensions 400LDN0630 ... 1000 (dimensions in mm [inch])



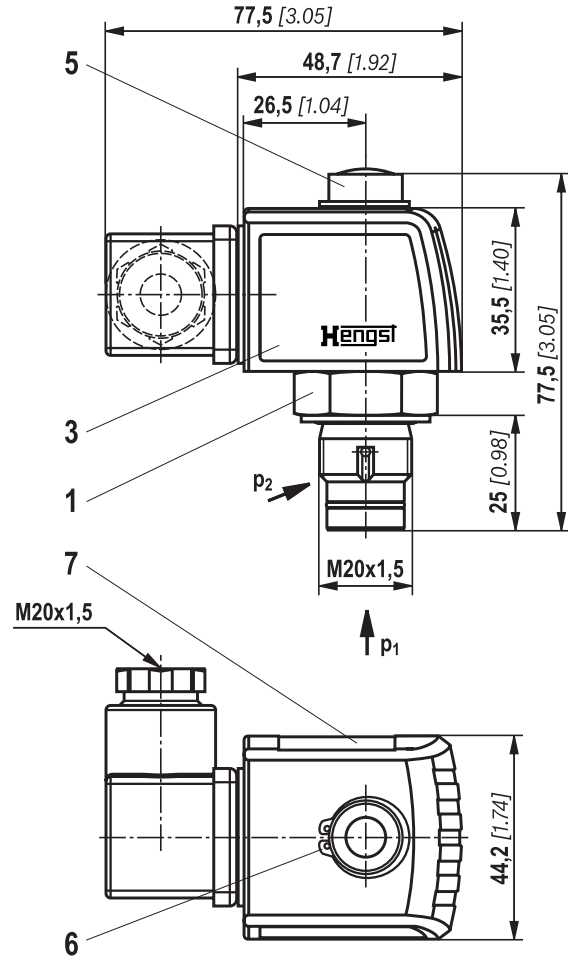
Type	B1	B2	B3	B4	B5	B6	B7	C1	ØC2	ØC3	D1	SW
400LDN0630	530	200	166	242	110	120	115	SAE 2"	141 [5.55]	23	40	41
400LDN1000	[20.87]	[7.87]	[6.54]	[9.53]	[4.33]	[4.72]	[4.53]	6000 psi	188 [7.40]	[0.91]	[1.57]	[1.61]

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

Pressure differential indicator with mounted switching element M12x1



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



- 1 Mechanical optical maintenance indicator; max. tightening torque  $M_{A \max} = 50 \text{ Nm}$  [36.88 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,  
**material no. R900003923**
- 7 Name plate

## Ordering code

### Spare parts

#### Filter element

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

#### Filter element

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

#### Size

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

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

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

#### Differential pressure

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

#### Bypass valve

05	<b>Without</b> bypass valve	<b>0</b>
----	-----------------------------	----------

#### Seal

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

#### Order example:

**2.0160 PWR10 - B00-0-M**

**Material no.: R928006818**

**For further information on Hengst filter elements, please refer to data sheet 51520.**

## 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
----	--------------------	-----

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

#### 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

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



## Assembly, commissioning, maintenance

### Assembly

- ▶ The max. operating pressure of the system must not exceed the max. admissible 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

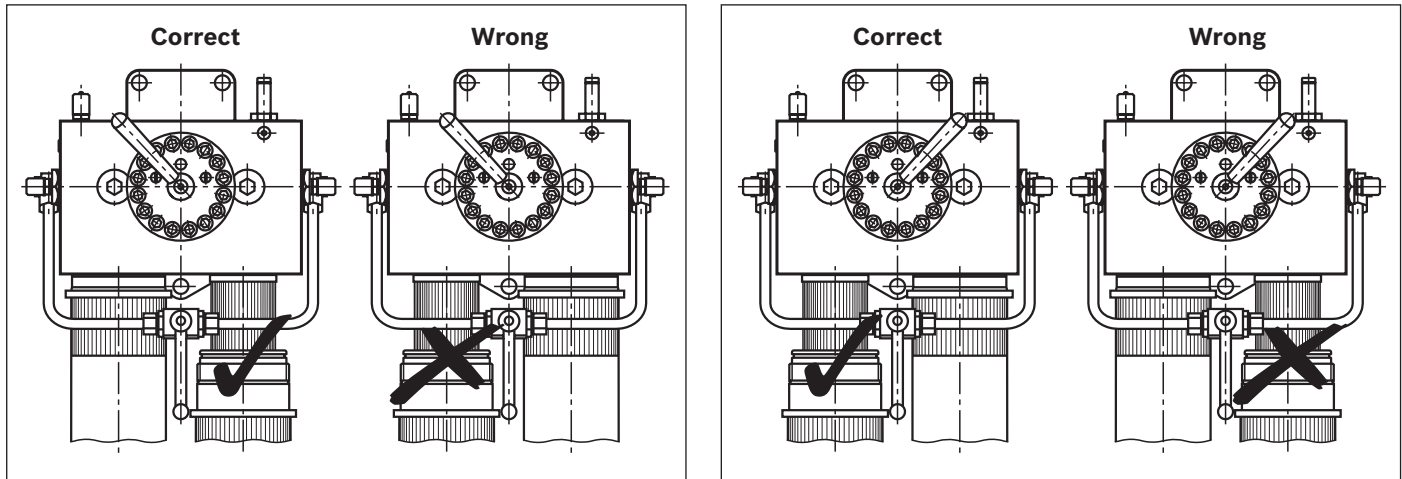
- ▶ Bring the switching lever into central position in order to fill both filter sides and open the pressure equalization valve.
- ▶ Commission the system.
- ▶ Bleed filter by opening the bleed screw, close when fluid escapes.
- ▶ Switch the filter into the operating position; to do so, switch the switching 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 51420.
- ▶ Install the new or cleaned filter element on the spigot again by slightly rotating it.
- ▶ The filter is to be assembled in reverse order.
- ▶ 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!

#### **👉 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 $\mu_{\text{total}} = 0.14$	M8 / 12 [8.9] $\pm 10\%$		M12 / 40 [29.5] $\pm 10\%$		M16 / 100 [73.8] $\pm 10\%$			M22 / 140 [103.3] $\pm 10\%$		
Quantity	3									
Recommended property class of screw	8.8									
Minimum screw-in depth	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	max. 50 [36.9]									
Cubic connector screw M3 switching element EN-175301-803	M3 / 0.5 [0.4]									

### Accessories

Series	N0040	N0063	N0100	0130	0150	N0160	N0250	N0400	N0630	N1000
Threaded coupling	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 AB22-15 for 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 16889:2008-06
$\Delta p$ (pressure loss) characteristic curves	ISO 3968:2001-12
Compatibility with hydraulic fluid	ISO 2943:1998-11
Collapse pressure test	ISO 2941:2009-04

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

### Classification according to the Pressure Equipment Directive

The duplex filters for hydraulic applications according to 51408 are pressure holding equipment according to article 1, section 2.1.4 of the Pressure Equipment Directive 97/23/EC (PED). However, based on the exception in article 1, section 3.6 of the PED, hydraulic filters are exempt from the PED if they are not classified higher than category I (guideline 1/19).

The fluids from the chapter “Compatibility with approved pressure fluids” were considered for the classification. The intended use is only permitted with fluids in group 2 and within the specified operating limits (see “Technical data”). These filters do not receive a CE mark.

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

The duplex filters according to 51408 are not equipment or components in the sense of directive 94/9/EC and are not provided with a CE mark. It has been proven with the ignition risk analysis that these inline filters do not have own ignition sources acc. to DIN EN 13463-1:2009.

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

WE-1SP-M12x1 **R928028409**

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

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

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

The 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

#### Note:

Maintenance Indicators with EC type examination certificate on request.

## Directives and standardization

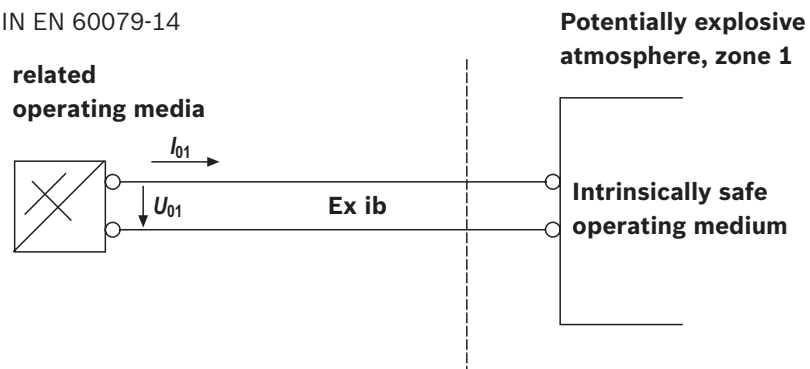
Complete filter with mech./opt. maintenance indicator			
Use/assignment		Gas 2G	Dust 2D
Assignment		Ex II 2G c IIC TX	Ex II 2D c IIC TX
Minimum conductivity of the medium	pS/m	min	300
Dust accumulation		max	–
			0.5 mm

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 <sub>max</sub> 40 °C
		max	1,0 W T4 T <sub>max</sub> 80 °C
Surface temperature <sup>2)</sup>		max	–
			100 °C
inner capacity	Ci		neglectable
inner inductivity	Li		neglectable
Dust accumulation		max	–
			0.5 mm

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

Possible circuit according to DIN EN 60079-14



## 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. admissible ignition temperature is not exceeded.
- ▶ When using the duplex filters according to 51429 in explosive areas, sufficient potential equalization 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.

## 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.

Hengst Filtration GmbH  
 Hardtwaldstr. 43  
 68775 Ketsch, Germany  
 Phone +49 (0) 62 02 / 6 03-0  
 hydraulicfilter@hengst.de  
 www.hengst.com

© This document, as well as the data, specifications and other information set forth in it, are the exclusive property of Hengst Filtration GmbH. It may not be reproduced or given to third parties without consent of Hengst Filtration GmbH. The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.