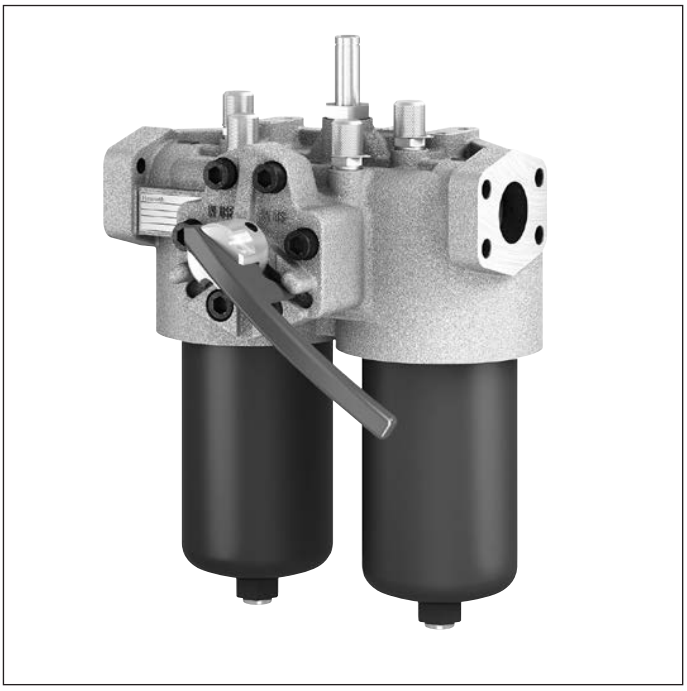
Duplex filter
with filter element according to DIN 24550

Type 210/250LDN0040 to 0400

RE 51484
Edition: 2023-03
Replaced: 2021-04



- Size according to DIN 24550: 0040 to 0400
- Nominal pressure 210 bar [3045 psi] or 250 bar [3625 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 the separation of solid materials from fluids and lubricating oils and are intended for installation in pipelines. A filter element can be changed without any operational interruption.
They have the following characteristics:

- Filters for inline installation, switchable
- Highly efficient filter materials
- High collapse rating of the filter elements
- By default equipped with mechanical optical maintenance indicator with memory function
- Pressure equalization function integrated in the switch-over
- By default measuring ports with threaded coupling
- Filtration support by means of cyclone-shaped flow path
- Available as an option with different electronic switching elements, modular design
- Optional bypass valve integrated in the filter housing

Contents

Ordering code
Filter

01	02	03		04	05		06		07		08		09		09	
		–	2X	/			–		–		–		–		–	

Series

01	Duplex filter 210 bar *[3045 psi]* (only with port SAE 1 1/2")	**210LDN**
	Duplex filter 250 bar *[3625 psi]*	**250LDN**

Size

02	LDN... (Filter elements according to **DIN 24550**)	**0040** **0063** **0100** **0160** **0250** **0400**

03	Component series 20 ... 29 (20 ... 29: unchanged installation and connection dimensions)	**2X**

Filter rating in µm

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

Pressure differential

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

Maintenance indicator

06	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**
	Maintenance indicator, mech./optical, switching pressure 8.0 bar *[116 psi]* – only possible without bypass	**V8,0**

Seal

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

Port

08	**Frame size** / **Port**	**Pressure max. in bar** *[psi]*	**0040 ... 0100**	**0160 ... 0400**		
	G 1	250 *[3625]*	●		Pipe thread according to ISO 228	**R4**
	G 1 1/2	250 *[3625]*		●		**R6**
	SAE 1"	250 *[3625]*	X		SAE flange 3000 psi	**S4**
	SAE 1 1/2"	210 *[3045]*		X		**S6**
			● Standard port X Alternative connection possibility			

Supplementary information (several specifications possible)

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

Order example:
250LDN0160-2X/PWR3A00-V5,0-M-R6

Further versions are available upon request.

Preferred types

210/250LDN flow specifications for 30 mm²/s *[143 SUS]*, Filter rating 3 µm

Type	Flow in l/min *[gpm]* and Δ*p* = 1.5 bar *[21.75 psi]* [1]	Material no. Filter				Material no. Replacement filter element
250LDN0040-2X/PWR3A00-V5,0-M-..	27 *[7.1]*	..R4	**R928054937**	..S4	**R928054946**	**R928006645**
250LDN0063-2X/PWR3A00-V5,0-M-..	39 *[10.3]*	..R4	**R928054938**	..S4	**R928054947**	**R928006699**
250LDN0100-2X/PWR3A00-V5,0-M-..	49 *[12.9]*	..R4	**R928054939**	..S4	**R928054948**	**R928006753**
250LDN0160-2X/PWR3A00-V5,0-M-..	137 *[36.0]*	..R6	**R928054940**			**R928006807**
250LDN0250-2X/PWR3A00-V5,0-M-..	168 *[44.2]*	..R6	**R928054941**			**R928006861**
250LDN0400-2X/PWR3A00-V5,0-M-..	190 *[50.0]*	..R6	**R928054942**			**R928006915**
210LDN0160-2X/PWR3A00-V5,0-M-..	137 *[36.0]*	..S6	**R928054943**			**R928006807**
210LDN0250-2X/PWR3A00-V5,0-M-..	168 *[44.2]*	..S6	**R928054944**			**R928006861**
210LDN0400-2X/PWR3A00-V5,0-M-..	190 *[50.0]*	..S6	**R928054945**			**R928006915**

210/250LDN flow specifications for 30 mm²/s *[143 SUS]*, Filter rating 6 µm

Type	Flow in l/min *[gpm]* and Δ*p* = 1.5 bar *[21.75 psi]* [1]	Material no. Filter				Material no. Replacement filter element
250LDN0040-2X/PWR6A00-V5,0-M-..	31 *[8.2]*	..R4	**R928054949**	..S4	**R928054958**	**R928006646**
250LDN0063-2X/PWR6A00-V5,0-M-..	43 *[11.3]*	..R4	**R928054950**	..S4	**R928054959**	**R928006700**
250LDN0100-2X/PWR6A00-V5,0-M-..	53 *[13.9]*	..R4	**R928054951**	..S4	**R928054960**	**R928006754**
250LDN0160-2X/PWR6A00-V5,0-M-..	150 *[39.5]*	..R6	**R928054952**			**R928006808**
250LDN0250-2X/PWR6A00-V5,0-M-..	178 *[46.8]*	..R6	**R928054953**			**R928006862**
250LDN0400-2X/PWR6A00-V5,0-M-..	198 *[52.1]*	..R6	**R928054954**			**R928006916**
210LDN0160-2X/PWR6A00-V5,0-M-..	150 *[39.5]*	..S6	**R928054955**			**R928006808**
210LDN0250-2X/PWR6A00-V5,0-M-..	178 *[46.8]*	..S6	**R928054956**			**R928006862**
210LDN0400-2X/PWR6A00-V5,0-M-..	198 *[52.1]*	..S6	**R928054957**			**R928006916**

210/250LDN flow specifications for 30 mm²/s *[143 SUS]*, Filter rating 10 µm

Type	Flow in l/min *[gpm]* and Δ*p* = 1.5 bar *[21.75 psi]* [1]	Material no. Filter				Material no. Replacement filter element
250LDN0040-2X/PWR10A00-V5,0-M-..	38 *[10.0]*	..R4	**R928052641**	..S4	**R928054961**	**R928006647**
250LDN0063-2X/PWR10A00-V5,0-M-..	50 *[13.2]*	..R4	**R928052640**	..S4	**R928054962**	**R928006701**
250LDN0100-2X/PWR10A00-V5,0-M-..	58 *[15.3]*	..R4	**R928052642**	..S4	**R928054963**	**R928006755**
250LDN0160-2X/PWR10A00-V5,0-M-..	168 *[44.2]*	..R6	**R928052643**			**R928006809**
250LDN0250-2X/PWR10A00-V5,0-M-..	189 *[49.7]*	..R6	**R928052644**			**R928006863**
250LDN0400-2X/PWR10A00-V5,0-M-..	205 *[53.9]*	..R6	**R928052645**			**R928006917**
210LDN0160-2X/PWR10A00-V5,0-M-..	168 *[44.2]*	..S6	**R928054934**			**R928006809**
210LDN0250-2X/PWR10A00-V5,0-M-..	189 *[49.7]*	..S6	**R928054935**			**R928006863**
210LDN0400-2X/PWR10A00-V5,0-M-..	205 *[53.9]*	..S6	**R928054936**			**R928006917**

[1] Measured pressure differential over 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 connector, 2-pole, design A according to EN-175301-803	**EN175301-803**

Material numbers of the electronic switching elements

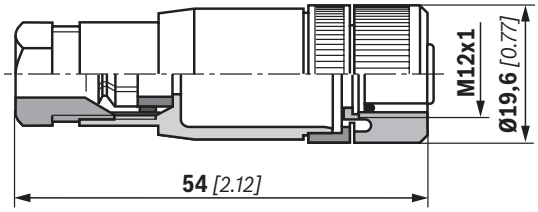
Material no.	Type	Signal	Switching points	Connector	LED
R928028409	WE-1SP-M12x1	Changeover	1	M12x1	Without
R928028410	WE-2SP-M12x1	Normally open (at 75%) / normally closed contact (at 100%)	2		3 pieces
R928028411	WE-2SPSU-M12x1				
R928036318	WE-1SP-EN175301-803	Normally closed contact	1	EN 175301-803	Without

Mating connector (max. permissible voltage: 50 V)

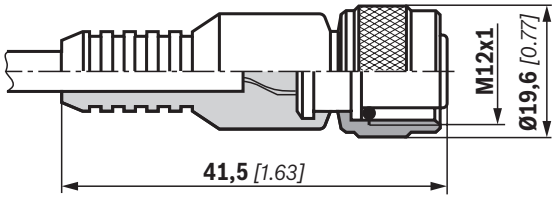
for electronic switching element with round plug-in connection M12x1

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 $p_{nom.}$ = 250 bar *[2320 psi]* with bypass valve, size 0160, with filter element 3 µm and electronic switching element M12x1 with 1 switching point.

Filter with mech./optical maintenance indicator:	250LDN0160-2X/PWR3A00-V5,0-M-R6	**Material no.:** R928054940
Electr. 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

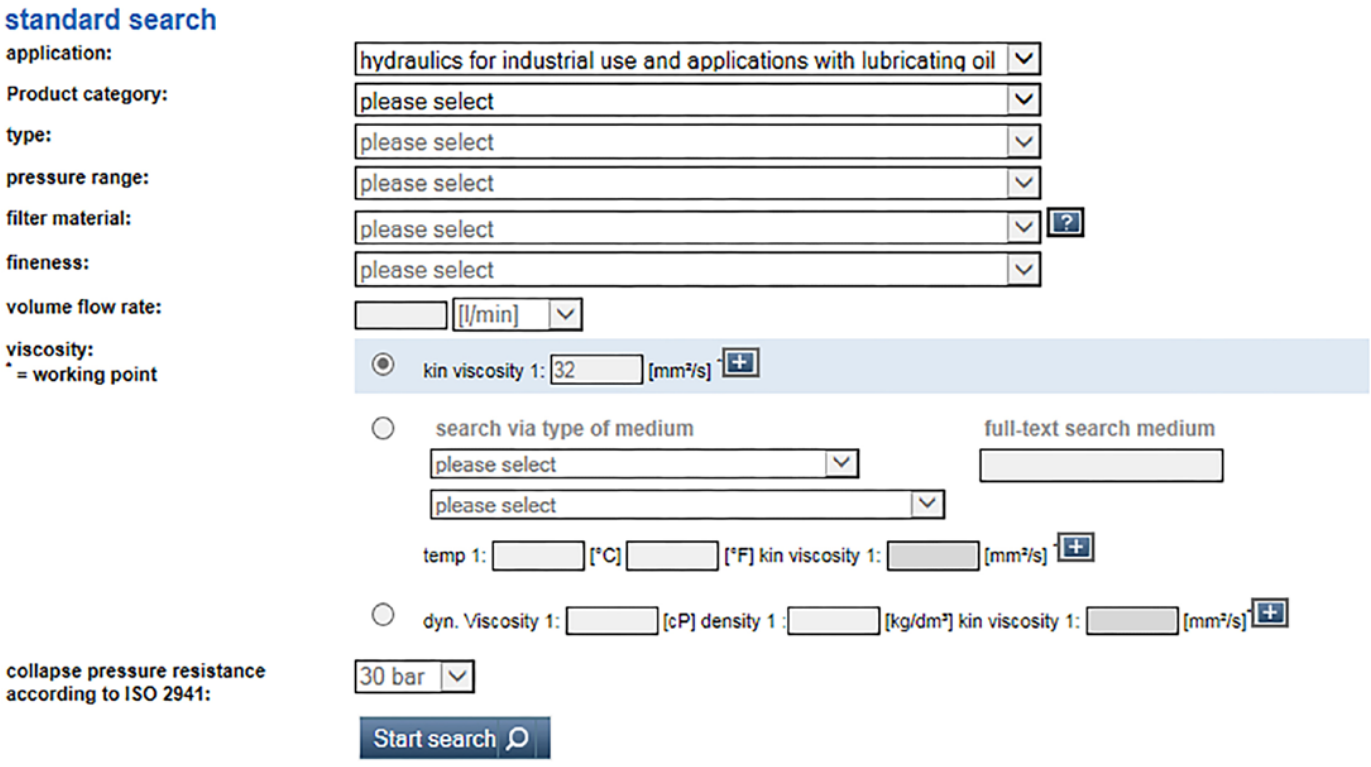
The straightforward selection of the filter size is possible using the FilterSelect online tool. The filter can be designed using the operating pressure, flow and fluid system parameters. The required filter rating is based on the application, the sensitivity to contamination of the components and the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

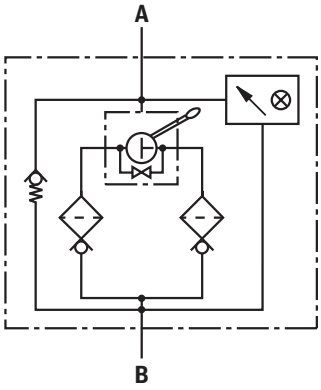
Link FilterSelect:
https://filter-select.com

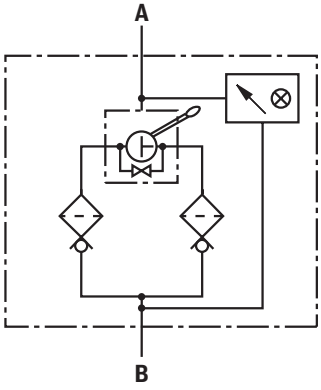
Other languages can be selected using the page navigation.



Symbols

Duplex filter
with bypass and
mechanical indicator

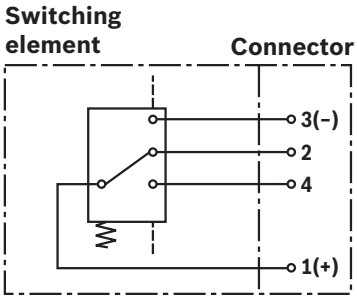




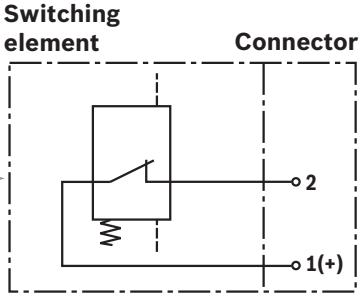
Duplex filter
without bypass and with
mechanical indicator

electronic switching element

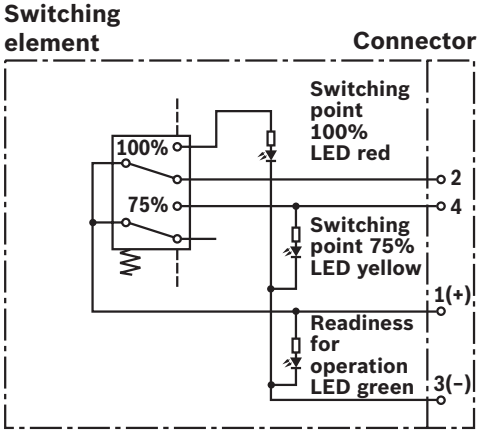
for maintenance indicator



WE-1SP-M12x1

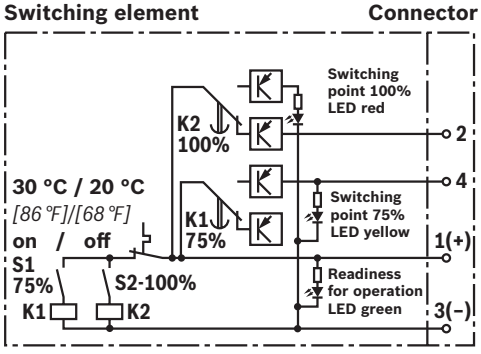


WE-1SP-EN175301-803



WE-2SP-M12x1

Circuit diagram drawn in plugged
condition (operating state)



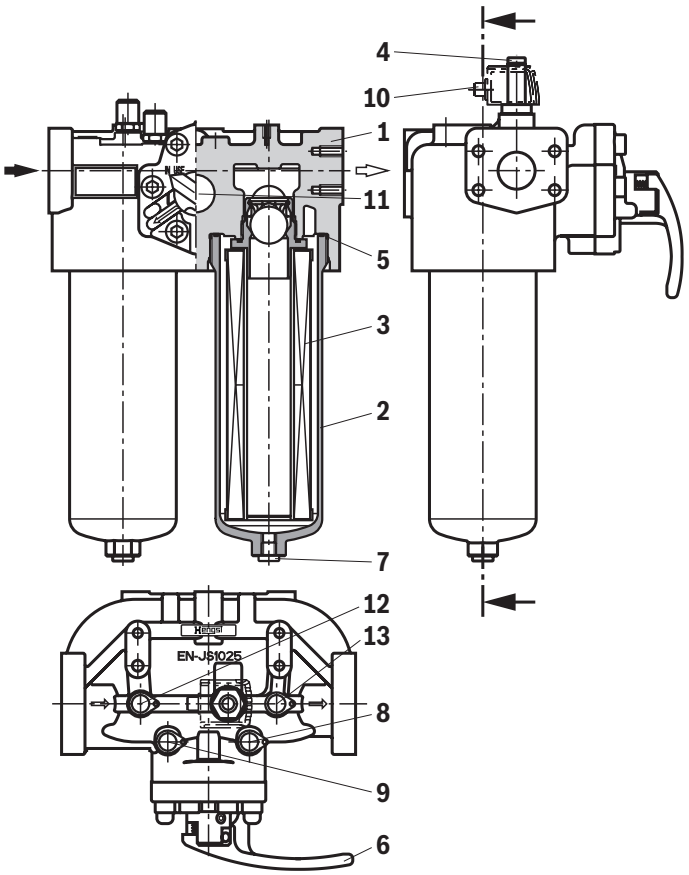
WE-2SPSU-M12x1

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

Function, section

The 210/250LDN duplex filter is suitable for direct installation into pressure lines. It is installed upstream components to be protected. Any use in the suction area is impermissible.

It basically consists of a filter head (1) with switch-over (6) 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-pressure-differential-stable filter elements (= code letter pressure differential A), there is also an assembled bypass valve (11).
Via the inlet, the fluid reaches the filter element (3) where it is cleaned. The dirt particles filtered out settle 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 quantity - can be securely absorbed.
As of size 0160, the standard equipment comprises a drain screw (7).
Via the threaded couplings as measuring ports (8, 9), the filter side to be maintained can be bled.
Threaded couplings as measuring ports on clean (12) and dirt side (13) are standard.
For integration of the maintenance indicator into an electric circuit, the mechanical/optical maintenance indicator may be amended by an electronic switching element.
To this end, the electronic switching element (10) must be attached to the mechanical/optical maintenance indicator (4) and held by means of a locking ring. The electronic switching elements are connected via a mating connector or a cable connection.
The electronic switching element must be ordered separately.



Type 210LDN0160-2X

☞ **WARNING**
for duplex filters with bypass valve!
If the maintenance indicator warning is not adhered to, and the filter element is not changed on indication, the by-pass valve will open with the increase in differential pressure and part of the flow will be diverted passed the filter element, to the clean side without being filtered. Thus, effective filtration is no longer guaranteed.

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

General					
Weight		**NG**	**0040**	**0063**	**0100**
		kg *[lbs]*	8.2 *[18.04]*	9.3 *[20.46]*	11.1 *[24.42]*
		NG	**0160**	**0250**	**0400**
		kg *[lbs]*	24.7 *[54.34]*	26.5 *[58.3]*	29.7 *[65.34]*
Volume		**NG**	**0040**	**0063**	**0100**
		l *[US gal]*	2 x 0.4 *2 x [0.1]*	2 x 0.5 *2 x [0.13]*	2 x 0.75 *2 x [0.19]*
		NG	**0160**	**0250**	**0400**
		l *[US gal]*	2 x 1.25 *2 x [0.32]*	2 x 2.5 *2 x [0.64]*	2 x 3.36 *2 x [0.86]*
Installation position			Vertical; inlet left, outlet right; filter bowl vertically downwards		
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%		
Material	▶ Filter head		Cast iron with spheroidal graphite		
	▶ Filter bowl		Steel		
	▶ Bypass valve		PA6 / steel / POM		
	▶ Optical maintenance indicator V2,2; V5,0; V8,0		Brass		
	▶ Electronic switching element		Plastic PA6		
	▶ Seals		NBR or FKM		

Hydraulic				
Maximum operating pressure		bar *[psi]*	210 *[3045 psi]* or 250 *[3625]*; no underpressure permissible	
Hydraulic fluid temperature range	Standard	°C *[°F]*	–10...+100 *[+14...+212]*	
Fatigue strength according to ISO 10771 [1]		Load cycles	> 10^6 at rated 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]*	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]*
			8.0 ± 0.8 *[116 ± 11.6]*	without bypass valve
Filtration direction			From the outside to the inside	

[1] 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-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 by means of 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			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	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	▶ A00	bar *[psi]*	30 *[435]*	
	▶ B00	bar *[psi]*	330 *[4785]*	

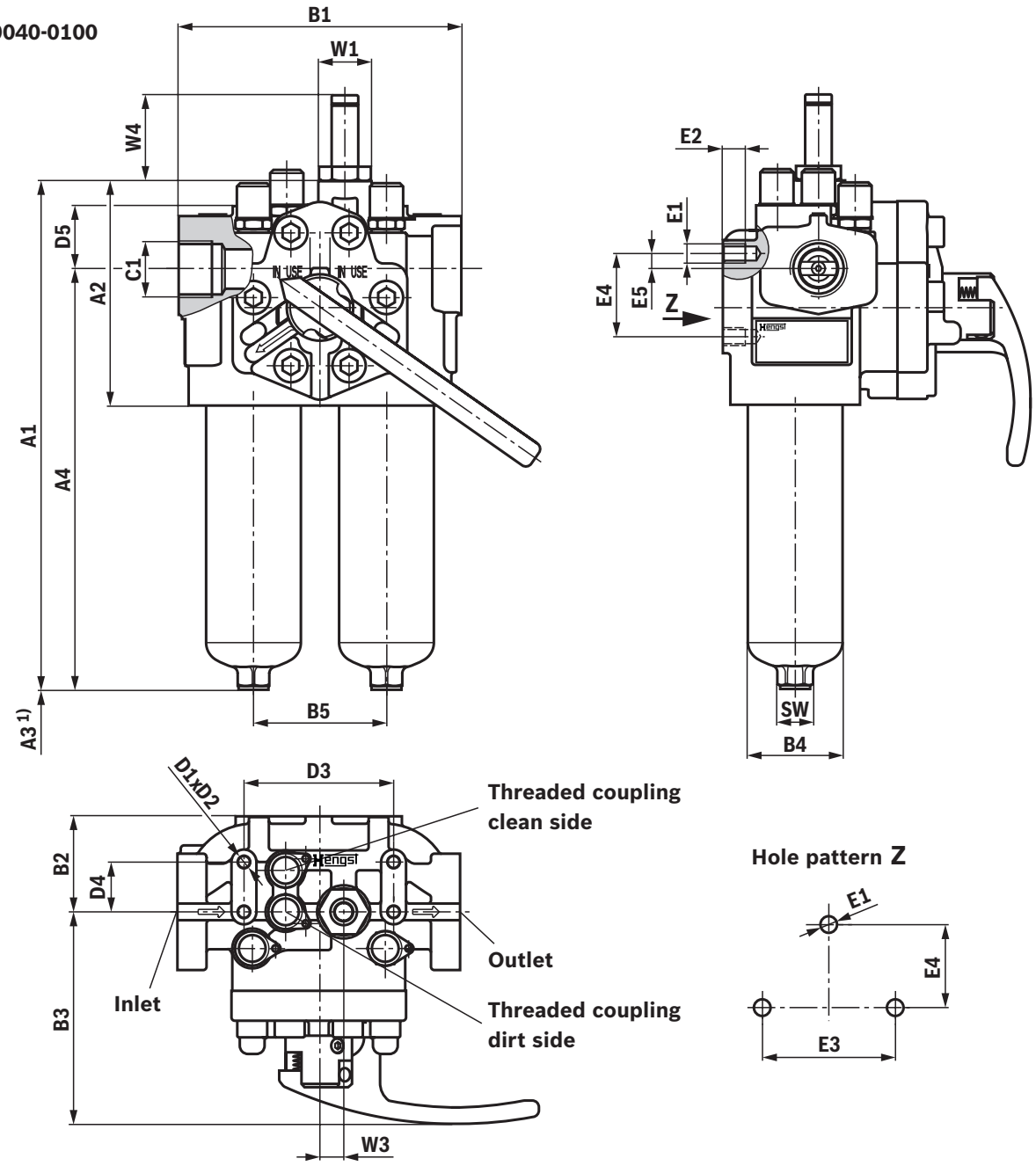
Hydraulic fluid		**Classification**	**Suitable sealing materials**	**Standards**
Mineral oil		HLP	NBR	DIN 51524
Bio-degradable	▶ Insoluble in water	HETG	NBR	VDMA 24568
		HEES	FKM	
	▶ Soluble in water	HEPG	FKM	VDMA 24568
Flame-resistant	▶ Water-free	HFDU, HFDR	FKM	VDMA 24317
	▶ Containing water	HFC	NBR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

☞ **Important information on hydraulic fluids:**
- ▶ For further information and data on the use of other hydraulic fluids, please 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 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: NG0040 ... NG0100

(Dimensions in mm *[inch]*)

250LDN0040-0100



1) Servicing height for filter element exchange

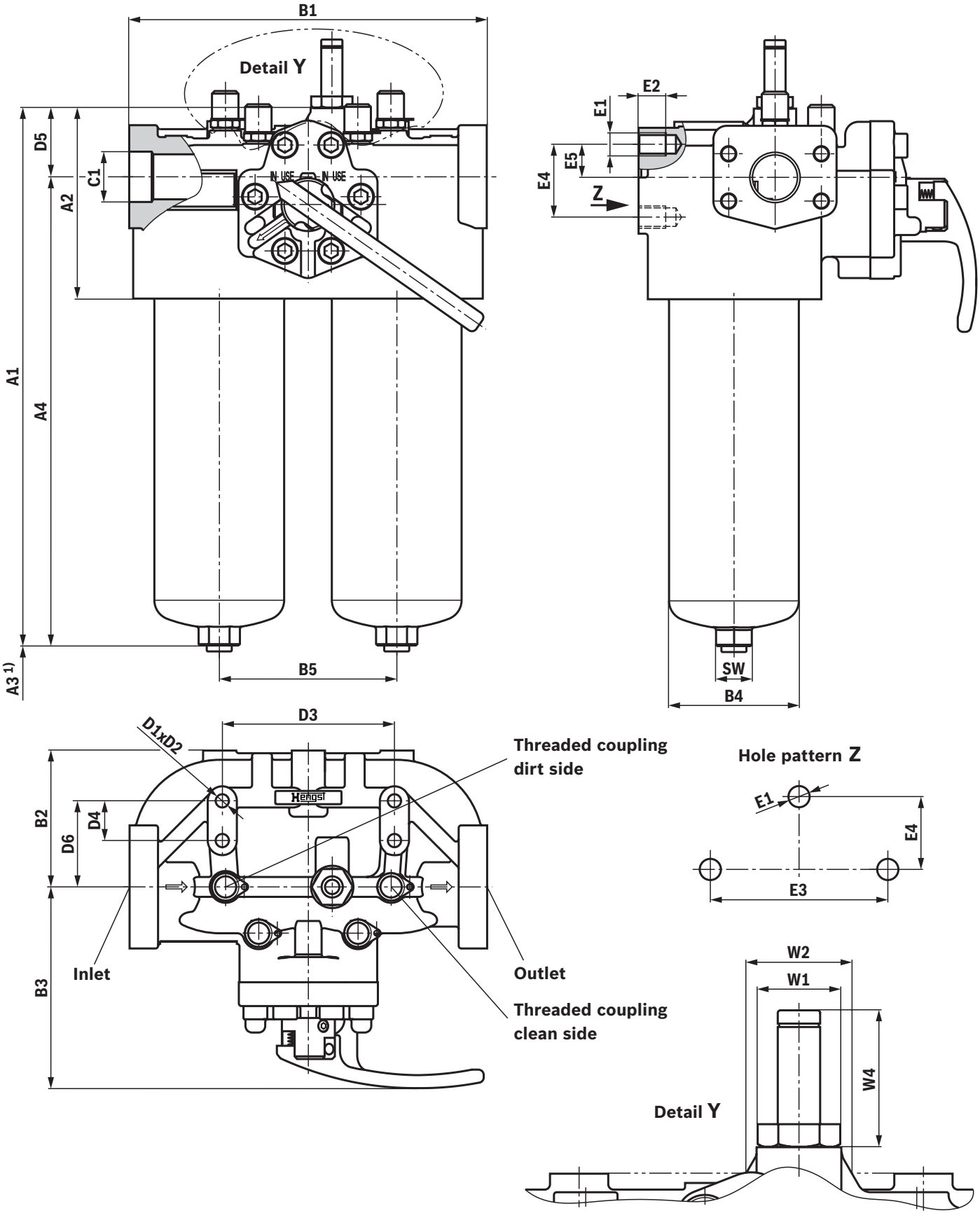
Type 250...	A1	A2	A3 1)	A4	B1	B2	B3	ØB4	B5	C1 connection R... Standard	C1 connection S... (SAE flange 3000 psi)
LDN0040	243 *[9.57]*	135 *[5.31]*	80 *[3.15]*	190 *[7.48]*	170 *[6.69]*	57.5 *[2.26]*	127.5 *[5.02]*	55 *[2.17]*	80 *[3.15]*	G 1 (R4)	SAE 1" 3000 psi (S4)
LDN0063	306 *[12.05]*			253 *[9.96]*							
LDN0100	395 *[15.55]*			342 *[13.46]*							

Type 250...	D1	D2	D3	D4	D5	E1	E2	E3	E4	E5	ØW1	W3	W4	SW
LDN0040	M8	12.8 *[0.50]*	90 *[3.54]*	30 *[1.18]*	38 *[1.50]*	M10	13.5 *[0.53]*	80 *[3.15]*	50 *[1.97]*	9 *[0.35]*	32 *[1.26]*	15 *[0.59]*	52 *[2.05]*	19 *[0.75]*
LDN0063														
LDN0100														

Dimensions: NG0160 ... NG0400

(Dimensions in mm *[inch]*)

210/250LDN0160-0400



Dimensions: NG0160 ... NG0400

(Dimensions in mm *[inch]*)

Type 210/250...	A1	A2	A3 [1]	A4	B1	B2	B3	ØB4	B5	C1 connection	
										R... Standard	S... (SAE flange 3000 psi)
LDN0160	316 *[12.44]*	144 *[5.67]*	140 *[5.51]*	264 *[10.39]*	270 *[10.63]*	103 *[4.06]*	152 *[5.98]*	98 *[3.86]*	134 *[5.28]*	G 1 1/2 (R6)	SAE 1 1/2" 3000 psi (S6) [2]
LDN0250	406 *[15.98]*			354 *[13.94]*							
LDN0400	557 *[21.93]*			505 *[19.88]*							

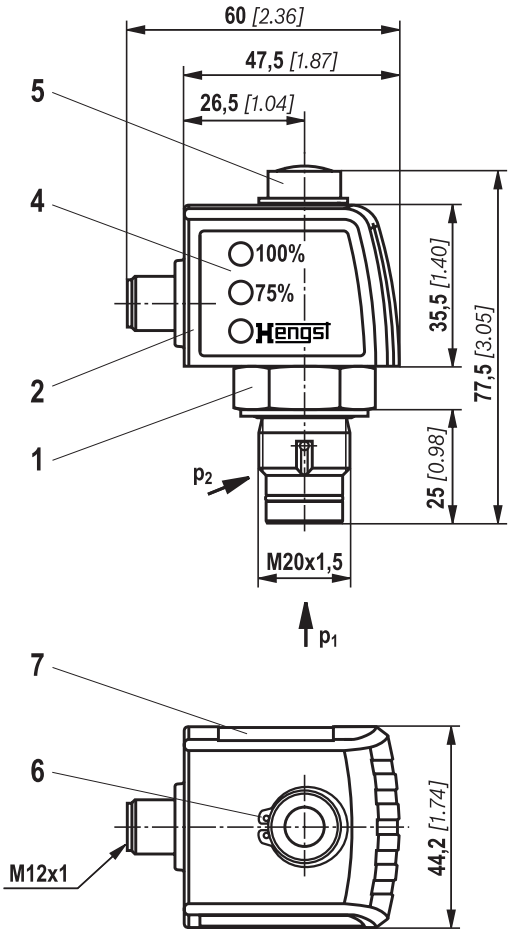
Type 210/250...	D1	D2	D3	D4	D5	E1	E2	E3	E4	E5	ØW1	ØW2	W3	W4	SW
LDN0160	M10	11.8 *[0.46]*	130 *[5.12]*	30 *[1.18]*	42 *[1.65]*	M16	20.5 *[0.81]*	134 *[5.28]*	55 *[2.17]*	25 *[0.98]*	32 *[1.26]*	40 *[1.57]*	18 *[0.71]*	52 *[2.05]*	27 *[1.06]*
LDN0250															
LDN0400															

[1] Servicing height for filter element exchange

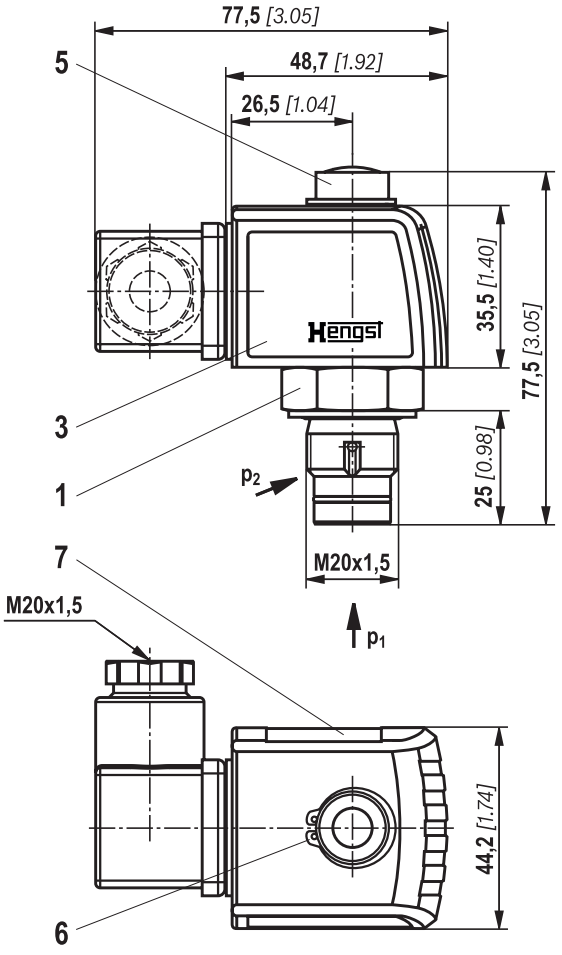
[2] Pressure reduction to 210 bar *[3045 psi]*

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 electric maintenance indicator (rotatable by 360°); round plug-in connection M12x1, 4-pole

3 Switching element with locking ring for electric 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

☞ **Notice:**
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 elements according to **DIN 24550**)	**0040** **0063** **0100** **0160** **0250** **0400**

Filter rating in µm

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

Pressure differential

04	Max. permissible pressure differential of the filter element 30 bar *[435 psi]* – filter with bypass valve	**A00**
	Max. permissible pressure differential of the filter element 330 bar *[4785 psi]* – filter without bypass valve	**B00**

Bypass valve

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

Seal

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

Order example:
2.0100 PWR3-A00-0-M

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

Preferred program replacement filter element

Replacement filter element 3 micron		Replacement filter element 6 micron		Replacement filter element 10 micron	
R928006645	2.0040 PWR3-A00-0-M	**R928006646**	2.0040 PWR6-A00-0-M	**R928006647**	2.0040 PWR10-A00-0-M
R928006699	2.0063 PWR3-A00-0-M	**R928006700**	2.0063 PWR6-A00-0-M	**R928006701**	2.0063 PWR10-A00-0-M
R928006753	2.0100 PWR3-A00-0-M	**R928006754**	2.0100 PWR6-A00-0-M	**R928006755**	2.0100 PWR10-A00-0-M
R928006807	2.0160 PWR3-A00-0-M	**R928006808**	2.0160 PWR6-A00-0-M	**R928006809**	2.0160 PWR10-A00-0-M
R928006861	2.0250 PWR3-A00-0-M	**R928006862**	2.0250 PWR6-A00-0-M	**R928006863**	2.0250 PWR10-A00-0-M
R928006915	2.0400 PWR3-A00-0-M	**R928006916**	2.0400 PWR6-A00-0-M	**R928006917**	2.0400 PWR10-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/optical indicator	**O**

Version

03	Pressure differential, modular design	**D01**

Switching pressure

04	2.2 bar *[31.9 psi]*	**2.2**
	5.0 bar *[72.5 psi]*	**5.0**
	8.0 bar *[116 psi]*	**8.0**

Seal

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

Max. nominal pressure

06	Switching pressure 2.2 bar *[31.9 psi]*, 450 bar *[6527 psi]*	**450**
	Switching pressure 5.0 bar *[72.5 psi]*, 450 bar *[6527 psi]*	
	Switching pressure 8.0 bar *[116 psi]*, 450 bar *[6527 psi]*	

Mechanical/optical maintenance indicator

Material no.	Description
R928038783	WO-D01-2,2-M-450
R901025313	WO-D01-5,0-M-450
R928038782	WO-D01-8,0-M-450
R928038782	WO-D01-2,2-V-450
R901066235	WO-D01-5,0-V-450
R928038784	WO-D01-8,0-V-450

Ordering code
Spare parts

Seal kit

01	02	03		04		05
D	**210/250LDN**		**–**	**2X**	**/**	

01	**Seal kit**	**D**

02	**Series**	**210/250LDN**

Size

03	0040-0100	**0040-0100**
	0160-0400	**0160-0400**

04	Component series 20 ... 29 (20 ... 29: unchanged installation and connection dimensions)	**2X**

Seal

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

Seal kit

Material no.	Description
R961011395	D210/250LDN0040-0100-2X/-M
R961011394	D210/250LDN0040-0100-2X/-V
R961011396	D210/250LDN0160-0400-2X/-M
R961011397	D210/250LDN0160-0400-2X/-V

Ordering code
Accessories

Material no.	Threaded coupling incl. hose for bleeding
R901360230	DN2-400/MCS20-MOS-G1/4/630ST3N00Z-P (NBR)
R901360231	DN2-400/MCS20-MOS-G1/4/630ST3F00Z-P (FKM)

Assembly, commissioning, maintenance

Assembly

The maximum operating pressure of the system must not exceed the maximum permissible operating pressure of the filter (see name plate).
During assembly of the filter (see also chapter "Tightening torque"), the flow direction (direction arrows) and the required servicing height of the filter element (see chapter "Dimensions") are to be considered.
Perfect functioning is only guaranteed in the installation position filter bowl vertically downwards. The maintenance indicator must be arranged in a well visible way.

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 in place by means of the locking ring.

Commissioning

- Bring the switching lever into central position in order to fill both filter sides.
- Commission the system.
- Bleed filter by opening the two front threaded couplings; close again when fluid escapes. Equipment for bleeding see chapter "Accessories".
- Switch the filter into the operating position; to do so, switch the switching lever to one of the two end positions. (see chapter "Assembly aid"). The switch-over lever is on the filter side that is out of order.

☞ **Notes:**

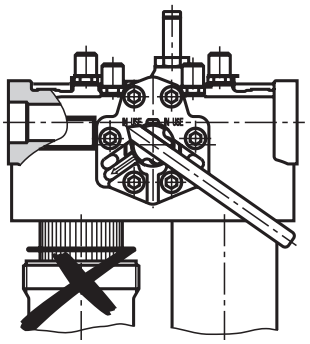
- During the exchange of the filter element, contamination of the environment with fluid has to be anticipated. For reasons of occupational safety and environmental protection, we recommend using suitable tanks for collecting the fluid.

Maintenance

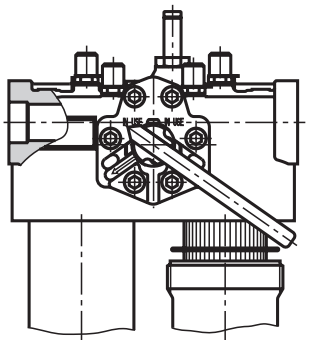
- If, at operating temperature, the red indicator pin reaches out of the mechanical/visual maintenance indicator and/or if the electronic switching element opens / closes the circuit, the filter element is contaminated and needs to be replaced and cleaned respectively.
- The material number of the corresponding replacement filter element is indicated on the name plate of the complete filter. It must comply with 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. (See chapter "Assembly aid")
- For pressure compensation and unlocking, pull the switch-over lever and switch to the opposite end position.
- Open the front threaded couplings (bleeding) at the decommissioned filter side in order to reduce the pressure. Equipment for bleeding see chapter "Accessories".
- Via the drain screw (from NG0160 fitted by default), the oil on the dirt side can be drained.
- Screw off the filter bowl
- 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 renew 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, refer to 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.
- 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 threaded coupling, which is still open. Equipment for bleeding see chapter "Accessories".
- After fluid escapes, close the threaded coupling again.
- Make sure that the switch-over lever is engaged.

Assembly, commissioning, maintenance
Assembly aid

incorrect



correct



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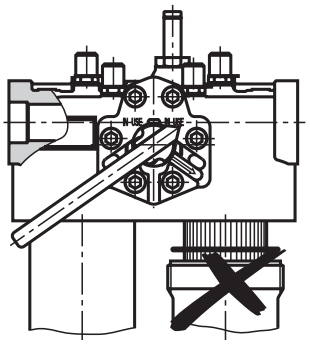
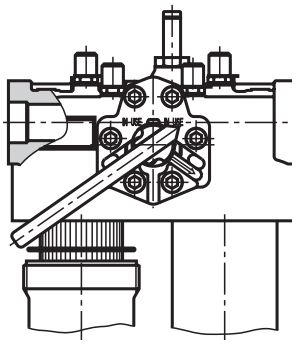


correct



⚠ WARNING!

- Assembly and disassembly work may only take place when the system is depressurized!
- Filter is under pressure!
- Remove the filter bowl only if it is depressurized!
- Do not exchange the mechanical/optical maintenance indicator while the filter is under pressure!
- If the flow direction is not considered during assembly, the flow will be prevented by installed check valves.
- 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:**

- All works at the filter shall be carried out by trained staff only.
- Functioning and safety are only guaranteed if original Bosch 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 conditions that do not comply with the installation conditions.

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

Fastening top

Series 210/250 ...	**LDN0040**	**LDN0063**	**LDN0100**	**LDN0160**	**LDN0250**	**LDN0400**
Screw/tightening torque with μ_{total} = 0.14	M8/10.5 Nm ± 10%			M10/21 Nm ± 10%		
Quantity	4					
Recommended property class of screw	8.8					
Minimum screw-in depth	10 mm + 4 mm					

Fastening back

Series 210/250 ...	**LDN0040**	**LDN0063**	**LDN0100**	**LDN0160**	**LDN0250**	**LDN0400**
Screw/tightening torque with μ_{total} = 0.14	M10/51 Nm ± 10%			M16/215 Nm ± 10%		
Quantity	3					
Recommended property class of screw	8.8					
Minimum screw-in depth	10 mm + 4 mm			19 mm + 2 mm		

Filter bowl and maintenance indicator

Series 210/250 ...	**LDN0040**	**LDN0063**	**LDN0100**	**LDN0160**	**LDN0250**	**LDN0400**
Tightening torque filter bowl	50 Nm + 10 Nm					
Tightening torque opt. maintenance indicator	50 Nm					
Tightening torque cubic connector screw switching element EN-175301-803	M3/0.5 Nm					

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

- 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 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 article 4, subsection 3, hydraulic filters are exempt from the PED if they are not classified higher than category I.

For 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 2014/34/EU (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.

The electronic maintenance indicators with one 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, this simple, electronic operating equipment may be used in systems without marking and certification.
The duplex filters and the electronic maintenance indicators described here can be used for the following potentially explosive areas:

	Zone suitability	
Gas	1	2
Dust	21	22

☞ **Notice:**
Maintenance indications with EC type examination certificate on request.

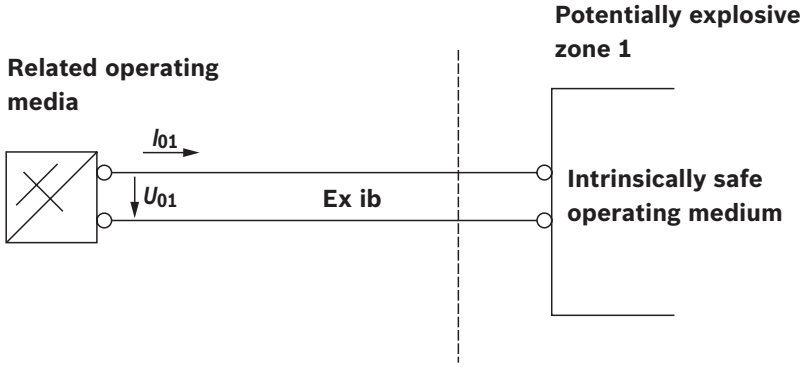
Directives and standardization

Complete filter with mechanical / optical maintenance indicator				
Use /assignment			**Gas 2G**	**Dust 2D**
Assignment [1]			Ex h II c T6...T1 Gb	Ex h II C T100°C...T450°C Db
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		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



⚠ WARNING!

- Explosion hazard due to high temperature! The temperature is aligned to the temperature of the media in the hydraulic circuit and should not exceed the specified value from the table mentioned referenced to the device identification. Measures are to be taken to ensure that the maximum permissible ignition temperature is not exceeded in the potentially explosive atmosphere.
- When using these filters in potentially explosive areas, appropriate equipotential bonding has to be ensured. The filter is preferably to be earthed via the mounting screws. Here, please note that paintings and oxidic protective layers are not electrically conductive.
- During filter element exchanges, the packaging material is to be removed from the replacement element outside the potentially 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

Intended use

This filter consists 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.
This filter may be 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 "Guidelines and standards".
- 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 Bosch Hengst spare parts, is permissible. Repair by the customer, particularly at pressurized components, is impermissible.
- 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 impermissible.
Improper use of the filters includes:

- Incorrect storage
- Incorrect transport
- Lack of cleanliness during storage, assembly and operation
- Incorrect installation
- Use of inappropriate/non-permissible hydraulic fluids
- Exceedance of the specified maximum pressures and load cycles
- Operation outside the approved temperature range
- Installation and operation in an impermissible 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.

Environment and recycling

- The used filter element must be disposed of according to the country-specific statutory environmental protection regulations.
- After the service life of the filter, the filter components can be recycled according to the applicable country-specific legal regulations for environmental protection.

Notes

Notes

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