

Inline filter with filter element according to DIN 24550

Type 445LEN0040 to 1000

RE 51423

Issue: 2023-06

Replaces: 2021-04



HAD7826_d

- Sizes according to **DIN 24550**: 0040 to 1000
- Nominal pressure 450 bar [6527 psi]
- Connection up to 2", SAE 2 1/2", SAE 24
- Operating temperature: -10 °C ... +100 °C [+14 °F ... +212 °F]

Features

Inline filters are used in hydraulic systems for separating solid materials from fluids and lubricating oils. They are intended for attachment in pipelines.

They distinguish themselves by the following:

- Filters for inline installation
- Size 1000 with divided filter bowl
- Special highly efficient filter materials
- Filtration of very fine particles and high dirt holding capacity across a broad pressure differential range
- High collapse resistance of the filter elements
- By default equipped with mechanical optical maintenance indicator with memory function
- Available as an option with different electronic switching elements, modular design
- Optional bypass valve integrated in the filter housing
- Optional measuring port
- High filtration performance due to the tangential cyclone-effect flow path

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Ordering codes
Filter

01	02	03	04	05	06	07	08	09	09	09
445LE	N		-		-	-	-	-	-	-

Series

01	Inline filter 450 bar [6527 psi]	445LE
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Filter element

02	With filter element according to DIN 24550	N
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Nominal size

03	LEN... (with filter element according to DIN 24550)	0040 0063 0100 0160 0250 0400 0630 1000
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Filter rating in µm

04	Absolute (ISO 16889 ; $\beta_x(c) \geq 200$) Glass fiber material, not cleanable	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] (with bypass valve	A00
	Max. permissible pressure differential of the filter element 330 bar [4786 psi] (without bypass valve	B00

Maintenance indicator

06	Maintenance indicator, mech./optical, switching pressure 5.0 bar [72.5 psi] – bypass cracking pressure 7 bar [101.53 psi]	V5,0
	Maintenance indicator, mech./optical, switching pressure 8.0 bar [116 psi] – without bypass valve	V8,0

Seal

07	NBR seal	M
	FKM seal	V

Connection

08	Frame size	0040	0063-0100	0160-0400	0630-1000	
	Connection					
	G1/2	●	X			R2
	G3/4	X	X			R3
	G1	X	●			R4
	G1 1/2			●		R6
	G2				●	R8
	SAE 1 1/2"			X		S6
	SAE 2"			X	X	S8
	SAE 2 1/2"				X	S9
	7/8-14 UNF-2B	X				U3
	1 1/16-12 UN-2B [SAE 12]		X			U4
	1 7/8-12 UN-2B			X		U6
		● Standard connection				
		X Alternative connection				

Ordering codes
Filter

01	02	03	04	05	06	07	08	09	09	09
445LE	N		-		-	-	-	-	-	-

Supplementary information (for configuration options, see chapter “Version options”)

09	Outlet top, outlet opposite, inlet closed (only with size 0160 - 1000) ¹⁾	7
	Filter rotated 180°, filter bowl can be unscrewed to the top (only with size 0160 - 1000)	9
	Bleed function in the filter bowl, drain in the filter head	
	Additional threaded couplings G 1/4, on the side (only with size 0160 - 1000), not possible with 7 or 9	M
	Maintenance indicator on the right (only with size 0160 - 1000), not possible with M	V3
	Maintenance indicator on the left (only with size 0160 - 1000), not possible with M	V9
	Manufacturer's inspection certificate M according to DIN 55350 T18 Z1	Z1

¹⁾ The option can only be configured with SAE flange connection

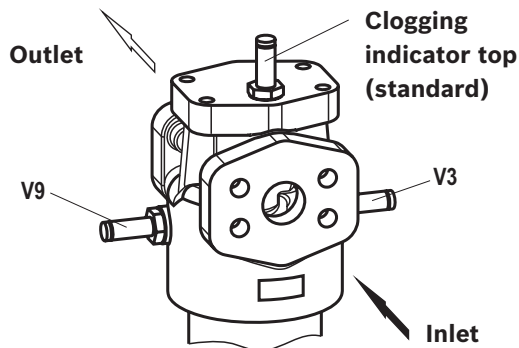
Order example:

445LEN0100-PWR3A00-V5,0-M-R4

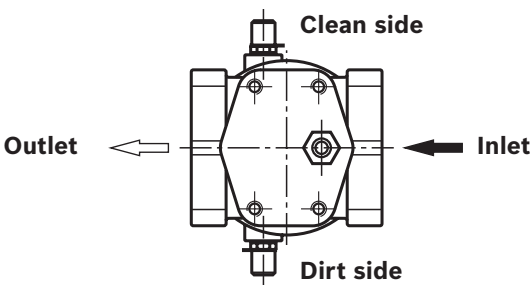
Further versions (filter materials, connections) are available on request.

Version options

Possible positions of the mechanical optical maintenance indicator

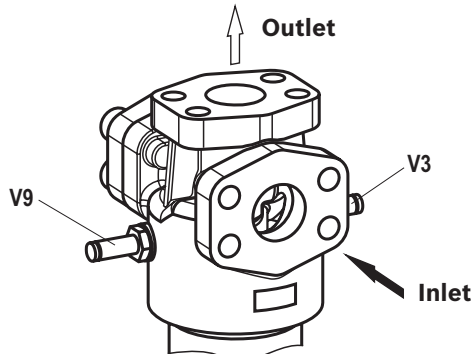


2 additional Minimes connections on the clean and dirt side



Cannot be combined with “7”, “9”, “V3” and “V9”

Outlet top – order option “7”
Outlet opposite inlet closed

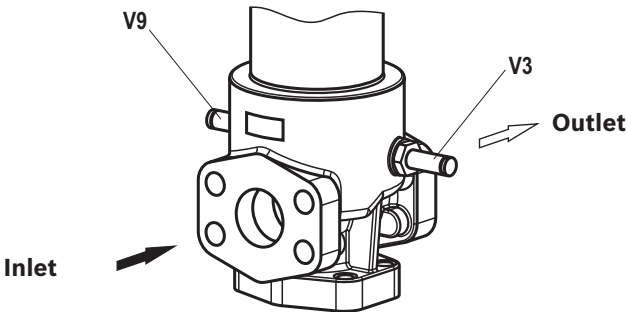


Cannot be combined with “M”!

Always specify the position of the clogging indicator (“V3” or “V9”)

In this version, the filter has no mounting possibility. The pipe mounting elements must be positioned close to the filter so that the filter weight can be held.

Filter rotated 180° – order option “9”
Filter bowl can be unscrewed from the top



Cannot be combined with “M”!

Always specify the position of the clogging indicator (“V3” or “V9”)

Preferred types

445LEN preferred types, NBR seal, flow specification for 30 mm²/s [142 SUS]

Inline filter with bypass, filter rating 3 µm

Type	Flow in l/min [gpm] at $\Delta p = 1.5 \text{ bar } [21.8 \text{ psi}]$ ¹⁾	Material no. Filter				Material no. replacement element
445LEN0040-PWR3A00-V5,0-M-..	26 [6.87]	..R2	R928043216	..U3	R928043456	R928006645
445LEN0063-PWR3A00-V5,0-M-..	36 [9.51]	..R4	R928043217	..U4	R928043457	R928006699
445LEN0100-PWR3A00-V5,0-M-..	46 [12.15]	..R4	R928043218	..U4	R928043458	R928006753
445LEN0160-PWR3A00-V5,0-M-..	126 [33.29]	..R6	R928043221	..U6	R928043461	R928006807
445LEN0250-PWR3A00-V5,0-M-..	212 [56.01]	..R6	R928043222	..U6	R928043462	R928006861
445LEN0400-PWR3A00-V5,0-M-..	258 [68.16]	..R6	R928043223	..U6	R928043463	R928006915
445LEN0630-PWR3A00-V5,0-M-..	325 [85.86]	..R8	R928043224	..S8	R928043304	R928006969
445LEN1000-PWR3A00-V5,0-M-..	486 [128.40]	..R8	R928043225	..S8	R928043305	R928007023

Inline filter with bypass, filter rating 6 µm

Type	Flow in l/min [gpm] at $\Delta p = 1.5 \text{ bar } [21.8 \text{ psi}]$ ¹⁾	Material no. Filter				Material no. replacement element
445LEN0040-PWR6A00-V5,0-M-..	33 [8.72]	..R2	R928043520	..U3	R928043760	R928006646
445LEN0063-PWR6A00-V5,0-M-..	55 [14.53]	..R4	R928043521	..U4	R928043761	R928006700
445LEN0100-PWR6A00-V5,0-M-..	69 [18.23]	..R4	R928043522	..U4	R928043762	R928006754
445LEN0160-PWR6A00-V5,0-M-..	175 [46.23]	..R6	R928043525	..U6	R928043765	R928006808
445LEN0250-PWR6A00-V5,0-M-..	253 [66.84]	..R6	R928043526	..U6	R928043766	R928006862
445LEN0400-PWR6A00-V5,0-M-..	298 [78.73]	..R6	R928043527	..U6	R928043767	R928006916
445LEN0630-PWR6A00-V5,0-M-..	406 [107.26]	..R8	R928043528	..S8	R928043608	R928006970
445LEN1000-PWR6A00-V5,0-M-..	505 [133.42]	..R8	R928043529	..S8	R928043609	R928007024

Inline filter with bypass, filter rating 10 µm

Type	Flow in l/min [gpm] at $\Delta p = 1.5 \text{ bar } [21.8 \text{ psi}]$ ¹⁾	Material no. Filter				Material no. replacement element
445LEN0040-PWR10A00-V5,0-M-..	37 [9.77]	..R3	R928043904	..U3	R928044064	R928006647
445LEN0063-PWR10A00-V5,0-M-..	70 [18.49]	..R4	R928043825	..U4	R928044065	R928006701
445LEN0100-PWR10A00-V5,0-M-..	78 [20.60]	..R4	R928043826	..U4	R928044066	R928006755
445LEN0160-PWR10A00-V5,0-M-..	211 [55.75]	..R6	R928043829	..U6	R928044069	R928006809
445LEN0250-PWR10A00-V5,0-M-..	280 [73.98]	..R6	R928043830	..U6	R928044070	R928006863
445LEN0400-PWR10A00-V5,0-M-..	325 [85.86]	..R6	R928043831	..U6	R928044071	R928006917
445LEN0630-PWR10A00-V5,0-M-..	460 [121.53]	..R8	R928043832	..S8	R928043912	R928006971
445LEN1000-PWR10A00-V5,0-M-..	515 [136.06]	..R8	R928043833	..S8	R928043913	R928007025

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
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Type of signal

02	1 switching point	1SP
	2 switching points, 3 LED	2SP
	2 switching points, 3 LED and signal suppression up to 30 °C [86 °F]	2SPSU

Connector

03	Round plug-in connection M12 x 1, 4-pole	M12 x 1
	Rectangular plug-in connection, 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-M12 x 1	Changeover	1	M12 x 1	without
R928028410	WE-2SP-M12 x 1	Normally open (at 75%) / normally closed contact (at 100%)	2		3 pieces
R928028411	WE-2SPSU-M12 x 1				
R928036318	WE-1SP-EN175301-803	Normally closed contact	1	EN 175301-803	without

Connection sockets

for electronic switching element with round plug-in connection M12 x 1

Connection socket suitable for K24 4-pole, M12 x 1 with screw connection, cable gland Pg9.

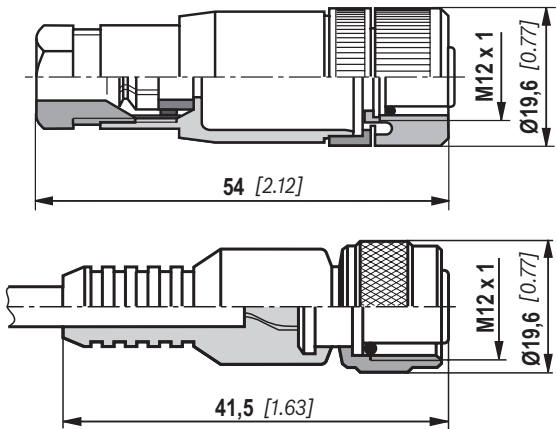
Material no. R900031155

Connection socket suitable for K24-3m 4-pole, M12 x 1 with integrated PVC cable, 3 m long.

Wire cross-section: 4 x 0.34 mm²

Wire identification: 1 brown 2 white
3 blue 4 black

Material no. R900064381



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

Order example:

Inline filter with mechanical optical maintenance indicator for $p_{Nominal} = 450 [6527 \text{ psi}]$ with bypass valve, Size 0160, with filter element 10 µm and electronic switching element M12 x 1 with 1 switching point.

Filter with mech. optical maintenance indicator: 445LEN0160-PWR10A00-V5,0-M-R6 Material no. R928043829

Switching element: WE-1SP-M12 x 1 Material no. R928028409

Connection socket: Connection socket suitable for K24 4-pole, M12 x 1 with screw connection, Cable gland Pg9. Material no. R900031155

Filter design

Filter size selection is made easy by using our online FilterSelect tool. The filter can be selected using basic parameters like, flow rates, system pressure, viscosities, etc.. The filter fineness is dependant on the required cleanliness level, application, type of contamination and environmental conditions.

The online tool is very user friendly with step-by-step guidelines.

A PDF file can be created of the selected filter, which contains all the stipulated parameters, including relevant part numbers of the selected filter and its spare parts.

Link FilterSelect:

<http://www.filterselect.de>

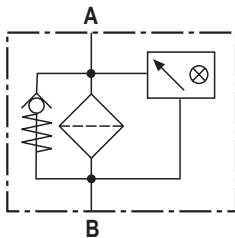
Other languages can be selected using the page navigation.

standard search

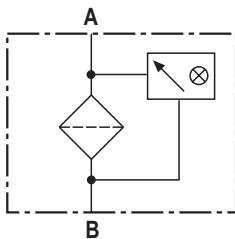
application:	hydraulics for industrial use and applications with lubricating oil ▼	
Product category:	please select ▼	
type:	please select ▼	
pressure range:	please select ▼	
filter material:	please select ▼	?
fineness:	please select ▼	
volume flow rate:	<input type="text"/> [l/min] ▼	
viscosity: * = working point	<input checked="" type="radio"/> kin viscosity 1: <input type="text" value="32"/> [mm²/s] +	
	<input type="radio"/> search via type of medium <div style="float: right;">full-text search medium</div> <div> <input type="text" value="please select"/> ▼ </div> <div> <input type="text" value="please select"/> ▼ </div> <div> temp 1: <input type="text"/> [°C] <input type="text"/> [°F] kin viscosity 1: <input type="text"/> [mm²/s] + </div>	
	<input type="radio"/> dyn. Viscosity 1: <input type="text"/> [cP] density 1: <input type="text"/> [kg/dm³] kin viscosity 1: <input type="text"/> [mm²/s] +	
collapse pressure resistance according to ISO 2941:	30 bar ▼	
	<div>Start search 🔍</div>	

Symbols

Inline filter with bypass and mechanical indicator

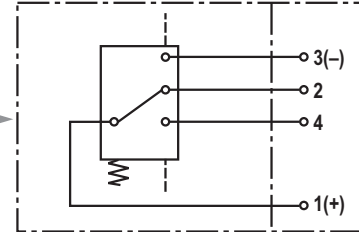


Inline filter without bypass and with mechanical indicator



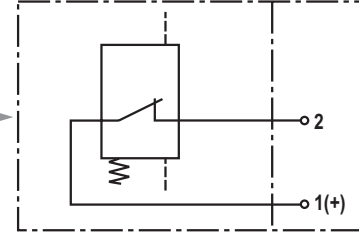
electronic switching element
for maintenance indicator

Switching element **Connector**



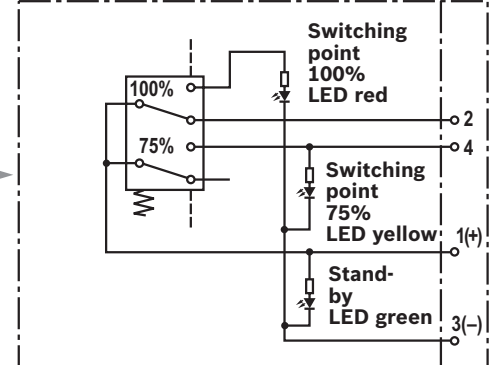
WE-1SP-M12 x 1

Switching element **Connector**



WE-1SP-EN175301-803

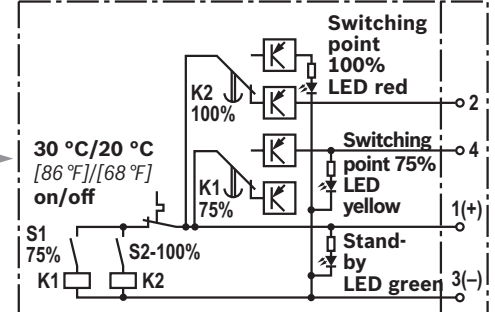
Switching element **Connector**



WE-2SP-M12 x 1

Circuit diagram drawn in plugged condition (operating state)

Switching element **Connector**



WE-2SPSU-M12 x 1

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

Function, section

The inline filter 445LEN is suitable for installation in pressure lines.

The inline filter consists of filter head (1), a removable filter bowl (2) (size 1000 filter pipe with filter cover), filter element (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), a by-pass valve (5) is fitted as a standard.

The fluid reaches the filter element (3) through the inlet port where it is cleaned. The filtered particulate settle either in the filter bowl (2) or in the filter element (3). The fluid then exits the filter through the outlet port and 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 (6). With the size 1000, the filter bowl has a two-part design. The filter pipe is secured against twisting in the filter head.


As a standard, the filter is equipped with a mechanical optical maintenance indicator (4). The electronic switching element (7) which has to be ordered separately is attached over the mechanical optical maintenance indicator (4) and is secured in place by a circlip ring.

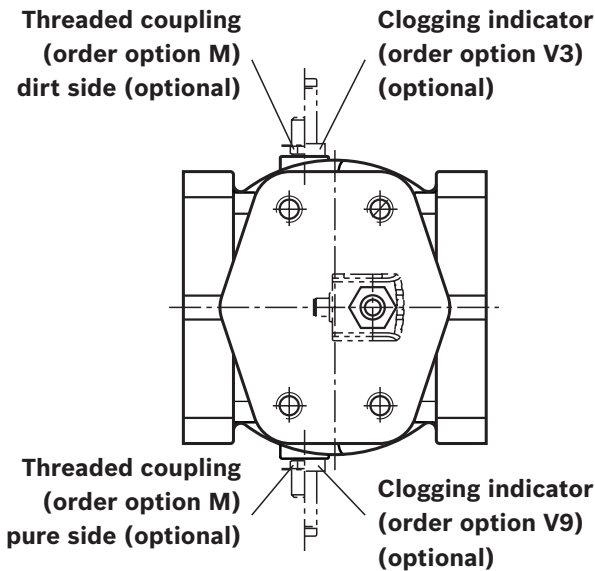
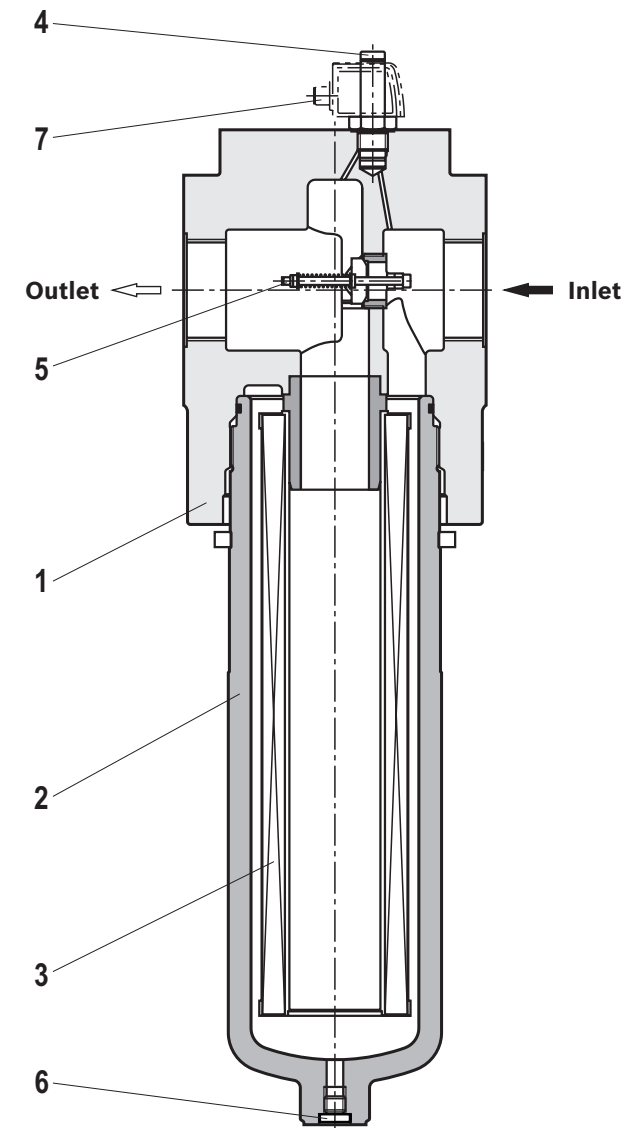
The electronic switching elements with 1 or 2 switching points are connected via a connection socket according to IEC-60947-5-2 or via a cable connection according to EN17301-803.

Variants

- **Order option supplementary information -7**
The standard outlet is closed with a SAE blind flange. The outlet is mounted upwards, which means that the direction of flow is angled upwards by 90°.
- **Order option supplementary information -9**
The bleeding is on the hexagon of the filter bowl. The drain function is located on the side of the filter head opposite the clogging indicator.

Type	Assembly position		
	Maintenance indicator	Bleeding	Draining
445LEN...			
0160-1000...9-V3	V3	On the filter bowl, top, G1/4	Opposite maintenance indicator
0160-1000...9-V9	V9		


Notice:
 Configuration options see version options on page 3



Technical data

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

General							
Installation position			vertical				
Ambient temperature range			°C [°F]	−10 ... +65 [+14 ... +149]; (briefly to −30 [−22])			
Storage conditions	− NBR seal	°C [°F]	−40 ... +65[−40... +149]; max. relative air humidity 65 %				
	− FKM seal	°C [°F]	−20 ... +65[−4 ... +149]; max. relative air humidity 65 %				
Weight	− Filters	NS	0040	0063	0100	0160	
		kg [lbs]	4.4 [9.7]	5 [11.1]	5.9 [13.1]	24 [53.2]	
		NS	0250	0400	0630	1000	
		kg [lbs]	26 [57.7]	30 [66.5]	60 [133.1]	104 [230.7]	
	− Filter bowl	NS	0040	0063	0100	0160	
		kg [lbs]	1.33 [2.93]	1.33 [2.93]	2.1 [4.63]	5.52 [12.17]	
		NS	0250	0400	0630	1000	
		kg [lbs]	8.02 [17.68]	12.21 [26.91]	21.36 [47.08]	45.34 [99.93]	
	Volume	NS	0040	0063	0100	0160	
		l [US gal]	0.25 [0.06]	0.35 [0.09]	0.52 [0.13]	1.4 [0.36]	
		NS	0250	0400	0630	1000	
		l [US gal]	1.95 [0.51]	3.1 [0.81]	5.0 [1.32]	6.5 [1.71]	
Material	− Filter head	GGG					
	− Filter bowl	Steel					
	− Optical maintenance indicator	Brass					
	− Electronic switching element	Plastic PA6					
	− Bypass valve	PA6 / Steel / POM					
	− Seals	NBR or FKM					
Hydraulic							
Maximum operating pressure			bar [psi]	450 [6527]			
Hydraulic fluid temperature range			°C [°F]	−10 ... +100 [+14... +212]			
Minimum conductivity of the medium			pS/m	300			
Fatigue strength according to ISO 10771			Load cycles	> 10 ⁶ 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]	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				

Technical data

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

Electric (electronic switching element)					
Electrical connection		Version		Round plug-in connection M12 x 1, 4-pole	Standard connection EN 175301-803
				WE-1SP-M12 x 1	WE-2SP-M12 x 1
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		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		β _{20(c)} ≥ 200		19/16/12 ... 22/17/14
	PWR10		β _{10(c)} ≥ 200		17/14/10 ... 21/16/13
	PWR6		β _{6(c)} ≥ 200		15/12/10 ... 19/14/11
	PWR3		β _{5(c)} ≥ 200		13/10/8 ... 17/13/10
Permissible pressure differential	– A00	bar [psi]	30 [435]		
	– B00	bar [psi]	330 [4785]		

Compatibility with permitted hydraulic fluids

Hydraulic fluid		Classification	Suitable sealing materials	Standards
Mineral oil		HLP	NBR	DIN 51524
Biodegradable	– 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	

**Important information on hydraulic fluids:**

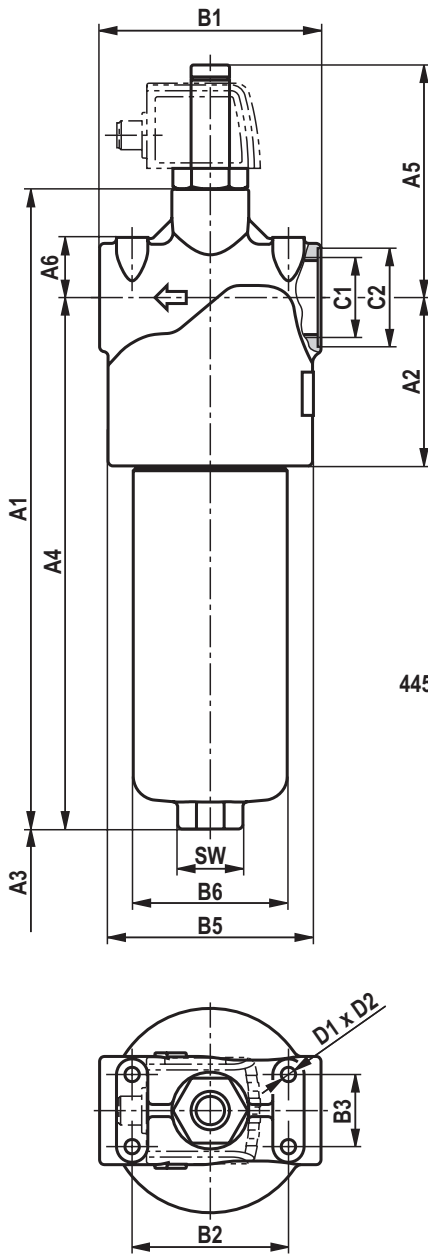
- For more information and data on the use of other hydraulic fluids, please refer to data sheet 90220 or contact us!
- **Flame-resistant – containing water:** due to possible chemical reactions with materials or surface coatings of machine and system components, the service life with these hydraulic fluids may be less than expected.

Filter materials made of filter paper P may not be used, filter elements with glass fiber material have to be used instead.

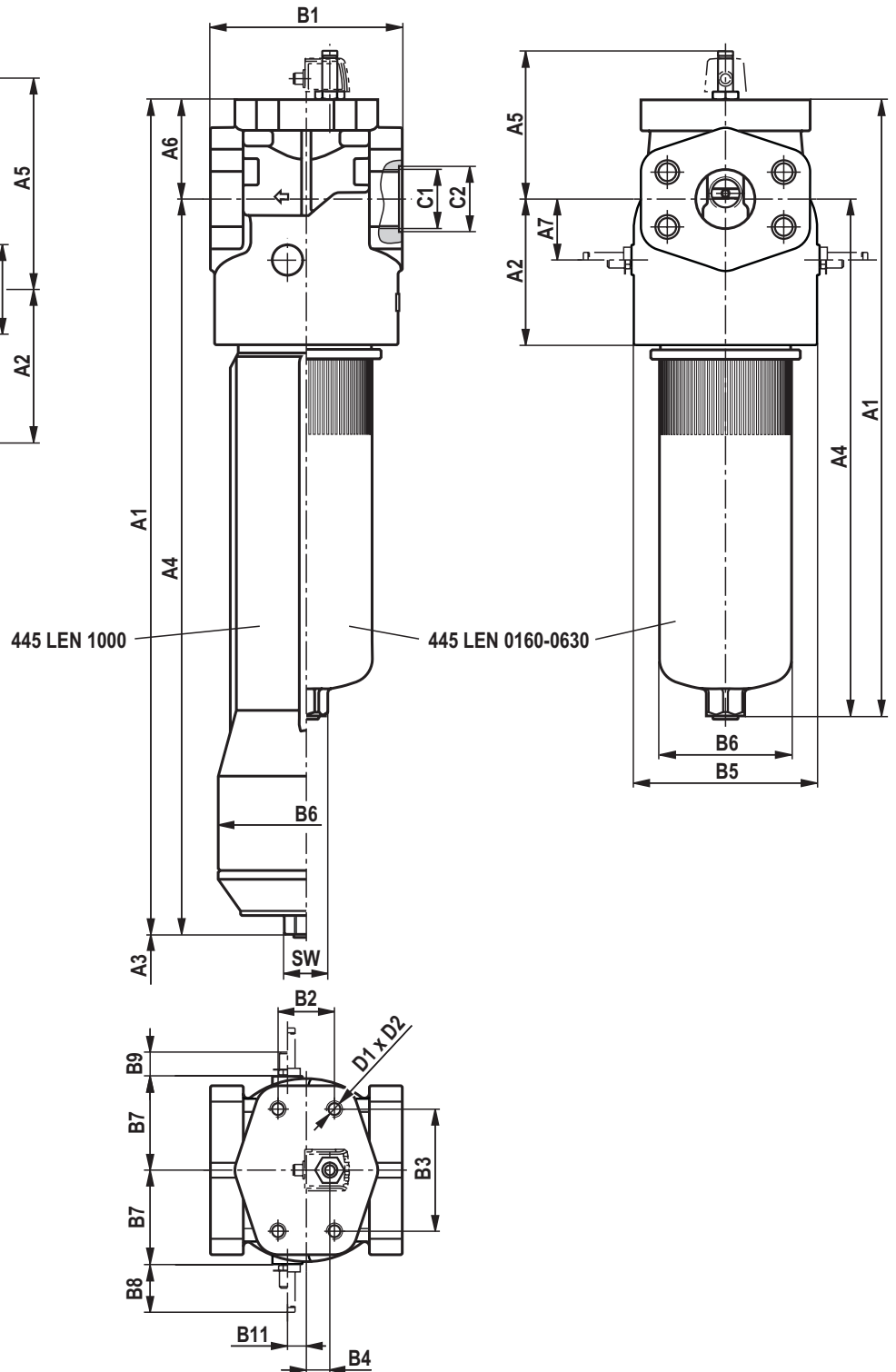
- **Biodegradable:** If filter materials made of filter paper are used, the filter life may be shorter than expected due to material incompatibility and swelling.

Dimensions: Size 0040 ... NG1000
(dimensions in mm [inch])

445LEN0040 ... 0100



445LEN0160 ... 1000



Dimensions: Size 0040 ... NG1000
(dimensions in mm *[inch]*)

445LEN...	A1	A2	A3 ¹⁾	A4	A5	A6	A7
0040	203 [7.99]	70 [2.76]	80 [3.15]	158 [6.22]	96.7 [3.81]	25 [0.98]	–
0063	266 [10.47]			221 [8.70]			
0100	356 [14.02]			311 [12.24]			
0160	344 [13.54]	110 [4.33]	120 [4.72]	262 [10.31]	133.7 [5.26]	82 [3.23]	46 [1.81]
0250	434 [17.09]			352 [13.86]			
0400	584 [22.99]			502 [19.76]			
0630	656 [25.83]	155 [6.10]	160 [6.30]	550 [21.65]	157.7 [6.21]	106 [4.17]	65 [2.56]
1000	893.5 [35.18]		630 [24.80]	787.5 [31.00]			

445LEN...	B1	B2	B3	B4	ØB5	ØB6	B7	B8	B9	B10	B11
0040	92 [3.62]	65 [2.56]	30 [1.18]	–	85 [3.35]	64 [2.52]	–	–	–	–	–
0063											
0100											
0160	164 [6.46]	55 [2.17]	105 [4.13]	30 [1.18]	150 [5.91]	114 [4.49]	80 [3.15]	51.7 [2.04]	29.3 [1.15]	128 [5.04]	20 [0.79]
0250											
0400											
0630										200 [7.87]	
1000						188 [7.40]					

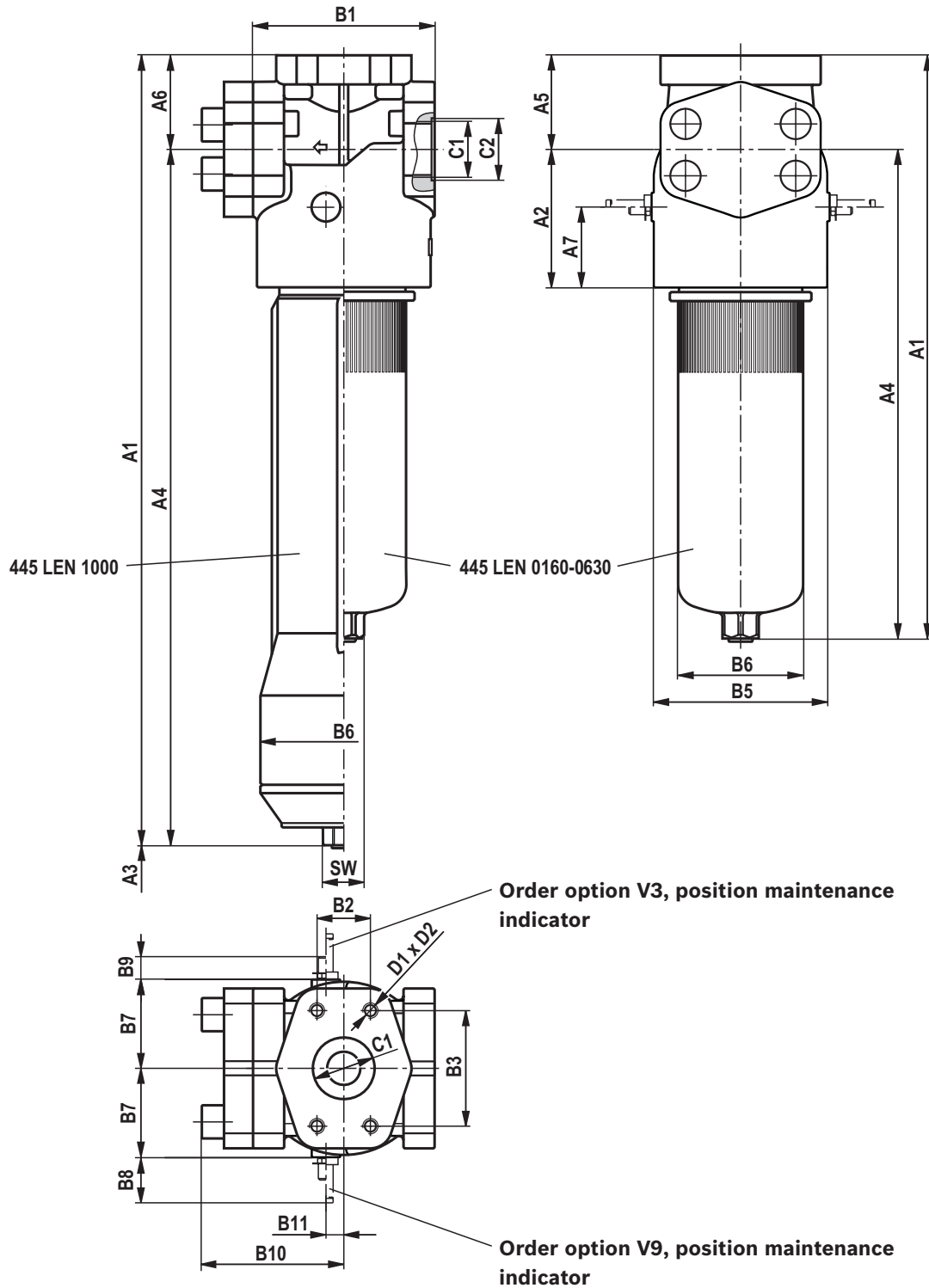
445LEN...	C1 connection						D1	D2	SW
	Standard R...	ØC2	Optional U...	ØC2	Optional S...	ØC2			
0040	G1/2	28 [1.10]	7/18-14 UNF-2B	34 [1.34]	-		M6	8 [0.31]	24 [0.94]
0063	G1	41 [1.61]	1 1/16 UN-2B	41 [1.61]					
0100									
0160	G1 1/2	56 [2.20]	1 7/8-12 UN-2B	65 [2.56]	SAE 1 1/2"	38 [1.50]	M12	28 [1.10]	32 [1.26]
0250					SAE 2"	51 [2.01]			
0400									
0630	G2	72 [2.83]	-	-	SAE 2 1/2"	63 [2.48]	M16	33 [1.30]	41 [1.61]
1000									

1) Servicing height for filter element exchange.

Dimensions: Size 0160 ... Size 1000 version 7
(dimensions in mm [inch])

445LEN0160 ... 1000 version 7

Outlet top, outlet opposite inlet closed



Dimensions: Size 0160 ... Size 1000 version 7
(dimensions in mm [inch])

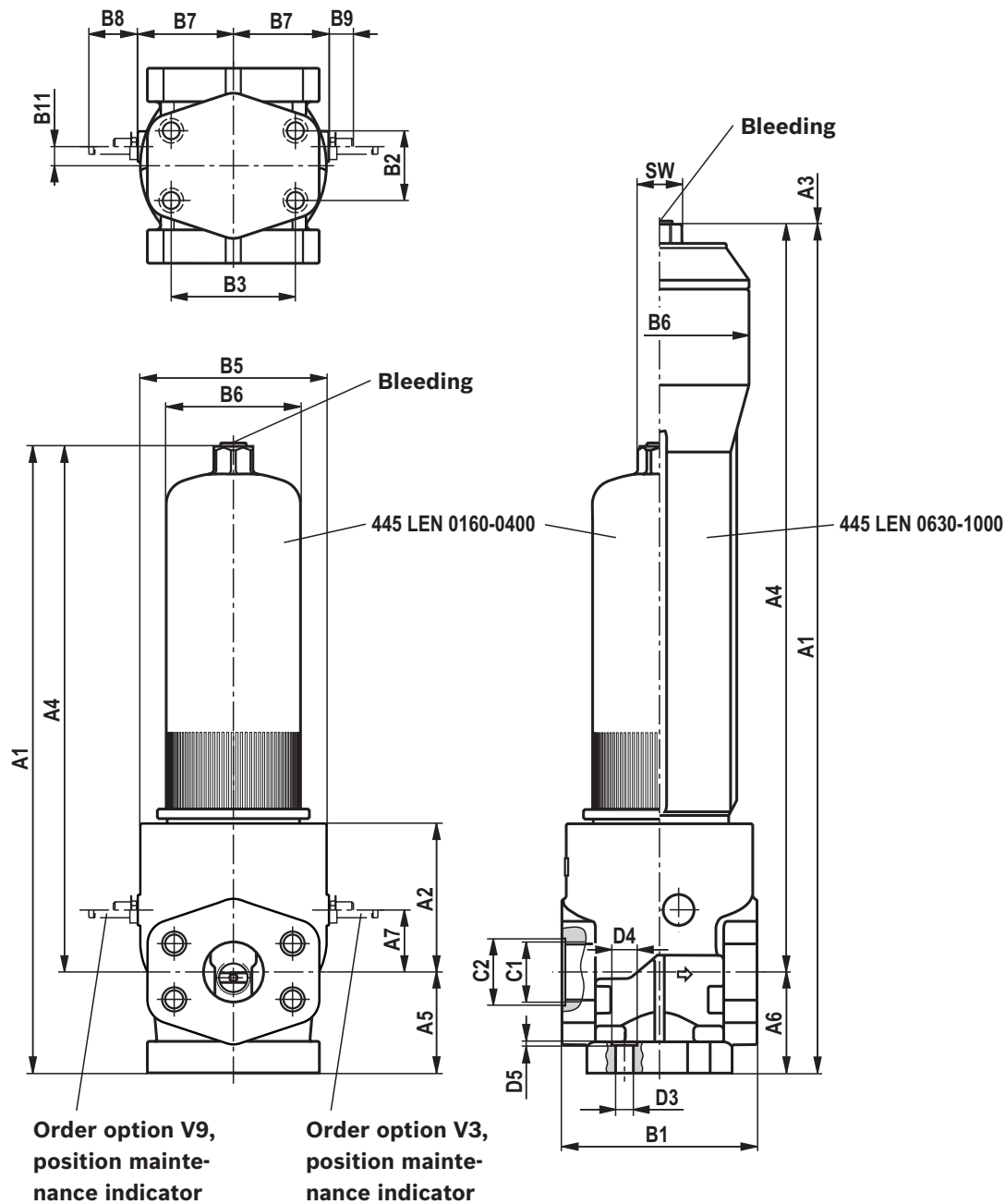
445LEN...	A1	A2	A3	A4	A5	A6	A7
0160...7	344 [13.54]	110 [4.33]	120 [4.72]	262 [10.31]	82 [3.23]	82 [3.23]	46 [1.81]
0250...7	434 [17.09]			352 [13.86]			
0400...7	584 [22.99]			502 [19.76]			
0630...7	656 [25.83]	155 [6.10]	160 [6.30]	550 [21.65]	106 [4.17]	106 [4.17]	65 [2.56]
1000...7	893.5 [35.18]		630 [24.80]	787.5 [31.00]			

445LEN...	B1	B2	B3	B4	ØB5	ØB6	B7	B8	B9	B10	B11		
0160...7	164 [6.46]	55 [2.17]	105 [4.13]	30 [1.18]	150 [5.91]	114 [4.49]	80 [3.15]	51.7 [2.04]	29.3 [1.15]	128 [5.04]	20 [0.79]		
0250...7													
0400...7													
0630...7	200 [7.87]	60 [2.36]	130 [5.12]	25 [0.98]	195 [7.68]	140 [5.51]	100 [3.94]			169 [6.65]			
1000...7						188 [7.40]							

445LEN...	C1 connection						D1	D2	SW
	Standard R...	ØC2	Optional U...	ØC2	Optional S...	ØC2			
0160...7	G1 1/2	56 [2.20]	1 7/8-12 UN-2B	65 [2.56]	–		M12	28 [1.10]	32 [1.26]
0250...7									
0400...7									
0630...7	–	–	–	–	SAE 2"	51 [2.01]	M16	33 [1.30]	41 [1.61]
1000...7					SAE 2 1/2"	63 [2.48]			

Dimensions: Size 0160 ... Size 1000 version 9
(dimensions in mm [inch])

445LEN0160 ... 1000 version 9
Filter rotated 180°, filter bowl can be unscrewed to the top



Type	Maintenance indicator	Assembly position	
		Bleeding	Draining
445LEN0160-1000...9-V3	V3	On the filter bowl, top, G1/4	Opposite maintenance indicator
445LEN0160-1000...9-V9	V9		

Dimensions: Size 0160 ... Size 1000 version 9
(dimensions in mm *[inch]*)

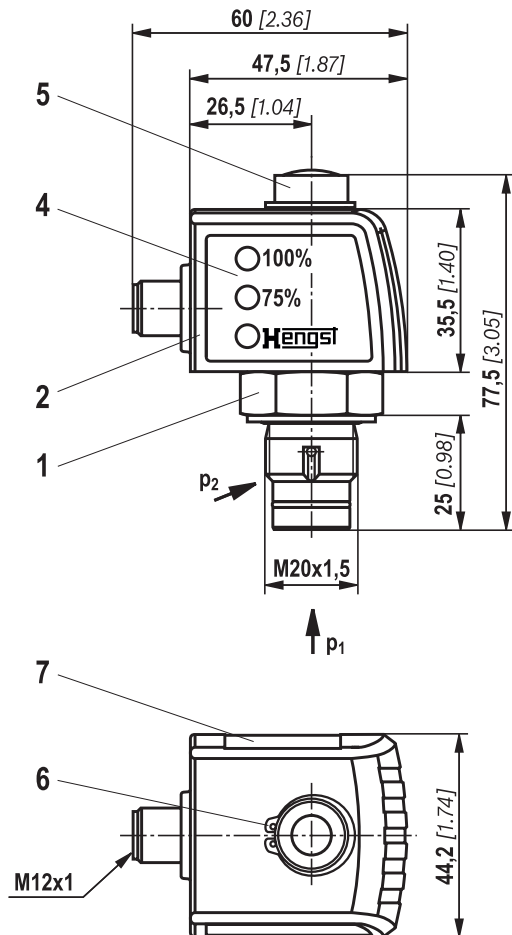
445LEN...	A1	A2	A3	A4	A5	A6	A7
0160...9	344 [13.54]	110 [4.33]	160 [6.30]	262 [10.31]	82 [3.23]	82 [3.23]	46 [1.81]
0250...9	434 [17.09]		250 [9.84]	352 [13.86]			
0400...9	584 [22.99]		400 [15.75]	502 [19.76]			
0630...9	656 [25.83]	155 [6.10]	160 [6.30]	550 [21.65]	106 [4.17]	106 [4.17]	65 2.56]
1000...9	893.5 [35.18]		630 [24.80]	787.5 [31.00]			

445LEN...	B1	B2	B3	B4	ØB5	ØB6	B7	B8	B9	B10	B11		
0160...9	164 [6.46]	55 [2.17]	105 [4.13]	30 [1.18]	150 [5.91]	114 [4.49]	80 [3.15]	51.7 [2.04]	29.3 [1.15]	128 [5.04]	20 [0.79]		
0250...9													
0400...9													
0630...9	200 [7.87]	60 [2.36]	130 [5.12]	25 [0.98]	195 [7.68]	140 [5.51]	100 [3.94]			169			
1000...9						188 [7.40]				[6.65]			

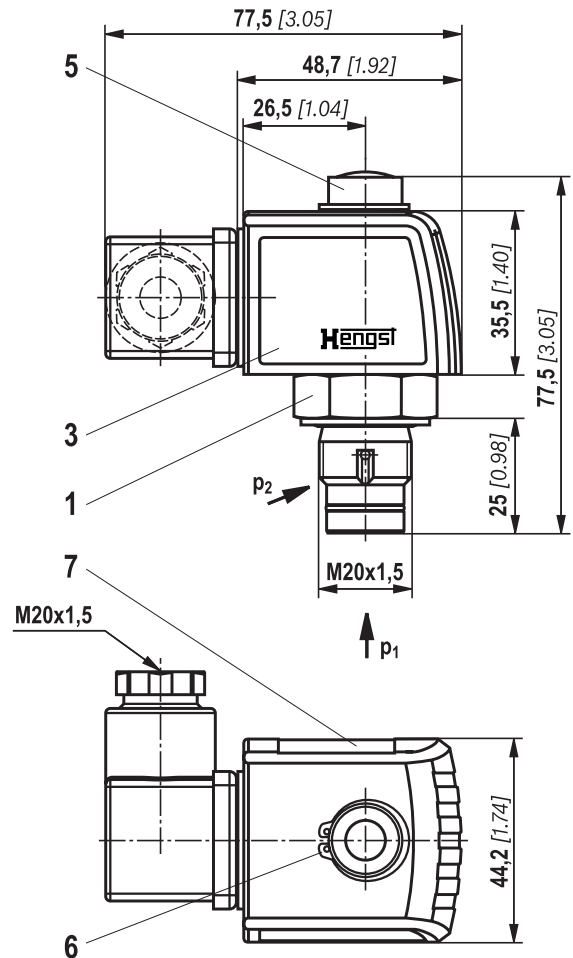
445LEN...	C1 connection						ØD3	ØD4	D5	SW
	Standard R...	ØC2	Optional U...	ØC2	Optional S...					
0160...9	G1 1/2	56 [2.20]	1 7/8-12 UN-2B	65 [2.56]	-		14 [0.55]	20 [0.79]	1 [0.04]	32 [1.26]
0250...9										
0400...9										
0630...9	-	-	-	-	SAE 2"	51 [2.01]	18 [0.71]	26 [1.02]		41 [1.61]
1000...9					SAE 2 1/2"	63 [2.48]				

Maintenance indicator (dimensions in mm [inch])

Pressure differential indicator with mounted switching element M12 x 1



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 M12 x 1, 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: 24V =
green: Stand-by
yellow: Switching point 75%
red: Switching point 100%
- 5 Visual indicator bistable
- 6 Locking ring DIN 471-16 x 1, **material no. R900003923**
- 7 Name plate



Notices:

Representation contains mechanical optical maintenance indicator (1) and electronic switching element (2) (3).

Ordering code
spare parts

Filter element

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

Filter element

01	Design	2.
----	--------	----

Nominal size

02	LEN... (with filter element according to DIN 24550)	0040 0063 0100 0160 0250 0400 0630 1000
----	--	--

Filter rating in µm

03	Absolute (ISO 16889 ; $\beta_x(c) \geq 200$)	Glass fiber material, not cleanable	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 [4786 psi] – filter without bypass valve	B00

Bypass valve

05	without bypass valve	0
----	-----------------------------	---

Seal

06	NBR seal	M
	FKM seal	V

Order example:

2.0100 PWR3-A00-0-M

For detailed information on Hengst filter elements please refer to data sheet 51420.

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
R928006969	2.0630 PWR3-A00-0-M	R928006970	2.0630 PWR6-A00-0-M	R928006971	2.0630 PWR10-A00-0-M
R928007023	2.1000 PWR3-A00-0-M	R928007024	2.1000 PWR6-A00-0-M	R928007025	2.1000 PWR10-A00-0-M

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	Pressure differential, 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	Switching pressure 5.0 bar [72.5 psi], 450 bar [6527 psi]	450
	Switching pressure 8.0 bar [116.0 psi], 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

Ordering code
spare parts

Seal kit

01	02	03	04
D	350/445LEN		-

01	Seal kit	D
02	Series 445LEN	350/445LEN

Nominal size

03	Size 0040-0100	0040-0100
	Size 0160-0400	0160-0400
	Size 0630	0630
	Size 1000	1000

Seal

04	NBR seal	M
	FKM seal	V

Seal kit	Material no.
D350/445LEN0040-0100-M	R928028527
D350/445LEN0040-0100-V	R928028528
D350/445LEN0160-0400-M	R928028532
D350/445LEN0160-0400-V	R928028533
D350/445LEN0630-M	R928028536
D350/445LEN0630-V	R928028529
D350/445LEN1000-M	R928028537
D350/445LEN1000-V	R928028534

Assembly, commissioning, maintenance

Installation

- ▶ The max. operating pressure of the system must not exceed the max. permissible operating pressure of the filter (see type 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”) must be taken into account.
- ▶ Easy filter element exchange is guaranteed in the installation position filter bowl vertically downwards. For filters with order option - supplementary information 9 - the installation position of the filter bowl is vertically upwards. The maintenance indicator should be arranged in a visible manner.
- ▶ Remove the plastic plugs in the filter inlet and outlet.
- ▶ Ensure that the system is assembled without tension stress.
- ▶ The optional electronic maintenance indicator is connected via the electronic switching element with 1 or 2 switching points, which is attached to the mechanical optical maintenance indicator and held by means of the locking ring.

Commissioning

Commission the system.

Notice:

There is no bleeding provided at the filter. However, some sizes or variants have optional threaded couplings which may also be used for bleeding.

Maintenance

- ▶ If at operating temperature, the red indicator pin extends out of the mechanical optical maintenance indicator and/or if the switching process in the electronic switching element is triggered, the filter element is contaminated and needs to be replaced and cleaned respectively. More details see data sheet 51450
- ▶ 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.
- ▶ Decommission the system.
- ▶ The operating pressure is to be release on the system side.

Notice:


There is no bleeding provided at the filter. However, some sizes or variants have optional threaded couplings which may also be used for bleeding.

- ▶ Via the drain screw (from size 0160 fitted by default), the oil on the dirt side can be drained.
- ▶ Unscrew filter bowl (or base with size 1000).
- ▶ 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 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. **Please note:**
Screw in the filter bowl to the stop, unscrew the filter bowl again by 1/8 to 1/2 rotation so that the filter bowl does not get stuck due to the pressure pulsation and can be loosened easily during maintenance work.
- ▶ The torque specifications (“Tightening torques” chapter) are to be observed.
- ▶ Commission the system and bleed the filter for order option - supplementary information 9

WARNING!

- ▶ Only with order option - supplementary information 9 - upwards installation position of the filter bowl is permitted. This variant guarantees safe bleeding.

Assembly, commissioning, maintenance

 **WARNING!**

▶ Assembly and disassembly only with depressurized system!


▶ Filter is under pressure!

▶ Remove the filter bowl only if it is not under pressure!

▶ Do not exchange the mechanical-optical maintenance

indicator while the filter is under pressure!

▶ If the flow direction is not considered during assembly, the filter element will be destroyed. Particles get in system and damage the following components.

 **Notices:**

▶ All works at the filter only be trained specialists.

▶ Functioning 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]*)

Mounting

Series 445LEN...	0040	0063	0100	0160	0250	0400	0160	0250
Screw/tightening torque with $\mu_{total} = 0.14$	M6 / 10.4 Nm \pm 10 %			M12 / 37 Nm \pm 10 %			M16 / 90 Nm \pm 10 %	
Quantity	4							
Recommended property class of screw	8.8							
Minimum screw-in depth	6 mm + 2 mm [0.24 + 0.08]			18 mm + 4 mm [0.7 + 0.16]			24 mm + 4 mm [0.94 + 0.16]	

Filter bowl and maintenance indicator

Series 445LEN...	0040	0063	0100	0160	0250	0400	0160	0250
Tightening torque filter bowl	Screw in the filter bowl to the stop, unscrew the filter bowl again by 1/8 to 1/2 rotation							
Tightening torque maintenance indicator	Max. 50 Nm							
Tightening torque cubic connector screw switching element EN-175301-803	M3/0.5 Nm							

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
Δp (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 inline filters for hydraulic applications according to 51423 are pressure holding equipment according to article 1, section 2.1.4 of the Pressure Equipment Directive 97/23/EC (PED). However, on the basis of the exception in article 1, section 3.6 of the PED, hydraulic filters

are exempt from the PED if they are not classified higher than category I (guideline 1/19).

The fluids from the chapter "Compatibility with approved pressure fluids" were considered for the classification. They do not receive a CE mark.

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

The inline filters according to 51423 are no 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-M12 x 1 R928028409

WE-1SP-EN175301-803 R928036318

are simple, electronic operating equipment that do not

have an own voltage source. This simple, electronic operating 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 inline filters and the electronic maintenance indicators described here can be used for the following explosive areas

	zone suitability	
Gas	1	2
Dust	21	22

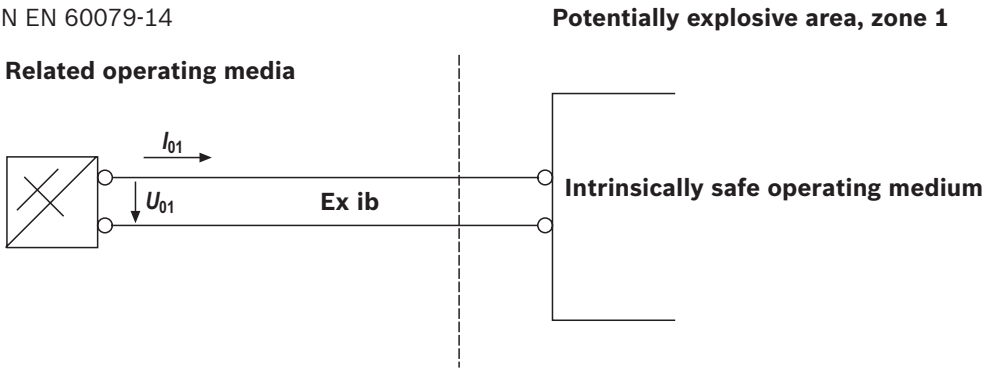
Directives and standardization

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
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 circuits		Ex ib IIC, Ex ic IIC		Ex ib IIIC
Technical data		Values only for intrinsically safe electric circuit		
Switching voltage	Ui	max	150 V AC/DC	
Switching current	Ii	max	1.0 A	
Switching power	Pi	max	1.3 W T4 T _{max} 40 °C	750 mW T _{max} 40 °C
		max	1.0 W T4 T _{max} 80 °C	550 mW T _{max} 100 °C
Surface temperature ¹⁾		max	–	100 °C
inner capacity	Ci		negligible	
inner inductivity	Li		negligible	
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 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 inline filters in accordance with 51423 in potentially explosive areas, appropriate equipotential bonding has to be ensured. The filter is preferably

to be earthed via the mounting screws. It has to be noted in this connection 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

Notices:

► Maintenance only by specialists, instruction by the machine end-user acc. to DIRECTIVE 1999/92/EC appendix II, section 1.1

► Functional and safety warranty only applicable when using genuine Hengst spare parts