

Tank mounted return line filter with filter element according to DIN 24550

Type 10TEN0040 to 1000; 10TE2000 and 2500

RE 51424

Edition: 2023-06

Replaces: 2021-04



H7855_d

- ▶ Size according to DIN 24550: 0040 to 1000
- ▶ additional sizes: 2000, 2500
- ▶ Nominal pressure 10 bar [145 psi]
- ▶ Connection up to 4"
- ▶ Operating temperature $-10\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$ [$14\text{ }^{\circ}\text{F}$ to $212\text{ }^{\circ}\text{F}$]

Features

The tank mounted return line filters are designed for installation on fluid tanks. Their function is to separate solid materials from fluids.

They distinguish themselves by the following:

- ▶ Filter for tank mounting
- ▶ 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
- ▶ Optionally equipped with mechanical optical maintenance indicator with memory function
- ▶ Available as an option with different electrical switching elements, modular design
- ▶ By default, the filters are equipped with a bypass valve integrated in the filter housing
- ▶ Optional measuring port

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Ordering code filter

Sizes 0040 to 0100

01	02	03		04	05		06		07		08		09		09		09		09
10TE	N		-		A00	-		-		-		-		-		-		-	

Series

01	Return line filter, simple 10 bar [145 psi]	10TE
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Filter element

02	With filter element according to DIN 24550	N
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Size

03	TEN... Filter element according to DIN 24550	0040 0063 0100
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Filter rating in µm

04	Nominal	Paper, not cleanable	P10 P25
	Nominal	Stainless steel wire mesh, cleanable	G10 G25 G40 G60 G100
	Absolute (ISO 16889; $\beta_{x(c)} \geq 200$)	Glass fiber material, not cleanable	PWR3 PWR6 PWR10 PWR20
	Absolute (ISO 16889; $\beta_{x(c)} \geq 200$)	Water-absorbing, not cleanable	AS3 AS6 AS10 AS20

Pressure differential

05	Max. permissible pressure differential of the filter element 30 bar [435 psi] – Filter with bypass valve	A00
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Maintenance indicator

06	Without maintenance indicator – bypass cracking pressure 3.5 bar [51 psi]	0
	Pressure gauge ¹⁾ 0...6 bar [0...87 psi] right – bypass cracking pressure 3.5 bar [51 psi]	MR
	Maintenance indicator, aluminum, mech.-optical, switching pressure 2.2 bar [32 psi], with additional pressure gauge ¹⁾ 0...6 bar [0...87 psi] right – bypass cracking pressure 3.5 bar [51 psi]	MRV2,2
	Maintenance indicator, polyamide, mech./optical, switching pressure 2.2 bar [32 psi] – bypass cracking pressure 3.5 bar [51 psi]	P2.2
	Maintenance indicator, aluminum, mech./optical, switching pressure 0.8 bar [11.6 psi] – bypass cracking pressure 3.5 bar [51 psi]	V0.8
	Maintenance indicator, aluminum, mech./optical, switching pressure 1.5 bar [21.8 psi] – bypass cracking pressure 3.5 bar [51 psi]	V1.5
	Maintenance indicator, aluminum, mech./optical, switching pressure 2.2 bar [32 psi] – bypass cracking pressure 3.5 bar [51 psi]	V2.2

Seal

07	NBR seal	M
	FKM seal	V

¹⁾ When using a pressure gauge, the maximum permissible operating pressure is reduced to 6 bar [87 psi].

Ordering code filter

Sizes 0040 to 0100

01	02	03	04	05	06	07	08	09	09	09	09
10TE	N		-		A00	-	-	-	-	-	-

Main inlet

08	Frame size	0040	0063-0100	
	Connection			
	G 3/4	●	X	R3
	G 1	X	●	R4
	1 1/16-12 UN -2B [SAE 12]	X	X	U4
	1 5/16-12 UN -2B [SAE 16]	X	X	U9
<input checked="" type="checkbox"/> Standard connection <input type="checkbox"/> Alternative connection				

Supplementary information (Multiple specifications possible)

09	Breathing filter	F
	Ventilation filter with surge protection	FN
	Threaded coupling right (not possible with pressure gauge right)	MR
	without bypass valve	NB
	Outlet pipe L110 mm [10.92 cm]	R110
	Outlet pipe L150 mm [5,9 in]	R150
	Outlet pipe L250 mm [9.8 inch]	R250

Order example:

10TEN0040-PWR10A00-P2,2-M-R3

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

Ordering code filter

sizes 0160 to 2500

01	02	03	04	05	06	07	08	09	09
10TE				- A00	-	-	-	-	-

Series

01	Return line filter, simple 10 bar [145 psi]	10TE
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Filter element

02	With filter element according to DIN 24550 (only with frame size 0160 - 1000)	N
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Size

03	TEN... Filter element according to DIN 24550	0160 0250 0400 0630 1000
	TE... (Filter elements according to Hengst standard)	2000 2500

Filter rating in μm

04	Nominal Paper, not cleanable	P10 P25
	Nominal Stainless steel wire mesh, cleanable	G10 G25 G40 G60 G100
	Absolute (ISO 16889; $\beta_{x(c)} \geq 200$) Glass fiber material, not cleanable	PWR3 PWR6 PWR10 PWR20
	Absolute (ISO 16889; $\beta_{x(c)} \geq 200$) Water-absorbing, not cleanable	AS3 AS6 AS10 AS20

Pressure differential

05	Max. permissible pressure differential of the filter element 30 bar [435 psi] – Filter with bypass valve	A00
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Maintenance indicator

06	Without maintenance indicator – bypass cracking pressure 3.5 bar [51 psi]	0
	Pressure gauge ¹⁾ 0...6 bar [0...87 psi] right – bypass cracking pressure 3.5 bar [51 psi]	ML
	Maintenance indicator, aluminum, mech.-optical, switching pressure 2.2. bar [32 psi], with additional pressure gauge ¹⁾ 0...6 bar [0...87 psi] right – bypass cracking pressure 3.5 bar [51 psi]	MLV2.2
	Maintenance indicator, polyamide, mech./optical, switching pressure 2.2 bar [32 psi] – bypass cracking pressure 3.5 bar [51 psi]	P2.2
	Maintenance indicator, aluminum, mech./optical, switching pressure 0.8 bar [11.6 psi] – bypass cracking pressure 3.5 bar [51 psi]	V0.8
	Maintenance indicator, aluminum, mech./optical, switching pressure 1.5 bar [21.8 psi] – bypass cracking pressure 3.5 bar [51 psi]	V1.5
	Maintenance indicator, aluminum, mech./optical, switching pressure 2.2 bar [32 psi] – bypass cracking pressure 3.5 bar [51 psi]	V2.2

Seal

07	NBR seal	M
	FKM seal	V

¹⁾ When using a pressure gauge, the maximum permissible operating pressure is reduced to 6 bar [87 psi].

Ordering code filter

sizes 0160 to 2500

01	02	03	04	05	06	07	08	09	09
10TE				- A00	-	-	-	-	-

Main inlet

08	Frame size	0160	0250	0400	0630	1000	2000	2500	
	Connection								
	G 1 1/4	●	X						R5
	G 1 1/2	X	●						R6
	SAE 1 1/4" - 3000 psi	X	X			-			S5
	SAE 1 1/2" - 3000 psi	X	X						S6
	1 7/8-12 UN 2B [SAE 24]	X	X						U6
	SAE 2" - 3000 psi			●	X				S8
	SAE 2 1/2" - 3000 psi			X	●				S9
	SAE 3" - 3000 psi					●	X	X	S10
	SAE 4" - 3000 psi					X	●	●	S12
<p>● Standard connection</p> <p>X Alternative connection</p>									

Supplementary information (Multiple specifications possible)

09	Threaded coupling left (not possible with pressure gauge left)	ML
	without bypass valve	NB

Order example:

10TEN0630-PWR10A00-P2,2-M-S9

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

Preferred types

Filter rating 3 µm, 6 µm, 10 µm and 20 µm

Filter type	Flow in l/min [gpm] with $v = 30 \text{ mm}^2/\text{s}$ [142 SUS] and $\Delta p = 0.5 \text{ bar}$ [7.25 psi] ¹⁾	Connection	Material no.	Connection	Material no.
10TEN0040-PWR3A00-P2,2-M-...	23 [6.1]	..R3	R928041292	..U4	R928041293
10TEN0063-PWR3A00-P2,2-M-...	35 [9.2]	..R4	R928041294	..U9	R928041295
10TEN0100-PWR3A00-P2,2-M-...	52 [13.7]	..R4	R928041296	..U9	R928041297
10TEN0160-PWR3A00-P2,2-M-...	105 [27.7]	..R5	R928041298	..S5	R928041299
10TEN0250-PWR3A00-P2,2-M-...	160 [42.3]	..R6	R928041300	..S6	R928041301
10TEN0400-PWR3A00-P2,2-M-...	290 [76.6]	..S8	R928041302	..S9	R928041303
10TEN0630-PWR3A00-P2,2-M-...	410 [108.3]	..S9	R928041304	..S8	R928041305
10TEN1000-PWR3A00-P2,2-M-...	560 [147.9]	..S10	R928041306	..S12	R928041307
10TE2000-PWR3A00-P2,2-M-...	900 [237.7]	..S12	R928041308	..S10	R928041309
10TE2500-PWR3A00-P2,2-M-...	1100 [290.6]	..S12	R928041310	..S10	R928041311

10TEN0040-PWR6A00-P2,2-M-...	40 [10.6]	..R3	R928052853	..U4	R928052854
10TEN0063-PWR6A00-P2,2-M-...	58 [15.3]	..R4	R928052855	..U9	R928052856
10TEN0100-PWR6A00-P2,2-M-...	76 [20.1]	..R4	R928052857	..U9	R928052858
10TEN0160-PWR6A00-P2,2-M-...	179 [47.3]	..R5	R928044990	..S5	R928053324
10TEN0250-PWR6A00-P2,2-M-...	248 [65.5]	..R6	R928046782	..S6	R928048118
10TEN0400-PWR6A00-P2,2-M-...	442 [116.8]	..S8	R928046816	..S9	R928052860
10TEN0630-PWR6A00-P2,2-M-...	545 [144.0]	..S9	R928044949	..S8	R928044930
10TEN1000-PWR6A00-P2,2-M-...	910 [240.4]	..S10	R928046825	..S12	R928052861
10TEN2000-PWR6A00-P2,2-M-...	1310 [346.1]	..S12	R928052862	..S10	R928052264
10TEN2500-PWR6A00-P2,2-M-...	1440 [380.4]	..S12	R928052863	..S10	R928044973

10TEN0040-PWR10A00-P2,2-M-...	43 [11.3]	..R3	R928041271	..U4	R928041272
10TEN0063-PWR10A00-P2,2-M-...	62 [16.4]	..R4	R928041273	..U9	R928041274
10TEN0100-PWR10A00-P2,2-M-...	80 [21.1]	..R4	R928041275	..U9	R928041276
10TEN0160-PWR10A00-P2,2-M-...	190 [50.2]	..R5	R928041277	..S5	R928041278
10TEN0250-PWR10A00-P2,2-M-...	260 [68.7]	..R6	R928041279	..S6	R928041280
10TEN0400-PWR10A00-P2,2-M-...	460 [121.5]	..S8	R928041281	..S9	R928041282
10TEN0630-PWR10A00-P2,2-M-...	560 [147.9]	..S9	R928041283	..S8	R928041284
10TEN1000-PWR10A00-P2,2-M-...	970 [256.2]	..S10	R928041285	..S12	R928041286
10TE2000-PWR10A00-P2,2-M-...	1350 [356.6]	..S12	R928041288	..S10	R928041289
10TE2500-PWR10A00-P2,2-M-...	1450 [383.0]	..S12	R928041290	..S10	R928041291

10TEN0040-PWR20A00-P2,2-M-...	62 [16.4]	..R3	R928041199	..U4	R928041200
10TEN0063-PWR20A00-P2,2-M-...	80 [21.1]	..R4	R928041201	..U9	R928041202
10TEN0100-PWR20A00-P2,2-M-...	95 [25.1]	..R4	R928041203	..U9	R928041204
10TEN0160-PWR20A00-P2,2-M-...	260 [68.7]	..R5	R928041205	..S5	R928041206
10TEN0250-PWR20A00-P2,2-M-...	320 [84.5]	..R6	R928041208	..S6	R928041209
10TEN0400-PWR20A00-P2,2-M-...	560 [147.9]	..S8	R928041210	..S9	R928041211
10TEN0630-PWR20A00-P2,2-M-...	630 [166.4]	..S9	R928041223	..S8	R928041224
10TEN1000-PWR20A00-P2,2-M-...	1270 [335.5]	..S10	R928041225	..S12	R928041226
10TE2000-PWR20A00-P2,2-M-...	1600 [422.7]	..S12	R928041228	..S10	R928041229
10TE2500-PWR20A00-P2,2-M-...	1680 [443.8]	..S12	R928041230	..S10	R928041231

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

Electronic switching element for maintenance indicators

If an electronic switching element with signal suppression up to 30 °C [86 °F] is used (WE-2SPSU-M12 X 1, **R928028411**), it has to be ensured that the aluminum version of the mechanical-optical maintenance indicator must be used. These maintenance indicators are referred

to in the filter type key as “V0.8”, “V1.5” or “V2.2”. Also refer to the chapter "Spare parts and accessories".

The temperature-controlled signal processing does not work with mechanical-optical maintenance indicators made of polyamide.

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	M12x1
	Rectangular connector, 2-pole, design A according to EN-175301-803, only possible with “1SP” type of signal.	EN175301-803

Material numbers of the electronic switching elements

With the “mechanical-optical maintenance indicator” option (V..., P...), two mechanical optical maintenance indicators are installed at the factory. So you must always order two electric switching elements as optional accessories.

Material no.	Type	Signal	Switching points	Connector	LED	
R928028409	WE-1SP-M12 x 1	Changeover	1	M12 x 1	No	
R928028410	WE-2SP-M12 x 1	Normally open (at 75%) / normally closed contact (at 100%)	2		EN 175301-803	3 pieces
R928028411	WE-2SPSU-M12 x 1					
R928036318	WE-1SP-EN175301-803	Normally closed contact	1			

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>

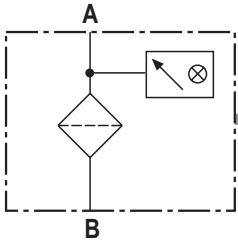
Other languages can be selected using the page navigation.

standard search

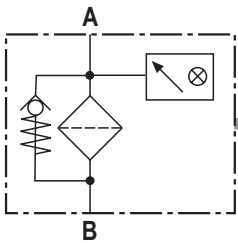
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type:	<input type="text" value="please select"/>
pressure range:	<input type="text" value="please select"/>
filter material:	<input type="text" value="please select"/> 
fineness:	<input type="text" value="please select"/>
volume flow rate:	<input type="text"/> [l/min] <input type="text"/>
viscosity: * = working point	<input checked="" type="radio"/> kin viscosity 1: <input type="text" value="32"/> [mm ² /s]  <input type="radio"/> search via type of medium full-text search medium <input type="text" value="please select"/> <input type="text"/> <input type="text" value="please select"/> <input type="text"/> temp 1: <input type="text"/> [°C] <input type="text"/> [°F] kin viscosity 1: <input type="text"/> [mm ² /s]  <input type="radio"/> dyn. Viscosity 1: <input type="text"/> [cP] density 1: <input type="text"/> [kg/dm ³] kin viscosity 1: <input type="text"/> [mm ² /s] 
collapse pressure resistance according to ISO 2941:	<input type="text" value="30 bar"/> <input type="text"/>
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Symbols

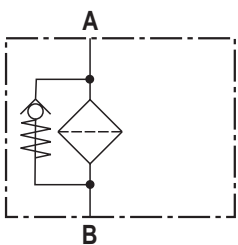
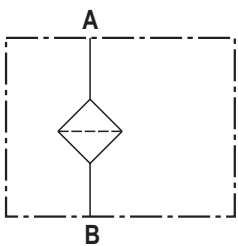
Tank mounted return line filter without bypass and with mechanical indicator



Tank mounted return line filter with bypass and mechanical indicator



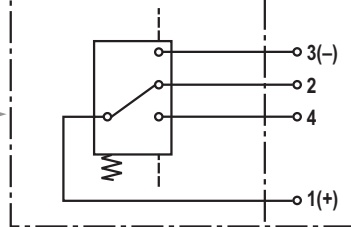
Tank mounted return line filters without bypass



Tank mounted return line filters with bypass

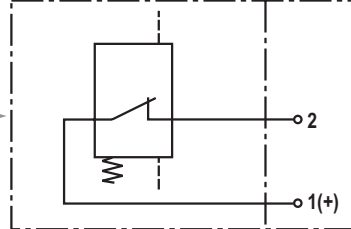
Electronic switching element for maintenance indicator

Switching element Connector



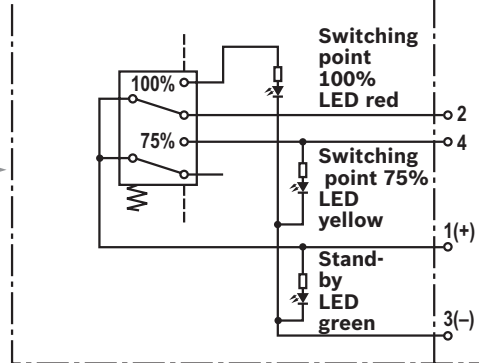
WE-1SP-M12 x 1

Switching element Connector



WE-1SP-EN175301-803

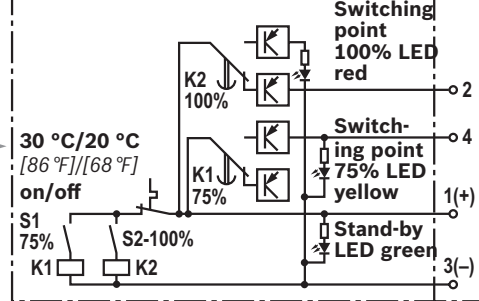
Switching element Connector



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)

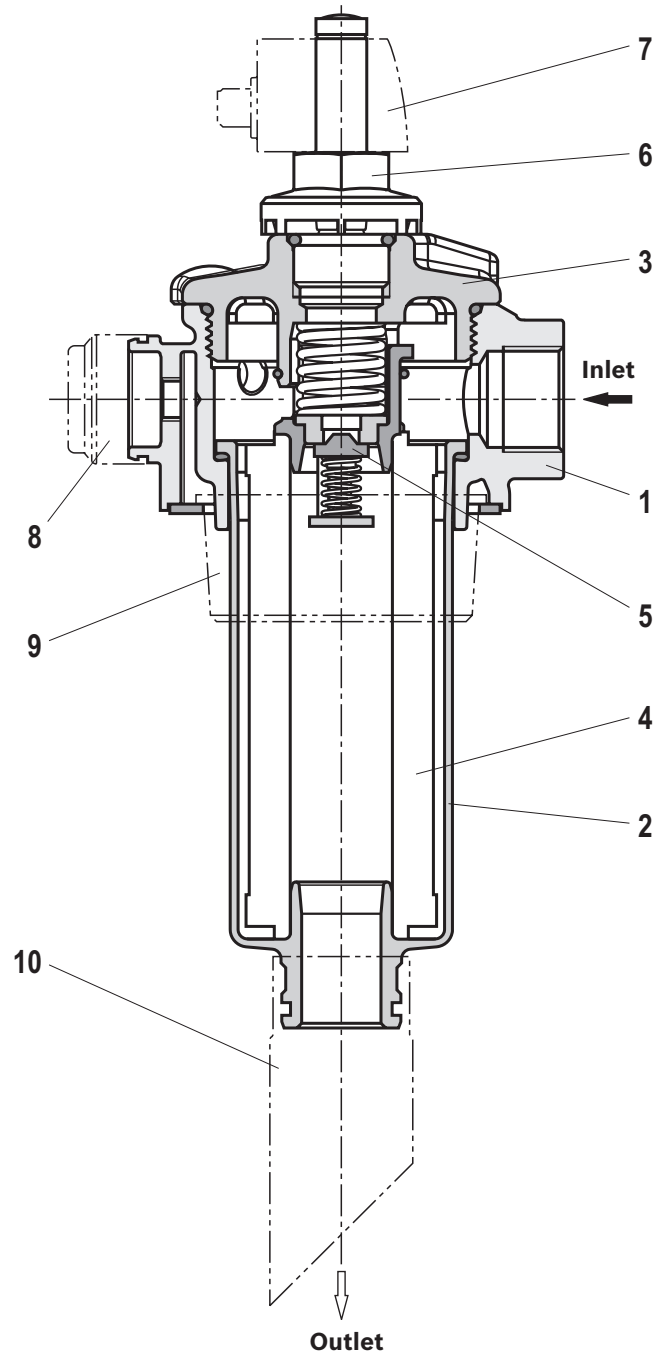
Function, section

The tank mounted return line filter is provided in the return line for direct attachment onto the tank of a hydraulic or lubrication system. It can also be used as filling or bypass filter. The filter basically consists of filter head (1) filter head (2), cover (3), filter element (4), as well as a bypass valve (5).

Optionally, the filter is equipped with mechanical optical maintenance indicator (6). The electronic maintenance indicator is connected via the electronic switching element (7) with 1 or 2 switching points (see p. 7), which has to be ordered separately.

During operation, the hydraulic fluid reaches the filter housing via the inlet; here, it flows through the filter element (4) from the outside to the inside and is cleaned according to the filter rating. The dirt particles filtered out settle in the filter head (2) and in the filter element (4). Via the outlet, the filtered hydraulic fluid enters the tank. In case of contamination, the necessary filter element exchange is displayed by the maintenance indicator (6). The electronic switching element (7) is attached to the mechanical optical maintenance indicator (6) and held by means of a locking ring.

Depending on the filter size, more additional functions are available (only for size 0040 - 0100) - e.g. a breathing filter (8), surge protection (9) or return pipes (10) in different lengths – also refer to the chapter “Ordering Codes Accessories”.



Type 10TEN0063

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

General							
Size	Size		0040	0063	0100	0160	0250
Weight	kg [lbs]		1.4 [3.09]	1.6 [3.53]	1.8 [3.97]	4.5 [9.92]	5.0 [11.03]
Size	Size		0400	0630	1000	2000	2500
Weight	kg [lbs]		8.0 [17.64]	10.0 [22.05]	18 [39.7]	21.5 [47.42]	27 [59.55]
Installation position			vertical				
Ambient temperature range	°C [°F]		-10 ... +65[+14...+149] (shortly down 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%				
Material	- Filter cover		Carbon fiber reinforced plastic (sizes 0040...0100) Aluminum (sizes 0160...2500)				
	- Filter head		Aluminum				
	- Filter bowl		Carbon fiber reinforced plastic (sizes 0040...0250) Steel aluminized (sizes 0400...2500)				
	- Bypass valve		Plastic / Aluminum from size 1000				
	- Visual Maintenance indicator (P2.2) (V...)		Plastic PA6				
	- Electronic switching element		Aluminum				
	- Pressure gauge		Plastic PA6				
	- Seals		Plastic				
	- Seals		NBR / FKM				
Surface requirement tank opening	- Roughness depth	R_z max.	µm	25 (10TDN0040...0100) and 6.3...16 (from 10TDN0160)			
	- Flatness	t_E max.	µm	0.3...0.5 (10TDN0040...0100) and 0.2 (from 10TDN0160)			
Hydraulic							
Maximum operating pressure	bar [psi]		10 [145]				
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		at rated operating pressure 200,000				
Type of pressure measurement of the maintenance indicator			Back pressure				
Assignment: Response pressure of the maintenance indicator / cracking pressure of the bypass valve	bar [psi]	Response pressure of the maintenance indicator		Cracking pressure of the bypass valve			
		without maintenance indicator		3.5 ± 0.35 [50.8±5.1]			
		with pressure gauge					
		V0.8 ± 0.15 [11.6 ± 2.2]					
		V1.5 ± 0.2 [21.8 ± 2.9]					
		V2.2 ± 0.3 [31.9 ± 4.4]					
P2.2 +0.45/-0,25 [31.9(+6.4/-3,6)]							
Filtration direction			From the outside to the inside				

Technical data

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

Electric (electronic switching element)				
Electrical connection	Round plug-in connection M12 x 1, 4-pole			Standard connection EN 175301-803
Version	1SP-M12 x 1	2SP-M12 x 1	2SPSU-M12 x 1	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 65		IP 67		IP 65
Ambient temperature range	°C [°F]	-25...+85 [-13...+185]		
For direct voltage above 24 V, spark extinguishing is to be provided for protecting the switching contacts.				
Weight	electronic switching element: - with round plug-in connection M12x1	kg [lbs]	0,1 [0.22]	

Filter element				
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	
Permissible pressure differential A	bar [psi]	30 [435]		

Compatibility with permitted hydraulic fluids

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



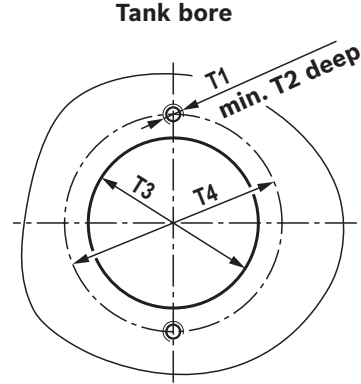
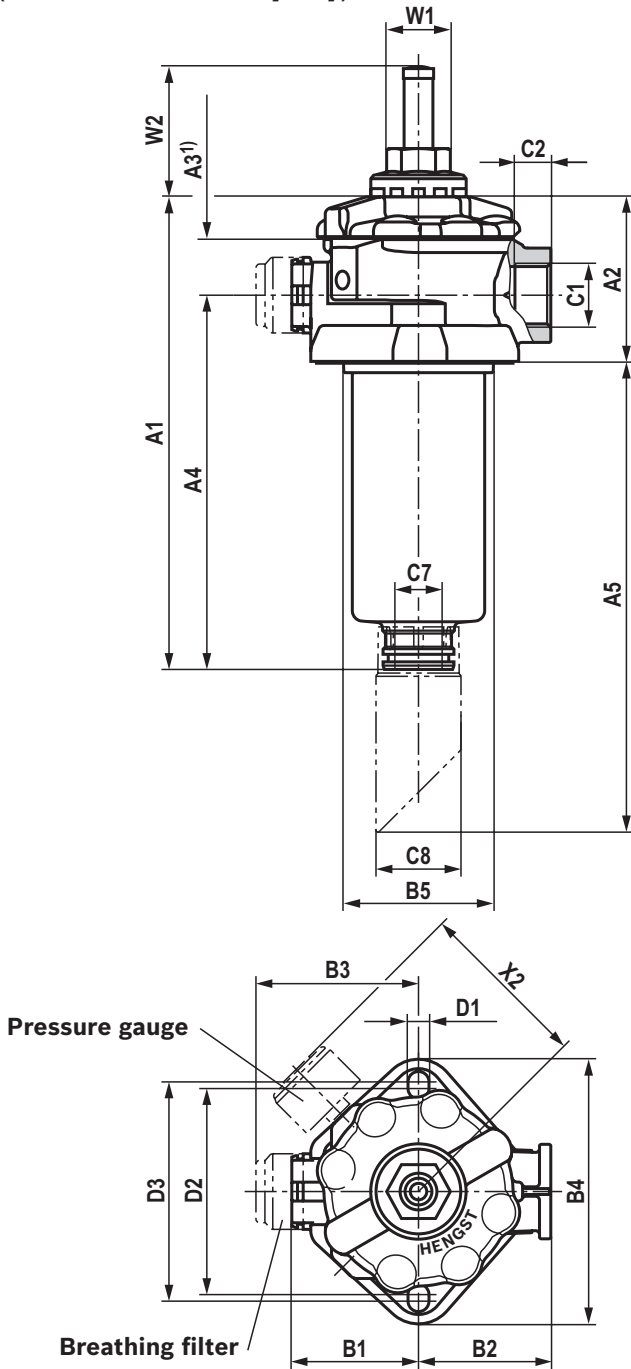
Important information on hydraulic fluids!

- For more information and data on the use of other hydraulic fluids, please refer to data sheet 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: 10TEN0040, 0063, 0100
(dimensions in mm [inch])



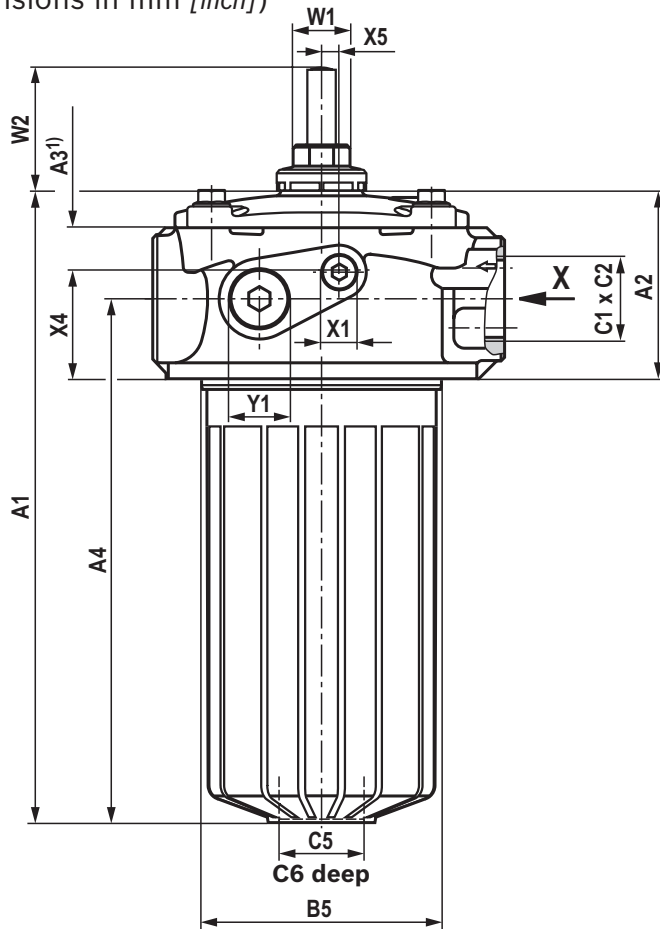
1) Servicing height for filter element exchange

Type 10...	A1	A2	A3 ¹⁾	A4	A5	
TEN0040	190 [7.38]	87 [3.43]	100 [3.94]	138 [5.43]	R110	190 [7.38]
					R150	230 [9.06]
					R250	330 [12.99]
TEN0063	250 [9.84]	87 [3.43]	160 [6.30]	198 [7.80]	R110	250 [9.84]
					R150	290 [11.42]
					R250	390 [15.35]
TEN0100	340 [13.39]	250 [9.84]	250 [9.84]	288 [11.34]	R110	340 [13.39]
					R150	380 [14.96]
					R250	480 [18.90]

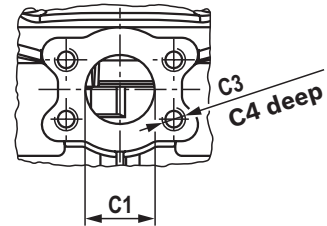
Type 10...	B1	B2	B3	B4	ØB5
TEN0040	67 [2.64]	70 [2.76]	86 [3.39]	140 [5.51]	80 [3.15]
TEN0063					
TEN0100					

Type 10...	C1 connection		C2	C7	ØC8	D1	D2	D3	T1	T2 ⁺² _[0.08]	ØT3	ØT4	W1	W2	X2 ≈
	Standard	Optional													
TEN0040	G 3/4	G 1	17 [0.67]	NW	45 [1.77]	11 [0.43]	109 [4.29]	116 [4.57]	M10	12 [0.47]	90 [3.54]	115 [4.53]	SW30	69 [2.72]	90 [3.54]
		1 1/16-12 UN-2B													
		1 5/16-12 UN-2B													
TEN0063	G 1	G 3/4	19 [0.75]	25	45 [1.77]	11 [0.43]	109 [4.29]	116 [4.57]	M10	12 [0.47]	90 [3.54]	115 [4.53]	SW30	69 [2.72]	90 [3.54]
		1 1/16-12 UN-2B													
		1 5/16-12 UN-2B													
TEN0100	G 1	G 3/4	19 [0.75]	25	45 [1.77]	11 [0.43]	109 [4.29]	116 [4.57]	M10	12 [0.47]	90 [3.54]	115 [4.53]	SW30	69 [2.72]	90 [3.54]
		1 1/16-12 UN-2B													
		1 5/16-12 UN-2B													

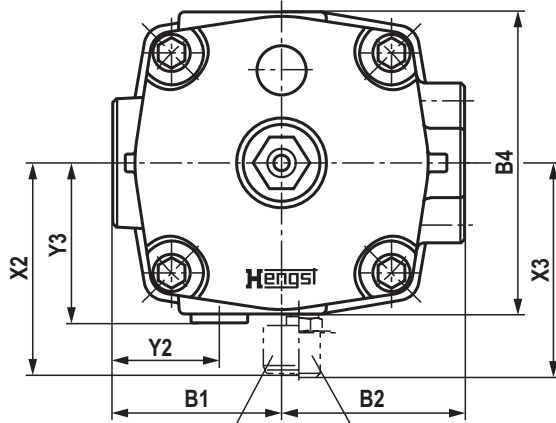
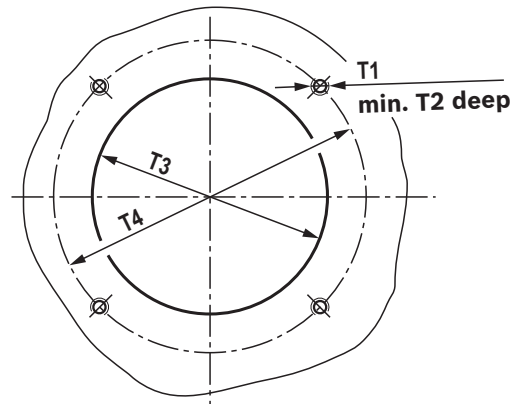
Dimensions: 10TEN0160, 0250
(dimensions in mm [inch])



View X



Tank bore



Pressure gauge Threaded coupling

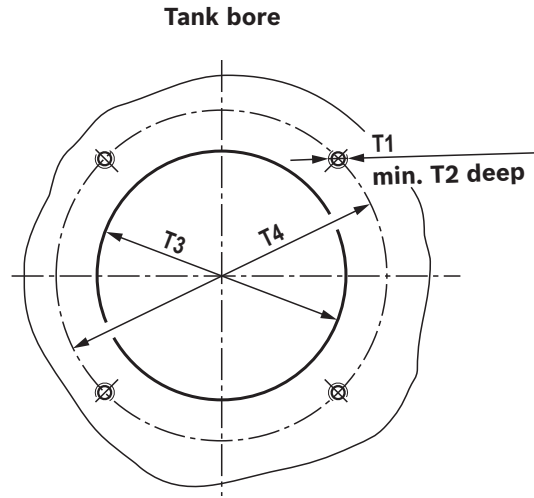
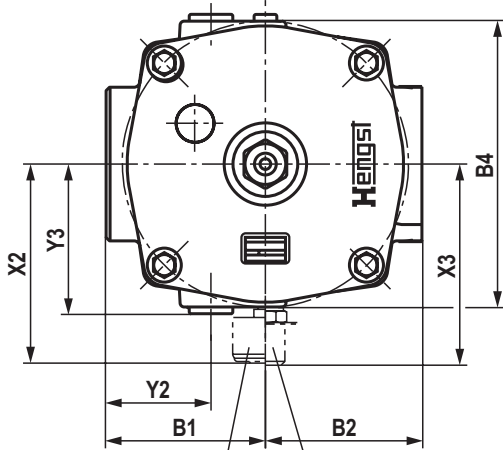
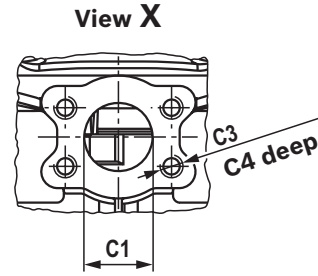
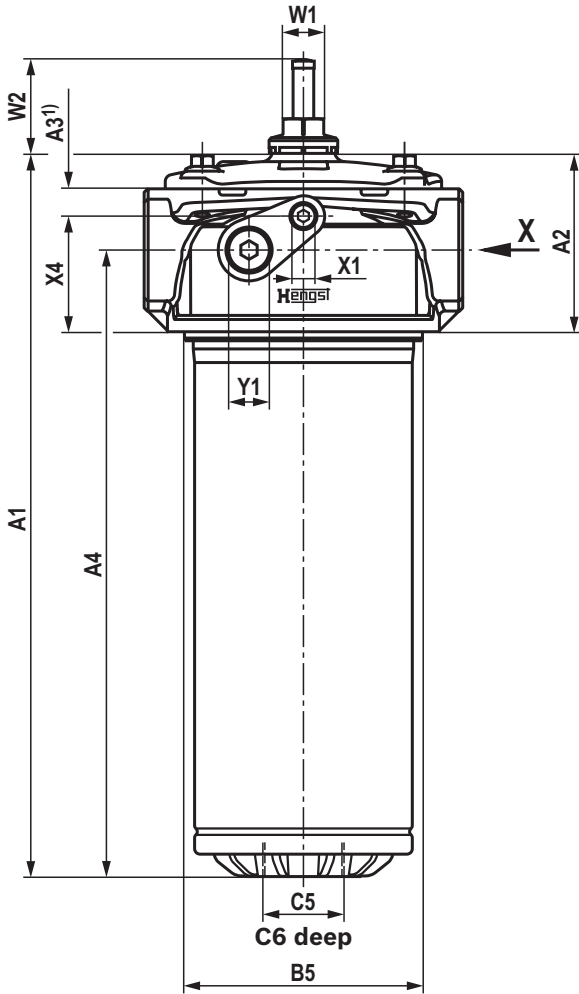
1) Servicing height for filter element exchange

Type 10...	A1	A2	A3 ¹⁾	A4	B1	B2
TEN0160	267 [10.51]	106 [4.17]	160 [6.30]	206 [8.11]	95 [3.74]	103 [4.06]
TEN0250	357 [14.06]		260 [10.24]	296 [11.65]		

Type 10...	B4	ØB5	C1 connection			C2	C3	C4	C5
			Standard	Optional					
TEN0160	170 [6.69]	135 [5.31]	G 1 1/4	G 1 1/2	SAE 1 1/4" 3000 psi	20 [0.79]	M12 M10	20 (24) [0.79 (0.94)] 16 (19) [0.63 (0.75)]	G 1 1/2
TEN0250				G 1 1/4	SAE 1 1/4" 3000 psi				

Type 10...	C6	T1	T2 ^{±2} _[0.08]	ØT3	ØT4	W1	W2	X1	X2 ≈	X3 ≈	X4	Y1	Y2	Y3
TEN0160	26 [1.02]	M10	12 [0.47]	140 [5.51]	185 [7.28]	SW30	69 [2.72]	G 1/4	120 [4.72]	116 [4.57]	60 [2.36]	G 3/4	60 [2.36]	90 [3.54]
TEN0250														

Dimensions: 10TEN0400, 0630
(dimensions in mm [inch])



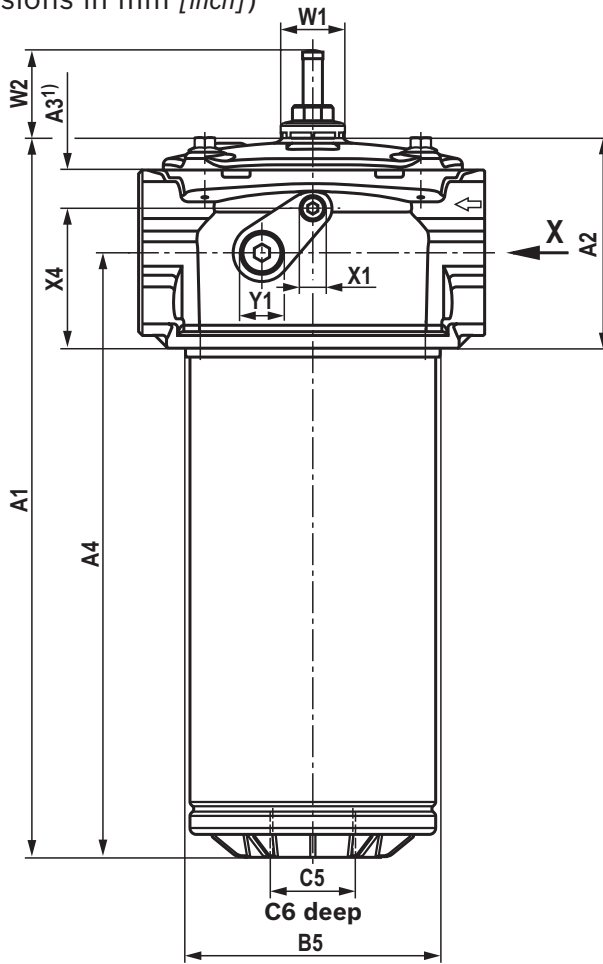
Pressure gauge Threaded coupling

¹⁾ Servicing height for filter element exchange

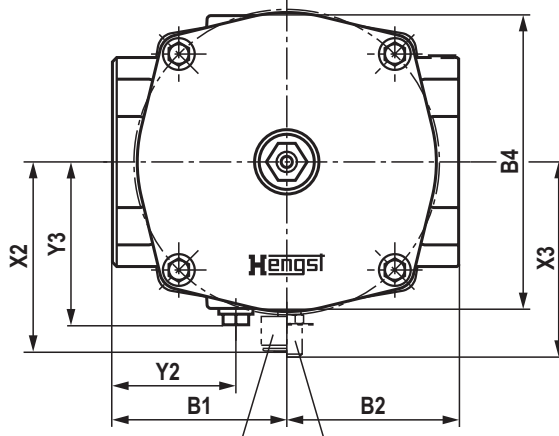
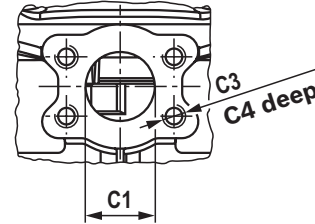
Type 10...	A1	A2	A3 ¹⁾	A4	B1	B2	B4	ØB5	C1 connection		C3
									Standard	Optional	
TEN0400	378 [14.88]	131	250 [9.84]	307 [12.09]	117	115	210	175	SAE 2" 3000 psi	SAE 2 1/2" 3000 psi	M12
TEN0630	528 [20.79]	[5.16]	400 [15.75]	457 [17.99]	[4.61]	[4.53]	[8.27]	[6.89]	SAE 2 1/2" 3000 psi	SAE 2" 3000 psi	

Type 10...	C4	C5	C6	T1	T2 ⁺² [0.08]	ØT3	ØT4	W1	W2	X1	X2 ≈	X3 ≈	X4	Y1	Y2	Y3
TEN0400	20 (24)	G 2	25	M10	12	178	220	SW30	69	G 1/4	138	134	85	G 3/4	77	110
TEN0630	[0.79(0.94)]		[0.98]		[0.47]	[7.01]	[8.66]		[2.72]		[5.43]	[5.28]	[3.35]		[3.03]	[4.33]

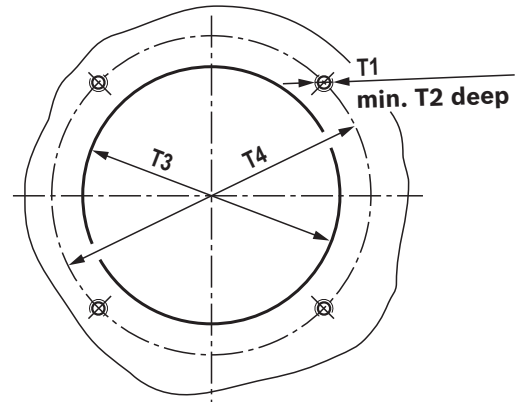
Dimensions: 10TEN1000, 10TE2000, 10TE2500
(dimensions in mm [inch])



View X



Tank bore



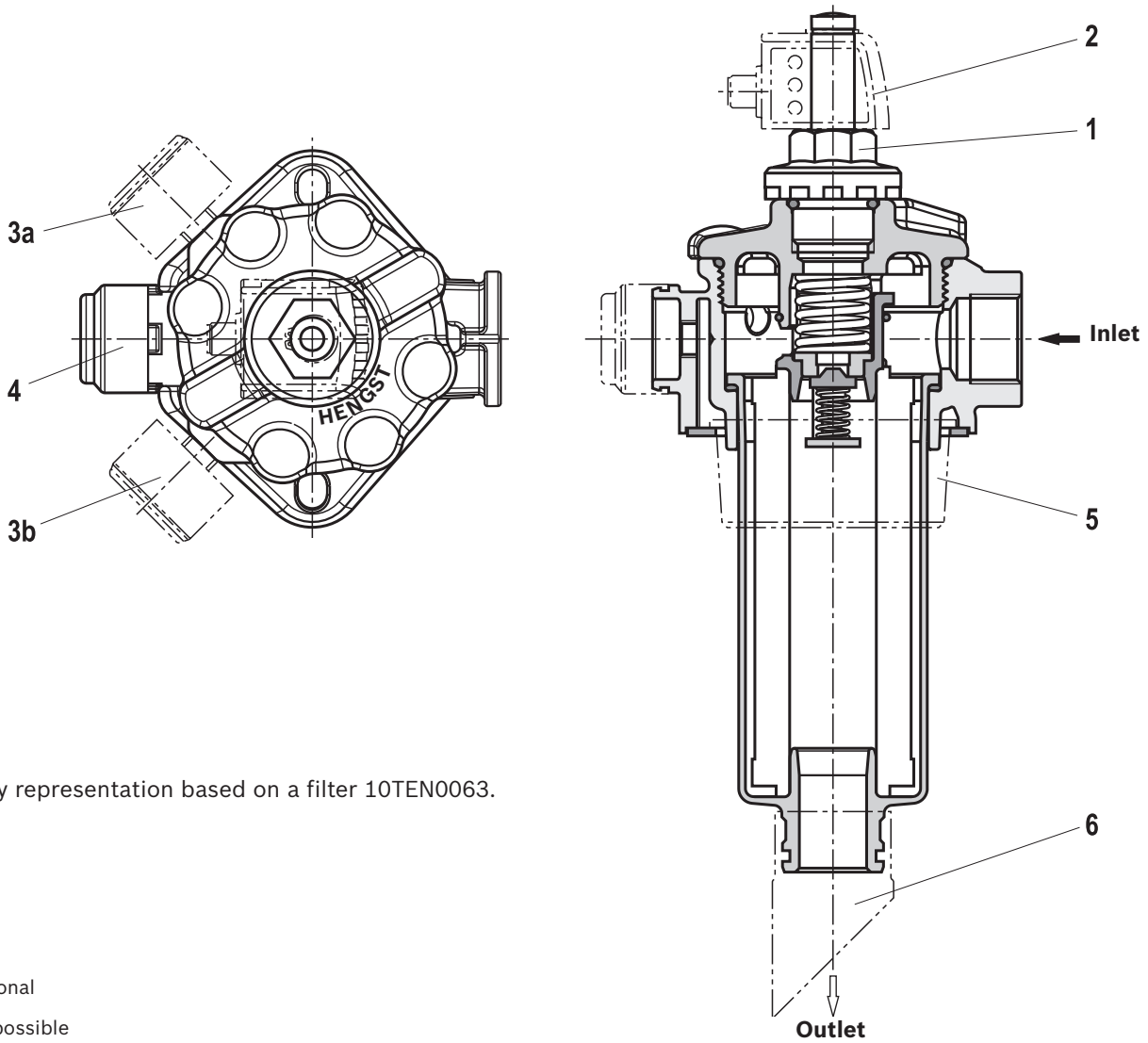
Pressure gauge Threaded coupling

¹⁾ Servicing height for filter element exchange

Type 10...	A1	A2	A3 ¹⁾	A4	B1	B2	B4	ØB5	C1 connection		C3
									Standard	Optional	
TEN1000	565 [22.24]	165 [6.50]	530 [20.87]	457 [17.99]	137 [5.39]	135 [5.31]	230 [9.06]	200 [7.87]	SAE 3" 3000 psi	SAE 4" 3000 psi	M16
TEN2000	923 [36.34]		880 [34.65]	833 [32.80]					SAE 4" 3000 psi	SAE 3" 3000 psi	
TEN2500	1158 [45.59]		1130 [44.49]	1068 [42.05]							

Type 10...	C4	C5	C6	T1	T2 ⁺² [0.08]	ØT3	ØT4	W1	W2	X1	X2 ≈	X3 ≈	X4	Y1	Y2	Y3
TEN1000	26 (30) [1.02 (1.18)]	G 3	35 [1.38]	M10	12 [0.47]	202 [7.95]	250 [9.84]	SW30	69 [2.72]	G 1/4	149 [5.87]	146 [5.75]	110 [4.33]	G 3/4	97 [3.82]	120 [4.72]
TEN2000																
TEN2500																

Options



Exemplary representation based on a filter 10TEN0063.

- Optional
- not possible

Ordering code	Maintenance indicator options	Item	Frame size	
			0040-0100	0160-2500
P2,2; V0,8; V1,5; V2,2	Mechanical optical maintenance indicator	1	●	●
MR	Pressure gauge right	3a	●	-
ML	Pressure gauge left	3b	-	●
V2,2MR	Mechanical optical maintenance indicator + pressure gauge right	1 + 3a	●	-
V2,2ML	Mechanical optical maintenance indicator + pressure gauge left	1 + 3b	-	●
plus R928...	Electronic switching element	See chapter "Accessories"		

Ordering code	Supplementary information options	Item	Frame size	
			0040-0100	0160-2500
F	Breathing filter	4	●	-
FN	Ventilation filter with surge protection	4 + 5	●	-
MR	Threaded coupling right (not possible with pressure gauge right)	3a	●	-
ML	Threaded coupling left (not possible with pressure gauge left)	3b	-	●
NB	Without bypass valve		●	●
R110	Outlet pipe 110 cm	6	● ¹⁾	-
R150	Outlet pipe 150 cm	6	● ¹⁾	-
R250	Outlet pipe 250 cm	6	● ¹⁾	-

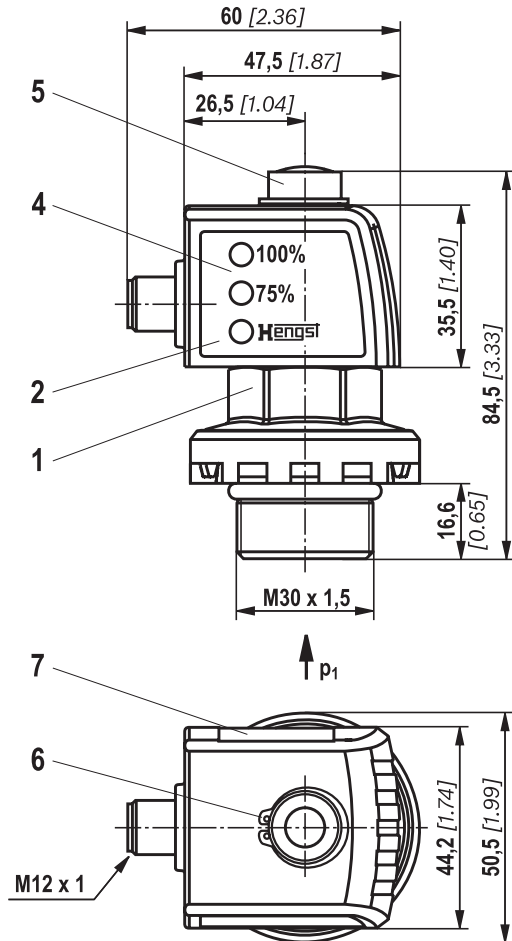
¹⁾ Outlet pipes for sizes 0040...0100 are to be ordered preferably pre-assembled over the complete filter.

Outlet pipes for other sizes must be ordered separately and are not pre-assembled.

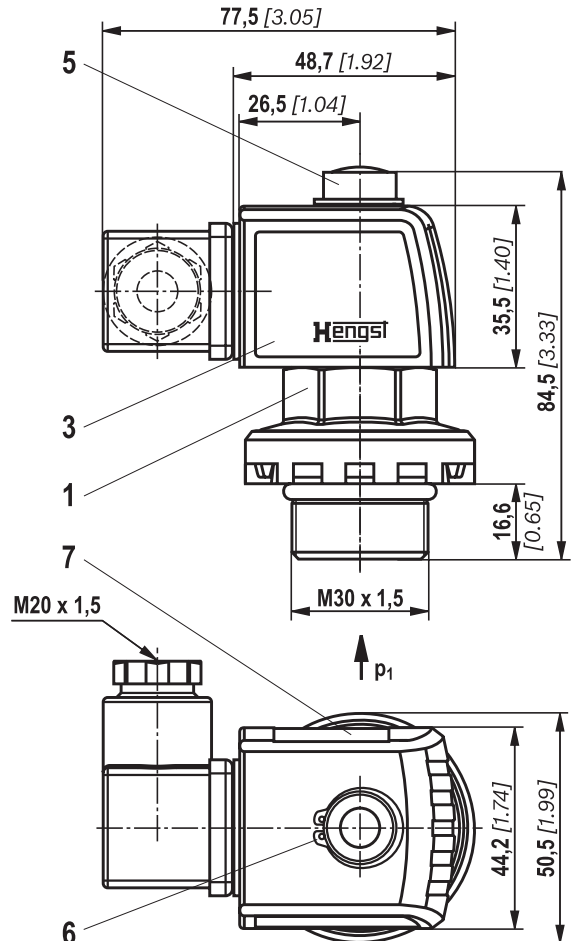
See chapter "Order Code Accessories".

Maintenance indicator (dimensions in mm [inch])

Electronic switching element with round plug-in connection M12 x 1, 4-pole



Electronic switching element with rectangular plug-in connection EN 175301-803



- 1 Mechanical optical maintenance indicator; max. tightening torque $M_{A \max} = 50 \text{ Nm}$ [36.88 lb-ft]
Tightening torque for back pressure indicator in PA6.6 $M_{A \max} = 35 \text{ Nm}$ [25.82 lb-ft]
- 2 Switching element with locking ring for electrical maintenance indicator (rotatable by 360°); plug-in connection M12 x 1, 4-pole
- 3 Switching element with locking ring for electrical maintenance indicator (rotatable by 360°); plug-in connection EN175301-803
- 4 Housing with three LEDs: 24V =
green: Stand-by
yellow: Switching point 75%
red: Switching point 100%
- 5 Optical 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).

If an electronic switching element with signal suppression up to 30 °C [86 °F] is used (WE-2SPSU-M12 X 1, **R928028411**), it has to be ensured that the aluminum version of the mechanical-optical maintenance indicator must be used. These maintenance indicators are referred to in the filter type key as "V0.8", "V1.5" or "V2.2".

See chapter "Order Code Spare Parts".

The temperature-controlled signal processing does not work with mechanical-optical maintenance indicators made of polyamide.

Ordering code spare parts

Filter element

01	02	03	04	05	06
1.		-	A00	-	0

01	Design	1.
----	--------	----

Size

02	TEN... (Filter elements according to DIN 24550)	0040 0063 0100 0160 0250 0400 0630 1000
	TE... (Filter elements according to Hengst standard)	2000 2500

Filter rating in μm

03	Nominal	Paper, not cleanable	P10 P25
	Nominal	Stainless steel wire mesh, cleanable	G10 G25 G40 G60 G100
	Absolute (ISO 16889); $\beta_{x(c)} \geq 200$	Glass fiber material, not cleanable	PWR3 PWR6 PWR10 PWR20
	Absolute (ISO 16889); $\beta_{x(c)} \geq 200$	Water-absorbing, not cleanable	AS3 AS6 AS10 AS20

Pressure differential

04	Maximum permissible pressure differential of the filter element: 30 bar [435 psi]	A00
----	---	-----

Bypass valve

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

Seal

06	NBR seal	M
	FKM seal	V

Order example:

1.0100 PWR3-A00-0-M

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

Ordering code spare parts

Preferred program Replacement elements

Filter element type	Filter material/material no.			
	PWR3	PWR6	PWR10	PWR20
1.0040 ...A00-0-M	R928005835	R928005836	R928005837	R928005838
1.0063 ...A00-0-M	R928005853	R928005854	R928005855	R928005856
1.0100 ...A00-0-M	R928005871	R928005872	R928005873	R928005874
1.0160 ...A00-0-M	R928005889	R928005890	R928005891	R928005892
1.0250 ...A00-0-M	R928005925	R928005926	R928005927	R928005928
1.0400 ...A00-0-M	R928005961	R928005962	R928005963	R928005964
1.0630 ...A00-0-M	R928005997	R928005998	R928005999	R928006000
1.1000 ...A00-0-M	R928006033	R928006034	R928006035	R928006036
1.2000 ...A00-0-M	R928041312	R928048158	R928040797	R928041313
1,2500 ...A00-0-M	R928041314	R928046806	R928040800	R928041315

Mechanical optical maintenance indicator

01	02	03	04	05	06	07
W	O	-	S01	-	-	10

01	Maintenance indicator	W
02	mechanical optical indicator	O

Design

03	Back pressure, modular design	S01
----	-------------------------------	-----

Switching pressure

04	0.8 bar [12 psi] (not possible with plastic version)	0,8
	1.5 bar [22 psi] (not possible with plastic version)	1,5
	2.2 bar [32 psi]	2,2

Seal

05	NBR seal	M
	FKM seal	V

Max. nominal pressure

06	10 bar [145 psi]	10
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Housing material

07	Plastic only 2.2 bar [32 psi] possible	PA
	Aluminum	without information

Mechanical optical maintenance indicator

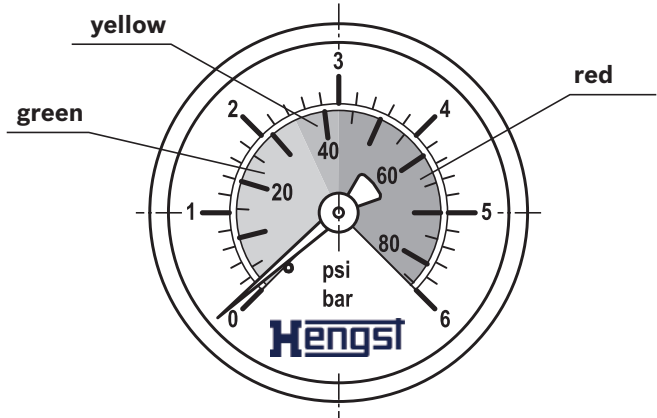
Material no.	Description
R928038773	WO-S01-0.8-M-10
R928038772	WO-S01-0.8-V-10
R928038776	WO-S01-1.5-M-10
R928038774	WO-S01-1.5-V-10
R901025310	WO-S01-2.2-M-10
R901066232	WO-S01-2.2-V-10
R928038771	WO-S01-2.2-M-10-PA
R928038769	WO-S01-2.2-V-10-PA

Ordering code spare parts

Pressure gauge ¹⁾

Material no.	Description
R928019224	M010 0-6 bar [0-87 psi], fluid connection R1/4, Ø 50 mm

¹⁾ When using a pressure gauge, the maximum permissible operating pressure is reduced to 6 bar [87 psi].



Breathing filter element

(only for 10TEN0040-0100) incl. plastic cap

Material no.	Description
R928019705	71.001 P5-S00-0-0

Seal kit

01	02	03	04	05
D	10TE		-	-

01	Seal kit	D
02	Series	10TE

Size

03	0040-0100	N0040-0100
	0160-0250	N0160-0250
	0400-0630	N0400-0630
	1000	N1000
	2000-2500	2000-2500

Seal

04	NBR seal	M
	FKM seal	V

Supplementary information

05	Breathing filter with oil mist separator (only for size 0040-0100)	FN
----	--	----

Seal kit

Material no.	Description
R928028013	D10TEN0040-0100-M
R928028014	D10TEN0160-0250-M
R928028015	D10TEN0400-0630-M
R928039806	D10TEN1000-M
R928039807	D10TE2000-2500-M
R928048445	D10TEN0040-0100-V

Material no.	Description
R928052864	D10TEN0160-0250-V
R928052765	D10TEN0400-0630-V
R928052865	D10TEN1000-V
R928052866	D10TE2000-2500-V
R928048707	D10TEN0040-0100-M-FN
R928048709	D10TEN0040-0100-V-FN

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).
- ▶ Before the assembly, the hole pattern of the tank must be compared to the dimensions from the “Dimensions” chapter.
- ▶ Drain pipes as of a length of approx. 500 mm must be carried in a bracket in order to avoid oscillations caused by the fluid flow in the tank. It is moreover to be ensured that in case of maintenance works, the filter bowl and the outlet pipe are pulled out of the filter head together.
- ▶ 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 and **on** the tank.
- ▶ 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. More details see data sheet 51450

Commissioning

Commission the system.

Notice:

There is no bleeding provided at the filter.

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 51420.
- ▶ 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.
- ▶ Switch off the system, discharge the filter on the pressure side.
- ▶ Screw off the filter cover (NG0040-0100) and/or loosen the screws (from NG0160) and remove the filter over upwards.

Notice:

Note that with lower ratings, it may take slightly longer to discharge the residual oil. If the filter element is removed before running off residue oil, dirty oil can occur on the clean side.

- ▶ Remove the filter element including the filter bowl. From frame size 0160, the filter bowls are equipped with removal brackets.
- ▶ Remove the filter element from the spigot in the filter bowl by rotating it slightly.
- ▶ Clean the filter components, if necessary.
- ▶ Check the seals at filter cover and filter bowl for damage and renew them, if necessary.
For suitable seal kits refer to chapter “Order Codes 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. The torque specifications (“Tightening torques” chapter) are to be observed.

Assembly, commissioning, maintenance

WARNING!

- ▶ Assembly and disassembly only with depressurized system! For the filter element exchange refer to “Maintenance”.
- ▶ Tank is under pressure!
- ▶ Do not exchange the optical/mechanical maintenance indicator while the filter is under pressure!

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])

Tank mounting

Series 10...	TEN0040	TEN0063	TEN0100	TEN0160	TEN0250	TEN0400	TEN0630	TEN1000	TE2000	TE2500
Screw	M10 x 30		M10 x 25				M12 x 25			
Tank mounting										
Quantity	2		4							
Recommended property class of screw			8.8							
Tightening torque with $\mu_{total} = 0.14$			21 Nm \pm 10%				37 Nm \pm 10%			

Connection flange SAE 3000 psi

Series 10...	TEN0040	TEN0063	TEN0100	TEN0160	TEN0250	TEN0400	TEN0630	TEN1000	TE2000	TE2500
Connection variant	Thread			SAE 1 1/4" / SAE 1 1/2"		SAE 2" / SAE 2 1/2"		SAE 3" / SAE 4"		
Tank mounting screw				M10 / M12		M12		M16		
Quantity						4				
Recommended property class of screw	-					8.8				
Tightening torque with $\mu_{total} = 0.14$				33 Nm \pm 10 % / 60 Nm \pm 10 %		60 Nm \pm 10%		137 Nm \pm 10%		

Filter cover

Series 10...	TEN0040	TEN0063	TEN0100	TEN0160	TEN0250	TEN0400	TEN0630	TEN1000	TE2000	TE2500
Screw	Re-tighten by hand until stop, if necessary using an open-end wrench (SW19).			M10		M12				
Filter cover										
Quantity	-					4				
Recommended property class of screw	-					8.8				
Tightening torque with $\mu_{total} = 0.14$	-			21 Nm \pm 10%		37 Nm \pm 10%				

Maintenance indicator

Series	10TEN0040...10TEN1000, 10TE2000, 10TE2500
Tightening torque maintenance indicator, mechanical optical, aluminum, V...	50 Nm \pm 5 Nm
Tightening torque maintenance indicator, mechanical optical, PA, P2,2	35 Nm \pm 3 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 Pressure Equipment Directive 97/23/EC

The return line filters for hydraulic applications according to 51424 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 PEG, 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 explosive areas according to directive 94/9/EC (ATEX)

The tank mounted return line filters according to 51424 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-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 tank mounted return line filters and the electronic maintenance indicators described here can be used for the following explosive areas:

	zone suitability	
Gas	1	2
Dust	21	22

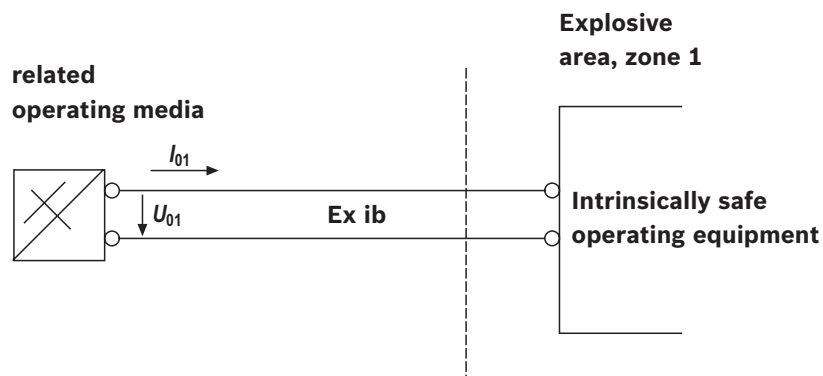
Directives and standardization

Complete filter with mech./opt. Maintenance indicator				
Use /assignment			Gas 2G	Dust 2D
Assignment			Ex II 2G c IIC T6	Ex II 2D c IIC T6
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



Directives and standardization

WARNING!

- | | |
|--|---|
| <ul style="list-style-type: none"> ▶ Explosion hazard due to high temperature!
The temperature depends on the temperature of the medium in the hydraulic circuit and must not exceed the value specified here. Measures are to be taken so that in the explosive area, the max. permissible ignition temperature is not exceeded. ▶ When using the tank mounted return line filters according to 51424 in explosive areas, appropriate | <p>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.</p> <ul style="list-style-type: none"> ▶ During filter element exchanges, the packaging material is to be removed from the replacement element outside the explosive area |
|--|---|

Notices:

- | | |
|--|--|
| <ul style="list-style-type: none"> ▶ Maintenance only by specialists, instruction by the machine end-user acc. to DIRECTIVE 1999/92/EC appendix II, section 1.1 | <ul style="list-style-type: none"> ▶ Functional and safety warranty only applicable when using genuine Hengst spare parts |
|--|--|

Notes

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