

Inline filter

RE 51401
Edition: 2023-06
Replaced: 2021-04

1/14

Types 40 FLEN 0160 to 1000; 40 FLE 0045, 0055, 0120 to 0270

Nominal sizes **according to DIN 24550**: 0160 to 1000
Nominal sizes according to Hengst standard: 0045, 0055, 0120 to 270
Nominal pressure 40 bar
Connections up to SAE 4"
Operating temperature $-10\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$



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Application

- Filtration of pressure fluids and lubricants.
- Filtration of fluids and gases.
- Direct installation into pipe work.
- Direct wear protection of downstream components and systems.
- Offline filtration at high filter service lives.

Features

- Filters for inline installation
- Particularly suited for off-line filtration
- Extremely large filter area
- Flow optimised design due to 3D computer-supported design
- Low pressure drop
- Special highly efficient filter media

Design

Three part modular design comprising of lower filter part with inlet and outlet, mantel tube and removable threaded filter head.

Further design variants available on request.

Filter element

Pleated design with optimised pleat density and various filter media.

For further detailed information please refer to our "Filter Elements" brochure.

The filter element is the most important component of the system "FILTER" in view of prolonged life and wear protection of the system.

The most important criteria for selection are the required degree of cleanliness of the operating medium, the initial pressure differential and the contamination retention capacity.

Accessories

Maintenance indicator

Basically, the filter is equipped with mechanical optical maintenance indicator. The electronic maintenance indicator is connected via the electronic switching element with 1 or 2 switching points, which has to be ordered separately. The electronic switching element is attached to the mechanical optical maintenance indicator and held by means of a locking

ring.

Bypass valve

To protect the filter element during startup and over pressurisation due to clogging.

Characteristic curves

Our software "FilterSelect" makes it possible to optimise filter selection, see download area <http://www.filterselect.de/>.

1) Additional characteristic curves for the filters in this catalogue can be found in the FilterSelect filter calculation programme.

Quality and standardization

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.

The pressure filters for hydraulic applications according to 51401 are pressure holding equipment according to article 1, section 2.1.4 of the pressure equipment directive 97/23/EG (DGRL) However, on the basis of the exception in article 1, section 3.6 of the DGRL hydraulic filters are exempt from the DGRL, if they are not classified higher than category I (guideline 1/19). They do not receive a CE mark.

Ordering code

Of the filter

Of the filter		40				- A		- 0		V2,2-S0							
Pressure 40 bar		= 40														Complementary details	
Design Inline filter with filter element according to DIN 24550		= FLEN														0 = Without	
Inline filter with filter element according to Hengst standard		= FLE														Z ²⁾ = Certificate	
Nom. size FLEN...		= 0160 0250 0400														Material	
		0630 1000														0 = Standard	
FLE...		= 0045 0055 0120														D ¹⁾ = Chemically nickelplated	
		0200 0270														Seal	
Filtration rating µm																M = NBR seal	
Nominal Stainless steel wire mesh, cleanable:																V = FKM seal	
G10, G25		= G...															
Paper, non-cleanable P10		= P...															
Absolute (ISO 16889) Micro glass, non-cleanable																	
PWR3, PWR10, PWR20		= PWR..															
Pressure differential Max. admissible pressure differential of the filter element 30 bar																	
Element model Standard adhesive T = 100 °C																	
Standard material																	
Chemically nickel-plated																	
Solenoid Without																	

Preferred types

Inline filter with bypass, filtration rating 10 µm and nominal pressure 40 bar

Type	Flow [Li/min] → at $v = 30 \text{ mm}^2/\text{s}$ and $\Delta p = 0.8 \text{ bar}$	Material number
40 FLEN 0160 PWR10-A00-07V2,2-S0M00	317	R928000335
40 FLEN 0250 PWR10-A00-07V2,2-S0M00	416	R928000336
40 FLE 0045 PWR10-A00-07V2,2-S0M00	496	R928000340
40 FLE 0055 PWR10-A00-07V2,2-S0M00	537	R928000341
40 FLEN 0400 PWR10-A00-07V2,2-S0M00	885	R928000337
40 FLEN 0630 PWR10-A00-07V2,2-S0M00	1129	R928000338
40 FLE 0120 PWR10-A00-07V2,2-S0M00	1355	R928000342
40 FLEN 1000 PWR10-A00-07V2,2-S0M00	1610	R928000339
40 FLE 0200 PWR10-A00-07V2,2-S0M00	2180	R928000343
40 FLE 0270 PWR10-A00-07V2,2-S0M00	2360	R928000344

Inline filter with bypass, filtration rating 3 µm and nominal pressure 40 bar

Type	Flow [Li/min] → at $v = 30 \text{ mm}^2/\text{s}$ and $\Delta p = 0.8 \text{ bar}$	Material number
40 FLEN 0160 PWR3-A00-07V2,2-S0M00	135	R928000325
40 FLEN 0250 PWR3-A00-07V2,2-S0M00	210	R928000326
40 FLE 0045 PWR3-A00-07V2,2-S0M00	310	R928000330
40 FLE 0055 PWR3-A00-07V2,2-S0M00	385	R928000331
40 FLEN 0400 PWR3-A00-07V2,2-S0M00	390	R928000327
40 FLEN 0630 PWR3-A00-07V2,2-S0M00	610	R928000328
40 FLEN 1000 PWR3-A00-07V2,2-S0M00	715	R928000329
40 FLE 0120 PWR3-A00-07V2,2-S0M00	960	R928000332
40 FLE 0200 PWR3-A00-07V2,2-S0M00	1260	R928000333
40 FLE 0270 PWR3-A00-07V2,2-S0M00	1520	R928000334

Ordering details: Electronic switching element for maintenance indicator

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 M12x1, 4-pole	M12x1
	Rectangular connector, 2-pole, design A according to EN-175301-803	EN175301-803

Material numbers of the electronic switching elements

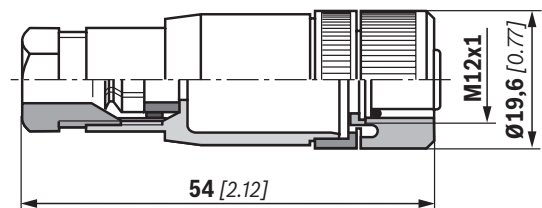
Material no.	Type	Signal	Switching points	Connector	LED
R928028409	WE-1SP-M12x1	Changeover	1	M12x1	Without
R928028410	WE-2SP-M12x1	Normally open (at 75%) / normally closed contact (at 100%)	2		3 pieces
R928028411	WE-2SPSU-M12x1				
R928036318	WE-1SP-EN175301-803	Normally closed contact	1	EN 175301-803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

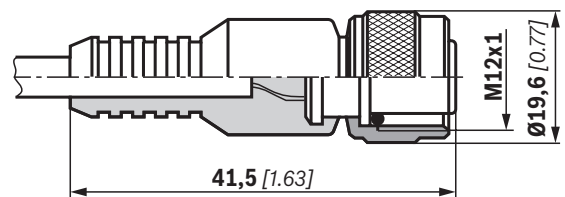


Mating connector suitable for K24-3m 4-pole, M12x1
with potted-in PVC cable, 3 m long.

Line cross-section: 4 x 0.34 mm²

Core marking: 1 brown 2 white
 3 blue 4 black

Material no. R900064381



Order example:

Pressure filter with mechanical optical maintenance indicator for $p_{nom.} = 40 \text{ bar [580 psi]}$ with bypass valve, nominal size 270, with filter element 10 µm and electronic switching element M12x1 with 1 switching point for pressure fluid mineral oil HLP according to DIN 51524.

Filter: 40 FLE 0270 PWR10-A00-07V2,2-S0M00

Material number: R928000344

Maintenance indicator: WE-1SP-M12x1

Material number: R928028409

Filter design

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

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

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

Link FilterSelect:

<http://www.filterselect.de>

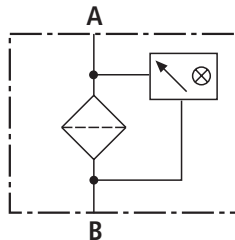
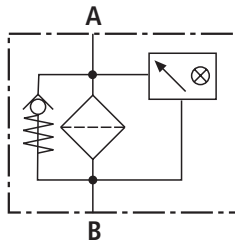
Other languages can be selected using the page navigation.

standard search

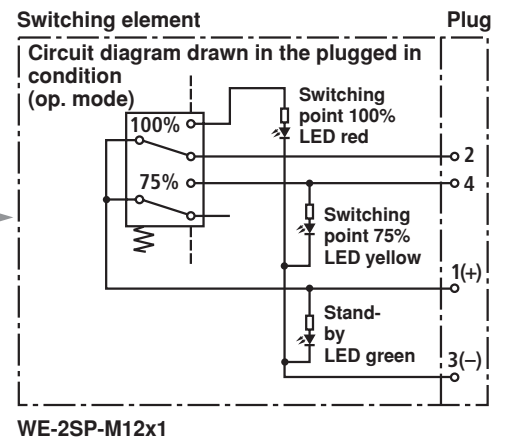
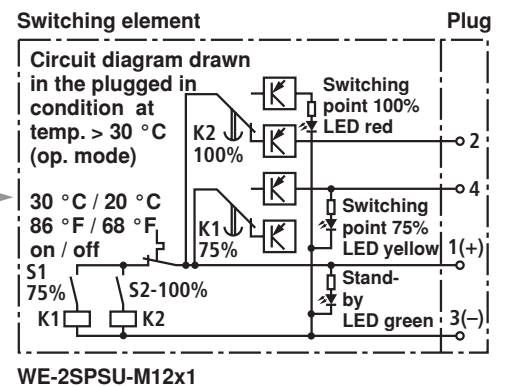
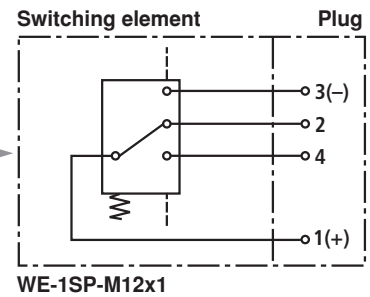
application:	<input type="text" value="hydraulics for industrial use and applications with lubricating oil"/>	
Product category:	<input type="text" value="please select"/>	
type:	<input type="text" value="please select"/>	
pressure range:	<input type="text" value="please select"/>	
filter material:	<input type="text" value="please select"/>	<input style="border: 1px solid black;" type="button" value="?"/>
fineness:	<input type="text" value="please select"/>	
volume flow rate:	<input type="text"/>	<input type="text" value="[l/min]"/>
viscosity:	<input checked="" type="radio"/> kin viscosity 1: <input type="text" value="32"/> [mm ² /s] <input type="button" value="+"/>	
* = working point	<input type="radio"/> search via type of medium <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div> <input type="text" value="please select"/> <input type="text" value="please select"/> </div> <div> full-text search medium <input type="text"/> </div> </div>	
	temp 1: <input type="text"/> [°C] <input type="text"/> [°F] kin viscosity 1: <input type="text"/> [mm ² /s] <input type="button" value="+"/>	
	<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] <input type="button" value="+"/>	
collapse pressure resistance according to ISO 2941:	<input type="text" value="30 bar"/>	
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Symbols

Pressure filter

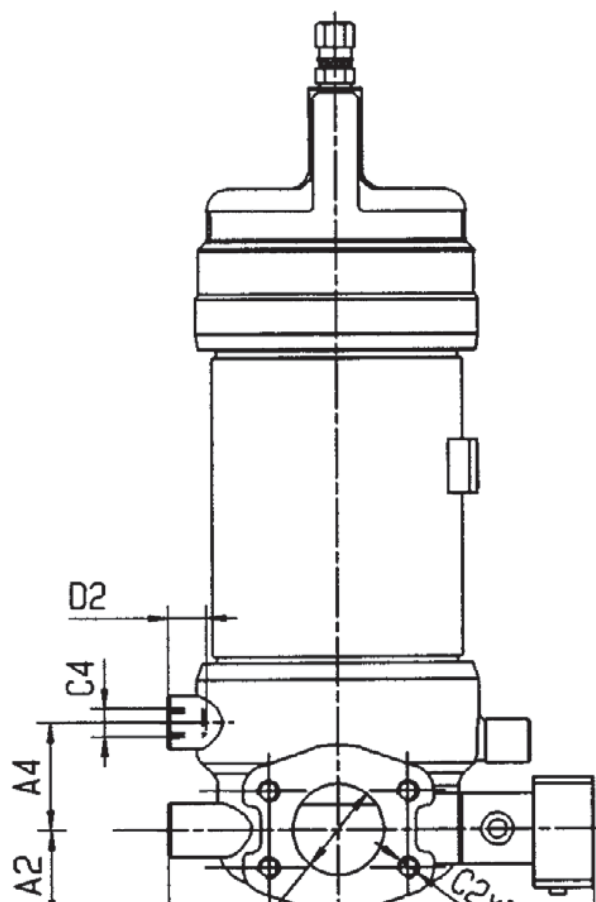


Electronic switching element
for maintenance indicator



Technical data (For applications outside these parameters, please consult us!)**Electronic** (electric switching element)

Electrical connection		Round plug-in connection M12 x 1, 4-pin
Contact load, direct voltage	A	max. 1
Voltage range	E1SP-M12x1 V DC/AC	max. 150
	E2SP V DC	10 to 30
Max. switching capacity with ohmic loads		20 VA; 20 W; (70 VA)
Switching type	E1SP-M12x1	Changeover
	E2SP-M12x1	Normally open at 75% of the response pressure Normally closed at 100% of the response pressure
	E2SPSU-M12x1	Normally open at 75% of the response pressure Normally closed at 100% of the response pressure Signal switching through at 30 °C [86 °F], Return switching at 20 °C [68 °F]
Display via LEDs in the electronic switching element E2SP...		Stand-by (LED green); 75% switching point (LED yellow) 100% switching point (LED red)
Type of protection according to EN 60529		IP 65
For direct voltage above 24 V a spark suppression is to be provided to protect the switching contacts.		
Weight	Electronic switching element: – with round plug-in connection M12 x 1 kg [lbs]	
	0.1 [0.22]	

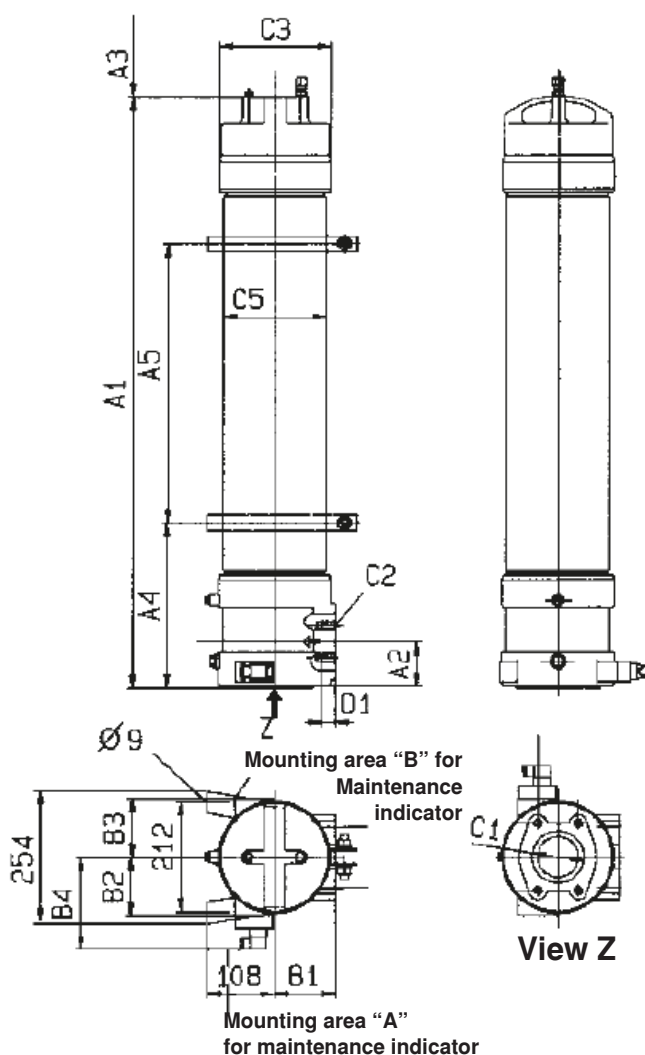
Dimensions: 40 FLEN 0160 - 0630, 40 FLE 0045, 0055, 0120 (dimensions in mm)**Filter housing for filter elements in accordance with DIN 24550**

Type 40 FLEN...	Volume in L	Weight in kg ¹⁾	A1	A2	A3 ²⁾	A4	B1	B2	B3	B4	C1	C2	C3	C4	C5	D1	D2
0160	1.4	12.0	411	49.5	160	60	160	95	143	70	SAE 2" 3000 psi DN50	M12	Ø 158	M16	Ø 140	21	22
0250	2.7	13.2	501		250												
0400	4.0	19.5	543	61.5	250	70	195	105	155	90	SAE 3" 3000 psi DN80	M16	Ø 188	M16	Ø 170	21	20
0630	7.1	21.9	693		400												

Filter housing for filter elements according to Hengst standard

Type 40 FLE...	Volume in L	Weight in kg ¹⁾	A1	A2	A3 ²⁾	A4	B1	B2	B3	B4	C1	C2	C3	C4	C5	D1	D2
0045	4.8	19.0	663	49.5	400	60	160	95	143	70	SAE 2" 3000 psi DN50	M12	Ø 158	M16	Ø 140	21	22
0055	6.8	23.0	831		568												
0120	14	27.4	1050	61.5	750	70	195	105	155	90	SAE 3" 3000 psi DN80	M16	Ø 188	M16	Ø 170	21	20

¹⁾ Weight including standard filter element and maintenance indicator.²⁾ Withdrawal dimension for filter element replacement.

Dimensions: 40 FLEN 1000, 40 FLE 0200 - 0270 (dimensions in mm)**Filter housing for filter elements in accordance with DIN 24550**

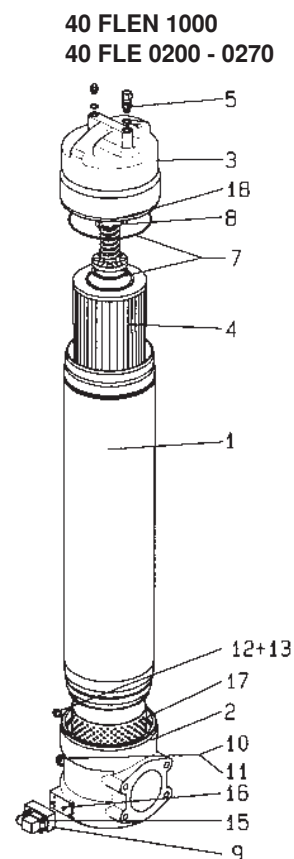
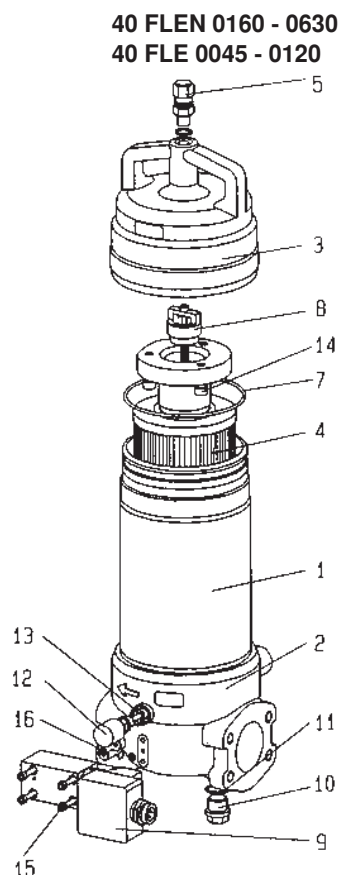
Type 40 FLEN...	Volume in L	Weight in kg ¹⁾	A1	A2	A3 ²⁾	A4	A5	B1	B2	B3	B4	C1	C2	C3	C5	D1
1000	12	50	553	90		260	65	118	113	113	183	SAE 4" 3000 psi DN100	M16	Ø 216	Ø 200	26

Filter housing for filter elements according to Hengst standard

Type 40 FLE...	Volume in L	Weight in kg ¹⁾	A1	A2	A3 ²⁾	A4	A5	B1	B2	B3	B4	C1	C2	C3	C5	D1
0200	22	60	911	90	758	320	310	118	113	113	183	SAE 4" 3000 psi DN100	M16	Ø 188	Ø 200	26
0270	28	70	1145		992		540									

¹⁾ Weight including standard filter element and maintenance indicator.²⁾ Withdrawal dimension for filter element replacement.

Spare parts list



		Size	FLEN		0160	0250			0400	0630		1000			
			FLE				0045	0055			0120		0200	0270	
Part	Piece	Description	Material												
1	1	Filter housing	Various	Please indicate ordering information “Filter”											
2	1	Lower filter part	Various	Please indicate ordering information “Filter”											
3	1	Filter head	Various	Please indicate ordering information “Filter”											
4	1	Filter element	Various	Please indicate ordering information “Filter Element”											
5	1	Bleed screw	5.8	Part No. 4158											
7	3	Seal ring	NBR / FKM	Please indicate ordering information “Filter”											
8	1	Bypass valve	Various	Part No. 5360									Please indicate ordering information “Filter”		
9	1	Clogged indicator	Various	See ordering information “Maintenance indicator”											
10	1	Blanking plug	Steel	Part No. 789											
11	1	Seal ring	Soft steel	Please indicate ordering information “Filter”											
12	1	Locking screw	Various	Part No. 4844											
13	1	Seal ring	Soft steel	Please indicate ordering information “Filter”											
14	3	Socket head cap screw	8.8	Part No. 637					Part No. 652			–			
15	4	Socket head cap screw	8.8	Part No. 633											
16	2	Seal ring	NBR / FKM	Please indicate ordering information “Filter”											
17	1	Protective basket	Steel	–									Part No. 4736		
18	1	Blanking plug	Steel	–									Part No. 795		

All part no.s Hengst specific.

Ordering code

Spare parts

Mechanical/optical maintenance indicator

01	02	03	04	05	06
W	O	–	D01	–	–

01	Maintenance indicator	W
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02	mechanical/optical indicator	O
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Version

03	Design pressure differential M20x1.5	D01
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Switching pressure

04	0.8 bar [11.6 psi]	0,8
	1.5 bar [22 psi]	1,5
	2.2 bar [32 psi]	2,2
	5.0 bar [72.5 psi]	5,0

Seal

05	NBR seal	M
	FKM seal	V

Max. operating pressure

06	Switching pressure 0.8 bar [11.8 psi], 160 bar [2321 psi]	160
	Switching pressure 1.5 bar [21.8 psi], 160 bar [2321 psi]	160
	Switching pressure 2.2 bar [31.9 psi], 160 bar [2321 psi]	160
	Switching pressure 5.0 bar [72.5 psi], 450 bar [6527 psi]	450

Mechanical/optical maintenance indicator

Material no.	Mechanical/optical maintenance indicator
R928038779	WO-D01-0,8-M-160
R928038781	WO-D01-1,5-M-160
R901025312	WO-D01-2,2-M-160
R901025313	WO-D01-5,0-M-450
R928038778	WO-D01-0,8-V-160
R928038780	WO-D01-1,5-V-160
R901066233	WO-D01-2,2-V-160
R901066235	WO-D01-5,0-V-450

The ordering details for filter elements can be found on page 3.

Sealing kits must be ordered by stating the complete part key.

Sealing material and surface coating for pressure fluids

			Ordering detail	
Mineral oils			Sealing material	Element model and material
Mineral oil	HLP	according to DIN 51524	M	...0
Fire-resistant hydraulic fluids				
Emulsions	HFA-E	according to DIN 24320	M	...0
Synthetic water solutions	HFA-S	according to DIN 24320	M	...D
Water solutions	HFC	according to VDMA 24317	M	...D
Phosphate esters	HFD-R	according to VDMA 24317	V	...D
Organic esters	HFD-U	according to VDMA 24317	V	...D
Hydraulic fluids that are fast biodegradable				
Triglycerides (rape seed oil) HETG		according to VDMA 24568	M	...D
Synthetic esters	HEES	according to VDMA 24568	V	...D
Polyglycoles	HEPG	according to VDMA 24568	V	...D

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.

Installation, commissioning and maintenance

Installation

Verify operating pressure with name plate information.

Screw the filter housing (position 1) to the fastening device considering the flow direction (direction arrows) and withdrawal height of the filter element (position 4).

Remove the plugs from the filter inlet and outlets. Fit the filter into the pipe work, ensuring that it is fitted free of tension.

Warning!

Assemble and disassemble the filter only when system is depressurised!

Vessel is under pressure!

When disassembling the filter, please note that the filter inlet and the filter outlet need to be emptied separately!

Remove the filter bowl only if it is not pressurised!

Do not replace the maintenance indicator while the filter is under pressure!

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

Service filter only by trained personnel!

Commissioning

Switch on system pump.

Bleed filter by opening the plug / bleed valve (position 5), close when operating fluid vents.

Maintenance

If the red indicator pin shows out of the logging indicator and/or if the switching process in the electric display is triggered, the filter element is clogged and needs to be replaced or cleaned respectively.

Filter element replacement

Switch of the operating pump.

Open bleed screw (position 5) and relieve pressure.

Open plug Pos. 10 and drain the contaminated oil from the filter housing.

Unscrew upper filter part / filter cover (position 3) and pull filter element from the spigot by rotating it slightly, and remove the same from the filter housing.

Again close plug Pos. 10.

Replace filter elements PWR..., P..., clean the filter element with material G The efficiency of the cleaning process depends on the type of contamination and the value of the pressure differential before the filter element was exchanged.

If the pressure differential after replacing the filter element is more than 50% of the value before replacing the filter element then the G.... element also needs to be replaced.

Install the cleaned or new filter element into the filter housing and with light turning movements push it on to the centering spigot. Beforehand apply some oil to the filter element seal ring. During installation take care to ensure that the filter element is not damaged due to contact on the top edge of the mantel tube.

Check the seal ring Pos. 7 in the mantel tube for damage or wear and replace if necessary. Install filter head by rotating it clock-wise by hand up to the last thread and rotate back 1/4 rotation. Don't use any tools.

Carry out commissioning as described above.

Technical modifications reserved!