

Filter elements

Type 18., for installation in Filtration Group filter housing (previously Mahle Industriefiltration)

RE 51535 Edition:
2021-04 Replaces:
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- Size 10 ... 940
- Differential pressure 10 ... 210 bar
- Filter rating from 3 μm

Features

- Filter media made of glass fiber material, filter paper and wire mesh for various fields of application. Information on filter material configuration is available in RE 51548
- Cleanable wire mesh filter media
- Attainable oil cleanliness class of up to ISO 10/6/4 (ISO 4406)
- High dirt holding capacity and filtration performance due to multi-layer glass fiber technology and simultaneous low initial differential pressure
- Filter elements with high differential pressure stability

Contents

Features 1
Ordering code 2
Configuration possibilities 4
Product description 5
Technical data 6
Assembly, commissioning, maintenance 7
Environment and recycling 7
Guidelines and standards 8
Intended use 9
Improper use 9

Ordering code

Filter element type 18.

01	02	03	04	05	06
18			-	-	0

Design

01 Filter element (for the admissible temperature ranges, refer to chapter "Technical data")	18
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Size

02 according to Filtration Group Size (type 1)	<p>Depending on the selected filter rating and the differential pressure, an additional designation is added to the size.</p> <p>For differential pressure code letter E = 20 bar 10 = P25, 11 = P10, 21 = PWR3, 31 = PWR10, 41 = PWR20, 51 = PWR6, 81 = G10, 82 = G25, 83 = G40, 84 = G60, 85 = G100</p> <p>For differential pressure code letter F = 210 bar 22 = PWR3, 32 = PWR10, 42 = PWR20, 52 = PWR6, 91 = G10, 92 = G25, 93 = G40, 94 = G60, 95 = G100</p>	<p>*05, *08, *11, *15, *30, *45</p>
according to Filtration Group Size (type 2)	<p>Depending on the selected filter rating and the differential pressure, an additional designation is added to the size.</p> <p>For differential pressure code letter A = 30 bar 15 = P25, 13 = P10, 21 = PWR3, 23 = PWR10, 25 = PWR20, 22 = PWR6, 33 = G10, 35 = G25, 36 = G40, 37 = G60, 38 = G100</p>	<p>*016/R, *025/R, *040/R, *063/R</p>
according to Filtration Group Size (type 3)		<p>5, 15, 20, 40, 45, 46, 80, 81, 100, 140, 150, 170, 200, 250, 275, 280, 300, 400, 500, 516, 760, 761, 884, 940, 5060</p>

Filter rating in µm

03 Absolute (ISO 16889)	Glass fiber material PWR... Generation 5, not reusable, not cleanable	<p>PWR1 PWR3 PWR6 PWR10 PWR20</p>
Nominal	Stainless steel wire mesh G, cleanable	<p>G10 G25 G40 G60 G100</p>
	<p>Paper P, not reusable, not cleanable</p> <p>Only configurable with a max. differential pressure of 60 bar [870 psi]</p>	<p>P10 P25</p>

Differential pressure

04 max. admissible differential pressure of the filter element	10 bar [145 psi], only configurable with selected frame sizes, see table Configuration possibilities	Joo
	16 bar [232 psi], only configurable with selected frame sizes, see table Configuration possibilities	Goo
	20 bar [290 psi], only configurable with selected frame sizes, see table Configuration possibilities	Eoo
	30 bar [435 psi], only configurable with selected frame sizes, see table Configuration possibilities	Aoo
	60 bar [870 psi], only configurable with selected frame sizes, see table Configuration possibilities	Doo
	160 bar [2321 psi], only configurable with selected frame sizes, see table Configuration possibilities	Coo
	210 bar [3050 psi], only configurable with selected frame sizes, see table Configuration possibilities	Foo

Bypass valve

05 without	o
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Seal

06 NBR	M
FKM	V

Further filter ratings and seal materials are available on request.

More detailed information on Hengst filter material configurations is available in RE 51548.

Configuration possibilities

Size	Differential pressure code letter						
	A	C	D	E	F	G	J
10		●					
100		●				●	
*05				●	●		
*08				●	●		
*11				●	●		
*15				●	●		
*30				●	●		
*45				●	●		
*016/R	●						
*025/R	●						
*040/R	●						
*063/R	●						
*100/R	●						
140	●	●	●			●	
15						●	
170						●	
179						●	
20		●				●	
200						●	
250						●	
275						●	
280						●	
300						●	
40		●				●	
400							●
45				●		●	
46				●		●	
5		●				●	
500						●	
*60						●	
516						●	
519C						●	
621							
690						●	
753						●	
760						●	
761						●	
80		●				●	
81						●	
822						●	
884							●
940						●	
980							●

● admissible configuration

Product description

The filter element is the main building block of industrial filters. It is in the filter element where the actual filtration takes place.

According to the large range of different housing designs and sizes, there is also a large number of different sizes and designs of inserted filter elements.

The main filter variables, such as retention capacity, dirt holding capacity and pressure loss are determined by the filter elements and the filter media used in them.

Further information on the characteristic values and filter media is available in RE 51548.

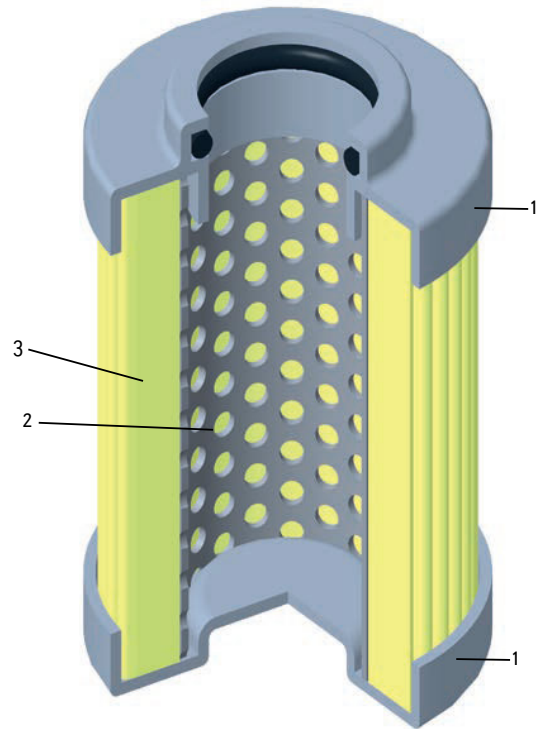
Hengst filter elements are used for filtration of various hydraulic fluids, lubricants and other industrial fluids and gases, depending on the series.

The filtration is usually realized from the outside to the inside. The fluid or gas must flow from the dirt side through the filter element into the clean side. However, in some applications the filtration is also realized from the inside to the outside of the filter element.

In general, Hengst filter elements consist of a combination of star-like, pleated filter media (3) called filter element mat.

The filter element mat is laid around a perforated support tube (2) which gives the set-up the required stability to withstand high pressure differentials.

The filter element mat laid around the support tube is glued to the joint and the two end disks (1) and therefore sealed between the dirt and the clean side. Sealing between the filter element and the filter housing is effectively done by means of seals on the spigot.



Technical data

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

general			
Storage conditions	– Seal NBR	°C [°F]	–40 ... +65 [–40 ... +149]; max. relative air humidity 65%
	– Seal FKM	°C [°F]	–20 ... +65 [–4 ... +149]; max. relative air humidity 65%
Material	– Cover of the filter element		Steel galvanized or tin-coated, aluminum or plastic (depending on the version)
	– Base of the filter element		Steel galvanized or tin-coated, aluminum or plastic (depending on the version)
	– Support tube of the filter element		Steel galvanized or tin-coated (depending on the version)
	– Seals		NBR or FKM
hydraulic			
Filtration direction			from the outside to the inside
Maximum differential pressure		bar [psi]	10 [145], 16 [232], 20 [290], 30 [435], 60 [870], 160 [2320], 210 [3050]

Admissible operating temperature range, depending on material combination

		Operating temperature range °C [°F]	
Filter material configuration	Code letter	Sealing material NBR "M" Adhesive (standard) "0" Material (standard) "0"	Sealing material (FKM) "V" Adhesive (standard) "0" Material (standard) "0"
Stainless steel wire mesh	G...	–40 ... +100 [–40 ... +212]	–20 ... +100 [–4 ... +212]
Glass fiber material PWR...	PWR...	–40 ... +100 [–40 ... +212]	–20 ... +100 [–4 ... +212]
Filter paper	P...	–40 ... +100 [–40 ... +212]	–20 ... +100 [–4 ... +212]

Compatibility with permitted hydraulic fluids

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

Important information on hydraulic fluids!

- For further 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 filter material are to be used instead.

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

Assembly, commissioning, maintenance

When must the filter element be replaced or cleaned?

As soon as the back pressure or the differential pressure setting of the maintenance indicator has been reached, this is indicated by the mechanical/visual maintenance indicator. If an electronic maintenance indicator is provided, an additional electric signal will sound. In this event, the filter element should be replaced or cleaned. It is not advisable to operate a filter housing without a filter element maintenance indicator. In the event that the filter housing is not fitted with a maintenance indicator, we recommend changing or cleaning the filter elements at least every 6 months.

Filter element exchange

Detailed instructions with regard to the filter element exchange can be found in the data sheet of the relevant filter series.

Environment and recycling

- The used filter element has to be disposed of according to the country-specific legal regulations for environmental protection.

WARNING!

- Filters are containers under pressure. Before opening the filter housing, check whether the system pressure in the filter has been decreased to ambient pressure. Only then may the filter housing be opened for maintenance.
- Filter elements must be unpacked outside ATEX zones

Notice:

- If the maintenance indicator alarm is disregarded, the disproportional, increasing differential pressure may damage the filter element (collapse).
- Information on dirt holding capacity characteristic values exclusively refer to the measurement results obtained under laboratory conditions according to ISO 16889. These may deviate from measurements obtained in real applications due to various influencing factors.

It is expected that a higher comparable dirt holding capacity, according to ISO 16889 at a comparable filtration ratio $\beta_{x(c)}$, can be achieved under real operating conditions.

- Warranty expires in the event that the delivered item is changed by the ordering party or third parties or improperly mounted, installed, maintained, repaired, used or exposed to environmental conditions that do not comply with the installation conditions.
- Technical characteristic values such as retention rate and dirt holding capacity have been determined at a temperature of 40 °C (+/- 5 °C).

Guidelines and standards

Hengst filter elements are tested and quality-controlled according to various ISO test standards:

Filtration performance test (multipass test)	ISO 16889:2008-06
Δp (pressure loss) characteristic curves	ISO 3968:2017-07
Compatibility with hydraulic fluid	ISO 2943:1998-11
Collapse pressure test	ISO 2941:2009-04
Fluid technology, hydraulic filters, part 2, evaluation criteria and requirements	DIN 24550-2:2006-09

Use in potentially explosive areas according to directive 2014/34/EU (ATEX):

The filter elements are not equipment or components in the sense of directive 2014/34/EU and are not provided with the CE marking.

It has been proven with the ignition risk analysis that these filter elements do not have own ignition sources according to DIN EN ISO 80079-36.

The filter elements can be used for the following potentially explosive atmospheres:

	Zone suitability	
Gas	1	2
Staub	21	22

WARNING!

- For use of the filter elements in potentially explosive areas, ATEX suitability of the complete filter assembly is an imperative requirement.
- Conductivity of the medium: at least 300 pS/m
- During filter element exchange, the packaging material

is to be removed from the replacement element outside the potentially explosive atmosphere.

- Maintenance to be conducted only by specialists, as per the instruction by the machine end-user according to DIRECTIVE 1999/92/EC appendix II, section 1.1

Intended use

The filter elements serve as components as per the EC Machinery Directive 2006/42/EC in hydraulic machinery for the separation of dirt particles.

The filter elements are to be used under the following boundary conditions and limits:

- Only in hydraulic systems with fluids of group 2, according to Pressure Equipment Directive 2014/68/EU
- only according to the application and environmental conditions in the chapter "Technical data"
- Only in compliance with the specified performance limits in the section "Technical data"
- only with hydraulic fluids and the intended seals according to the section "Compatibility with hydraulic fluids"
- Use in potentially explosive atmospheres according to the chapter "Guidelines and standards"
- Compliance with application and environmental conditions according to the technical data
- Compliance with the specified performance limits
- The filter elements are intended exclusively for professional use and not for private use.

Improper use

Any use deviating from the intended use is deemed as improper and thus not admissible.

Improper use of the filter elements includes:

- Incorrect storage
- Incorrect transport
- Lack of cleanliness during storage and assembly
- Incorrect installation
- Use of inappropriate/non-admissible hydraulic fluids
- Exceedance of the specified maximum pressures and load cycles
- Operation outside the approved temperature range
- Installation and operation in inadmissible device group and category

Hengst Filtration GmbH does not assume any liability for damage caused by improper use. The user assumes all risks involved with improper use.