Maintenance indicators for Hengst Filter

Type WE and WO

RE 51450
Edition: 2025-12
Replaced: 2021-04

H7857_d

- Pressure differential indicators WO for filters in pressure lines
- Backpressure indicators WO for return line filters
- Electronic switching element WE
- Nominal pressure 10, 160 and 450 bar [145, 2321 and 6527 psi]
- Operating temperature WO –30 °C to +100 °C [–22 °F to 212 °F]
- Operating temperature WE –30 °C to +85 °C [–22 °F to 185 °F]

Features

Maintenance indicators serve the monitoring of filters by indicating the exceedance of a pressure differential and/or a back pressure in the filter.

They distinguish themselves by the following:

- Modular structure
- Mechanical/visual indicators WO with one switching point and memory function
- Electronic switching element (WE) with one or two switching points
- Possibility to suppress the signal during cold start
- Optional improved resistance through differential pressure indicators in stainless steel

Inhalt

Ordering code
Mechanical optical maintenance indicator

01		02		03		04		05		06
WO	–		–		–		–		–	

Maintenance indicator

01	mechanical/optical	**WO**

Design

02	Back pressure, connection M30x1,5	**S01**
	Pressure differential, connection M20x1,5	**D01**

Switching pressure

03	**bar** *[psi]*	**S01**	**S01** (PA)	**D01** (160 bar) *[2321 psi]*	**D01** (450 bar) *[6527 psi]*	**D01** (450 bar / VA) *[6527 psi / VA]*	
	0.8 *[11.6]*	●		●			**0,8**
	1.5 *[21.8]*	●		●			**1,5**
	2.2 *[31.9]*	●	●	●	●	●	**2,2**
	5.0 *[72.5]*				●	●	**5,0**
	8.0 *[116]*				●		**8,0**

Seal

04	EPDM seal	**E** [1]
	NBR seal	**M**
	FKM seal	**V**

Maximum operating pressure

05	**S01**	10 bar *[145 psi]*	**10**
	D01	160 bar *[2321 psi]*	**160**
		450 bar *[6527 psi]*	**450**

Supplementary information

06	**Without** supplementary information	**Without**
	Back pressure indicator made of plastic (only with S01-2.2)	**-PA**
	Pressure differential indicator made of stainless steel (only for D01-2.2 and D01-5.0 and max. operating pressure 450 bar *[6527 psi]*)	**-VA** [2]

1) Only in combination with D01 - 450 bar/2.2 bar and D01-450 bar/5 bar and D01 VA

2) Only in combination with FKM or EPDM seal

Order example: WO-D01-2,2-M-450

Material no.: 1009240B

Other versions available on request

Hengst Filtration GmbH, RE 51450, Edition: 2025-12

Ordering code
Mechanical optical maintenance indicator

Material numbers of the mechanical-optical maintenance indicators – Pressure differential

Material no.	Type	Switching pressure in bar *[psi]*	Tolerance in bar *[psi]*	Material	Maximum operating pressure in bar *[psi]*
1000526B	WO-D01-5,0-M-450	5.0 *[72.5]*	±0.5 *[7.3]*	brass	up to 450 *[6527]*
1000531B	WO-D01-5,0-V-450				
1009242B	WO-D01-8,0-M-450	8.0 *[116]*	±0.8 *[11.6]*		
1009241B	WO-D01-8,0-V-450				
1009240B	WO-D01-2,2-M-450	2.2 *[31.9]*	±0.3 *[4.4]*		
1009239B	WO-D01-2,2-V-450				
1000525B	WO-D01-2,2-M-160	2.2 *[31.9]*	±0.3 *[4.4]*	Aluminium	up to 160 *[2321]*
1000530B	WO-D01-2,2-V-160				
1009238B	WO-D01-1,5-M-160	1.5 *[21.8]*	±0.2 *[2.9]*		
1009237B	WO-D01-1,5-V-160				
1009236B	WO-D01-0,8-M-160	0.8 *[11.6]*	±0.15 *[2.2]*		
1009235B	WO-D01-0,8-V-160				
1017017B	WO-D01-2,2-V-450-VA	2.2 *[31.9]*	±0.3 *[4.4]*	Stainless steel	up to 450 *[6527]*
1017244B	WO-D01-2,2-E-450-VA				
1016682B	WO-D01-5,0-V-450-VA	5.0 *[72.5]*	±0.5 *[7.3]*		
1017243B	WO-D01-5,0-E-450-VA				

Material numbers of the mechanical-optical maintenance indicators – Back pressure

Material no.	Type	Switching pressure in bar *[psi]*	Tolerance in bar *[psi]*	Material	Maximum operating pressure in bar *[psi]*
1000524B	WO-S01-2,2-M-10	2.2 *[31.9]*	±0.3 *[4.4]*	Aluminium	up to 10 *[145]*
1000529B	WO-S01-2,2-V-10				
1009234B	WO-S01-1,5-M-10	1.5 *[21.8]*	±0.2 *[2.9]*		
1009233B	WO-S01-1,5-V-10				
1009232B	WO-S01-0,8-M-10	0.8 *[11.6]*	±0.15 *[2.2]*		
1009231B	WO-S01-0,8-V-10				
1009230B	WO-S01-2,2-M-10-PA	2.2 *[31.9]*	± 0.44 *[6.4]*	PA6.6	up to 10 *[145]*
1009229B	WO-S01-2,2-V-10-PA		± 0.3 *[4.4]*		

Ordering code
Accessories

(dimensions in mm *[inch]*)

Electronic switching element for maintenance indicators

01		02		03
WE	–		–	

Maintenance indicator

01	Electronic switching element	**WE**

Type of signal

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

Connector

03	Round plug-in connection M12x1, 4-pole	**M12x1**
	Rectangular connector, 2-pole, design A according to EN-175301-803	**EN175301-803**

Material numbers of the electronic switching elements

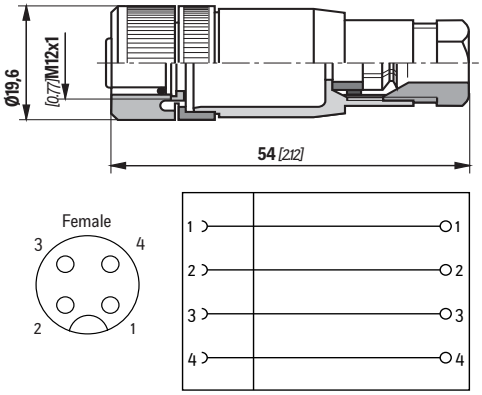
Material no.	Type	Signal	Switching points	Connector	LED
1006503B	WE-1SP-M12x1	Changeover	1	M12x1	none
1006504B	WE-2SP-M12x1	Normally open (at 75%) / normally closed contact (at 100%)	2		3 pieces
1006505B	WE-2SPSU-M12x1				
1008297B	WE-1SP-EN175301-803	Normally closed contact	1	EN 175301-803	none

Junction boxes

for electronic switching element with round plug-in connection

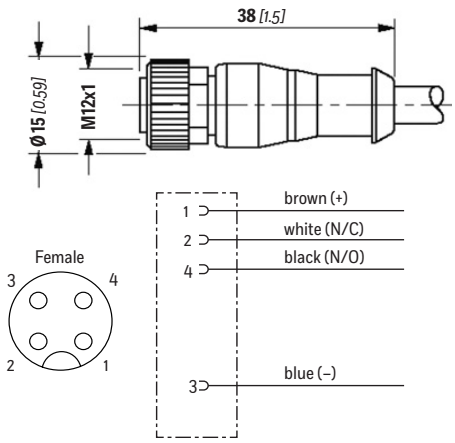
Cable socket: ACC-LD-G-PG9-250VAC/VDC

Cable gland:	Pg9
Screw terminal:	M12x1, 4-pole
Protection class:	IP67
Ambient temperature:	-40 to 85 °C
Conductor cross-section:	4 x 0.75 mm²
Operating voltage:	250 V AC/DC
Maximum operating current per contact:	4 A
Rated voltage:	n/a
Material-No.:	**1000460B**



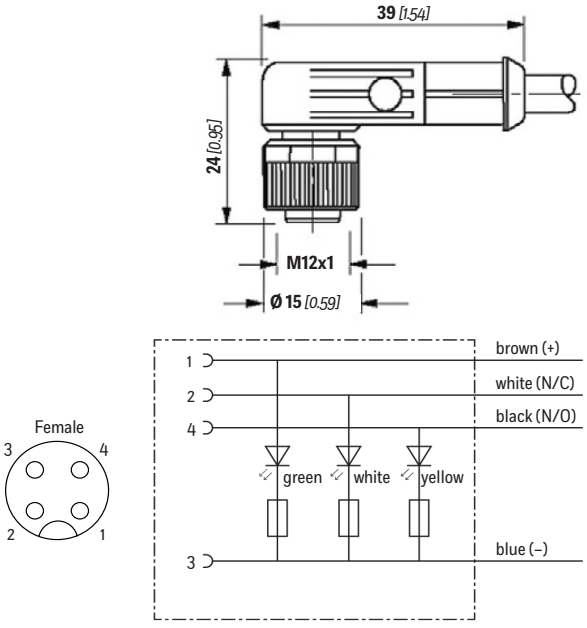
Cable socket: ACC-LD-G-K3-4P-250VAC/VDC

Cable length/diameter:	3 m/4.7 mm
Protection class:	IP65
Ambient temperature:	-40 to 80 °C
Screw terminal:	M12x1, 4-pole
Conductor cross-section:	4 x 0.34 mm²
Operating voltage:	250 V AC/DC
Maximum operating current per contact:	4 A
Rated voltage:	2.5 kV
Material-No.:	**1000466B**



Cable socket: ACC-LD-W-K5-4P-24VDC-LED

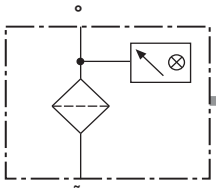
Cable length/diameter:	5 m/5.2 mm
Protection class:	IP65
Ambient temperature:	-5 to 80 °C
Screw terminal:	M12x1, 4-pole
Conductor cross-section:	4 x 0.34 mm²
Operating voltage:	24 V DC
Maximum operating current per contact:	4 A
Rated voltage:	0.8 kV
LED configuration:	green: Energy; yellow: Signal S1; white: Signal S2
Material-No.:	**1056845B**

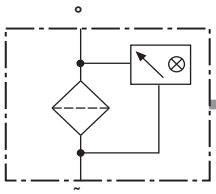


Symbols

A line filter as an example

mechanical/optical back pressure indicator with a return flow filter without bypass





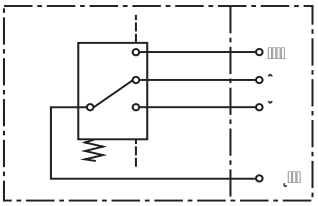
mechanical/optical pressure differential indicator with a line filter without bypass

Electronic switching element

for maintenance indicator

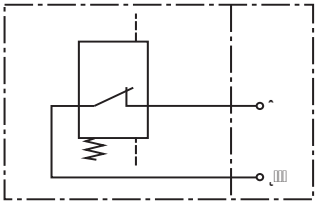
Circuit diagrams drawn in the plugged-in state (operating state)

Switching element Connector



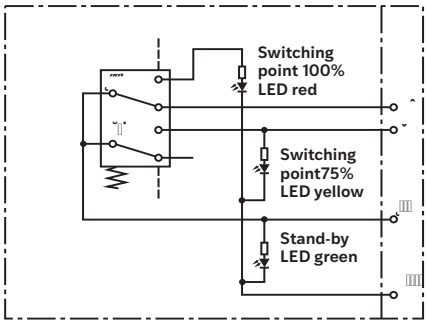
WE-1SP-M12x1

Switching element Connector



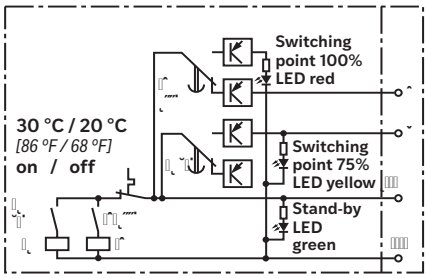
WE-1SP-EN175301-803

Switching element Connector



WE-2SP-M12x1

Switching element Connector



WE-2SPSU-M12x1

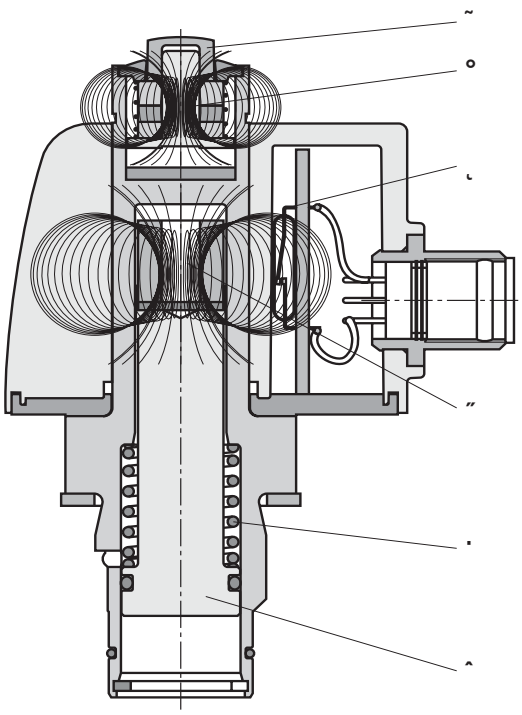
Operating state at temperatures > 30 °C [86 °F]

Function, section

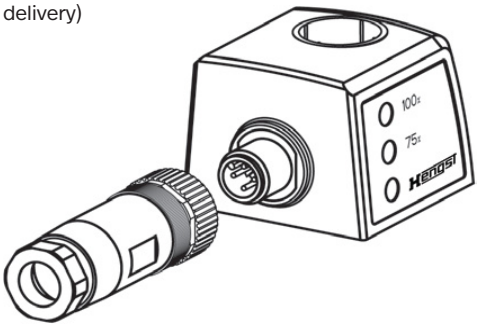
By default, the Hengst filters are supplied with a mechani-cal/visual maintenance indicator (WO). The electronic switching element (WE) is available as accessory and compatible with all mechanical/visual maintenance indicators. The electronic switching element is attached to the visual maintenance indicator and fixed by means of a locking ring. The electronic maintenance indicator is not dependent on the nominal pressure of the filter.

The increasing back pressure and/or pressure differential pushes a piston (1) against a spring (2) upwards. The solenoid (3) mounted on the piston is moved together with the piston. The visual pin (4) may take two valid positions. If the position of the piston (1) with solenoid (3) is below the nominal pressure of the maintenance indicator, the visual pin remains in retracted “rest position”. Upon first exceedance of the nominal pressure, the position of the visual pin (5) is changed rapidly into the second possible “On condition” by repellence of the solenoid of the pin (5) to the solenoid of the piston (3). The pin will permanently remain in this extended position, even visible after machine switch-off (or pressure drop, cold start) (memory function). It has to be acknowledged.

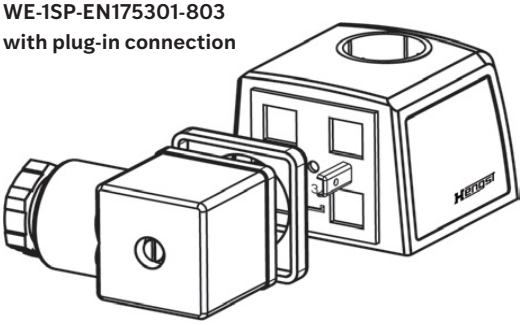
The reed contact (6) integrated in the switching element is actuated by the change in the magnetic field. For two switching points, two reed contacts are installed. For the WE-2SPSU electronic switching element, the temperature for temperature suppression is derived via the housing of the mechanical-optical maintenance indicator. The WE-2SPSU electronic switching element is not suitable for the mechanical-optical maintenance indicator made of polyamide (WO-S01-2,2-...-PA).



WE-2SP-M12x1
with connection socket (not included in the scope of delivery)



WE-1SP-EN175301-803
with plug-in connection



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

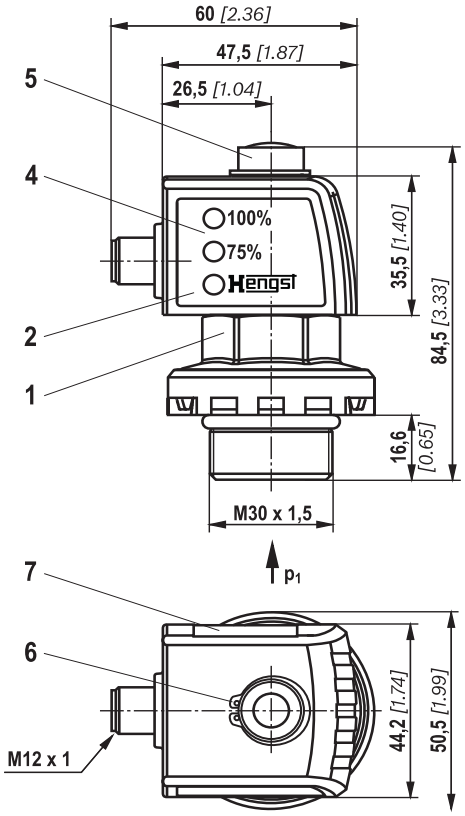
Mechanical optical maintenance indicator				
Version	D01 (450 bar) *[6527 psi]*	D01 (160 bar) *[2321 psi]*	S01	S01 (PA)
Material	Stainless steel or brass	Aluminium	Aluminium	PA6.6

Seal material		NBR	FKM	EPDM
Temperature range	°C *[°F]*	–30…+100 *[–22…212]*	–20 …+120 *[–4…248]*	–30 …+120 *[–22…248]*

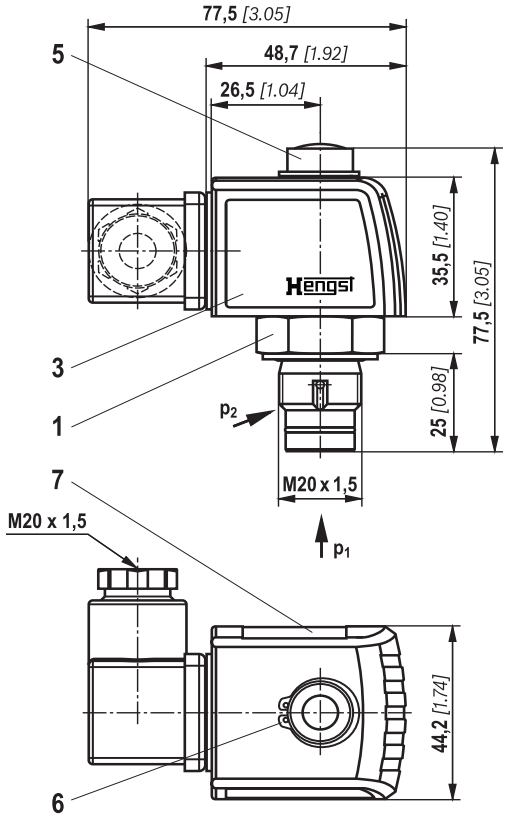
electric (electronic switching element)					
Electrical connection		Round plug-in connection M12x1, 4-pole			Standard connection EN 175301-803
	Version	WE-1SP-M12x1	WE-2SP-M12x1	WE-2SPSU-M12x1	WE-1SP-EN175301-803
Contact load, direct voltage	$A_{max.}$	1			
Voltage range	$V_{max.}$	150 (AC/DC)	10 … 30 (DC)		250 (AC)/200 (DC)
max. switching power with resistive load	W	20			70
Switching type – 75% signal		–	Normally open contact		– Normally closed contact
– 100% signal		Changeover	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			IP 65
Ambient temperature range	°C *[°F]*	–25 … +85 *[–13 … +185]*			
For direct voltage above 24 V, spark extinguishing is to be provided in order to protect the switching contacts.					
Weight electronic switching element	kg *[lbs]*	0.1 *[0.22]*			

Dimensions: Maintenance indicator
(dimension in mm *[inch]*)

Back pressure indicator with mounted switching element



Pressure differential indicator with mounted switching element



1 Mechanical optical maintenance indicator; max. tightening torque $M_{A\ max}$ = 50 Nm *[36.88 lb-ft]* tightening torque for back pressure indicator in PA6.6 $M_{A\ max}$ = 35 Nm *[25.82 lb-ft]*
2 Switching element with locking ring for electrical maintenance indicator (rotatable by 360°); round plug-in connection M12x1, 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: green: stand-by yellow: switching point 75% red: switching point 100%
5 Optical indicator with memory function
6 Locking ring DIN 471-16x1
7 Name plate

RE 51450, Edition: 2025-12, **Hengst Filtration GmbH**

Installation, operating and maintenance instructions

Connection of the electronic switching elements
By default, the filter is equipped with mechanical/visual maintenance indicator WO. The electronic switching element is attached to the mechanical/visual maintenance indicator and fixed by means of a locking ring.

What must generally be observed with Hengst filters:
- Components must always be assembled without tension stress.
- The filter housing must always be grounded.

When has the filter element to be replaced or cleaned?
- The filter element is to be exchanged after initial commissioning of the system.
- Upon start-up in cold condition, the red pushbutton of the visual maintenance indicator (4) may jump out and an electrical signal is output via the switching element. Only push the red pushbutton in again after the operating temperature has been reached. If it jumps out again immediately or if the electric signal has not gone out at operating temperature, the filter element must be exchanged or cleaned respectively.
- The filter element should be replaced or cleaned after max. 6 months.

Tightening torque of 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
Compatibility with hydraulic fluid	ISO 2943:1998-11

Hengst products are developed, manufactured and assembled as part of a certified quality management system in accordance with ISO 9001:2015. The relevant standards and directives can be found in the CE Declaration of Conformity.

Use in potentially explosive areas according to directive 2014/34/EU

These maintenance indicator according to 51450 are not equipment or components in terms of Directive 2014/34/EU and are not provided with the CE mark. It has been proven with the ignition risk analysis that these inline filters do not have own ignition sources acc. to DIN EN ISO 80079-36.

The electronic maintenance indicators with one switching point:
WE-1SP-M12x1 **1006503B**
WE-1SP-EN175301-803 **1008297B**
are, according to DIN EN 60079-11:2012, simple, electronic operating equipment without own voltage source.

According to DIN EN 60079-14:2014, in intrinsically safe electric circuits (Ex ib), this simple, electronic operating equipment may be used in systems without marking and certification.
The electronic maintenance indicators described here can be used for the following potentially explosive areas:

	Zone suitability	
Gas	1	2
Dust	21	22

☞ **Note:**
Maintenance indicators with EC type examination certificate upon request.

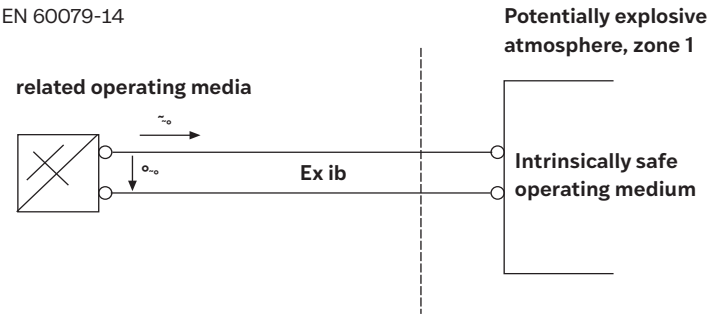
Complete filter with mech/opt. maintenance indicator			
Use /assignment		**Gas 2G**	**Dust 2D**
Assignment [1]		Ex h IIC T4...T1 Gb	Ex h IIC T100°C...T450°C Db
Conductivity of the medium pS/m	min	300	
Dust accumulation	max	–	0.5 mm

Electronic switching element in the intrinsically safe electric circuit			
Use /assignment		**Gas 2G**	**Dust 2D**
Assignment		Ex II 2G Ex ib IIB T4 Gb	Ex II 2D Ex ib IIIC T100°C Db
adm. intrinsically safe electric circuits		Ex ib IIC, Ex ic IIC	Ex ib IIIC
Technical data		**Values only for intrinsically safe electric circuit**	
Switching voltage Ui	max	150 V AC/DC	
Switching current Ii	max	1.0 A	
Switching power Pi	max	1.3 W T4 T_{max} 40 °C	750 mW T_{max} 40 °C
	max	1.0 W T4 T_{max} 80 °C	550 mW T_{max} 100 °C
Surface temperature	max	–	100 °C
Inner capacity Ci		neglectable	
Inner inductivity Li		neglectable	
Dust accumulation	max	–	0.5 mm

[1] The temperature depends on the temperature of the medium in the filter and must not exceed the value specified here.

Directives and standardization

Possible circuit according to DIN EN 60079-14



⚠ WARNING!

- Risk of explosion 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 to ensure that the maximum permissible ignition temperature is not exceeded in the potentially explosive atmosphere.
- When using filters in potentially explosive atmospheres, adequate equipotential bonding must be ensured. The filters should preferably be grounded via the mounting screws. Here, please note that paintings and oxidic protective layers are not electrically conductive.
- During filter element change-outs, the packaging material is to be removed from the replacement element outside the potentially explosive area.

⚠ Notes:

- Maintenance by specialist staff only. Instruction by the machine end-user according to DIRECTIVE 1999/92/EC appendix II, section 1.1
- Functional and safety warranty only applicable when using genuine Hengst spare parts.

Use

Intended use
The maintenance indicators and switching elements serve as components within the meaning of the EC Machinery Directive 2006/42/EC in hydraulic machines for filters for the separation of dirt particles.

The components are used under the following boundary conditions and limits:
- Only in systems with fluids of group 2, according to Pressure Equipment Directive 2014/68/EU
- Only according to the application and environmental conditions in the section "Technical data"
- Only in compliance with the specified performance limits in the section “Technical data"; extended operational durability/load cycles on request
- Only with hydraulic fluids and the seals provided for this purpose according to the chapter “Compatibility with hydraulic fluids” of the filter data sheets
- Use in potentially explosive areas according to the section "Directives and standardization".
- The instructions for the operating modes in the chapter "Installation, operating and maintenance instructions" must be followed
- Compliance with application and environmental conditions according to the technical data
- Compliance with the specified performance limits
- Use in the original condition, without damage
- Maintenance work is only permitted with original Hengst spare parts. Repair by the customer, particularly at pressurized components, is not permissible.
- The components are intended exclusively for professional use and not for private use.

Improper use
Any use deviating from the intended use is improper and thus not permissible.

Improper use of the components includes:
- Incorrect storage
- Incorrect transport
- Lack of cleanliness during storage and assembly
- Incorrect installation
- Use of inappropriate/non-permissible hydraulic fluids
- Exceedance of the specified maximum pressures and load cycles
- Operation outside the approved temperature range
- Installation and operation in a not-permissible device group or category
- Operation outside the specified limits for the operating voltage, see the section "Technical data"

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

Environment and recycling

- At the end of the service life of the filter, the filter components can be recycled according to the countryspeci-fic statutory environmental protection regulations.

Translation table (Rexroth material number to Hengst material number)

Hengst filter material no.	Type code material no. mechanical-optical maintenance indicators – differential pressure	Rexroth filter material no.
1000526B	WO-D01-5,0-M-450	R901025313
1000531B	WO-D01-5,0-V-450	R901066235
1009242B	WO-D01-8,0-M-450	R928038785
1009241B	WO-D01-8,0-V-450	R928038784
1009240B	WO-D01-2,2-M-450	R928038783
1009239B	WO-D01-2,2-V-450	R928038782
1000525B	WO-D01-2,2-M-160	R901025312
1000530B	WO-D01-2,2-V-160	R901066233
1009238B	WO-D01-1,5-M-160	R928038781
1009237B	WO-D01-1,5-V-160	R928038780
1009236B	WO-D01-0,8-M-160	R928038779
1009235B	WO-D01-0,8-V-160	R928038778
1017017B	WO-D01-2,2-V-450-VA	R928055341
1017244B	WO-D01-2,2-E-450-VA	R928055606
1016682B	WO-D01-5,0-V-450-VA	R928054976
1017243B	WO-D01-5,0-E-450-VA	R928055605
mechanical-optical maintenance indicators – back pressure		
1000524B	WO-S01-2,2-M-10	R901025310
1000529B	WO-S01-2,2-V-10	R901066232
1009234B	WO-S01-1,5-M-10	R928038776
1009233B	WO-S01-1,5-V-10	R928038774
1009232B	WO-S01-0,8-M-10	R928038773
1009231B	WO-S01-0,8-V-10	R928038772
1009230B	WO-S01-2,2-M-10-PA	R928038771
1009229B	WO-S01-2,2-V-10-PA	R928038769

Hengst filter material no.	Type code	Rexroth filter material no.
electronic switching elements		
1006503B	WE-1SP-M12x1	R928028409
1006504B	WE-2SP-M12x1	R928028410
1006505B	WE-2SPSU-M12x1	R928028411
1008297B	WE-1SP-EN175301-803	R928036318
Junction boxes		
1000460B	ACC-LD-G-PG9-50VAC/VDC	R900031155
1056845B	ACC-LD-W-K5-4P-24VDC-LED	----------
1000466B	ACC-LD-G-K3-4P-250VAC/VDC	R901426552

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