# Inline filter with filter element according to DIN 24550

## Type 350LEN0040 to 1000; 350LE0130, 0150

**RE 51422**
Edition: 2021-04
Replaces: -


350LEN_d

- Size as per **DIN 24550**: 0040 to 1000
- Other sizes: 0130, 0150
- Nominal pressure: 350 bar *[5,079 psi]*
- Connection sizes up to G2; SAE 2"; SAE 24
- Operating temperature: -10 °C to 100 °C *[14 °F to 212 °F]*

## Features

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

They come with the following features:

- Filter for inline installation
- Special, highly efficient filter materials
- Filtration of very fine particles and high dirt holding capacity across a broad pressure differential range
- High collapse rating of the filter elements
- Equipped standard with mechanical optical maintenance indicator with memory function
- Various, optional electronic switching elements, modular design
- Optional bypass valve integrated in the filter housing
- High filtration performance due to tangential, cyclonic flow path
- Additional configurations available for special fluids

## Contents

## Filter ordering code

| 01 | 02 | 03 | | 04 | 05 | 06 | | 07 | | 08 | | 09 | | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **350LE** | | | **–** | | | | **–** | | **–** | | **–** | | **–** | |

**Series**

| | | |
|---|---|---|
| 01 | Inline filter, 350 bar *[5,079 psi]* | **350LE** |

**Filter element**

| | | |
|---|---|---|
| 02 | With filter element as per **DIN 24550** | **N** |

**Size**

| | | |
|---|---|---|
| 03 | LEN...<br>(Filter element as per **DIN 24550**) | **0040**<br>**0063**<br>**0100**<br>**0160**<br>**0250**<br>**0400**<br>**0630**<br>**1000** |
| | LE...<br>(Filter element as per **Hengst standard**) | **0130**<br>**0150** |

**Filter rating in µm**

| | | | |
|---|---|---|---|
| 04 | **Absolute**<br>**(ISO 16889; $\beta_{x(c)} \geq 200$)** | Glass fiber material, not cleanable | **PWR3**<br>**PWR6**<br>**PWR10**<br>**PWR20** |
| | **Nominal** | Stainless steel wire mesh, cleanable | **G10**<br>**G25**<br>**G40**<br>**G60**<br>**G100** |

**Pressure differential**

| | | |
|---|---|---|
| 05 | Max. admissible filter element pressure differential: 30 bar *[435 psi]*, filter **with** bypass valve | **A** |
| | Max. admissible filter element pressure differential: 330 bar *[4,786 psi]*, filter has **no** bypass valve | **B** |

**Element design**

| | | |
|---|---|---|
| 06 | Standard adhesive with galvanized steel | **00** |
| | Special adhesive with stainless steel | **HV** [1)] |

**Maintenance indicator**

| | | |
|---|---|---|
| 07 | Maintenance indicator, mech. visual, switching pressure: 2.2 bar *[32 psi]* – bypass cracking pressure: 3.5 bar *[51 psi]* | **V2.2** |
| | Maintenance indicator, mech. visual, switching pressure: 5.0 bar *[72.5 psi]* – bypass cracking pressure: 7 bar *[102 psi]* | **V5.0** |
| | Maintenance indicator, mech. visual, switching pressure 8.0 bar *[116 psi]* – **no** bypass valve | **V8.0** |

**Seal**

| | | |
|---|---|---|
| 08 | NBR seal | **M** |
| | FKM seal | **V** |
| | EPDM seal | **E** [2)] |

## Filter ordering code

| 01 | 02 | 03 | | 04 | 05 | 06 | | 07 | | 08 | | 09 | | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **350LE** | | | – | | | | – | | – | | – | | – | |

**Connection**

| 09 | Installation size | | 0040 | 0063-0100 | 0130-0150 | 0160-0400 | 0630-1000 | |
|---|---|---|---|---|---|---|---|---|
| | **Connection** | | | | | | | |
| | G1/2 | Pipe thread as per ISO 228 | ● | X | | | | **R2** |
| | G3/4 | | X | X | | | | **R3** |
| | G1 | | X | ● | X | | | **R4** |
| | G1 1/4 | | | | ● | X | | **R5** |
| | G1 1/2 | | | | X | ● | | **R6** |
| | G2 | | | | | | ● | **R8** |
| | SAE 1 1/2" | SAE flange 6,000 psi | | | | X | | **S6** |
| | SAE 2" | | | | | | X | **S8** |
| | SAE 10" | Pipe thread as per SAE J1926 | X | | | | | **U3** |
| | SAE 12" | | | X | | | | **U4** |
| | SAE 20" | | | | X | | | **U5** |
| | SAE 24" | | | | | X | | **U6** |
| | ● Standard connection<br>X Alternative connection option | | | | | | | |

**Supplementary information**

| 10 | Manufacturer's inspection certificate M as per DIN 55350 T18 | **Z1** |
|---|---|---|

1) Only with FKM or EPDM seal
2) Only with maintenance indicator V5.0

**Order example:**
**350LEN0100-PWR10A00-V5.0-M-R4**

**Other versions are available on request.**

## Preferred types

### 350LE(N), flow specifications for 30 mm²/s *[143 SUS]*

#### Inline filter, 3 µm filter rating

| Type | Flow in l/min *[US gpm]* whereas **Δ*p* = 1.5 bar** *[21.76 psi]* [1)] | Material no. Filter | | | | Replacement element material no. |
|---|---|---|---|---|---|---|
| 350LEN0040-PWR3A00-V5.0-M-... | 32 *[8.5]* | ...R2 | **R928033024** | ...U3 | **R928033216** | **R928006645** |
| 350LEN0063-PWR3A00-V5.0-M-... | 48 *[12.7]* | ...R4 | **R928033025** | ...U4 | **R928033217** | **R928006699** |
| 350LEN0100-PWR3A00-V5.0-M-... | 64 *[16.9]* | ...R4 | **R928033026** | ...U4 | **R928033218** | **R928006753** |
| 350LE0130-PWR3A00-V5.0-M-... | 103 *[27.2]* | ...R5 | **R928033027** | ...U5 | **R928033219** | **R928022274** |
| 350LE0150-PWR3A00-V5.0-M-... | 127 *[33.6]* | ...R5 | **R928033028** | ...U5 | **R928033220** | **R928022283** |
| 350LEN0160-PWR3A00-V5.0-M-... | 160 *[42.3]* | ...R6 | **R928033029** | ...U6 | **R928033221** | **R928006807** |
| 350LEN0250-PWR3A00-V5.0-M-... | 267 *[70.5]* | ...R6 | **R928033030** | ...U6 | **R928033222** | **R928006861** |
| 350LEN0400-PWR3A00-V5.0-M-... | 335 *[88.5]* | ...R6 | **R928033031** | ...U6 | **R928033223** | **R928006915** |
| 350LEN0630-PWR3A00-V5.0-M-... | 449 *[118.6]* | ...R8 | **R928034432** | ...S8 | **R928034448** | **R928006969** |
| 350LEN1000-PWR3A00-V5.0-M-... | 597 *[157.7]* | ...R8 | **R928034433** | ...S8 | **R928034449** | **R928007023** |

#### Inline filter, 6 µm filter rating

| Type | Flow in l/min *[US gpm]* whereas **Δ*p* = 1.5 bar** *[21.76 psi]* [1)] | Material no. Filter | | | | Replacement element material no. |
|---|---|---|---|---|---|---|
| 350LEN0040-PWR6A00-V5.0-M-... | 41 *[10.8]* | ...R2 | **R928033280** | ...U3 | **R928033472** | **R928006646** |
| 350LEN0063-PWR6A00-V5.0-M-... | 69 *[18.2]* | ...R4 | **R928033281** | ...U4 | **R928033473** | **R928006700** |
| 350LEN0100-PWR6A00-V5.0-M-... | 104 *[27.5]* | ...R4 | **R928033282** | ...U4 | **R928033474** | **R928006754** |
| 350LE0130-PWR6A00-V5.0-M-... | 125 *[33]* | ...R5 | **R928033283** | ...U5 | **R928033475** | **R928022275** |
| 350LE0150-PWR6A00-V5.0-M-... | 135 *[35.7]* | ...R5 | **R928033284** | ...U5 | **R928033476** | **R928022284** |
| 350LEN0160-PWR6A00-V5.0-M-... | 265 *[70]* | ...R6 | **R928033285** | ...U6 | **R928033477** | **R928006808** |
| 350LEN0250-PWR6A00-V5.0-M-... | 320 *[84.5]* | ...R6 | **R928033286** | ...U6 | **R928033478** | **R928006862** |
| 350LEN0400-PWR6A00-V5.0-M-... | 400 *[105.7]* | ...R6 | **R928025783** | ...U6 | **R928033479** | **R928006916** |
| 350LEN0630-PWR6A00-V5.0-M-... | 520 *[137.4]* | ...R8 | **R928034464** | ...S8 | **R928034480** | **R928006970** |
| 350LEN1000-PWR6A00-V5.0-M-... | 635 *[167.8]* | ...R8 | **R928034465** | ...S8 | **R928034481** | **R928007024** |

#### Inline filter, 10 µm filter rating

| Type | Flow in l/min *[US gpm]* whereas **Δ*p* = 1.5 bar** *[21.76 psi]* [1)] | Material no. Filter | | | | Replacement element material no. |
|---|---|---|---|---|---|---|
| 350LEN0040-PWR10A00-V5.0-M-... | 51 *[13.5]* | ...R2 | **R928033536** | ...U3 | **R928033728** | **R928006647** |
| 350LEN0063-PWR10A00-V5.0-M-... | 76 *[20.1]* | ...R4 | **R928033537** | ...U4 | **R928033729** | **R928006701** |
| 350LEN0100-PWR10A00-V5.0-M-... | 100 *[26.4]* | ...R4 | **R928033538** | ...U4 | **R928033730** | **R928006755** |
| 350LE0130-PWR10A00-V5.0-M-... | 191 *[50.5]* | ...R5 | **R928025653** | ...U5 | **R928033731** | **R928022276** |
| 350LE0150-PWR10A00-V5.0-M-... | 202 *[53.4]* | ...R5 | **R928028868** | ...U5 | **R928033732** | **R928022285** |
| 350LEN0160-PWR10A00-V5.0-M-... | 261 *[69]* | ...R6 | **R928033541** | ...U6 | **R928033733** | **R928006809** |
| 350LEN0250-PWR10A00-V5.0-M-... | 330 *[87.2]* | ...R6 | **R928033542** | ...U6 | **R928033734** | **R928006863** |
| 350LEN0400-PWR10A00-V5.0-M-... | 409 *[108.1]* | ...R6 | **R928033543** | ...U6 | **R928033735** | **R928006917** |
| 350LEN0630-PWR10A00-V5.0-M-... | 590 *[155.9]* | ...R8 | **R928034496** | ...S8 | **R928034512** | **R928006971** |
| 350LEN1000-PWR10A00-V5.0-M-... | 650 *[171.7]* | ...R8 | **R928034497** | ...S8 | **R928034513** | **R928007025** |

[1)] Measured pressure differential across filter and measuring equipment in accordance with ISO 3968. The measured pressure differential at the maintenance indicator is lower.

## Accessories ordering code
(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 LEDs | **2SP** |
| | 2 switching points, 3 LEDs and signal suppression up to 30 °C *[86 °F]* | **2SPSU** |

**Plug**

| | | |
|---|---|---|
| 03 | M12x1, 4-pole round plug-in connection | **M12x1** |
| | 2-pole rectangular plug-in connection, design A as per EN 175301-803 | **EN 175301-803** |

**Material numbers for electronic switching elements**

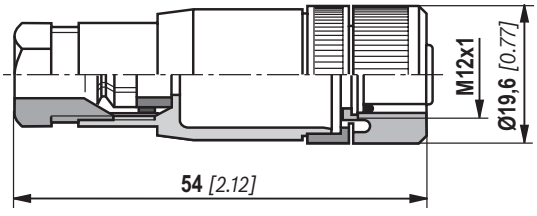
| Material no. | Type | Signal | Switching points | Plug | LEDs |
|---|---|---|---|---|---|
| **R928028409** | WE-1SP-M12x1 | Changeover | 1 | M12x1 | 0 |
| **R928028410** | WE-2SP-M12x1 | Normally open (at 75%)/ normally closed contact (at 100%) | 2 | | 3 |
| **R928028411** | WE-2SPSU-M12x1 | | | | |
| **R928036318** | WE-1SP-EN175301-803 | Normally closed contact | 1 | EN 175301-803 | 0 |

## **Mating connectors** (max. admissible voltage: 50 V)

For electronic switching element with M12x1 round plug-in connection

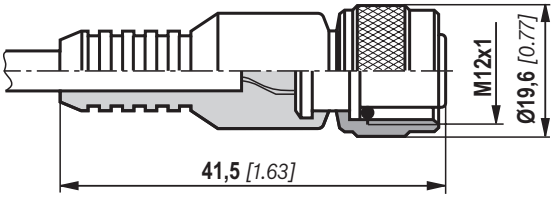
Mating connector fitting M12x1,
4-pole K24 with screw connection, Pg9 cable gland.

**Material no. R900031155**




Mating connector fitting M12x1,
4-pole K24-3m 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**




For more round plug-in connections, see data sheet 08006.

**Order example:**
Inline filter with mechanical visual maintenance indicator for $p_{nom}$ = 350 bar *[5,079 psi]* with bypass valve, size 0100, with 10 µm filter element and M12x1 electronic switching element with 1 switching point for HLP mineral oil hydraulic fluid as per DIN 51524.

| | | |
|---|---|---|
| **Filter with mech. visual maintenance indicator:** | 350LEN0100-PWR10A00-V5.0-M-R4 | **Material no. R928033538** |
| **Electronic switching element:** | WE-1SP-M12x1 | **Material no. R928028409** |
| **Mating connector:** | Mating connector fitting M12x1, 4-pole K24 | **Material no. R900031155** |

## Filter design

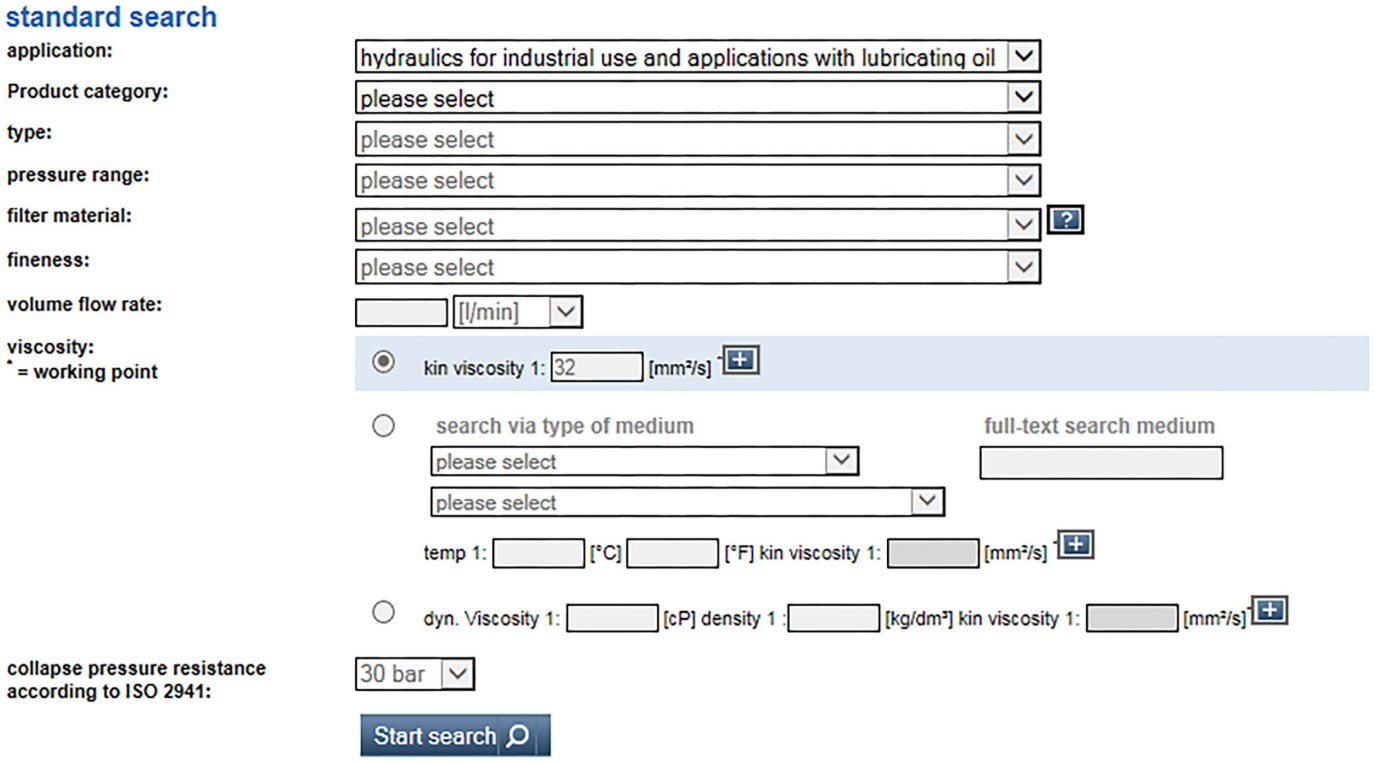
Easy selection of the filter size is made possible by the FilterSelect online tool. The filter can be designed using the operating pressure, flow and fluid system parameters. The required filter rating is based on the application, the sensitivity to contamination of the components and the environmental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

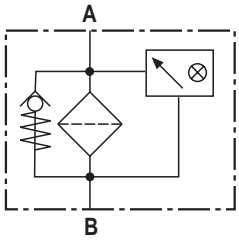
Link FilterSelect:
http://www.filterselect.de

Other languages can be selected using the page navigation.

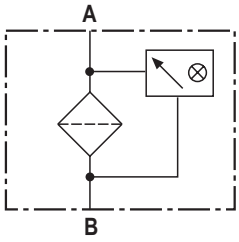


## Symbols

**Inline filter**
with bypass
and mechanical indicator



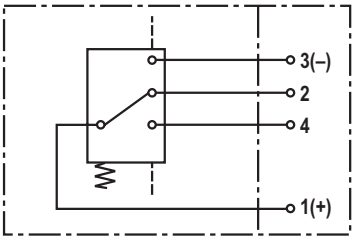

**Inline filter,**
no bypass,
with mechanical indicator




**Electronic switching element**

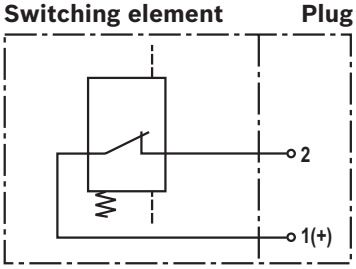
**for maintenance indicator**

**Switching element** **Plug**



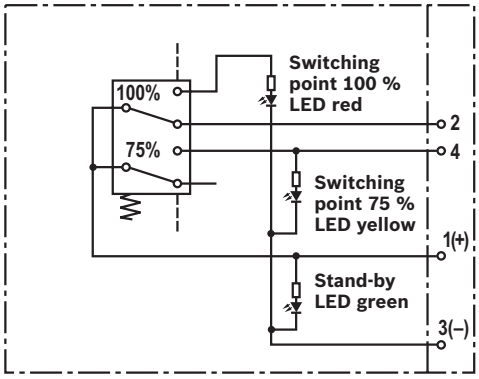

**WE-1SP-M12x1**

**Switching element** **Plug**




**WE-1SP-EN175301-803**

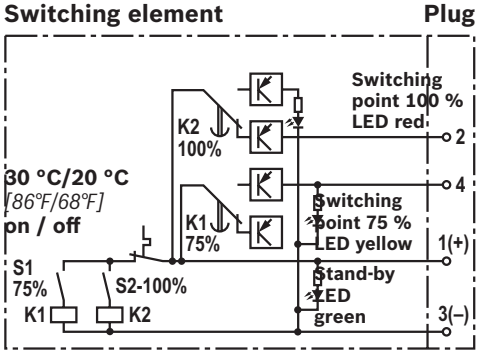
**Switching element** **Plug**




**WE-2SP-M12x1**

Circuit diagram drawn in plugged condition (operating state)

**Switching element** **Plug**



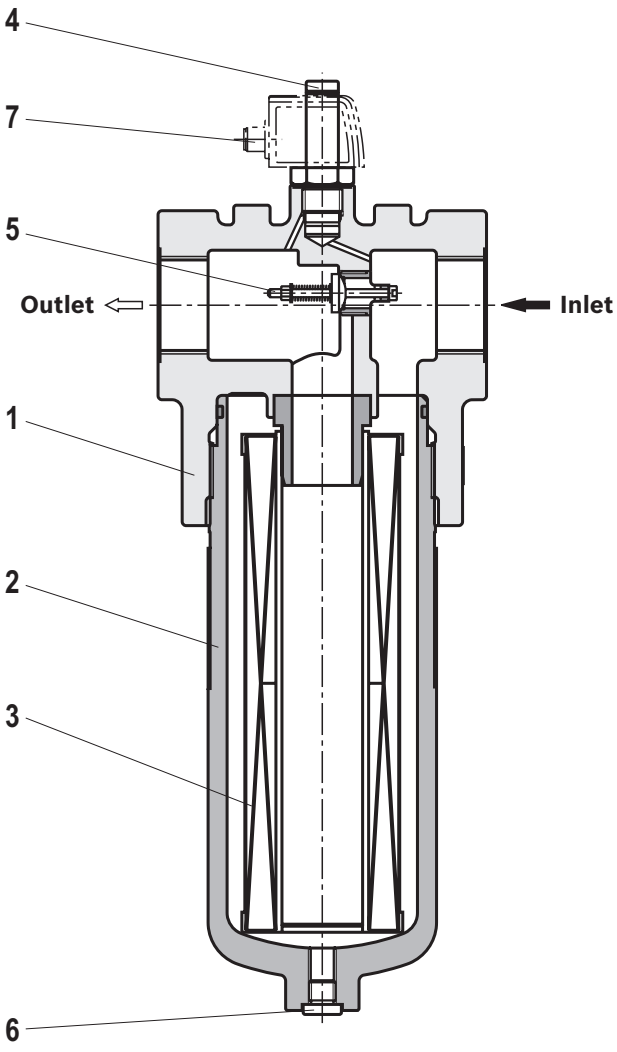

**WE-2SPSU-M12x1**

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

## Function, cross-section

The 350LE(N) inline filter is designed for direct installation into pressure lines.
It consists primarily of a filter head (1), a threaded filter bowl (2), a filter element (3) and a mechanical optical maintenance indicator (4). For filters with low collapse filter elements (= pressure differential code letter A), a bypass valve (5) comes standard.
The fluid passes through the inlet to the filter element, where it is cleaned. Any dirt particles filtered out collect in the filter element. The filtered fluid then enters the hydraulic circuit through the outlet.
The filter housing and all connection elements are designed so that pressure spikes — as they may occur, e.g., due to an accelerated fluid quantity from large control valves opening abruptly — can be safely absorbed. Sizes 0160 and larger come with a drain screw (6) standard.
Size 1000 comes with a two-part filter bowl, with the filter bowl fixed to prevent the bowl from spinning in the filter head.

An electronic switching element (7) can be added to the mechanical optical maintenance indicator in order to integrate it into an electric circuit. The electronic switching element must be attached to the mechanical visual maintenance indicator and held with the locking ring supplied. The electronic switching elements are connected with a mating connector or cable connection.
The electronic switching element must be ordered separately.




**⚠ WARNING**

- If the maintenance indicator is ignored when an element change is required, there is the possibility the filter will go into bypass and contaminated oil will pass to the clean side of the filter outlet. Therefore the filtration effectiveness is no longer guaranteed.

## Technical data
(Please consult us for applications outside these parameters)

| **General** | | | | | | | |
|---|---|---|---|---|---|---|---|
| Installation position | | | Vertical | | | | |
| Ambient temperature range | | °C *[°F]* | -10 to +65 *[14 to 149]* (down to -30 *[-22]* for brief periods) | | | | |
| Storage conditions | ▶ NBR/EPDM seal | °C *[°F]* | -40 to 65 *[-40 to 149]*; max. relative air humidity: 65% | | | | |
| | ▶ FKM seal | °C *[°F]* | -20 to 65 *[-4 to 149]*; max. relative air humidity: 65% | | | | |
| Weight | ▶ Filter | Size | **0040** | **0063** | **0100** | **0130** | **0150** |
| | | kg *[lbs]* | 4.4 *[9.7]* | 5.0 *[11.1 ]* | 5.9 *[13.0]* | 10.5 *[23.2 ]* | 11.2 *[24.8 ]* |
| | | Size | **0160** | **0250** | **0400** | **0630** | **1000** |
| | | kg *[lbs]* | 17.2 *[30.0 ]* | 19.5 *[43.1]* | 23.0 *[50.8]* | 45.0 *[99.5]* | 93.0 *[205.6]* |
| | ▶ Filter bowl | Size | **0040** | **0063** | **0100** | **0160** | |
| | | kg *[lbs]* | 1.3 *[2.9]* | 1.3 *[2.9]* | 2.1 *[4.6]* | 5.5 *[12.1]* | |
| | | Size | **0250** | **0400** | **0630** | **1000** | |
| | | kg *[lbs]* | 8.0 *[17.6]* | 12.2 *[26.9]* | 21.4 *[47.2]* | Filter pipe [1] 45.3 *[99.8]*<br>End cap 2.0 *[4.4]* | |
| Flow | | Size | **0040** | **0063** | **0100** | **0130** | **0150** |
| | | l *[US gal]* | 0.3 *[0.1]* | 0.4 *[0.1]* | 0.5 *[0.1]* | 0.9 *[0.2]* | 1.1 *[0.3]* |
| | | Size | **0160** | **0250** | **0400** | **0630** | **1000** |
| | | l *[US gal]* | 1.3 *[0.3]* | 1.9 *[0.5]* | 3.0 *[0.8]* | 4.5 *[1.2]* | 6.5 *[1.7]* |
| Material | ▶ Filter head | | Ductile iron | | | | |
| | ▶ Filter bowl | | Steel | | | | |
| | ▶ Bypass valve | | PA6 / steel / POM | | | | |
| | ▶ Seals | | NBR or FKM | | | | |
| | ▶ Visual maintenance indicator | | Brass | | | | |
| | ▶ Electronic switching element | | Nylon 6 plastic | | | | |

| **Hydraulics** | | | |
|---|---|---|---|
| Max. operating pressure | bar *[psi]* | 350 *[5,079]* | |
| Hydraulic fluid temperature range | °C *[°F]* | -10 *to* 100 *[14 to 212]* (down to -30 *[-22]* for brief periods) | |
| Min. medium conductivity | pS/m | 300 | |
| Fatigue strength as per ISO 10771 | load cycles | > $10^6$ at max. operating pressure | |
| Maintenance indicator pressure measurement type | | Pressure differential | |
| Assignment: Maintenance indicator response pressure/ bypass valve cracking pressure | | Maintenance indicator response pressure | Bypass valve cracking pressure |
| | bar *[psi]* | 2.2 ± 0.3 *[31.9 ± 4.4]* | 3.5 ± 0.35 *[50.8 ± 5.1]* |
| | bar *[psi]* | 5.0 ± 0.5 *[72.5 ± 7.3]* | 7.0 ± 0.5 *[101.5 ± 7.3]* |
| | bar *[psi]* | 8.0 ± 0.8 *[116 ± 11.6]* | No bypass valve |
| Direction of filtration | | From the outside to the inside | |

[1] This weight is not relevant to changing the filter element, since only the cap has to be unscrewed.

## Technical data
(Please consult us for applications outside these parameters)

| **Electrical** (electronic switching element) | | | | | | |
|---|---|---|---|---|---|---|
| Electrical connection | | | M12x1, 4-pole round plug-in connection | | | EN 175301-803 standard connection |
| | | Version | WE-1SP-M12x1 | WE-2SP-M12x1 | WE-2SPSU-M12x1 | WE-1SP-EN175301-803 |
| Contact load, DC 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]* | |
| LED indicators in 2SP electronic switching elements | | | | Stand-by (LED green) 75% switching point (LED yellow) 100% switching point (LED red) | | |
| IP rating as per EN 60529 | | IP | 67 | | | 65 |
| Ambient temperature range | | °C *[°F]* | -25 *to* 85 *[-13 to 185]* | | | |
| Include spark extinguishing for DC voltage above 24 V to protect the switching contacts. | | | | | | |
| Weight | Electronic switching element | kg *[lbs]* | 0.1 *[0.22]* | | | |

| **Filter element** | | | | |
|---|---|---|---|---|
| **Glass fiber material PWR..** | | | Inorganic fiber-based single-use element | |
| | | | Filtration ratio as per ISO 16889 up to $\Delta p$ = 5 bar *[72.5 psi]* | Best oil cleanliness as per ISO 4406 [*SAE-AS 4059*] |
| | | 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 |
| Admissible pressure differential | ▶ A | bar *[psi]* | 30 *[435]* | |
| | ▶ B | bar *[psi]* | 330 *[4,785]* | |

**For detailed information on Hengst filter elements, see data sheet 51420.**

## Compatibility with permitted hydraulic fluids

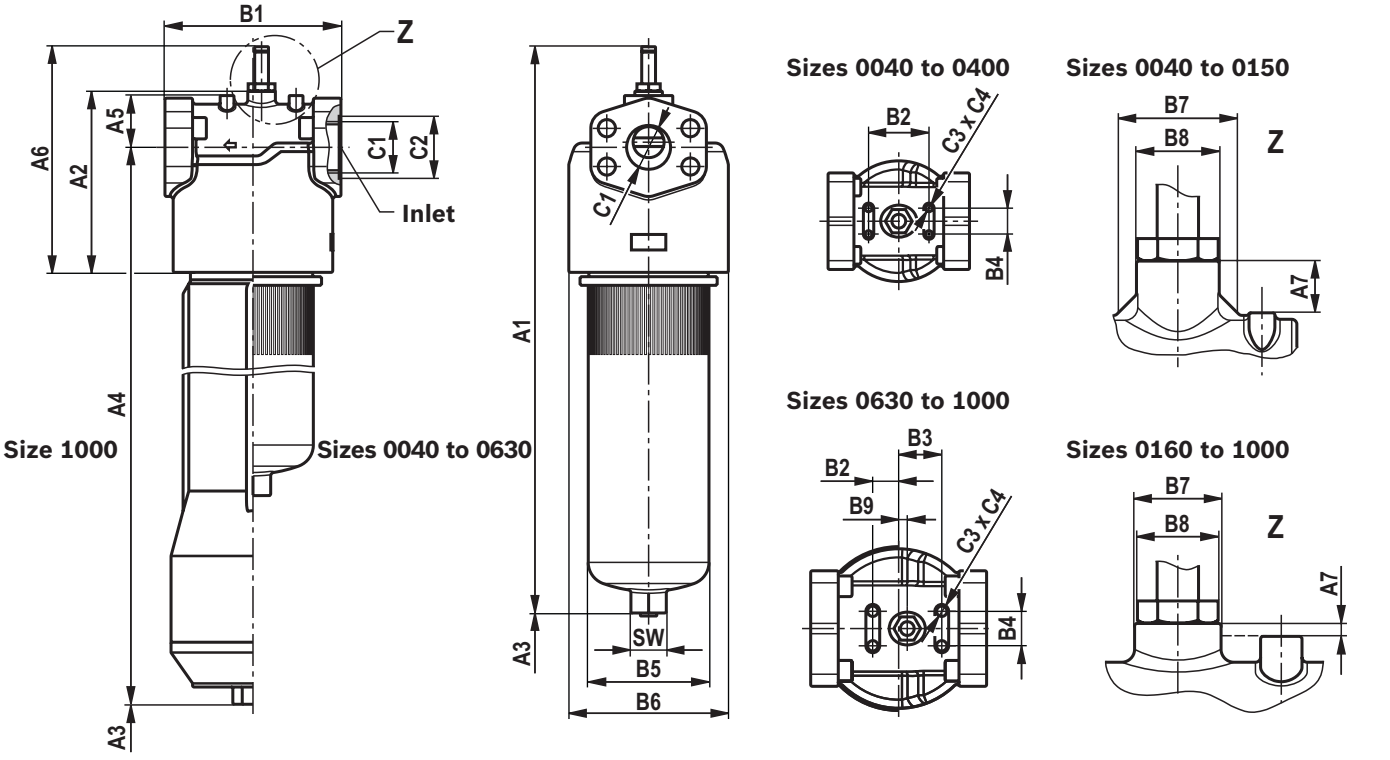
| Hydraulic fluid | | Classification | Suitable sealing materials | Suitable adhesive | Standards |
|---|---|---|---|---|---|
| Mineral oil | | HLP | NBR | Standard | DIN 51524 |
| Biodegradable | ▶ Water insoluble | HETG | NBR | | VDMA 24568 |
| | | HEES | FKM | | |
| | ▶ Water soluble | HEPG | FKM | | VDMA 24568 |
| Flame-resistant | ▶ Waterless | HFDU, HFDR | FKM | | VDMA 24317 |
| | ▶ Aqueous | HFAS | NBR | | DIN 24320 |
| | | HFAE | NBR | | |
| | | HFC | NBR | | VDMA 24317 |
| | ▶ Skydrol | – | EPDM | Special “H” | – |

☞ **Important information on hydraulic fluids:**

- ▶ For more information and data on the use of other hydraulic fluids, see data sheet 90220 or contact us.
- ▶ **Flame-resistant, aqueous**: Due to possible chemical reactions with materials or machine and system component surface coating, the service life with these hydraulic fluids may be less than expected. Do not use filter materials made of filter paper P, use filter elements with glass fiber filter material 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: 350LE(N) sizes 0040 to 1000

(Dimensions in mm *[inch]*)



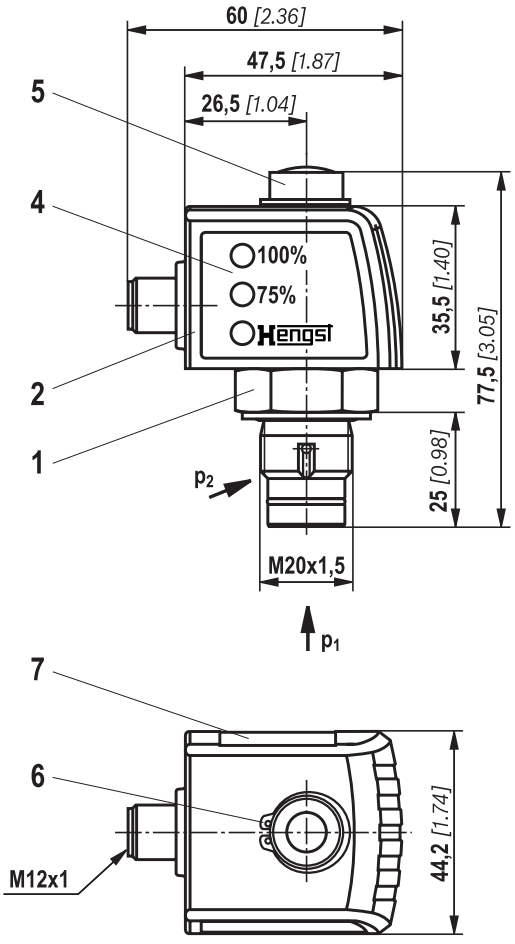

| Type 350... | A1 | A2 | A3 [1] | A4 | A5 | A6 | A7 | B1 [2] | B2 | B3 | ØB4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **LEN0040** | 203 *[7.99]* | 115 *[4.53]* | 80 *[3.15]* | 158 *[6.22]* | 25 *[0.98]* | 167 *[6.57]* | 20 *[0.79]* | 92 *[3.62]* | 65 *[2.56]* | – | 30 *[1.18]* |
| **LEN0063** | 266 *[10.47]* | | | 221 *[8.70]* | | | | | | | |
| **LEN0100** | 356 *[14.02]* | | | 311 *[12.24]* | | | | | | | |
| **LE0130** | 328 *[12.91]* | 150 *[5.91]* | 140 *[5.51]* | 273 *[10.75]* | 40 *[1.57]* | 202 *[7.95]* | 15 *[0.59]* | 132 *[5.20]* | 80 *[3.15]* | | |
| **LE0150** | 364 *[14.33]* | | | 324 *[12.76]* | | | | | | | |
| **LEN0160** | 322 *[12.68]* | 170 *[6.69]* | | 262 *[10.31]* | 50 *[1.97]* | 222 *[8.74]* | 10 *[0.39]* | 164 *[6.46]* | 70 *[2.76]* | | |
| **LEN0250** | 412 *[16.22]* | | | 352 *[13.86]* | | | | | | | |
| **LEN0400** | 562 *[22.13]* | | | 502 *[19.76]* | | | | | | | |
| **LEN0630** | 605 *[23.82]* | 210 *[8.27]* | 160 *[6.30]* | 540 *[21.26]* | 60 *[2.36]* | 262 *[10.31]* | 5 *[0.20]* | 204 *[8.03]* | 30 *[1.18]* | 50 *[1.97]* | 40 *[1.57]* |
| **LEN1000** | 843 *[33.19]* | | 650 *[25.59]* | 778 *[30.63]* | | | | | | | |

| Type 350... | ØB5 | ØB6 | ØB7 | ØB8 | B9 | C1 connection | | | | | C3 | C4 | SW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | R... (ISO 228) | ØC2 | U... (SAE J1926) | ØC2 | S... (SAE flanges) | | | |
| **LEN0040** | 64 *[2.52]* | 85 *[3.35]* | 47 *[1.85]* | 32 *[1.26]* | – | G1/2 | 28 *[1.10]* | SAE 10" 7/8-14 UNF-2B | 34 *[1.34]* | – | M6 | 8 *[0.31]* | 32 *[1.26]* |
| **LEN0063** | | | | | | G1 | 41 *[1.61]* | SAE 12" 1 1/16-12 UN-2B | | | | | |
| **LEN0100** | | | | | | | | | | | | | |
| **LE0130** | 92 *[3.62]* | 118 *[4.65]* | | | | G1 1/4 | 51 *[2.01]* | SAE 20" 1 5/8-12 UN-2B | 58 *[2.28]* | | | | |
| **LE0150** | | | | | | | | | | | | | |
| **LEN0160** | 114 *[4.49]* | 140 *[5.51]* | 32 *[1.26]* | | | G1 1/2 | 56 *[2.20]* | SAE 24" 1 7/8-12 UN-2B | 65 *[2.56]* | SAE 1 1/2" 6,000 psi | M8 | 12 *[0.47]* | |
| **LEN0250** | | | | | | | | | | | | | |
| **LEN0400** | | | | | | | | | | | | | |
| **LEN0630** | 140 *[5.51]* | 185 *[7.28]* | | | 10 *[0.39]* | G2 | 72 *[2.83]* | – | | SAE 2" 6,000 psi | M12 | | 41 *[1.61]* |
| **LEN1000** | 190 *[7.48]* | | | | | | | | | | | | |

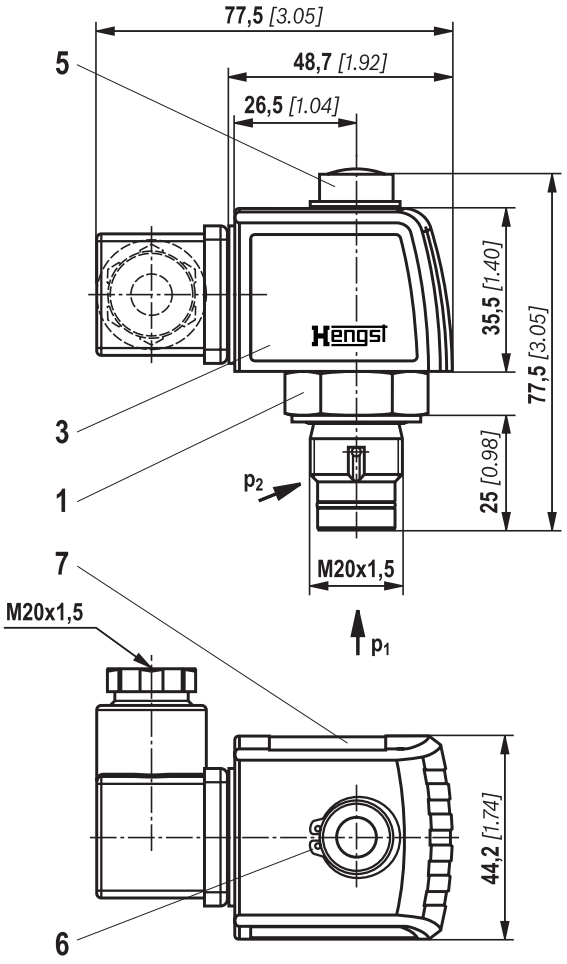
[1] Servicing height for changing filter element [2] Dimension B1 is reduced by 4 mm *[0.16 in]* for SAE flanges

## Maintenance indicator
(Dimensions in mm *[inch]*)

**Pressure differential indicator with mounted M12x1 switching element**




**Pressure differential indicator with mounted EN 175301-803 switching element**




**1** Mechanical optical maintenance indicator; max. tightening torque $M_{A\,max}$ = 50 Nm *[36.88 lb-ft]*

**2** Switching element with locking ring for electrical maintenance indicator (rotatable 360°); M12x1, 4-pole round plug-in connection

**3** Switching element with locking ring for electrical maintenance indicator (rotatable 360°); EN 175301-803 rectangular plug-in connection

**4** Housing with three LEDs: 24 V =
green: Stand-by
yellow: Switching point 75%
red: Switching point 100%

**5** Visual indicator with memory function

**6** 16x1 DIN 471 locking ring, **Material no. R900003923**

**7** Name plate

☞ **Important:**
Illustration includes a mechanical visual maintenance indicator (1) and electronic switching element (2), (3).

## Spare parts ordering codes

### Filter element

| 01 | 02 | 03 | | 04 | 05 | | 06 | | 07 |
|---|---|---|---|---|---|---|---|---|---|
| **2.** | | | **–** | | | **–** | **0** | **–** | |

**Filter element**

| | | |
|---|---|---|
| 01 | Design | **2.** |

**Size**

| | | |
|---|---|---|
| 02 | LEN...<br>(Filter element as per **DIN 24550**) | **0040**<br>**0063**<br>**0100**<br>**0160**<br>**0250**<br>**0400**<br>**0630**<br>**1000** |
| | LE...<br>(Filter elements as per **Hengst standard**) | **0130**<br>**0150** |

**Filter rating in µm**

| | | | |
|---|---|---|---|
| 03 | **Absolute**<br>**(ISO 16889; $\beta_{x(c)} \geq 200$)** | Glass fiber material, not cleanable | **PWR3**<br>**PWR6**<br>**PWR10**<br>**PWR20** |
| | **Nominal** | Stainless steel wire mesh, cleanable | **G10**<br>**G25**<br>**G40**<br>**G60**<br>**G100** |

**Pressure differential**

| | | |
|---|---|---|
| 04 | Max. admissible filter element pressure differential: 30 bar *[435 psi]*, filter **with** bypass valve | **A** |
| | Max. admissible filter element pressure differential: 330 bar *[4,786 psi]*, filter has **no** bypass valve | **B** |

**Element design**

| | | |
|---|---|---|
| 05 | Standard adhesive with galvanized steel | **00** |
| | Special adhesive with stainless steel | **HV** [1] |

**Bypass valve**

| | | |
|---|---|---|
| 06 | **Without** bypass valve | **0** |

**Seal**

| | | |
|---|---|---|
| 07 | NBR seal | **M** |
| | FKM seal | **V** |
| | EPDM seal | **E** |

[1] Only with FKM or EPDM seal

**Order example:**
**2.0100 PWR10-A00-0-M**
**Material no. R928006755**

**For detailed information on Hengst filter elements, see data sheet 51420.**

## Spare parts ordering codes

### Filter element

### Preferred replacement filter element program

| 3-micron replacement filter element | | 6-micron replacement filter element | | 10-micron replacement filter element | |
|---|---|---|---|---|---|
| **R928006645** | 2.0040 PWR3-A00-0-M | **R928006646** | 2.0040 PWR6-A00-0-M | **R928006647** | 2.0040 PWR10-A00-0-M |
| **R928006699** | 2.0063 PWR3-A00-0-M | **R928006700** | 2.0063 PWR6-A00-0-M | **R928006701** | 2.0063 PWR10-A00-0-M |
| **R928006753** | 2.0100 PWR3-A00-0-M | **R928006754** | 2.0100 PWR6-A00-0-M | **R928006755** | 2.0100 PWR10-A00-0-M |
| **R928006807** | 2.0160 PWR3-A00-0-M | **R928006808** | 2.0160 PWR6-A00-0-M | **R928006809** | 2.0160 PWR10-A00-0-M |
| **R928006861** | 2.0250 PWR3-A00-0-M | **R928006862** | 2.0250 PWR6-A00-0-M | **R928006863** | 2.0250 PWR10-A00-0-M |
| **R928006915** | 2.0400 PWR3-A00-0-M | **R928006916** | 2.0400 PWR6-A00-0-M | **R928006917** | 2.0400 PWR10-A00-0-M |
| **R928006969** | 2.0630 PWR3-A00-0-M | **R928006970** | 2.0630 PWR6-A00-0-M | **R928006971** | 2.0630 PWR10-A00-0-M |
| **R928007023** | 2.1000 PWR3-A00-0-M | **R928007024** | 2.1000 PWR6-A00-0-M | **R928007025** | 2.1000 PWR10-A00-0-M |

### Mechanical visual maintenance indicator

| 01 | 02 | | 03 | | 04 | | 05 | | 06 |
|---|---|---|---|---|---|---|---|---|---|
| **W** | **O** | **–** | **D01** | **–** | | **–** | | **–** | |

| | | |
|---|---|---|
| 01 | **Maintenance indicator** | **W** |

| | | |
|---|---|---|
| 02 | **Mechanical visual indicator** | **O** |

**Version**

| | | |
|---|---|---|
| 03 | Pressure differential, modular design | **D01** |

**Switching pressure**

| | | |
|---|---|---|
| 04 | 2.2 bar *[32 psi]* | **2.2** |
| | 5.0 bar *[72.5 psi]* | **5.0** |

**Seal**

| | | |
|---|---|---|
| 05 | EPDM seal | **E** [1] |
| | NBR seal | **M** |
| | FKM seal | **V** |

**Max. operating pressure**

| | | |
|---|---|---|
| 06 | Switching pressure of 2.2 bar *[31.9 psi]*: 160 bar *[2,320 psi]* | **160** |
| | Switching pressure of 5.0 bar *[72.5 psi]*: 450 bar *[6,527 psi]* | **450** |
| | Switching pressure of 8.0 bar *[116 psi]*: 450 bar *[6,527 psi]* | **450** |

[1] Only with a switching pressure of 5.0 bar

### Mechanical visual maintenance indicator

| Material no. | Description |
|---|---|
| **R928038785** | WO-D01-8.0-M-450 |
| **R901025313** | WO-D01-5.0-M-450 |
| **R901025312** | WO-D01-2.2-M-160 |
| **R928038784** | WO-D01-8.0-V-450 |
| **R901066235** | WO-D01-5.0-V-450 |
| **R901066233** | WO-D01-2.2-V-160 |
| **R928054248** | WO-D01-5.0-E-450 |

## Spare parts ordering codes

### Seal kit

| 01 | 02 | 03 | | 04 |
|---|---|---|---|---|
| **D** | **350/445LE** | | **–** | |

| | | |
|---|---|---|
| 01 | **Seal kit** | **D** |

| | | |
|---|---|---|
| 02 | **Series** | **350/445LE** |

**Size**

| | | |
|---|---|---|
| 03 | Sizes 0040-0100 | **N0040-0100** |
| | Sizes 0130-0150 | **0130-0150** |
| | Sizes 0160-0400 | **N0160-0400** |
| | Size 0630 | **N0630** |
| | Size 1000 | **N1000** |

**Seal**

| | | |
|---|---|---|
| 04 | NBR seal | **M** |
| | FKM seal | **V** |
| | EPDM seal | **E** |

### Seal kit

| Material no. | Description |
|---|---|
| **R928028527** | D350/445LEN0040-0100-M |
| **R928028530** | D350LE0130-0150-M |
| **R928028532** | D350/445LEN0160-0400-M |
| **R928028536** | D350/445LEN0630-M |
| **R928028537** | D350/445LEN1000-M |
| **R928028528** | D350/445LEN0040-0100-V |
| **R928028531** | D350LE0130-0150-V |
| **R928028533** | D350/445LEN0160-0400-V |
| **R928028529** | D350/445LEN0630-V |
| **R928028534** | D350/445LEN1000-V |
| **R961010717** | D350/445LEN0040-0100-E |
| **R961010716** | D350LE0130-0150-E |
| **R961010715** | D350/445LEN0160-0400-E |
| **R961010714** | D350/445LEN0630-E |
| **R961010713** | D350/445LEN1000-E |

## Assembly, commissioning, maintenance

### Assembly

- The max. operating pressure of the system cannot exceed the max. admissible operating pressure of the filter (see name plate).
- When assembling the filter (see also “Tightening torques”), note the flow direction (arrows) and the required servicing height of the filter element (see “Dimensions”).
- Filter element exchange is made easiest when the filter bowl is oriented downward. Ensure the maintenance indicator is easily visible.
- Remove the plastic plugs in the filter inlet and outlet.
- Make sure power is disconnected during assembly.
- The optional electrical maintenance indicator is connected using the electronic switching element with 1 or 2 switching points, which is placed on the mechanical visual maintenance indicator and held in place by a locking ring.

### Commissioning

- Commission the system.

☞ **Important:**
The filter has no bleeding mechanism.

### Maintenance

- If the red indicator pin rises out of the mechanical visual maintenance indicator and/or the electronic switching element switches at operating temperature, the filter element is dirty and has to be replaced/cleaned. For more details, see data sheet 51420.
- The material number of the correct replacement filter element is on the name plate of the complete filter. Verify that it matches the material number on the filter element.
- Decommission the system.
- Release operating pressure on the system side.

☞ **Important:**
The filter has no bleeding mechanism.

- Drain the oil on the dirt side using the drain screw (size 0160 and larger).
- Unscrew the filter bowl (or base if size 1000).
- Slightly turn the filter element to remove it from the spigot.
- Clean the filter components as needed.
- Check the seals on the filter bowl for damage and replace them as needed.
  For compatible seal kits, see “Spare parts”.
- Wire mesh filter elements can be cleaned. For detailed cleaning instructions, see data sheet 51420.
- Slightly turn the new or cleaned filter element to install it on the spigot.
- Assembly is reverse of removal.
- Note the torque specifications (“Tightening torques”).
- Commission the system.

**⚠ WARNING**

- Only install or remove when system is not pressurized.
- Filter is pressurized.
- Only remove filter bowl when it is not pressurized.
- Do not replace maintenance indicator when filter is pressurized.
- Failure to observe flow of direction during assembly will cause filter element to be damaged beyond repair. Particles will enter the system and damage downstream components.

☞ **Important:**

- Only trained specialists may work on the filter.
- The safety and functionality of the filter are only guaranteed with original Hengst spare parts.
- The warranty will be void if the delivery item is modified or improperly mounted, installed, maintained, repaired or used by the ordering party or a third party, or exposed to environmental conditions exceeding our installation conditions.

## Tightening torques

### Mounting

| Series 350... | | LEN0040 | LEN0063 | LEN0100 | LE0130 | LE0150 | LEN0160 | LEN0250 | LEN0400 | LEN0630 | LEN1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Screw/tightening torque when $\mu_{total}$ = 0.14 | Nm *[lb-ft]* | M6/4.5 *[3.3]* ± 10% | | | | | M8/10.5 *[7.7]* ± 10% | | | M12/37 *[27.3]* ± 10% | |
| Quantity | | 4 | | | | | | | | | |
| Recommended screw property class | | 8.8 | | | | | | | | | |
| Min. screw-in depth | mm *[inch]* | 6 *[0.24]* + 1 *[0.04]* | | | | | 10 *[0.4]* + 2 *[0.08]* | | | | |

### Filter bowl and maintenance indicator

| Series 350... | | LEN0040 | LEN0063 | LEN0100 | LE0130 | LE0150 | LEN0160 | LEN0250 | LEN0400 | LEN0630 | LEN1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Filter bowl | | Screw in filter bowl as far as it will go, then unscrew 1/8 to 1/2 turn | | | | | | | | | |
| Maintenance indicator | Nm *[lb-ft]* | Max. 50 *[36.9]* | | | | | | | | | |
| EN 175301-803 switching element cubic connector screw | Nm *[lb-ft]* | M3/0.5 *[3.7]* | | | | | | | | | |

## 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 |
| Δ*p* (pressure loss) characteristic curves | ISO 3968:2001-12 |
| Compatibility with hydraulic fluid | ISO 2943:1998-11 |
| Collapse pressure test | ISO 2941:2009-04 |

The development, manufacture and assembly of Hengst industrial filters and Hengst filter elements is carried out within the framework of a certified quality management system in accordance with ISO 9001:2015.

### Classification according to the Pressure Equipment Directive

Inline filters for hydraulic applications as per 51422 are considered pressure holding equipment under Article 1 Section 2.1.4 Pressure Equipment Directive 97/23/EC (PED). However, under Article 1 Section 3.6 PED, hydraulic filters are exempt from the PED if they are not classified higher than Category I (Guideline 1/19).
The fluids from “Compatibility with permitted hydraulic fluids” were considered for the classification.
They do not receive a CE mark.

### Use in explosive areas as per Directive 94/9/EC (ATEX)

Inline filters as per 51422 are not equipment or components in terms of Directive 94/9/EC and do not receive a CE mark. The ignition risk analysis showed that these inline filters do not have their own ignition sources as per DIN EN 13463-1:2009.

According to DIN EN 60079-11:2012, electronic maintenance indicators with a switching point:
WE-1SP-M12x1 **R928028409**
WE-1SP-EN175301-803 **R928036318**
are considered simple electronic operating equipment that does not have its own voltage source. This simple electronic operating equipment may – according to DIN EN 60079-14:2012 – be used in intrinsically safe electric circuits (Ex ib) in systems without requiring marking and certification.
Inline filters and the electronic maintenance indicators described here can be used in the following explosive areas:

| | Zone suitability | |
|---|---|---|
| Gas | 1 | 2 |
| Dust | 21 | 22 |

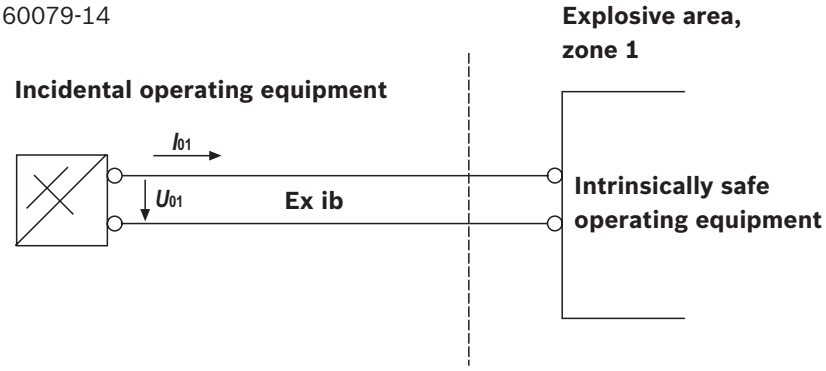
## Directives and standardization

| **Complete filter with mech. visual maintenance indicator** | | | | |
|---|---|---|---|---|
| **Use/classification** | | | **Gas 2G** | **Dust 2D** |
| Classification | | | Ex II 2G c IIC TX | Ex II 2D c IIC TX |
| Medium conductivity | pS/m | min. | 300 | |
| Dust accumulation | | max. | – | 0.5 mm |

| **Electronic switching element in intrinsically safe electric circuit** | | | | |
|---|---|---|---|---|
| **Use/classification** | | | **Gas 2G** | **Dust 2D** |
| Classification | | | Ex II 2G Ex ib IIB T4 Gb | Ex II 2D Ex ib IIIC T100 °C Db |
| Admissible intrinsically safe electric circuits | | | Ex ib IIC, Ex ic IIC | Ex ib IIIC |
| **Technical data** | | | **Values only for intrinsically safe electric circuit** | |
| Switching voltage | Vi | 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 capacitance | Ci | | Negligible | |
| Inner inductance | Li | | Negligible | |
| Dust accumulation | | max. | – | 0.5 mm |

[1] Temperature is based on the temperature of the medium in the filter and cannot exceed this value.

Possible circuit as per DIN EN 60079-14




**⚠ WARNING**

- Explosion hazard due to high temperature. Temperature is based on temperature of medium in hydraulic circuit and cannot exceed this value. Take steps to make sure max. admissible ignition temperature is not exceeded in explosive area.
- Make sure potential equalization is sufficient when using 51422 inline filters in explosive areas. Grounding the filter with mounting screws is recommended. Note that paint and oxide protective coating are not electrically conductive.
- When replacing filter element, remove packaging material from explosive area around replacement element.

☞ **Important:**

- Safety and functionality of the filter are only guaranteed with original Hengst spare parts.
- Maintenance may only be performed by specialists on instruction of the owner in accordance with Directive 1999/92/EC Annex II Section 1.1.

## Notes

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