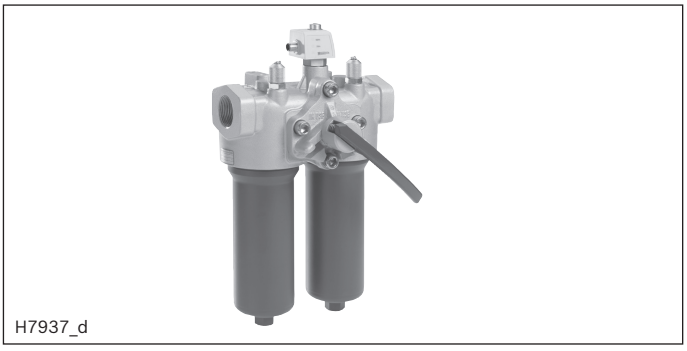
# Duplex filter
# with filter element according to DIN 24550

## Type 150LDN0040 to 0400; 150LD0130, 0150

**RE 51446**
Edition: 2021-04
Replaces: -


H7937_d

- Size according to **DIN 24550**: 0040 to 0400
- Additional sizes: 0130, 0150
- Nominal pressure 160 bar *[2321 psi]*
- Connection up to 1 1/2"
- Operating temperature –10 °C to +100 °C *[14 °F to 212 °F]*

## Features

Duplex filters are used in hydraulic systems for separating solid materials from the fluids and lubricating oils. They are intended for installation into piping and allow for the exchange of the filter element without operational interruption.

They distinguish themselves by the following:

- Filters 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
- By default equipped with mechanical optical maintenance indicator with memory function
- Various, optional electronic switching elements, modular design
- Optional bypass valve integrated in the filter housing
- Pressure equalization function integrated in the switch-over
- Optional measuring port

## Contents

# Ordering code
# Filter

| 01 | 02 | 03 | | 04 | 05 | | 06 | | 07 | | 08 | | 09 | | 09 | | 09 | | 09 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **150LD** | | | – | | | – | | – | | – | | – | | – | | – | | – | |

**Series**

| | | |
|---|---|---|
| 01 | Duplex filter 160 bar *[2320 psi]* | **150LD** |

**Filter element**

| | | |
|---|---|---|
| 02 | With filter element according to **DIN 24550** | **N** |

**Size**

| | | |
|---|---|---|
| 03 | LDN...<br>(Filter element according to **DIN 24550**) | **0040**<br>**0063**<br>**0100**<br>**0160**<br>**0250**<br>**0400** |
| | LD...<br>(Filter elements according to **Hengst standard**) | **0130**<br>**0150** |

**Filter rating in µm**

| | | | |
|---|---|---|---|
| 04 | **Nominal** | Stainless steel wire mesh, cleanable | **G10**<br>**G25**<br>**G40**<br>**G60**<br>**G100** |
| | **Nominal** | Filter paper, not cleanable | **P10**<br>**P25** |
| | **Absolute**<br>**(ISO 16889 ; $\beta_x$(c) ≥ 200)** | Non-woven glass fiber media, not cleanable | **PWR3**<br>**PWR6**<br>**PWR10**<br>**PWR20** |

**Pressure differential**

| | | |
|---|---|---|
| 05 | Max. admissible pressure differential of the filter element 30 bar *[435 psi]*, with bypass valve | **A00** |
| | Max. admissible pressure differential of the filter element 330 bar *[4785 psi]*, without bypass valve | **B00** |

**Maintenance indicator**

| | | |
|---|---|---|
| 06 | Maintenance indicator, mech./optical, switching pressure 1.5 bar *[12.8 psi]* – bypass cracking pressure 2.5 bar *[36.6 psi]* | **V1,5** |
| | Maintenance indicator, mech./optical, switching pressure 2.2 bar *[32 psi]* – bypass cracking pressure 3.5 bar *[51 psi]* | **V2,2** |
| | Maintenance indicator, mech./optical, switching pressure 5.0 bar *[72.5 psi]* – bypass cracking pressure 7 bar *[102 psi]* | **V5,0** |

**Seal**

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

**Connection**

| 08 | **Frame size** | **0040 ... 0100** | **0130 ... 0150** | **0160 ... 0400** | | |
|---|---|---|---|---|---|---|
| | **Connection** | | | | | |
| | G 1 | ● | | | Pipe thread according to ISO 228 | **R4** |
| | G 1 1/4 | | ● | | | **R5** |
| | G 1 1/2 | | | ● | | **R6** |
| | SAE 12 | X | | | Pipe thread according to SAE J1926 | **U4** |
| | SAE 1 1/4" | | X | | SAE flange 3000 psi | **S5** |
| | SAE 1 1/2" | | | X | | **S6** |
| | | ● Standard connection<br>X Alternative connection | | | | |

## Ordering code
## Filter

| 01 | 02 | 03 | | 04 | 05 | | 06 | | 07 | | 08 | | 09 | | 09 | | 09 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **150LD** | | | **–** | | | **–** | | **–** | | **–** | | **–** | | **–** | | **–** | | **–** | |

**Supplementary information** (Multiple specifications possible)

| | | |
|---|---|---|
| 09 | Bleed valve instead of bleed screw | **E** |
| | Additional threaded couplings, G1/4 top clean and dirt side | **M** |
| | Without bypass valve (only possible in connection with filter element version "A00") [1)] | **NB** |
| | Manufacturer's inspection certificate M according to DIN 55350 T18 | **Z1** |

1) **Attention:** If this option is selected and the maintenance indicator is not observed, the filter element may collapse in case of pressure differentials of more than 30 bar *[435 psi]*.

**Order example:**
**150LDN0160-PWR3A00-V2,2-M-R6**

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

## Preferred types

**150LD(N) preferred types, NBR seal, flow specifications for 30 mm²/s** *[143 SUS]*
**Duplex filter, filter rating 3 µm**

| Type | Flow in l/min *[US gpm]* with Δ*p* = 1 bar *[14.5 psi]* [1)] | Material no. filters | | | | Material no. replacement filter element |
|---|---|---|---|---|---|---|
| 150LDN0040-PWR3A00-V5,0-M-.. | 25 *[6.60]* | ..R4 | **R928039315** | ..U4 | **R928041843** | **R928006645** |
| 150LDN0063-PWR3A00-V5,0-M-.. | 35 *[9.25]* | ..R4 | **R928039318** | ..U4 | **R928041844** | **R928006699** |
| 150LDN0100-PWR3A00-V5,0-M-.. | 42 *[11.10]* | ..R4 | **R928039319** | ..U4 | **R928041845** | **R928006753** |
| 150LD0130-PWR3A00-V5,0-M-.. | 62 *[16.38]* | ..R5 | **R928039322** | ..S5 | **R928041841** | **R928022274** |
| 150LD0150-PWR3A00-V5,0-M-.. | 80 *[21.13]* | ..R5 | **R928039324** | ..S5 | **R928041842** | **R928022283** |
| 150LDN0160-PWR3A00-V5,0-M-.. | 85 *[22.45]* | ..R6 | **R928039326** | ..S6 | **R928039327** | **R928006807** |
| 150LDN0250-PWR3A00-V5,0-M-.. | 100 *[26.42]* | ..R6 | **R928039354** | ..S6 | **R928039352** | **R928006861** |
| 150LDN0400-PWR3A00-V5,0-M-.. | 125 *[33.02]* | ..R6 | **R928039357** | ..S6 | **R928039355** | **R928006915** |

**150LD(N) preferred types, NBR seal, flow specifications for 30 mm²/s** *[143 SUS]*
**Duplex filter, filter rating 6 µm**

| Type | Flow in l/min *[US gpm]* with Δ*p* = 1 bar *[14.5 psi]* [1)] | Material no. filters | | | | Material no. replacement filter element |
|---|---|---|---|---|---|---|
| 150LDN0040-PWR6A00-V5,0-M-.. | 32 *[8.45]* | ..R4 | **R928041846** | ..U4 | **R928041860** | **R928006646** |
| 150LDN0063-PWR6A00-V5,0-M-.. | 39 *[10.30]* | ..R4 | **R928041847** | ..U4 | **R928041861** | **R928006700** |
| 150LDN0100-PWR6A00-V5,0-M-.. | 50 *[13.20]* | ..R4 | **R928041848** | ..U4 | **R928041862** | **R928006754** |
| 150LD0130-PWR6A00-V5,0-M-.. | 86 *[22.71]* | ..R5 | **R928041849** | ..S5 | **R928041850** | **R928022275** |
| 150LD0150-PWR6A00-V5,0-M-.. | 92 *[24.30]* | ..R5 | **R928041851** | ..S5 | **R928041852** | **R928022284** |
| 150LDN0160-PWR6A00-V5,0-M-.. | 102 *[26.94]* | ..R6 | **R928041853** | ..S6 | **R928041854** | **R928006808** |
| 150LDN0250-PWR6A00-V5,0-M-.. | 110 *[29.05]* | ..R6 | **R928041855** | ..S6 | **R928041856** | **R928006862** |
| 150LDN0400-PWR6A00-V5,0-M-.. | 122 *[32.22]* | ..R6 | **R928041857** | ..S6 | **R928041858** | **R928006916** |

**150LD(N) preferred types, NBR seal, flow specifications for 30 mm²/s** *[143 SUS]*
**Duplex filter, filter rating 10 µm**

| Type | Flow in l/min *[US gpm]* with Δ*p* = 1 bar *[14.5 psi]* [1)] | Material no. filters | | | | Material no. replacement filter element |
|---|---|---|---|---|---|---|
| 150LDN0040-PWR10A00-V5,0-M-.. | 33 *[8.72]* | ..R4 | **R928038264** | ..U4 | **R928041838** | **R928006647** |
| 150LDN0063-PWR10A00-V5,0-M-.. | 41 *[10.83]* | ..R4 | **R928038267** | ..U4 | **R928041839** | **R928006701** |
| 150LDN0100-PWR10A00-V5,0-M-.. | 53 *[14.00]* | ..R4 | **R928038268** | ..U4 | **R928041840** | **R928006755** |
| 150LD0130-PWR10A00-V5,0-M-.. | 93 *[24.56]* | ..R5 | **R928038269** | ..S5 | **R928041836** | **R928022276** |
| 150LD0150-PWR10A00-V5,0-M-.. | 105 *[27.73]* | ..R5 | **R928038270** | ..S5 | **R928041837** | **R928022285** |
| 150LDN0160-PWR10A00-V5,0-M-.. | 112 *[29.59]* | ..R6 | **R928039325** | ..S6 | **R928038271** | **R928006809** |
| 150LDN0250-PWR10A00-V5,0-M-.. | 125 *[33.02]* | ..R6 | **R928039353** | ..S6 | **R928038272** | **R928006863** |
| 150LDN0400-PWR10A00-V5,0-M-.. | 135 *[35.66]* | ..R6 | **R928039356** | ..S6 | **R928038273** | **R928006917** |

## 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 plug-in connector, 2-pole, design A according to EN-175301-803 | **EN175301-803** |

**Material numbers of the electronic switching elements**

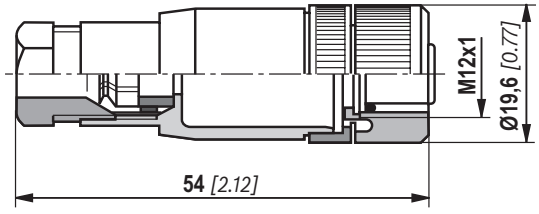
| Material no. | Type | Signal | Switching points | Connector | LED |
|---|---|---|---|---|---|
| **R928028409** | WE-1SP-M12x1 | Changeover | 1 | M12x1 | No |
| **R928028410** | WE-2SP-M12x1 | Normally open (at 75 %) / normally closed contact (at 100 %) | 2 | | 3 pieces |
| **R928028411** | WE-2SPSU-M12x1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

## Mating connectors according to IEC 60947-5-2

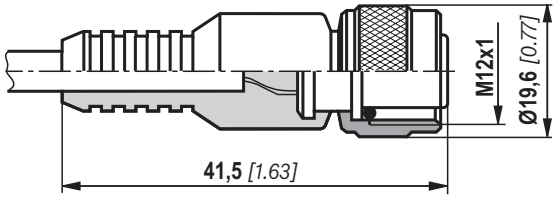
**For electronic switching element with round plug-in connection M12x1**

**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**




**For more round plug-in connections and technical data refer to data sheet 08006.**

**Order example:**
Duplex filter with mechanical optical maintenance indicator for $p_{nom.}$ = 160 bar *[2320 psi]* with bypass valve, size 0160, with filter element 3 µm and electronic switching element M12x1 with 1 switching point for hydraulic fluid mineral oil HLP according to DIN 51524.

| | | |
|---|---|---|
| **Filter with mech. optical maintenance indicator:** | **150LDN0160-PWR3A00-V2,2-M-R6** | **Material no. R928039326** |
| **Electr. switching element:** | **WE-1SP-M12x1** | **Material no. R928028409** |
| **Mating connector:** | **Mating connector suitable for K24 4-pole, M12x1 with screw connection, cable gland Pg9.** | **Material no. R900031155** |

## Filter design

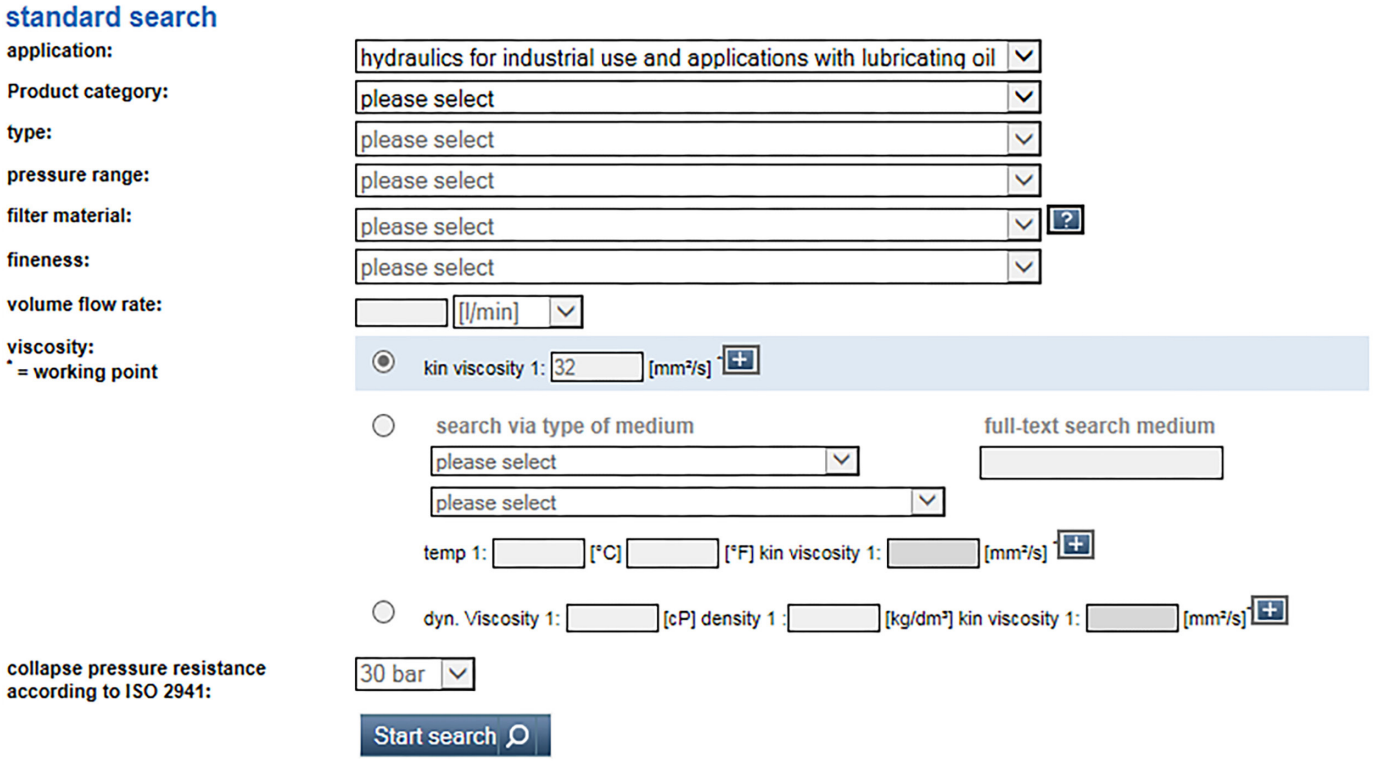
Easy selection of the filter size is made possible by the FilterSelect online tool. The filter can be designed using the operating pressure, flow and fluid system parameters. The required filter rating is based on the application, the sensitivity to contamination of the components and the environmental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

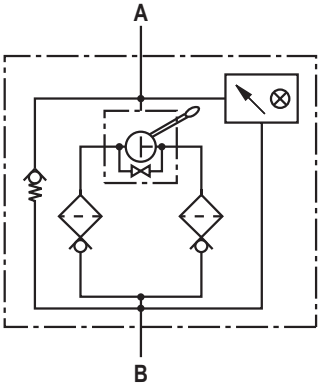
Link FilterSelect:
http://www.filterselect.de/

Other languages can be selected using the page navigation.

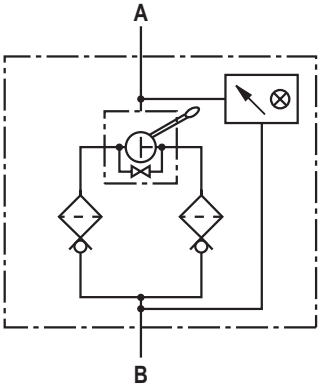


## Symbols

**Duplex filter with bypass and mechanical indicator**

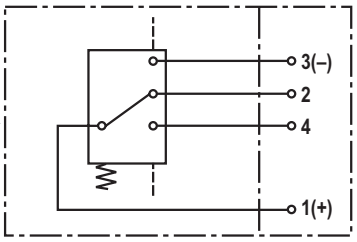



**Duplex filter without bypass and with mechanical indicator**



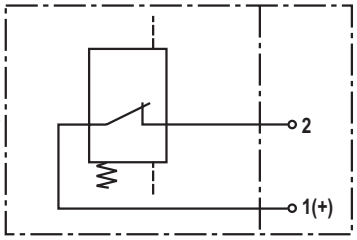

**Electronic switching element for maintenance indicator**

**Switching element Connector**



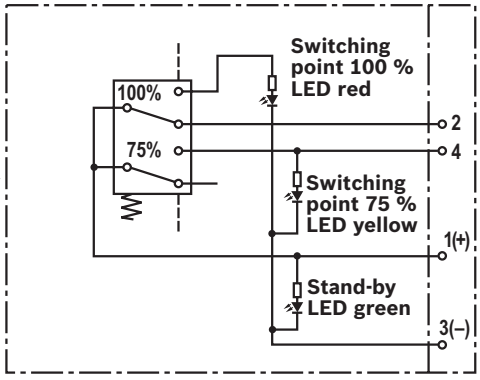

**WE-1SP-M12x1**

**Switching element Connector**




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

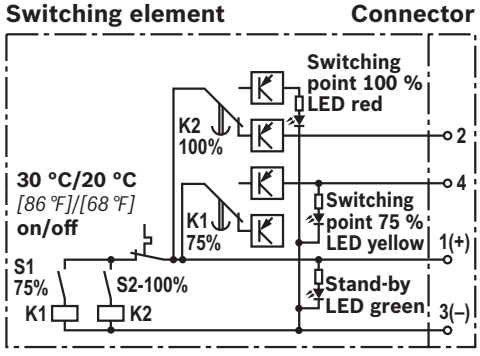
**Switching element Connector**




**WE-2SP-M12x1**

**Circuit diagram drawn in plugged condition (operating state)**

**Switching element Connector**

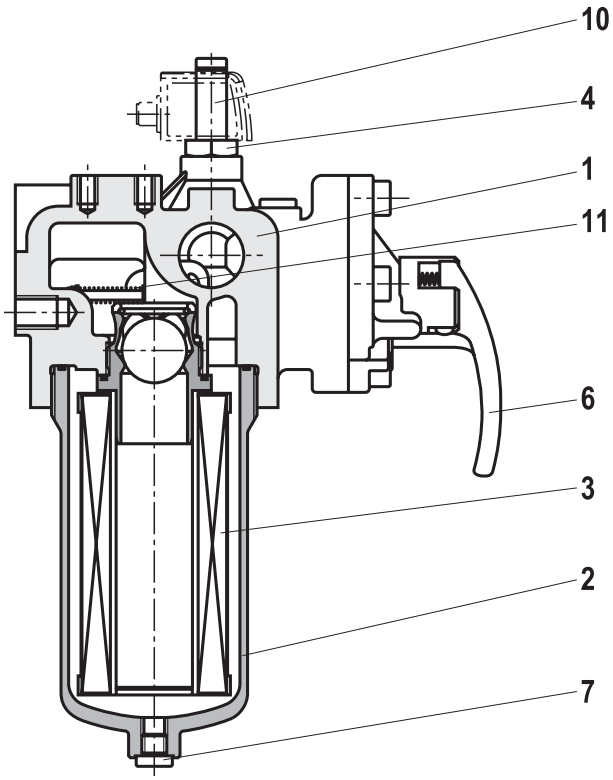


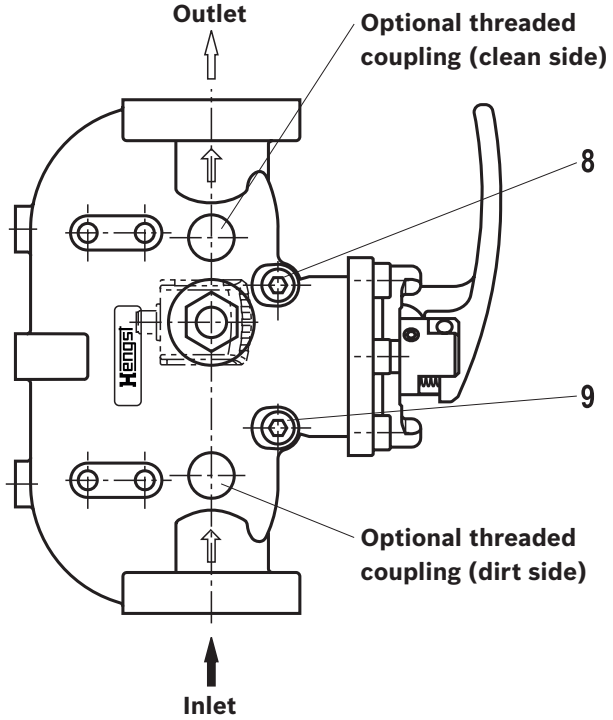

**WE-2SPSU-M12x1**

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

## Function, section

The 150LD(N) duplex filter is suitable for direct installation into pressure lines. It is installed upstream of components to be protected. Any use in the suction area is not admissible.
It basically consists of a filter head (1) with switch-over fitting (6) and integrated pressure equalization function, two screwable filter bowls (2), two filter elements (3) as well as a mechanical optical maintenance indicator (4).
In case of filters with low-collapse filter elements (= code letter pressure differential A), there is also an integrated bypass valve (11).
Via the inlet, the fluid reaches the filter element (3) where it is cleaned. The dirt particles filtered out collect in the filter element (3). Via the outlet, the filtered fluid enters the hydraulic circuit.
The filter housing and all connection elements are designed so that pressure peaks - as they may e.g. occur in case of abrupt opening of large control valves due to the accelerated fluid quantity - can be securely absorbed.
For sizes 0160 and larger, the filter bowl is equipped with a drain plug (7).
Via the bleed screws and/or the optional bleed valves – amending information E – (8, 9), the filter side to be maintained can be bled.
Measuring ports in the form of threaded couplings on clean and dirt side are available in the type key under the amending information "M".
Only then will the filter head be drilled accordingly.
By default, the filter is equipped with mechanical optical maintenance indicator (4). The electronic switching element (10) which has to be ordered separately is attached to the mechanical optical maintenance indicator (4) and held by means of a locking ring.
The electronic switching elements with 1 or 2 switching points are connected via a mating connector according to IEC-60947-5-2 or via a cable connection according to EN17301-803.




**Type 150LDN0160**

☞ **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

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

| **general** | | | | | | |
|---|---|---|---|---|---|---|
| Weight | | | Size | **0040** | **0063** | **0100** | **0130** |
| | | | kg *[lbs]* | 7.4 [16.3] | 8.5 *[18.7]* | 10.3 *[22.7]* | 13.9 *[30.6]* |
| | | | Size | **0150** | **0160** | **0250** | **0400** |
| | | | kg *[lbs]* | 17.3 *[38.1]* | 21.6 *[47.6]* | 23.4 *[51.6]* | 26.2 *[57.7]* |
| Volume | | | Size | **0040** | **0063** | **0100** | **0130** |
| | | | l<br>*[US gal]* | 2 x 0.35<br>2 x *[0.09]* | 2 x 0.45<br>2 x *[0.12]* | 2 x 0.7<br>2 x *[0.18]* | 2 x 0.82<br>2 x *[0.22]* |
| | | | Size | **0150** | **0160** | **0250** | **0400** |
| | | | l<br>*[US gal]* | 2 x 0.98<br>2 x *[0.26]* | 2 x 1.25<br>2 x *[0.33]* | 2 x 1.95<br>2 x *[0.51]* | 2 x 2.9<br>2 x *[0.77]* |
| Installation position | | | | Vertical | | | |
| Ambient temperature range | | | °C *[°F]* | –10 ... +100 *[14 ... +212]* (shortly up to –30 *[ –22]*) | | | |
| Material | – Filter head | | | Ductile Iron | | | |
| | – Filter bowl | | | Steel | | | |
| | – Bypass valve | | | PA6 / steel / POM | | | |
| | – Seals | | | NBR or FKM | | | |
| | – Optical maintenance indicator | V1,5; V2,2 | | Aluminum | | | |
| | | V5,0 | | Brass | | | |
| | – Electronic switching element | | | Plastic PA6 | | | |

| **hydraulic** | | | | |
|---|---|---|---|---|
| Maximum operating pressure | | bar *[psi]* | 160 *[2288]* | |
| Hydraulic fluid temperature range | | °C *[°F]* | –10 ... +100 *[+14 ... +212]* | |
| Minimum conductivity of the medium | | pS/m | 300 | |
| Fatigue strength according to ISO 10771 | | Load cycles | > $10^6$ with operating pressure | |
| Type of pressure measurement of the maintenance indicator | | | Pressure differential | |
| Assignment: Response pressure of the maintenance indicator/Cracking pressure of the bypass valve | | | Response pressure of the maintenance indicator | Cracking pressure of the bypass valve |
| | | bar *[psi]* | 1.5 ± 0.2 *[21.8 ± 2.9]* | 2.5 ± 0.25 *[36.3 ± 3.6]* |
| | | | 2.2 ± 0.3 *[31.9 ± 4.4]* | 3.5 ± 0.35 *[50.8 ± 5.1]* |
| | | | 5.0 ± 0.5 *[72.5 ± 7.3]* | 7.0 ± 0.5 *[101.5 ± 7.3]* |
| Filtration direction | | | From the outside to the inside | |

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

| **electric** (electronic switching element) | | | | | | |
|---|---|---|---|---|---|---|
| Electrical connection | | | Round plug-in connection 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 | | – |
| | – 100 % signal | | Changeover | Normally closed contact | | Normally closed contact |
| | – 2SPSU | | | | Signal interconnection at 30 °C *[86 °F]*, return switching at 20 °C *[68 °F]* | |
| Display via LEDs in the electronic switching element 2SP... | | | | Stand-by (LED green); 75 % switching point (LED yellow) 100 % switching point (LED red) | | |
| Protection class according to EN 60529 | | | IP 67 | | | IP 65 |
| Ambient temperature range | | °C *[°F]* | –25 ... +85 *[–13 ... +185]* | | | |
| For direct voltage above 24 V, spark extinguishing is to be provided for protecting the switching contacts. | | | | | | |
| Weight | Electronic switching element: – with round plug-in connection M12x1 | kg *[lbs]* | 0.1 *[0.22]* | | | |

| **Filter element** | | | | |
|---|---|---|---|---|
| Non-woven glass fiber media PWR.. | | | Single-use element on the basis of inorganic fiber | |
| | | | Filtration ratio according to ISO 16889 up to $\Delta p$ = 5 bar *[72.5 psi]* | Achievable oil cleanliness according to ISO 4406 *[SAE-AS 4059]* |
| Particle separation | | PWR20 | $\beta_{20(c)} \geq 200$ | 19/16/12 ... 22/17/14 |
| | | PWR10 | $\beta_{10(c)} \geq 200$ | 17/14/10 ... 21/16/13 |
| | | PWR6 | $\beta_{6(c)} \geq 200$ | 15/12/10 ... 19/14/11 |
| | | PWR3 | $\beta_{3(c)} \geq 200$ | 13/10/8 ... 17/13/10 |
| Admissible pressure differential | A | bar *[psi]* | 30 *[435]* | |
| | B | bar *[psi]* | 330 *[4785]* | |

## Compatibility with 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 |
| | – containing water | HFAS | NBR | DIN 24320 |
| | | HFAE | NBR | |
| | | HFC | NBR | VDMA 24317 |

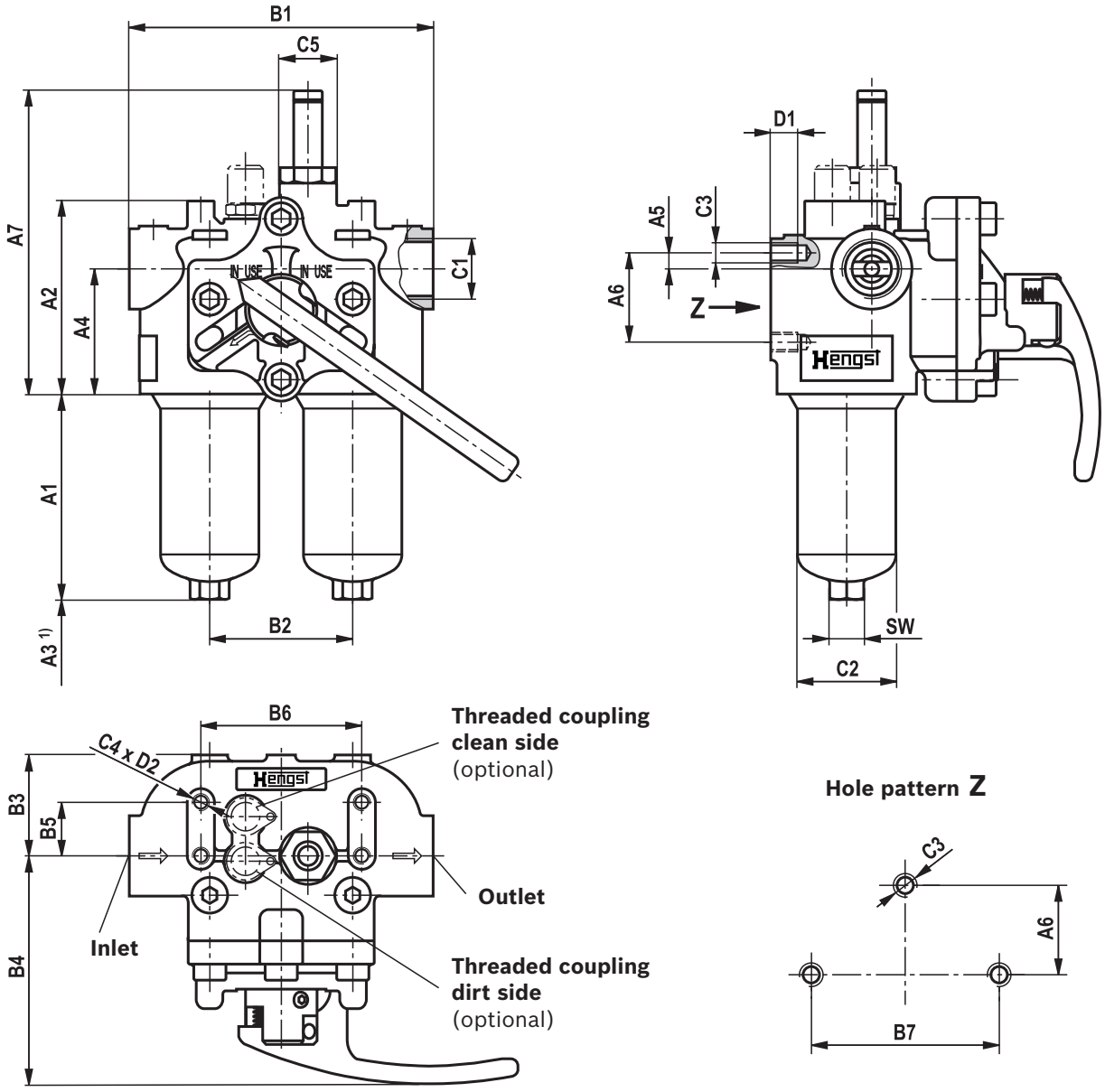
☞ **Important information on hydraulic fluids!**

- For more information and data on the use of other hydraulic fluids, please refer to data sheet 90220 or contact us.
- **Flame-resistant - containing water:** Due to possible chemical reactions with materials or surface coatings of machine and system components, the service life with these hydraulic fluids may be less than expected. Filter materials made of filter paper P... (cellulose) may not be used, filter elements with filter materials made of glass fiber have 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 and swelling.

## Dimensions: Size 0040 ... size 0100

(dimensions in mm *[inch]*)

**150LDN0040-0100**




1) Servicing height for filter element exchange

**Filter housing for filter elements in accordance with DIN 24550**

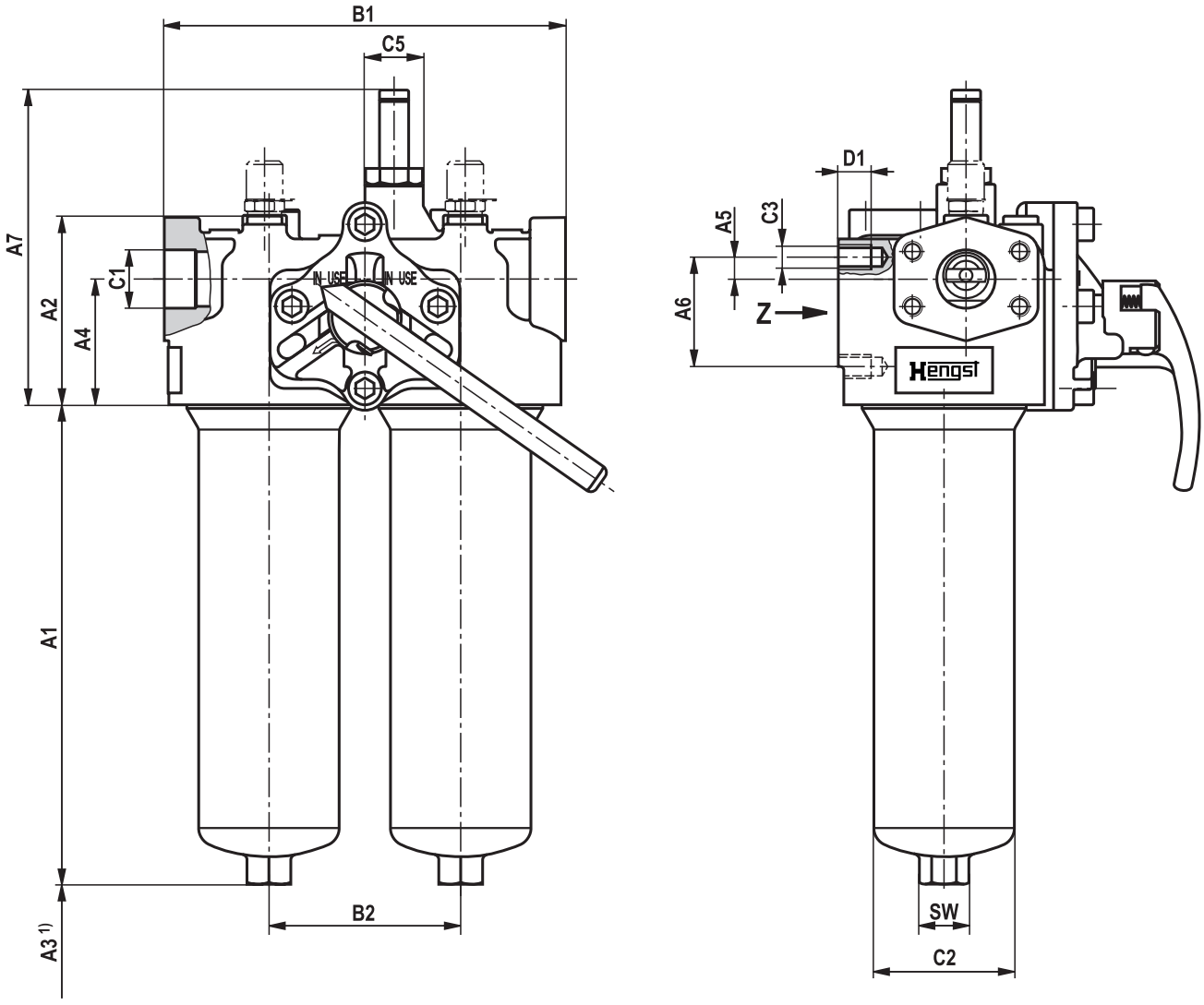
| Type | A1 | A2 | A3[1)] | A4 | A5 | A6 | A7 | B1 | B2 | B3 | B4 | B5 | B6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **150LDN0040** | 115 *[4.53]* | 108 *[4.25]* | 80 *[3.15]* | 70 *[2.76]* | 9 *[0.35]* | 50 *[1.97]* | 170 *[6.69]* | 170 *[6.69]* | 80 *[3.15]* | 56.5 *[2.22]* | 127 *[5.00]* | 30 *[1.18]* | 90 *[3.54]* |
| **150LDN0063** | 179 *[7.05]* | | | | | | | | | | | | |
| **150LDN0100** | 269 *[10.59]* | | | | | | | | | | | | |

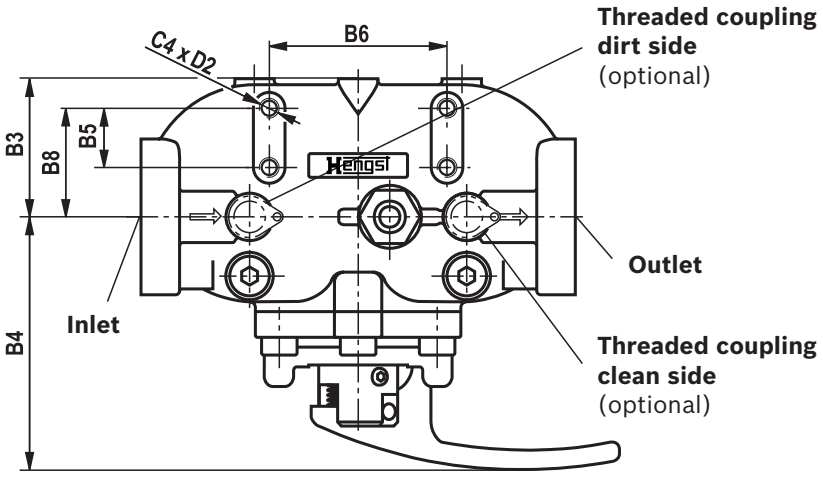
| Type | B7 | C1 connection | | | ØC2 | C3 | C4 | ØC5 | D1 | D2 | SW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | R standard | U (SAEJ1926) | S (SAE flange 3000 psi) | | | | | | | |
| **150LDN0040** | 80 *[3.15]* | G 1 | SAE 12 1 1/16-12UN-2B | – | 57 *[2.24]* | M10x1.5 | M8x1.25 | 32 *[1.26]* | 15 *[0.59]* | 15 *[0.59]* | 19 *[0.75]* |
| **150LDN0063** | | | | | | | | | | | |
| **150LDN0100** | | | | | | | | | | | |

## Dimensions: Size 0130 ... size 0400

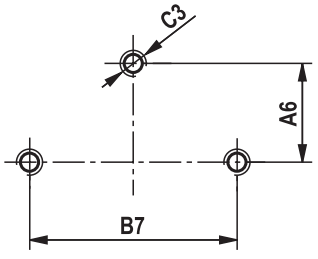
(dimensions in mm *[inch]*)

**150LD(N)0130-0400**




**Hole pattern Z**




1) Servicing height for filter element exchange

## Dimensions: Size 0130 ... size 0400

(dimensions in mm *[inch]*)

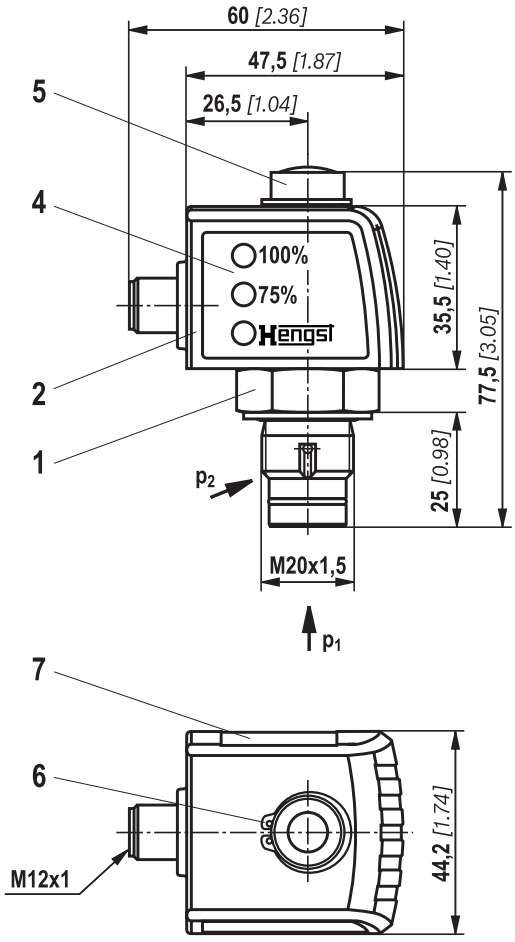
**Filter housing for filter elements according to DIN 24550 and according to Hengst standard**

| Type | A1 | A2 | A3[1)] | A4 | A5 | A6 | A7 | B1 | B2 | B3 | B4 | B5 | B6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **150LD0130** | 213 *[8.39]* | 99 *[3.90]* | 140 *[5.51]* | 69 *[2.72]* | 12 *[0.47]* | 50 *[1.97]* | 173 *[6.81]* | 220 *[8.66]* | 105 *[4.13]* | 70 *[2.76]* | 128 *[5.04]* | 30 *[1.18]* | 90 *[3.54]* |
| **150LD0150** | 263 *[10.35]* | | | | | | | | | | | | |
| **150LDN0160** | 184 *[7.24]* | 115 *[4.53]* | | 80 *[3.15]* | 25 *[0.98]* | 55 *[2.17]* | 184 *[7.24]* | 270 *[10.63]* | 134 *[5.28]* | 103 *[4.06]* | 152 *[5.98]* | | 130 *[5.12]* |
| **150LDN0250** | 274 *[10.79]* | | | | | | | | | | | | |
| **150LDN0400** | 425 *[16.73]* | | | | | | | | | | | | |

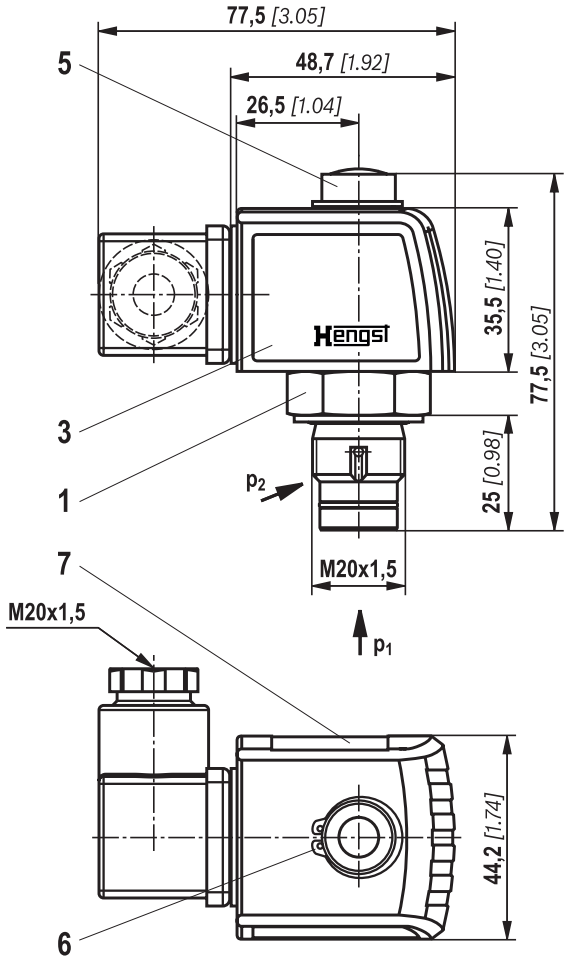
| Type | B7 | B8 | C1 connection | | | ØC2 | C3 | C4 | ØC5 | D1 | D2 | SW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | R standard | U (SAEJ1926) | S (SAE flange 3000 psi) | | | | | | | |
| **150LD0130** | 105 *[4.13]* | 65 *[2.56]* | G 1 1/4 | SAE12 15/16-12UN-2B | SAE 1 1/4" | 77 *[3.03]* | M12 | M8 | 32 *[1.26]* | 18 *[0.71]* | 12 *[0.47]* | 24 *[0.94]* |
| **150LD0150** | | | | | | | | | | | | |
| **150LDN0160** | 134 *[5.28]* | | G 1 1/2 | SAE20 15/8-12UN-2B | SAE 1 1/2" | 98 *[3.86]* | M16 | M10 | | 22 *[0.87]* | 15 *[0.59]* | 27 *[1.06]* |
| **150LDN0250** | | | | | | | | | | | | |
| **150LDN0400** | | | | | | | | | | | | |

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

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




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




**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 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: 24 V =
Green: Stand-by
Yellow: Switching point 75 %
Red: Switching point 100 %

**5** Visual indicator with memory function

**6** Locking ring DIN 471-16x1, **material no. R900003923**

**7** Name plate

☞ **Notices:**
Representation contains mechanical optical maintenance indicator (1) and electronic switching element (2).

# Ordering code
# Spare parts

## Filter element

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

**Filter element**

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

**Size**

| | | |
|---|---|---|
| 02 | LDN...<br>(Filter element according to **DIN 24550)** | **0040**<br>**0063**<br>**0100**<br>**0160**<br>**0250**<br>**0400** |
| | LD...<br>(Filter elements according to **Hengst standard**) | **0130**<br>**0150** |

**Filter rating in µm**

| | | | |
|---|---|---|---|
| 03 | **Nominal** | Stainless steel wire mesh, cleanable | **G10**<br>**G25**<br>**G40**<br>**G60**<br>**G100** |
| | **Nominal** | Filter paper, not cleanable | **P10**<br>**P25** |
| | **Absolute**<br>**(ISO 16889 ; $\beta_x$(c) ≥ 200)** | Non-woven glass fiber media, not cleanable | **PWR3**<br>**PWR6**<br>**PWR10**<br>**PWR20** |

**Pressure differential**

| | | |
|---|---|---|
| 04 | Max. admissible pressure differential of the filter element 30 bar *[435 psi]* | **A00** |
| | Max. admissible pressure differential of the filter element 330 bar *[4785 psi]* | **B00** |

**Bypass valve**

| | | |
|---|---|---|
| 05 | Without bypass valve | **0** |

**Seal**

| | | |
|---|---|---|
| 06 | NBR seal | **M** |
| | FKM seal | **V** |

**Order example:**
**2.0100 PWR3-A00-0-M**

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

## Preferred program replacement filter element

| Replacement filter element 3 micron | | Replacement filter element 6 micron | | Replacement filter element 10 micron | |
|---|---|---|---|---|---|
| **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 |
| **R928022274** | 2.0130 PWR3-A00-0-M | **R928022275** | 2.0130 PWR6-A00-0-M | **R928022276** | 2.0130 PWR10-A00-0-M |
| **R928022283** | 2.0150 PWR3-A00-0-M | **R928022284** | 2.0150 PWR6-A00-0-M | **R928022285** | 2.0150 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 |

# Ordering code
# Spare parts

## Mechanical optical maintenance indicator

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

| | | |
|---|---|---|
| 01 | Maintenance indicator | **W** |
| 02 | Mechanical visual indicator | **O** |
| 03 | Design pressure differential M20x1.5 | **D01** |

**Switching pressure**

| | | |
|---|---|---|
| 04 | 1.5 bar *[21.8 psi]* | **1,5** |
| | 2.2 bar *[31.9 psi]* | **2,2** |
| | 5.0 bar *[72.5 psi]* | **5,0** |

**Seal**

| | | |
|---|---|---|
| 05 | NBR seal | **M** |
| | FKM seal | **V** |

**Max. nominal pressure**

| | | |
|---|---|---|
| 06 | 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. | Description |
|---|---|
| **R928038781** | WO-D01-1,5-M-160 |
| **R901025312** | WO-D01-2,2-M-160 |
| **R901025313** | WO-D01-5,0-M-450 |
| **R928038780** | WO-D01-1,5-V-160 |
| **R901066233** | WO-D01-2,2-V-160 |
| **R901066235** | WO-D01-5,0-V-450 |

## Ordering code
## Spare parts

### Seal kit

| 01 | 02 | 03 | | 04 |
|---|---|---|---|---|
| **D** | **150LD** | | **–** | |

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

| | | |
|---|---|---|
| 02 | **Series** | **150LD** |

**Size**

| | | |
|---|---|---|
| 03 | 0040-0100 | **N0040-0100** |
| | 0130-0150 | **0130-0150** |
| | 0160-0400 | **N0160-0400** |

**Seal**

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

### Seal kit

| Material no. | Description |
|---|---|
| **R928039376** | D150LDN0040-0100-M |
| **R928039377** | D150LD0130-0150-M |
| **R928039378** | D150LDN0160-0400-M |
| **R928051944** | D150LDN0040-0100-V |
| **R928051934** | D150LD0130-0150-V |
| **R928048001** | D150LDN0160-0400-V |

## Assembly, commissioning, maintenance

**Assembly**

The max. operating pressure of the system must not exceed the max. admissible operating pressure of the filter (see name plate).
During assembly of the filter (see also chapter "Tightening torque"), the flow direction (direction arrows) and the required servicing height of the filter element (see chapter "Dimensions") are to be considered.
Proper function is only guaranteed in the installation with the filter bowl vertically downwards. The maintenance indicator must be arranged so it is easily viewed in operation.

Remove the plastic plugs in the filter inlet and outlet.

Ensure that the system is assembled without tension stress.
The optional electronic maintenance indicator is connected via the electronic switching element with 1 or 2 switching points, which is attached to the mechanical optical maintenance indicator and held by means of the locking ring.

**Commissioning**

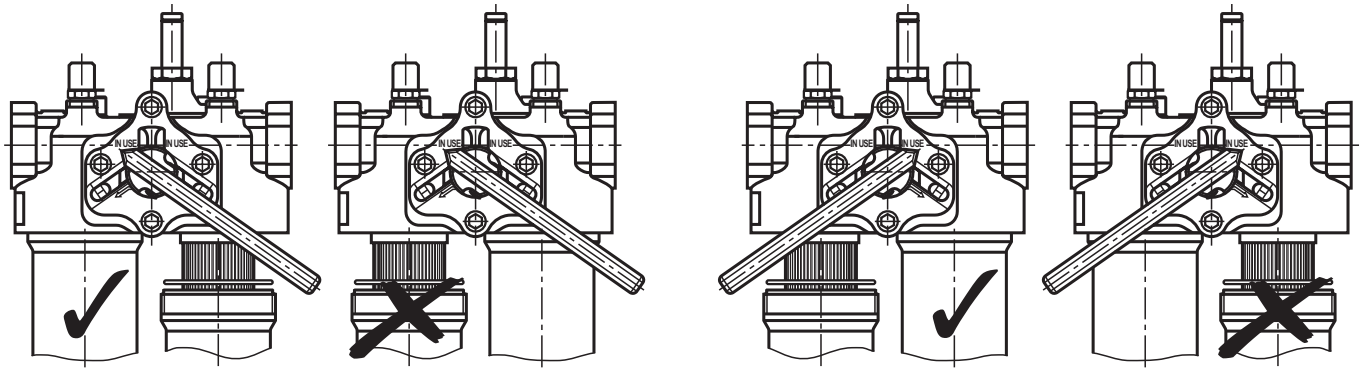
Bring the switching lever into central position in order to fill both filter sides.
Start the system.
Bleed filter by opening the bleed screws or bleed valves, close when operating liquid begins to escape.
Switch the filter into the operating position; to do so, switch the switching lever to one of the two end positions. The switch-over lever is on the filter side that is out of order.

**Maintenance**

- If at operating temperature, the red indicator pin reaches out of the mechanical optical maintenance indicator and/or if the switching process in the electronic switching element is triggered, the filter element is contaminated and needs to be replaced or cleaned respectively.
- The material number of the corresponding replacement filter element is indicated on the name plate of the complete filter. It must correspond to the material number on the filter element.
- The switch-over lever is on the filter side that is out of order. Observe the switching symbol on the switching lever and/or the switch-over.
- For pressure equalization and unlocking, pull the switch-over lever and switch to the opposite end position.
- Open the bleed screw or bleed valve at the decommissioned filter side in order to reduce the pressure.
- Via the drain screw (from size 0160 and larger), the oil on the dirt side can be drained.
- Unscrew the filter bowl – see figure assembly aid.
- Remove the filter element from the spigot by rotating it slightly.
- Clean the filter components, if necessary.
- Check the seals at the filter bowl for damage and replace them, if necessary.
  For suitable seal kits refer to chapter "Spare parts".
- Filter elements made of wire mesh can be cleaned. The efficiency of the cleaning process depends on the type of dirt and the amount of the pressure differential before the filter element exchange. If the pressure differential after the filter element exchange exceeds 150 % of the value of a brand-new filter element, the filter element made of wire mesh (G...) also needs to be replaced. For detailed cleaning instructions refer to data sheet 51420.
- Install the new or cleaned filter element on the spigot again by slightly rotating it.
- The filter is to be assembled in reverse order.
- The torque specifications ("Tightening torques" chapter) are to be observed.
- To fill the maintained filter side, pull the switch-over lever.
- The filter is bled via the bled screw or the bleed valve which is still open.
- After fluid escapes, close the bleed screw or the bleed valve again.
- Make sure that the switch-over lever is engaged.

## Assembly, commissioning, maintenance
## Assembly aid

**Correct** **Wrong** **Correct** **Wrong**




☞ **WARNINGS!**

- Assemble and disassemble only with depressurized system! For the filter element exchange refer to "Maintenance".
- Tank is pressurized!
- Maintenance only by trained specialists.
- Remove the filter bowl only if it is not under pressure!
- Do not exchange the maintenance indicator while the filter is under pressure!
- Do not operate the switching lever during the filter element exchange.
- When disassembling the filter, ensure that the downstream side is depressurized via the system.
- Warranty is only applicable when using genuine Bosch Hengst spare parts!
- Warranty becomes void if the delivered item is changed by the ordering party or third parties or improperly mounted, installed, maintained, repaired, used or exposed to environmental condition that do not comply with the installation conditions.

## Tightening torques
(dimensions in mm *[inch]*)

**Fastening top**

| **Series 150 ...** | **LDN0040** | **LDN0063** | **LDN0100** | **LD0130** | **LD0150** | **LDN0160** | **LDN0250** | **LDN0400** |
|---|---|---|---|---|---|---|---|---|
| Screw/tightening torque with $\mu_{total}$ = 0.14 | M8/10.5 Nm ± 10 % [8 lb-ft +/- 10%] | | | | | M10/21 Nm ± 10 % [16 lb-ft +/- 10%] | | |
| Quantity | 4 | | | | | | | |
| Recommended property class of screw | 8.8 | | | | | | | |
| Minimum screw-in depth | 10 mm + 4 mm | | | 10 mm + 1 mm | | 10 mm + 4 mm | | |

**Fastening back**

| **Series 150 ...** | **LDN0040** | **LDN0063** | **LDN0100** | **LD0130** | **LD0150** | **LDN0160** | **LDN0250** | **LDN0400** |
|---|---|---|---|---|---|---|---|---|
| Screw/tightening torque with $\mu_{total}$ = 0.14 | M10/21 Nm ± 10 % [16 lb-ft +/- 10%] | | | M12/37 Nm ± 10 % [27 lb-ft +/- 10%] | | M16/90 Nm ± 10 % [66 lb-ft +/- 10%] | | |
| Quantity | 3 | | | | | | | |
| Recommended property class of screw | 8.8 | | | | | | | |
| Minimum screw-in depth | 10 mm + 4 mm | | | 14 mm + 2 mm | | 19 mm + 2 mm | | |

**Filter bowl and maintenance indicator**

| **Series 150 ...** | **LDN0040** | **LDN0063** | **LDN0100** | **LD0130** | **LD0150** | **LDN0160** | **LDN0250** | **LDN0400** |
|---|---|---|---|---|---|---|---|---|
| Tightening torque filter bowl | 50 Nm + 10 Nm [37 lb-ft +/- 10%] | | | | | | | |
| Tightening torque maintenance indicator | 50 Nm [37 lb-ft max] | | | | | | | |
| Tightening torque cubic connector screw switching element EN-175301-803 | M3/0.5 Nm [0.4 lb-ft +/- 10%] | | | | | | | |

## 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

The duplex filters for hydraulic applications according to 51446 are pressure holding equipment according to article 1, section 2.1.4 of the Pressure Equipment Directive 97/23/EC (PED).

However, based on the exception in article 1, section 3.6 of the PED, hydraulic filters are exempt from the PED if they are not classified higher than category I (guideline 1/19). They do not receive a CE mark.

### Use in explosive areas according to directive 94/9/EC (ATEX)

The duplex filters according to 51446 are not equipment or components in the sense of directive 94/9/EC and are not provided with a CE mark. It has been proven with the ignition risk analysis that these inline filters do not have own ignition sources acc. to DIN EN 13463-1:2009.

According to DIN EN 60079-11:2012, the electronic maintenance indicators WE-1SP-M12x1 and WE-1SP-EN175301-803 are simple, electronic operating equipment not having an own voltage source. This simple, electronic operating equipment may - according to DIN EN 60079-14:2008 - in intrinsically safe electric circuits (Ex ib) be used in systems without marking and certification.

The duplex filters and the electronic maintenance indicators described here can be used for the following explosive areas:

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

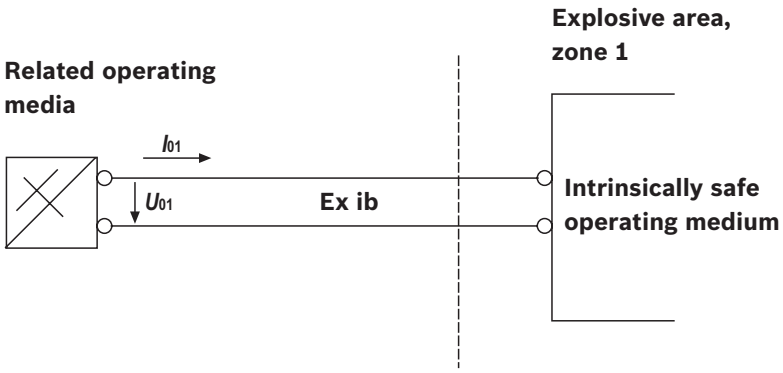
| **Complete filter with mech./opt. maintenance indicator** | | | | |
|---|---|---|---|---|
| **Use /assignment** | | | **Gas 2G** | **Dust 2D** |
| Assignment | | | Ex II 2G c IIB TX | Ex II 2D c IIB TX |
| Conductivity of the medium | pS/m | Min | 300 | |
| Dust accumulation | | Max | – | 0.5 mm |

| **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 [1)] | | 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!**

- Explosion hazard due to high temperature!
  The temperature depends on the temperature of the medium in the hydraulic circuit and must not exceed the value specified here. Measures are to be taken so that in the explosive area, the max. admissible ignition temperature is not exceeded.
- When using the duplex filters according to 51446 in explosive areas, sufficient potential equalization has to be ensured. The filter is preferably to be grounded via the mounting screws. It has to be noted in this connection that paintings and oxidic protective layers are not electrically conductive.
- Maintenance only by specialists, instruction by the machine end-user acc. to DIRECTIVE 1999/92/EC appendix II, section 1.1.
- During filter element exchanges, the packaging material is to be removed from the replacement element outside the explosive area.
- Functional and safety warranty only applicable when using genuine Hengst spare parts.

## Notes

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