

# Series EHD 241-451

## 4568 PSI

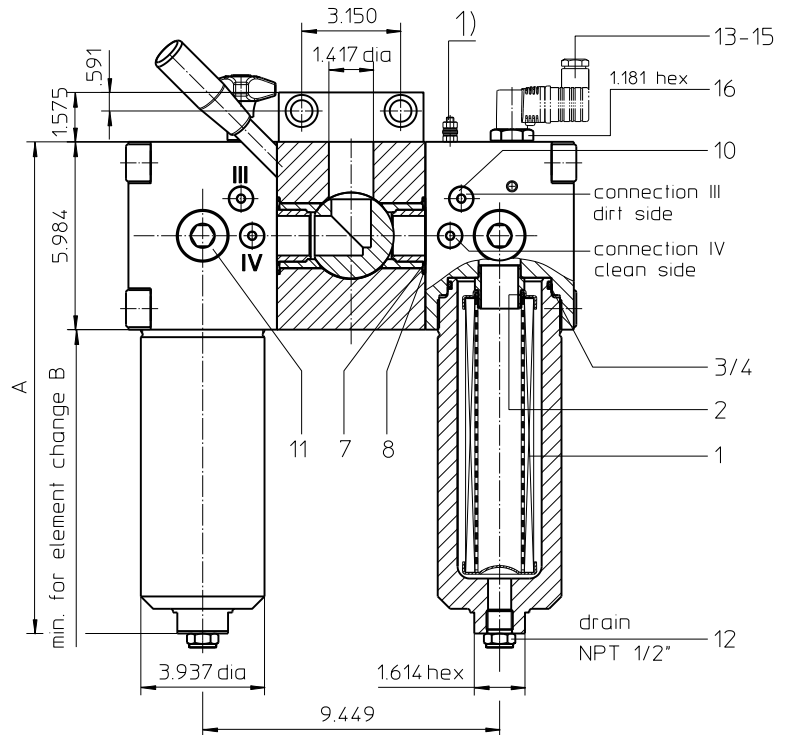
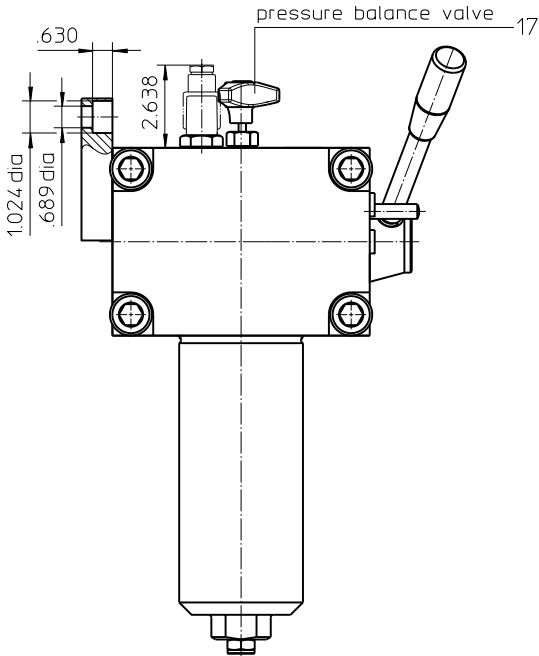
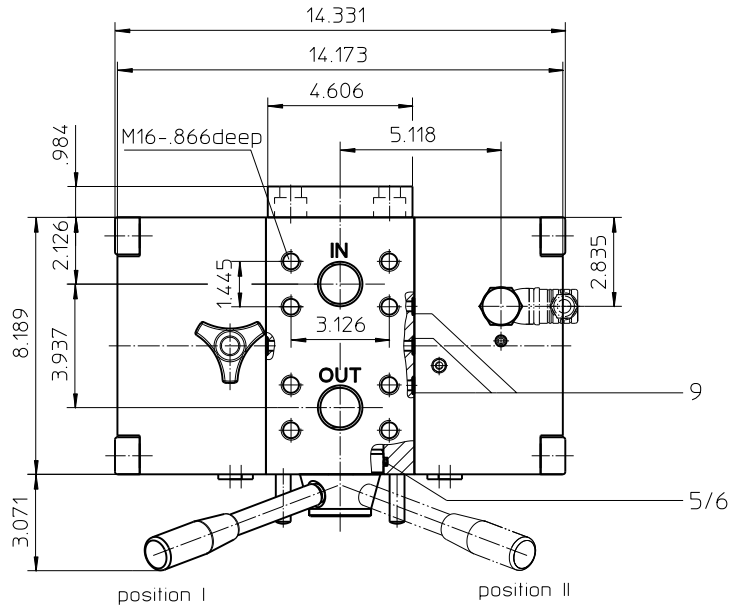
**Dimensions:**

type	EHD 241	EHD 451
connection	SAE 1 1/2"	
A	15.66	22.95
B	13.38	20.66
weigh lbs.	223	247
volume tank	2x .22 Gal.	2x .47 Gal.

- 1) Connection for the potential equalization, only for application in the explosive area.

Connections III and IV to be used for pressure relief and air bleeding respective filter side.

Position I: left filter side in operation  
 Position II: right filter side in operation



Dimensions: inches

Designs and performance values are subject to change.



Powering Business Worldwide

# Pressure Filter, change over Series EHD 241-451 4568 PSI

## Description:

Stainless steel-pressure filters changeover series EHD 241-451 are suitable for operating pressure up to 4568 PSI. The pressure peaks are absorbed by a sufficient margin of safety.

Duplex filters can be serviced without interruption of operation. The upper part has a three-way-change-over valve which allows to change-over the flow from the dirty filter-side to the clean filter-side without interrupting the operation. The change-over procedure does not lead to a cross sectional contraction. Prior to the change-over procedure a built-in pressure balance valve equalizes the housing pressure. After change-over the pressure balance valve is to be closed again. The closed filter-side has to be air-bled by vent III respectively by vent IV. Then change filter element. After screw in the filter bowl the pressure balance has to be opened shortly and the just serviced filter-side has to be air-bled. Filter elements are available down to a filter fineness of  $5 \mu\text{m}_{(C)}$ .

Eaton filter elements are known for high intrinsic stability and an excellent filtration capability, a high dirt-retaining capacity and a long service life.

Eaton filter elements are available with a pressure difference resistance up to  $\Delta p$  2320 PSI and a rupture strength up to  $\Delta p$  3625 PSI.

The internal valves are integrated into the centering pivot for the filter element.

After reaching the opening pressure the by-pass valve causes that an unfiltered partial flow passes the filter. The reversing valve provides another level of protection for the filter element. The reverse flow will not be filtered.

Eaton filter are suitable for all petroleum based fluids, HW-emulsions, most synthetic hydraulic fluids and lubrication oils.

## 1. Type index:

### 1.1. Complete filter: (ordering example)

<b>EHD. 241. 10VG. HR. E. P. VA. FS. 7. VA. - . - . AE</b>												
1	2	3	4	5	6	7	8	9	10	11	12	13

- |    |  |
|----|--|
| 1  | <b>series:</b><br>EHD = stainless steel-pressure filter, change over   |
| 2  | <b>nominal size:</b> 241, 451  |
| 3  | <b>filter-material and filter-fineness:</b><br>80G, 40G, 25G stainless steel wire mesh<br>25VG, 16VG, 10VG, 6VG, 3VG microglass  |
| 4  | <b>filter element collapse rating:</b><br>30 = $\Delta p$ 435 PSI<br>HR = $\Delta p$ 2320 PSI (rupture strength $\Delta p$ 3625 PSI)   |
| 5  | <b>filter element design:</b><br>E = single-end open   |
| 6  | <b>sealing material:</b><br>P = Nitrile (NBR)<br>V = Viton (FPM)   |
| 7  | <b>filter element specification:</b><br>- = standard<br>VA = stainless steel   |
| 8  | <b>process connection:</b><br>FS = SAE-flange connection 6000 PSI  |
| 9  | <b>process connection size:</b><br>7 = 1 1/2"  |
| 10 | <b>filter housing specification:</b><br>VA = stainless steel   |
| 11 | <b>specification pressure vessel:</b><br>- = standard (PED 2014/68/EU)<br>IS20 = ASME VIII Div.1 with ASME equivalent material,<br>see sheet-no. 55217 (max. operating pressure 2635 PSI)                                |
| 12 | <b>internal valve:</b><br>- = without<br>S1 = with by-pass valve $\Delta p$ 51 PSI<br>S2 = with by-pass valve $\Delta p$ 102 PSI<br>R = reversing valve, $Q \leq 55.75$ GPM  |
| 13 | <b>clogging indicator or clogging sensor:</b><br>- = without<br>AOR = visual, see sheet-no. 1606<br>AOC = visual, see sheet-no. 1606<br>AE = visual-electric, see sheet-no. 1615<br>VS5 = electronic, see sheet-no. 1619 |

To add an indicator to your filter, use the corresponding indicator data sheet to find the indicator details and add them to the filter assembly model code.

### 1.2. Filter element: (ordering example)

<b>01E. 240. 10VG. HR. E. P. VA</b>						
1	2	3	4	5	6	7

- |   |   |
|---|---|
| 1 | <b>series:</b><br>01E. = filter element according to company standard |
| 2 | <b>nominal size:</b> 240, 450   |
| 3 | - 7   see type index-complete filter                                  |

## Accessories:

- gauge port- and bleeder connection, see sheet-no. 1650

## Technical data:

operating temperature:	+14°F to +212°F
operating medium	mineral oil, other media on request
max. operating pressure:	4568 PSI
test pressure:	6532 PSI
max. operating pressure at IS20:	3625 PSI
test pressure at IS20:	4713 PSI
process connection:	SAE-flange 6000 PSI
housing material:	EN10088-1.4571 (316 Ti according to AISI)
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
air bleeding and measure connections dirt side:	BSPP ¼

Classified under the Pressure Equipment Directive 2014/68/EU for mineral oil (fluid group 2), Article 4, Para. 3.  
 Classified under ATEX Directive 2014/34/EU according to specific application (see questionnaire sheet-no. 34279-4).

## Pressure drop flow curves:

### Filter calculation/sizing

The pressure drop of the assembly at a given flow rate Q is the sum of the housing  $\Delta p$  and the element  $\Delta p$  and is calculated as follows:

$$\Delta p_{assembly} = \Delta p_{housing} + \Delta p_{element}$$

$$\Delta p_{housing} = (\text{see } \Delta p = f(Q) \text{ - characteristics})$$

$$\Delta p_{element} (PSI) = Q (GPM) \times \frac{MSK}{1000} \left( \frac{PSI}{GPM} \right) \times \nu (SUS) \times \frac{\rho}{0.876} \left( \frac{kg}{dm^3} \right)$$

For ease of calculation our Filter Selection tool is available online at [www.eaton.com/hydraulic-filter-evaluation](http://www.eaton.com/hydraulic-filter-evaluation)

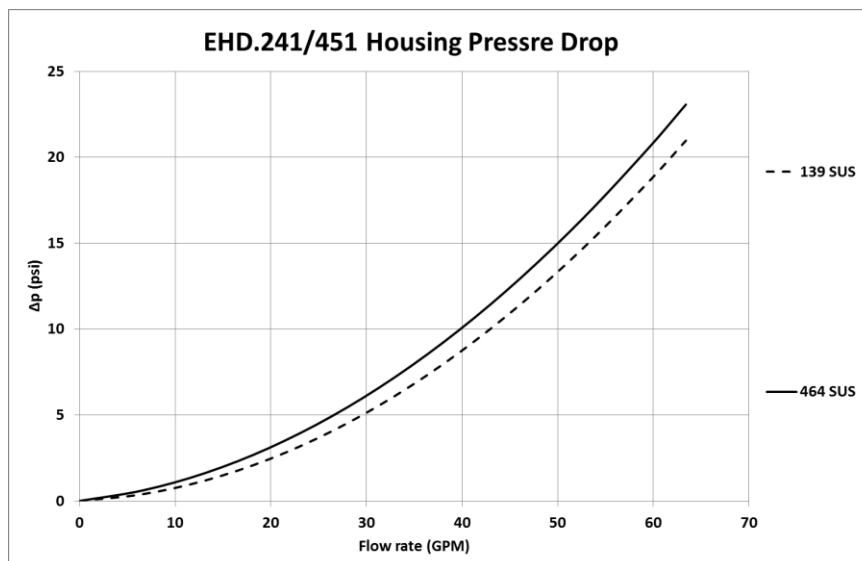
### Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in psi/gpm apply to mineral oil (HLP) with a density of 0.876 kg/dm<sup>3</sup> and a kinematic viscosity of 139 SUS (30 mm<sup>2</sup>/s). The pressure drop changes proportionally to the change in kinematic viscosity and density.

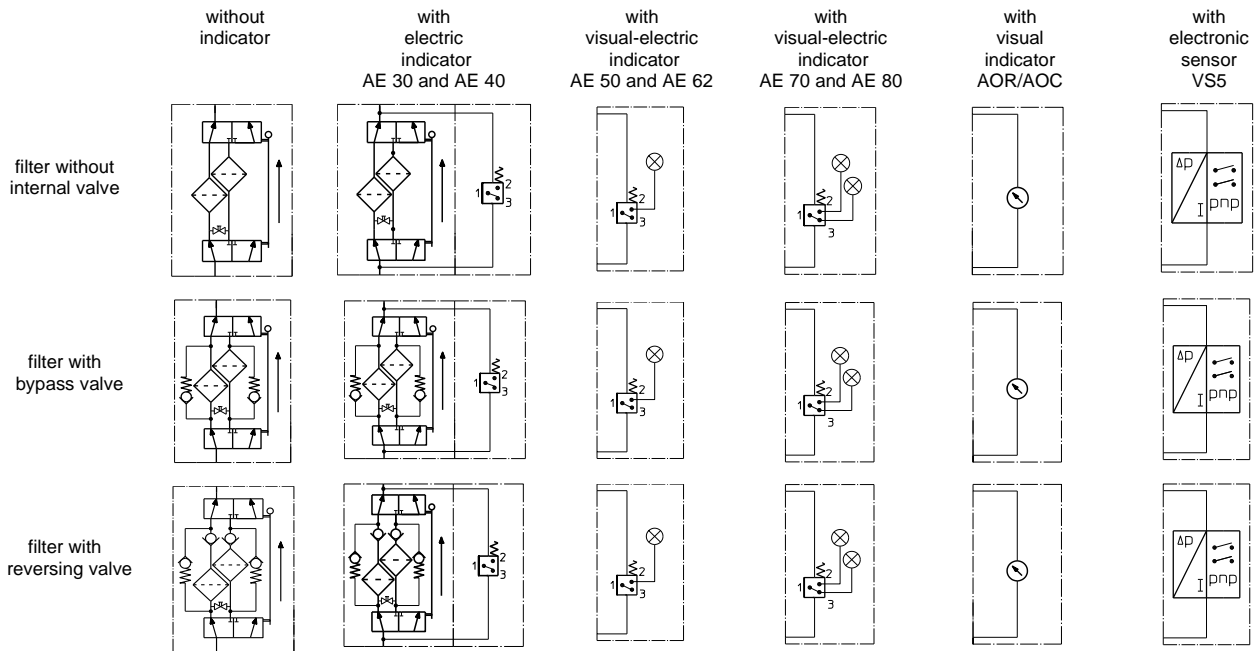
EHD	VG					G		
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G
241	2.092	1.452	0.930	0.799	0.546	0.0651	0.0607	0.0416
451	1.126	0.782	0.500	0.430	0.294	0.0349	0.0326	0.0223

### $\Delta p = f(Q)$ – characteristics according to ISO 3968

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0.876 kg/dm<sup>3</sup>. The pressure drop changes proportionally to the density.



## Symbols:



## Spare parts:

item	qty.	designation	dimension		article-no.	
			EHD 241	EHD 451		
1	2	filter element	01E.240...	01E.450...		
2	2	O-ring	34 x 3,5		304338 (NBR)	304730 (FPM)
3	2	O-ring	76 x 4		305599 (NBR)	310291 (FPM)
4	2	support ring	84 x 3,2 x 1,5		312309	
5	3	O-ring	70 x 4		306253 (NBR)	310280 (FPM)
6	2	support ring	076 x 70 x 45°		317709	
7	4	O-ring	56 x 3		305072 (NBR)	305322 (FPM)
8	4	O-ring	42,52 x 2,62		304352 (NBR)	304392 (FPM)
9	4	O-ring	10 x 2		309998 (NBR)	310272 (FPM)
10	4	screw plug	BSPP 1/4"		306968	
11	4	screw plug	BSPP 1"		308498	
12	2	screw plug	NPT 1/2"		307766	
13	1	clogging indicator, visual	AOR or AOC		see sheet-no. 1606	
14	1	clogging indicator, visual-electric	AE		see sheet-no. 1615	
15	1	clogging sensor, electronic	VS5		see sheet-no. 1619	
16	1	screw plug	20913-4		314442	
17	1	pressure balance valve	DN10		310316	

item 16 execution only without clogging indicator or clogging sensor

## Test methods:

Filter elements are tested according to the following ISO standards:

ISO 2941	Verification of collapse/burst resistance
ISO 2942	Verification of fabrication integrity
ISO 2943	Verification of material compatibility with fluids
ISO 3723	Method for end load test
ISO 3724	Verification of flow fatigue characteristics
ISO 3968	Evaluation of pressure drop versus flow characteristics
ISO 16889	Multi-pass method for evaluating filtration performance

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