



# Pressure Filter

## Series MDD 40-63

### 2900 PSI

#### Description:

Duplex pressure filter series MDD 40-63 with change-over valve have a working pressure up to 2900 PSI. Pressure peaks can be absorbed with a sufficient safety margin. Duplex filters can be serviced without interruption of operation.

The filter head has a three-way-change-over valve which diverts the flow from the dirty filter-side to the clean filter-side without interrupting operation of the filter. All filter housings have an integrated pressure balance valve to make main valve operation from one filter side to the other easier. Filter elements are available down to 5  $\mu\text{m}_{(0)}$ . Finer filtration is available upon request.

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

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

The internal valve is integrated into the filter head. After reaching the bypass pressure setting, the bypass valve will send unfiltered partial flow around the filter.

The reversing valve provides another level of protection for the filter element. The reverse flow will not be filtered.

#### 1. Type index:

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

**MDD. 40. 10VG. HR. E. P. - . UG. 3. - . - . AE**

1	2	3	4	5	6	7	8	9	10	11	12
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- |    |                                                                                                                                                                                                                          |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | <b>series:</b><br>MDD = medium pressure filter, change over                                                                                                                                                              |
| 2  | <b>nominal size:</b> 40, 63                                                                                                                                                                                              |
| 3  | <b>filter-material and filter-fineness:</b><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> (see catalog)<br>- = standard<br>VA = stainless steel<br>IS06 = for HFC applications, see sheet-no. 31601                                                                           |
| 8  | <b>process connection:</b><br>UG = thread connection                                                                                                                                                                     |
| 9  | <b>process connection size:</b><br>3 = -8 SAE (MDD 40)<br>4 = -12 SAE (MDD 63)                                                                                                                                           |
| 10 | <b>filter housing specification:</b> (see catalog)<br>- = standard<br>IS06 = for HFC applications, see sheet-no. 31605<br>IS12 = for stainless steel ball valve, see sheet-no. 41028                                     |
| 11 | <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, $Q \leq 18.50$ GPM                                              |
| 12 | <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)

**01NL. 40. 10VG. HR. E. P. -**

1	2	3	4	5	6	7
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- |   |                                                                              |
|---|------------------------------------------------------------------------------|
| 1 | <b>series:</b><br>01NL. = standard filter element according to DIN 24550, T3 |
| 2 | <b>nominal size:</b> 40, 63                                                  |
| 3 | - 7   see type index-complete filter                                         |

#### Accessories:

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

## Technical data:

design temperature:	14 °F to +212 °F
operating temperature:	14 °F to +176 °F
operating medium	mineral oil, other media on request
max. operating pressure:	2900 PSI
test pressure:	4147 PSI
process connection:	thread connection
housing material:	C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
air bleeding and measure connections dirt side:	BSPP ¼
measure connections clean side:	BSPP ½

Classified under the Pressure Equipment Directive 2014/68/EC for mineral oil (fluid group 2), Article 4, Para. 3.  
 Classified under ATEX Directive 2014/34/EC 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.eatonpowersource.com/calculators/filtration/](http://www.eatonpowersource.com/calculators/filtration/)

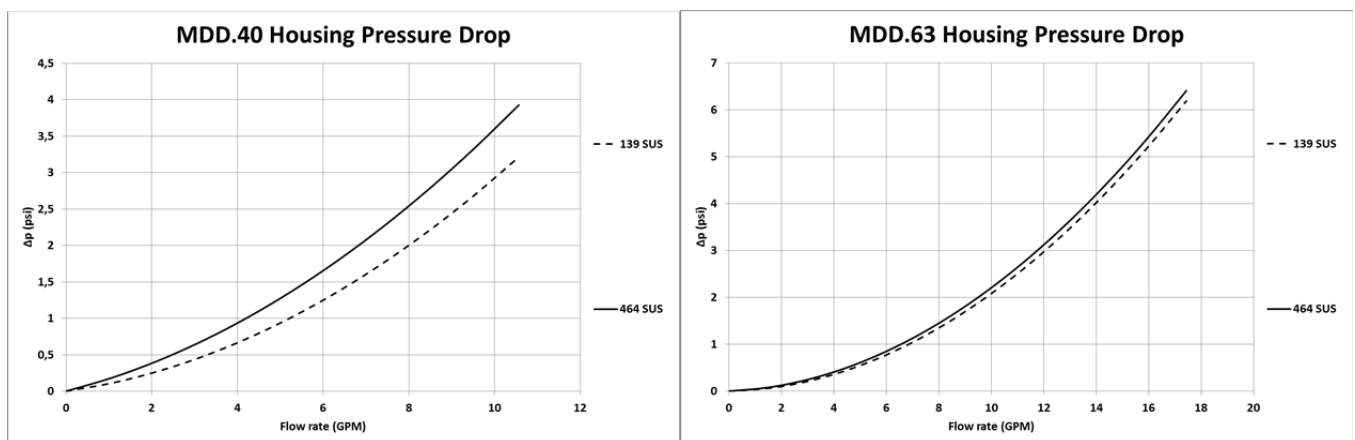
### Material gradient coefficients (MSK) for filter elements

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.

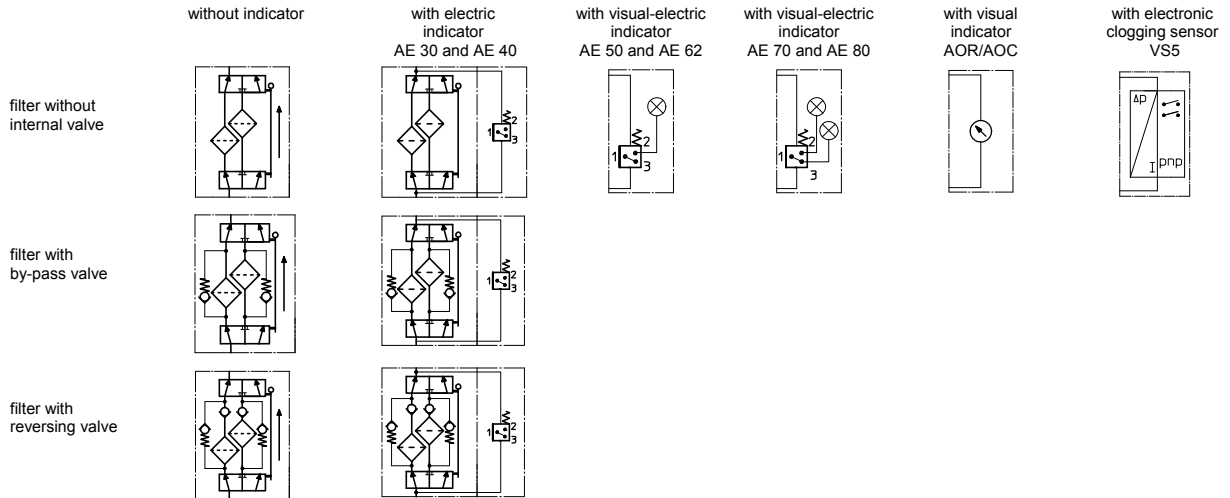
MDD	VG				
	3VG	6VG	10VG	16VG	25VG
40	6.991	4.853	3.107	2.705	1.848
63	4.214	2.926	1.873	1.631	1.114

### $\Delta p = f(Q)$ – 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.	
			MDD 40 01NL.40...	MDD 63 01NL.63...		
1	2	filter element				
2	2	O-ring		22 x 3,5	304341 (NBR)	304392 (FPM)
3	2	O-ring		54 x 3	304657 (NBR)	304720 (FPM)
4	2	support ring		60 x 2,6 x 1	311779	
5	3	O-ring		26 x 3	304379 (NBR)	318576 (FPM)
6	4	O-ring		28 x 3	316778 (NBR)	318366 (FPM)
7	4	O-ring		18 x 3	304359 (NBR)	304399 (FPM)
8	4	O-ring		6,5 x 2	313553 (NBR)	318577 (FPM)
9	2	screw plug		1/2 BSPP	304678	
10	2	screw plug		1/4 BSPP	305003	
11	1	clogging indicator, visual		AOR or AOC	see sheet-no. 1606	
12	1	clogging indicator, visual-electric		AE	see sheet-no. 1615	
13	1	clogging sensor, electronic		VS5	see sheet-no. 1619	
14	1	O-ring		15 x 1,5	315357 (NBR)	315427 (FPM)
15	1	O-ring		22 x 2	304708 (NBR)	304721 (FPM)
16	1	O-ring		14 x 2	304342 (NBR)	304722 (FPM)
17	1	screw plug		20913-4	309817	
18	1	pressure balance valve		3/8"	305000	

item 17 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