

67
9
86
188
min. for element change 180
64
22
52
30
G1/2
1
12
3/4
2
1
11
30
8-10

measuring connection dirt side
measuring connection clean side
5
6

40
132
55
48
11 passage
34
32
86
185
120
7
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

pressure balance valve
position I
position II

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

Designs and performance values are subject to change.

Pressure Filter, change over Series HDD 30 DN15 PN315

Description:

Pressure filters change over series HDD 30 are suitable for operating pressure up to 315 bar. 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 Δp 160 bar and a rupture strength up to Δp 250 bar.

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.

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

Type index:

Complete filter: (ordering example)

HDD.	30.	10VG.	HR.	E.	P.	-	G.	3.	-	-	AE
1	2	3	4	5	6	7	8	9	10	11	12

- 1 **series:**
HDD = pressure filter change over
- 2 **nominal size:** 30
- 3 **filter material:**
25VG, 16VG, 10VG, 6VG, 3VG microglass
- 4 **filter element collapse rating:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)
- 5 **filter element design:**
E = single-end open
- 6 **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 **filter element specification:**
- = standard
VA = stainless steel
ISO6 = for HFC application, see sheet-no. 31601
- 8 **process connection:**
G = thread connection according to ISO 228
- 9 **process connection size:**
3 = G $\frac{1}{2}$
- 10 **filter housing specification:**
- = standard
- 11 **internal valve:**
- = without
S1 = with bypass valve Δp 3,5 bar
S2 = with bypass valve Δp 7,0 bar
- 12 **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electric, see sheet-no. 1615
VS5 = electronic, see sheet-no. 1619

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

Filter element: (ordering example)

01E.	30.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

- 1 **series:**
01E = filter element according to company standard
- 2 **nominal size:** 30
- 3 - 7 see type index-complete filter

Accessories:

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

Technical data:

operating temperature:	-10 °C to +100 °C
operating medium:	mineral oil, other media on request
max. operating pressure:	315 bar
test pressure:	450 bar
standard process connection:	thread connection according to ISO 228
housing material:	EN-GJS-400-18-LT, carbon steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
measuring- and bleeder connections:	G 1/4
volume tank:	2x 0,11 l

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 Δp and the element Δp and is calculated as follows:

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

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

$$\Delta p_{\text{element}} (\text{mbar}) = Q \left(\frac{\text{l}}{\text{min}} \right) \times \frac{\text{MSK}}{10} \left(\frac{\text{mbar}}{\text{l/min}} \right) \times \nu \left(\frac{\text{mm}^2}{\text{s}} \right) \times \frac{\rho}{0,876} \left(\frac{\text{kg}}{\text{dm}^3} \right)$$

For ease of calculation our Filter Selection tool is available online at www.eatonpowersource.com/calculators/filtration/

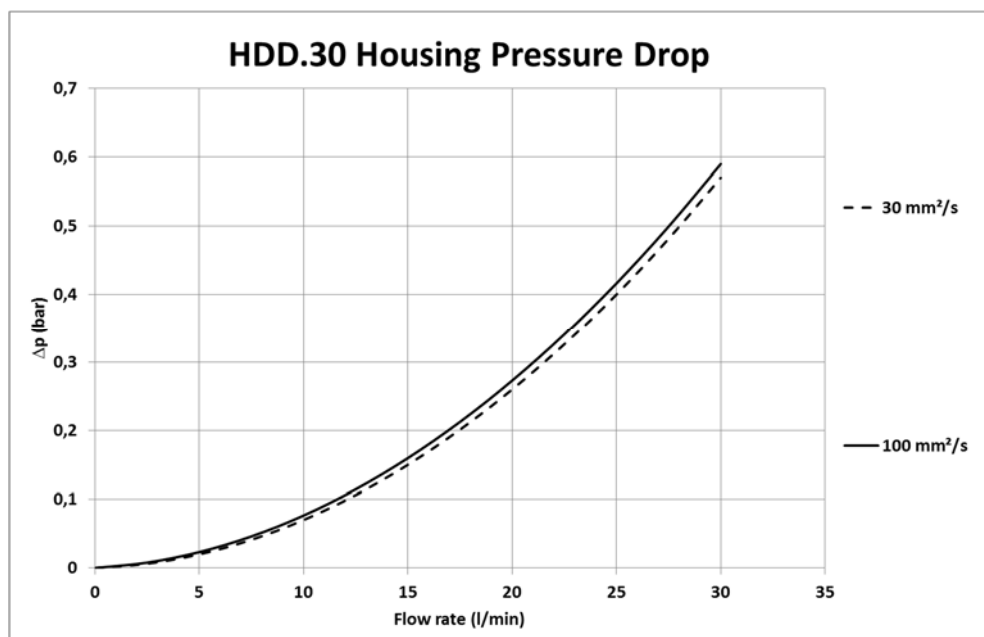
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in mbar/(l/min) apply to mineral oil (HLP) with a density of 0,876 kg/dm³ and a kinematic viscosity of 30 mm²/s (139 SUS). The pressure drop changes proportionally to the change in kinematic viscosity and density.

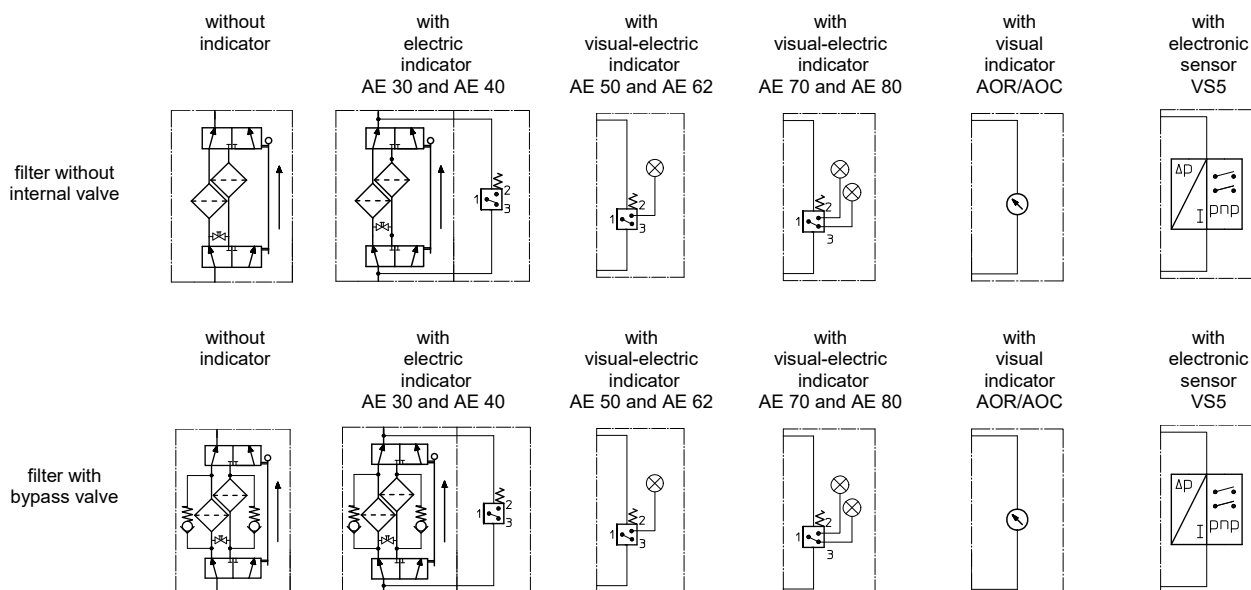
HDD	VG				
	3VG	6VG	10VG	16VG	25VG
30	10,116	7,023	4,496	3,915	2,674

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

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0,876 kg/dm³. The pressure drop changes proportionally to the density.



Symbols:



Spare parts:

item	qty.	designation	dimension	article-no.	
1	2	filter element	01E.30...		
2	2	O-ring	12,37 x 2,62	304356 (NBR)	304396 (FPM)
3	2	O-ring	40 x 3	304389 (NBR)	304391 (FPM)
4	2	support ring	48 x 2,6 x 1	305391	
5	2	O-ring	10 x 3	307285 (NBR)	311019 (FPM)
6	2	O-ring	32 x 3	304368 (NBR)	311020 (FPM)
7	4	screw plug	G 1/4	305003	
8	1	clogging indicator, visual	AOR or AOC	see sheet-no. 1606	
9	1	clogging indicator, visual-electric	AE	see sheet-no. 1615	
10	1	clogging sensor, electronic	VS5	see sheet-no. 1619	
11	1	screw plug	20913-4	309817	
12	1	pressure balance valve	DN10	305000	

item 11 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

North America

44 Apple Street
Tinton Falls, NJ 07724
Toll Free: 800 656-3344
(North America only)
Tel: +1 732 212-4700

China

No. 3, Lane 280,
Linhong Road
Changning District, 200335
Shanghai, P.R. China
Tel: +86 21 5200-0099

Europe/Africa/Middle East

Auf der Heide 2
53947 Nettersheim, Germany
Tel: +49 2486 809-0

Friedensstraße 41
68804 Altlufheim, Germany
Tel: +49 6205 2094-0

An den Nahewiesen 24
55450 Langenlonsheim, Germany
Tel: +49 6704 204-0

Singapore

100G Pasir Panjang Road #07-08
Singapore 118523
Tel: +65 6825-1668

Brazil

Av. Ermano Marchetti, 1435 -
Água Branca, São Paulo - SP,
05038-001, Brazil
Tel: +55 11 3616-8461

For more information, please

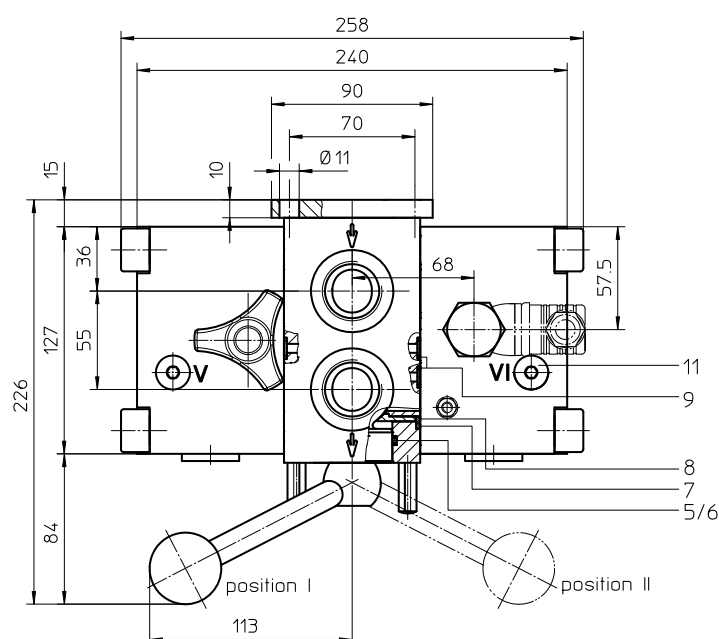
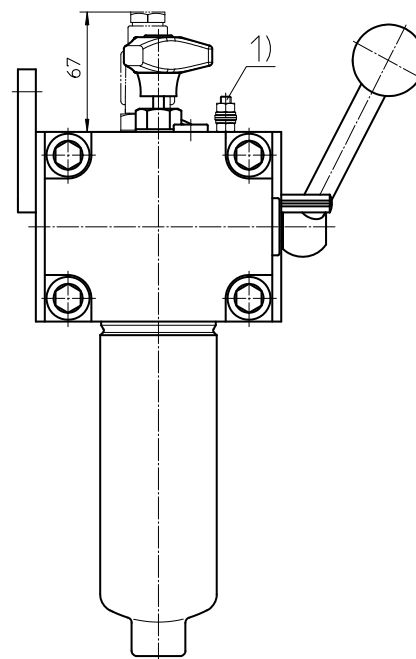
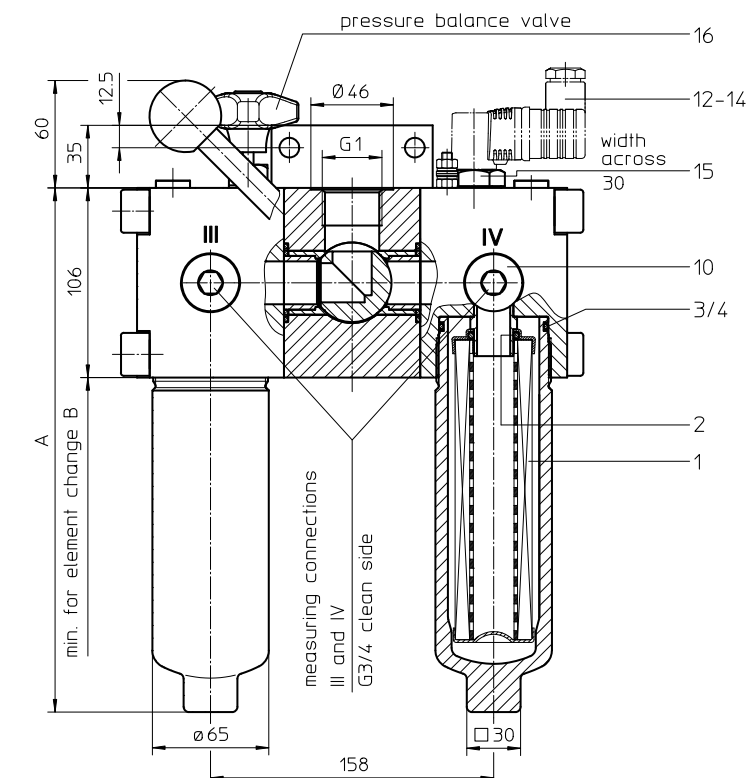
email us at filtration@eaton.com

or visit www.eaton.com/filtration

© 2019 Eaton. All rights reserved. All trademarks and registered trademarks are the property of their respective owners. All information and recommendations appearing in this brochure concerning the use of products described herein are based on tests believed to be reliable. However, it is the user's responsibility to determine the suitability for his own use of such products. Since the actual use by others is beyond our control, no guarantee, expressed or implied, is made by Eaton as to the effects of such use or the results to be obtained. Eaton assumes no liability arising out of the use by others of such products. Nor is the information herein to be construed as absolutely complete, since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

Series HDD 61-151

DN25 PN315



Dimensions:

type	HDD 61	HDD 91	HDD 151
connection	G 1		
A	228	293	402
B	275	340	450
weight kg	27	28	31
volume tank	2x 0,3 l	2x 0,4 l	2x 1,6 l

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

Measure connections V and VI 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: mm

Designs and performance values are subject to change.

Pressure Filter, change over Series HDD 61-151 DN25 PN315

Description:

Pressure filters change over series HDD 61-151 are suitable for operating pressure up to 315 bar. 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 up to a pressure resistance of Δp 160 bar and a rupture strength of Δp 250 bar.

Eaton filter can be used for petroleum-based fluids, HW emulsions, water glycols, most synthetic fluids and lubrication fluids. Consult factory for specific fluid applications.

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.

Type index:

Complete filter: (ordering example)

HDD.	91.	10VG.	HR.	E.	P.	-	G.	5.	-	-	AE
1	2	3	4	5	6	7	8	9	10	11	12

- 1 | **series:**
HDD = pressure filter change over
- 2 | **nominal size:** 61, 91, 151
- 3 | **filter material:**
25VG, 16VG, 10VG, 6VG, 3VG microglass
- 4 | **filter element collapse rating:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)
- 5 | **filter element design:**
E = single-end open
- 6 | **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 | **filter element specification:**
- = standard
VA = stainless steel
IS06 = for HFC applications, see sheet-no. 31601
- 8 | **process connection:**
G = thread connection according to ISO228
- 9 | **process connection size:**
5 = G 1
- 10 | **filter housing specification:**
- = standard
IS06 = for HFC applications, see sheet-no. 31605
- 11 | **internal valve:**
- = without
S1 = with bypass valve Δp 3,5 bar
S2 = with bypass valve Δp 7,0 bar
R = reversing valve, $Q \leq 70,06$ l/min
- 12 | **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electric, see sheet-no. 1615
VS5 = electronic, see sheet-no. 1619

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

Filter element: (ordering example)

01E.	90.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

- 1 | **series:**
01E = filter element according to company standard
- 2 | **nominal size:** 60, 90, 150
- 3 | - 7 | see type index-complete filter

Accessories:

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

Technical data:

operating temperature:	-10 °C to +100 °C
operating medium:	mineral oil, other media on request
max. operating pressure:	315 bar
test pressure:	450 bar
process connection:	thread connection according to ISO 228
housing material:	C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
bleeder- and measuring connections dirt side:	G ¼
measuring connections clean side:	G ¾

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 Δp and the element Δp and is calculated as follows:

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

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

$$\Delta p_{\text{Element}} (\text{mbar}) = Q \left(\frac{\text{l}}{\text{min}} \right) \times \frac{\text{MSK}}{10} \left(\frac{\text{mbar}}{\text{l/min}} \right) \times v \left(\frac{\text{mm}^2}{\text{s}} \right) \times \frac{p}{0,876} \left(\frac{\text{kg}}{\text{dm}^3} \right)$$

For ease of calculation our Filter Selection tool is available online at

www.eatonpowersource.com/calculators/filtration/

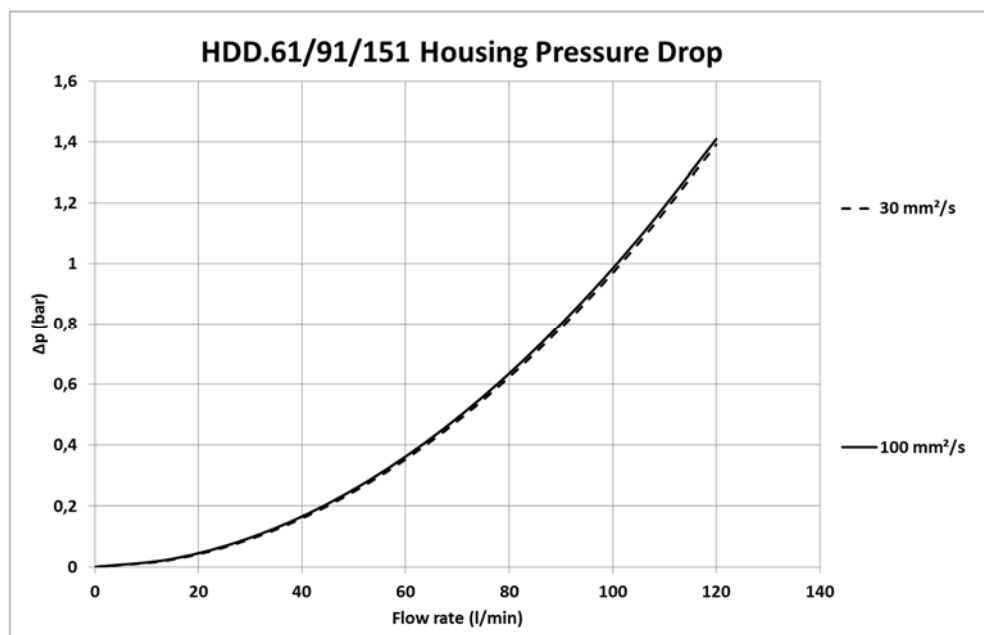
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in mbar/(l/min) apply to mineral oil (HLP) with a density of 0,876 kg/dm³ and a kinematic viscosity of 30 mm²/s (139 SUS). The pressure drop changes proportionally to the change in kinematic viscosity and density.

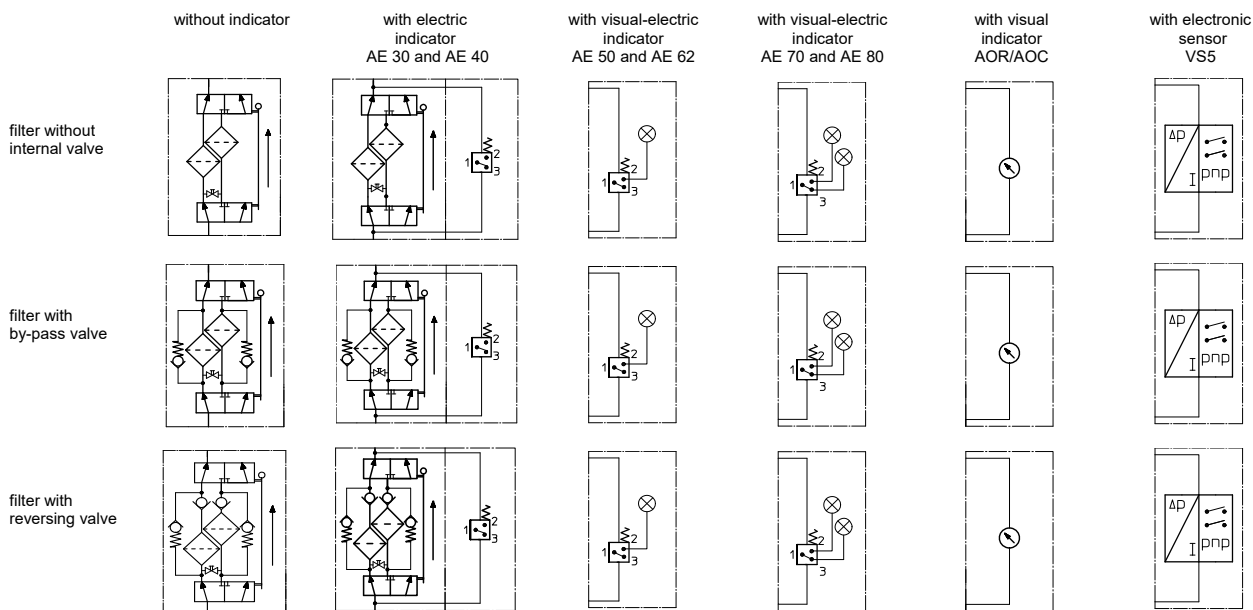
HDD	VG				
	3VG	6VG	10VG	16VG	25VG
61	5,438	3,775	2,417	2,104	1,438
91	3,271	2,271	1,454	1,266	0,865
151	1,952	1,355	0,867	0,755	0,516

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

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0,876 kg/dm³. The pressure drop changes proportionally to the density.



Symbols:



Spare parts:

item	qty.	designation	dimension			article-no.	
			HDD 61	HDD 91	HDD 151		
1	2	filter element	01E.60...	01E.90...	01E.150...		
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		61 x 2,6 x 1		304660	
5	3	O-ring		45 x 3		304991 (NBR)	304997 (FPM)
6	2	support ring		49,7 x 2,4 x 1		317709	
7	4	O-ring		38 x 3		304340 (NBR)	317013 (FPM)
8	4	O-ring		28 x 3		316778 (NBR)	318366 (FPM)
9	4	O-ring		8 x 2		310004 (NBR)	316530 (FPM)
10	2	screw plug		G 3/4		308529	
11	2	screw plug		G 1/4		305003	
12	1	clogging indicator, visual		AOR or AOC		see sheet-no. 1606	
13	1	clogging indicator, visual-electric		AE		see sheet-no. 1615	
14	1	clogging sensor, electronic		VS5		see sheet-no. 1619	
15	1	screw plug		20913-4		309817	
16	1	pressure balance valve		DN10		305000	

item 15 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

North America
44 Apple Street
Tinton Falls, NJ 07724
Toll Free: 800 656-3344
(North America only)
Tel: +1 732 212-4700

China
No. 3, Lane 280,
Linhong Road
Changning District, 200335
Shanghai, P.R. China
Tel: +86 21 5200-0099

Europe/Africa/Middle East
Auf der Heide 2
53947 Nettersheim, Germany
Tel: +49 2486 809-0

Friedensstraße 41
68804 Altludersheim, Germany
Tel: +49 6205 2094-0

An den Nahewiesen 24
55450 Langenlonsheim, Germany
Tel: +49 6704 204-0

Singapore
100G Pasir Panjang Road #07-08
Singapore 118523
Tel: +65 6825-1668

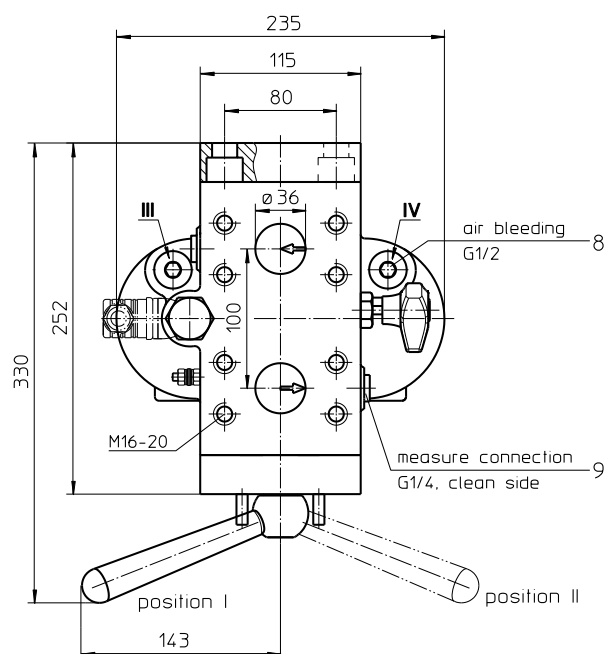
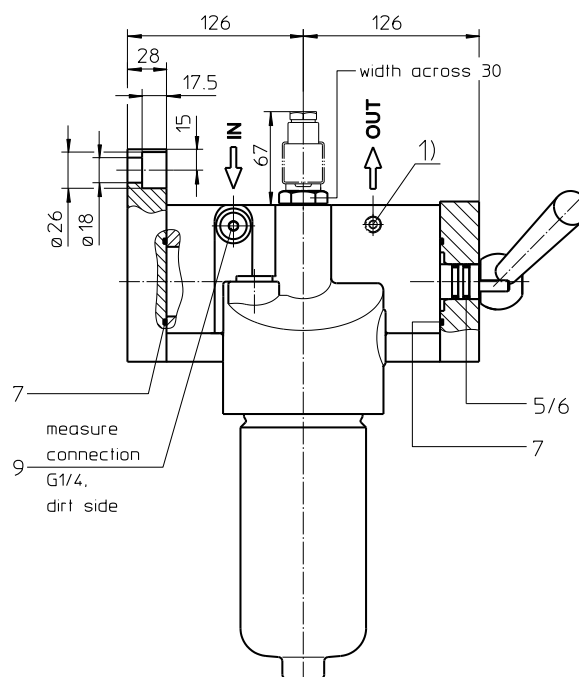
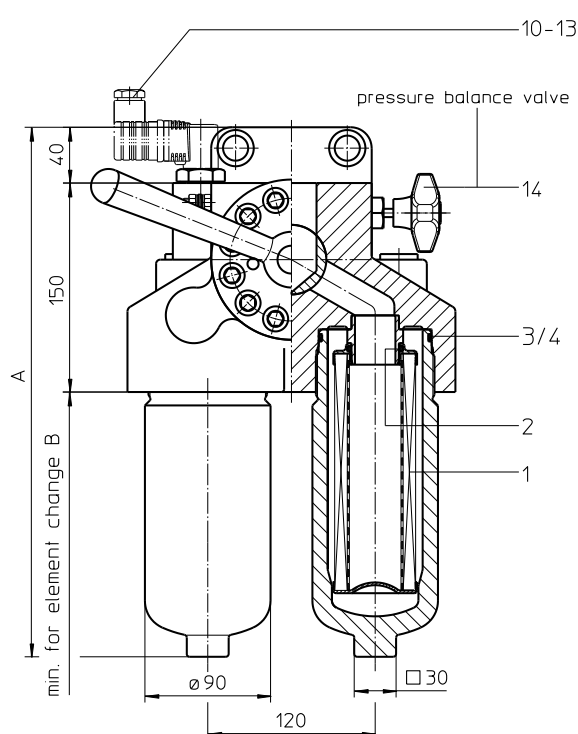
Brazil
Av. Ermano Marchetti, 1435 -
Água Branca, São Paulo - SP,
05038-001, Brazil
Tel: +55 11 3616-8461

**For more information, please
email us at filtration@eaton.com
or visit www.eaton.com/filtration**

© 2019 Eaton. All rights reserved. All trademarks and registered trademarks are the property of their respective owners. All information and recommendations appearing in this brochure concerning the use of products described herein are based on tests believed to be reliable. However, it is the user's responsibility to determine the suitability for his own use of such products. Since the actual use by others is beyond our control, no guarantee, expressed or implied, is made by Eaton as to the effects of such use or the results to be obtained. Eaton assumes no liability arising out of the use by others of such products. Nor is the information herein to be construed as absolutely complete, since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

Series HDD 170-450

DN40 PN315



Dimensions:

type	connection	A	B	weight	volume tank
HDD 170	SAE 1 1/2"	380	350	38 kg	2x 0,7 l
HDD 240		430	400	40 kg	2x 0,9 l
HDD 360		510	480	45 kg	2x 1,2 l
HDD 450		615	585	50 kg	2x 1,6 l

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

Measure 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: mm

Pressure Filter, change over Series HDD 170-450 DN40 PN315

Description:

Pressure filters change over series HDD 170-450 are suitable for operating pressure up to 315 bar. 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 up to a pressure resistance of Δp 160 bar and a rupture strength of Δp 250 bar.

Eaton filter can be used for petroleum-based fluids, HW emulsions, water glycols, most synthetic fluids and lubrication fluids. Consult factory for specific fluid applications.

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.

Type index:

Complete filter: (ordering example)

HDD.	170.	10VG.	HR.	E.	P.	-	FS.	7.	-	-	-	AE
1	2	3	4	5	6	7	8	9	10	11	12	13

- 1 | **series:**
HDD = pressure filter change over
- 2 | **nominal size:** 170, 240, 360, 450
- 3 | **filter material:**
25VG, 16VG, 10VG, 6VG, 3VG microglass
- 4 | **filter element collapse rating:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)
- 5 | **filter element design:**
E = single-end open
- 6 | **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 | **filter element specification:**
- = standard
VA = stainless steel
- 8 | **process connection:**
FS = SAE-flange connection 6000 PSI
- 9 | **process connection size:**
7 = 1 1/2"
- 10 | **filter housing specification:**
- = standard
- 11 | **specification pressure vessel:**
- = standard (PED 2014/68/EU)
IS20 = ASME VIII Div.1 with ASME equivalent material, see sheet no. 55217 (max. operating pressure 280 bar)
- 12 | **internal valve:**
- = without
S1 = with bypass valve Δp 3,5 bar
S2 = with bypass valve Δp 7,0 bar
R = reversing valve, $Q \leq 211,008$ l/min
- 13 | **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electric, see sheet-no. 1615
VS5 = electronic, see sheet-no. 1619

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

Filter element: (ordering example)

01E.	170.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

- 1 | **series:**
01E = filter element according to company standard
- 2 | **nominal size:** 170, 240, 360, 450
- 3 | - 7 | see type index-complete filter

Accessories:

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

Technical data:

operating temperature:	-10 °C to +100 °C
operating medium:	mineral oil, other media on request
max. operating pressure:	315 bar
test pressure:	450 bar
max. operating pressure at IS20:	280 bar
test pressure at IS20:	364 bar
process connection:	SAE-flange 6000 PSI
housing material:	EN-GJS-400-18-LT, C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
measuring connections:	G ¼
bleeder connections:	G ½

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 Δp and the element Δp and is calculated as follows:

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

$$\Delta p_{\text{Element}} (\text{mbar}) = Q \left(\frac{\text{l}}{\text{min}} \right) \times \frac{\text{MSK}}{10} \left(\frac{\text{mbar}}{\text{l/min}} \right) \times v \left(\frac{\text{mm}^2}{\text{s}} \right) \times \frac{p}{0,876} \left(\frac{\text{kg}}{\text{dm}^3} \right)$$

For ease of calculation our Filter Selection tool is available online at
www.eatonpowersource.com/calculators/filtration/

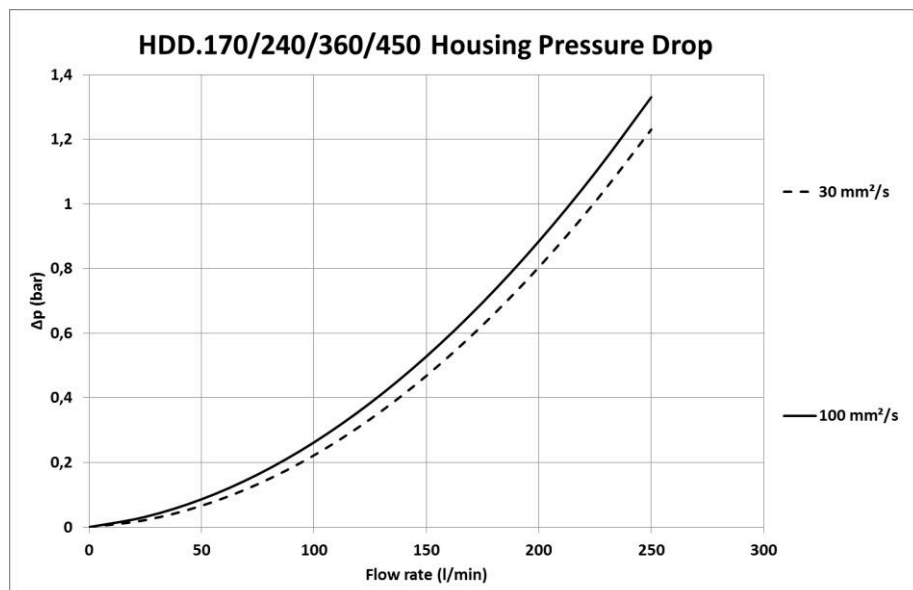
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in mbar/(l/min) apply to mineral oil (HLP) with a density of 0,876 kg/dm³ and a kinematic viscosity of 30 mm²/s (139 SUS). The pressure drop changes proportionally to the change in kinematic viscosity and density.

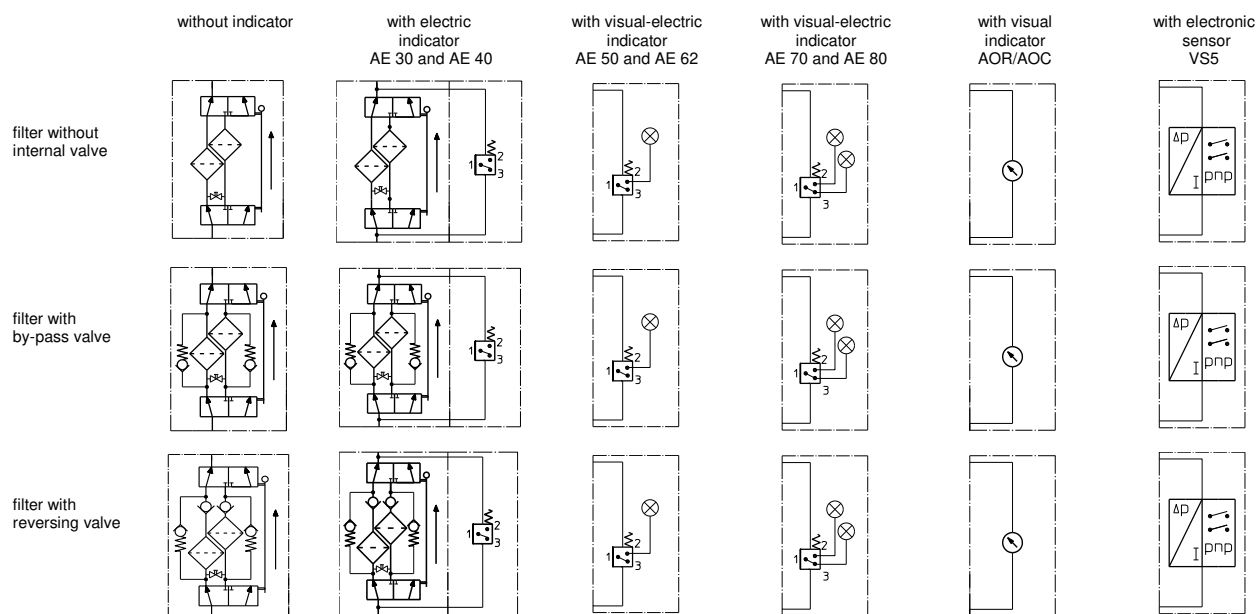
HDD	VG				
	3VG	6VG	10VG	16VG	25VG
170	2,187	1,518	0,972	0,846	0,578
240	1,685	1,170	0,749	0,652	0,446
360	1,233	0,856	0,548	0,477	0,326
450	0,907	0,630	0,403	0,351	0,240

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

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0,876 kg/dm³. The pressure drop changes proportionally to the density.



Symbols:



Spare parts:

item	qty.	designation	dimension				article-no.	
			HDD 170	HDD 240	HDD 360	HDD 450		
1	2	filter element	01E.170...	01E.240...	01E.360...	01E.450...		
2	2	O-ring	34 x 3,5				304338 (NBR)	304730 (FPM)
3	2	O-ring	75 x 3				302215 (NBR)	304729 (FPM)
4	2	support ring	81 x 2,6 x 1				304581	
5	2	O-ring	18 x 3				304359 (NBR)	304399 (FPM)
6	2	support ring	25 x 2,5 x 0,5				311311	
7	2	O-ring	56 x 3				305072 (NBR)	305322 (FPM)
8	2	screw plug	G 1/2				304678	
9	2	screw plug	G 1/4				305003	
10	1	clogging indicator, visual	AOR or AOC				see sheet-no. 1606	
11	1	clogging indicator, visual-electric	AE				see sheet-no. 1615	
12	1	clogging sensor, electronic	VS5				see sheet-no. 1619	
13	1	screw plug	20913-4				309817	
14	1	pressure balance valve	DN10				305000	

item 13 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

North America
44 Apple Street
Tinton Falls, NJ 07724
Toll Free: 800 656-3344
(North America only)
Tel: +1 732 212-4700

China
No. 3, Lane 280,
Linhong Road
Changning District, 200335
Shanghai, P.R. China
Tel: +86 21 5200-0099

Europe/Africa/Middle East
Auf der Heide 2
53947 Nettersheim, Germany
Tel: +49 2486 809-0

Friedensstraße 41
68804 Altludheim, Germany
Tel: +49 6205 2094-0

An den Nahewiesen 24
55450 Langenlonsheim, Germany
Tel: +49 6704 204-0

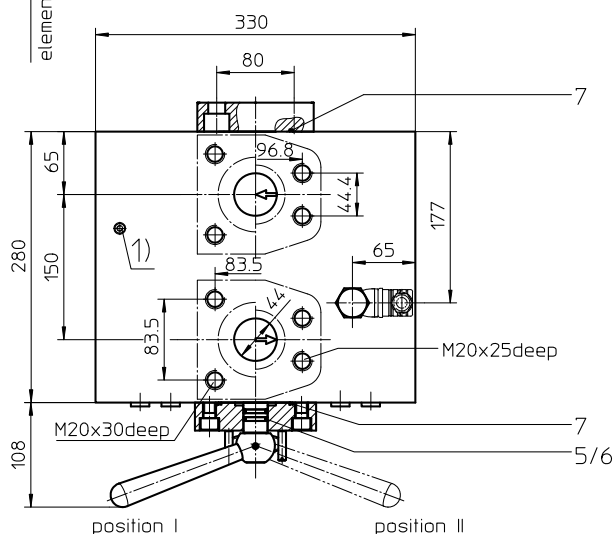
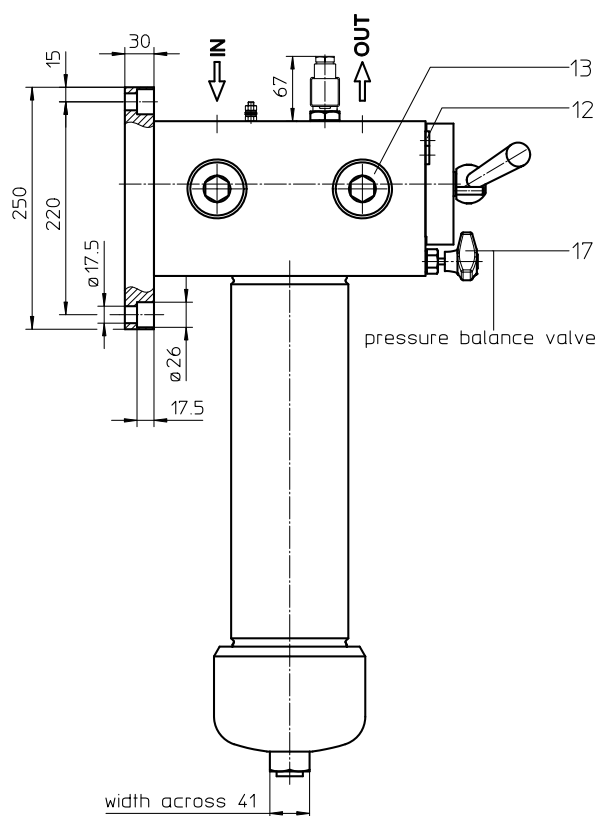
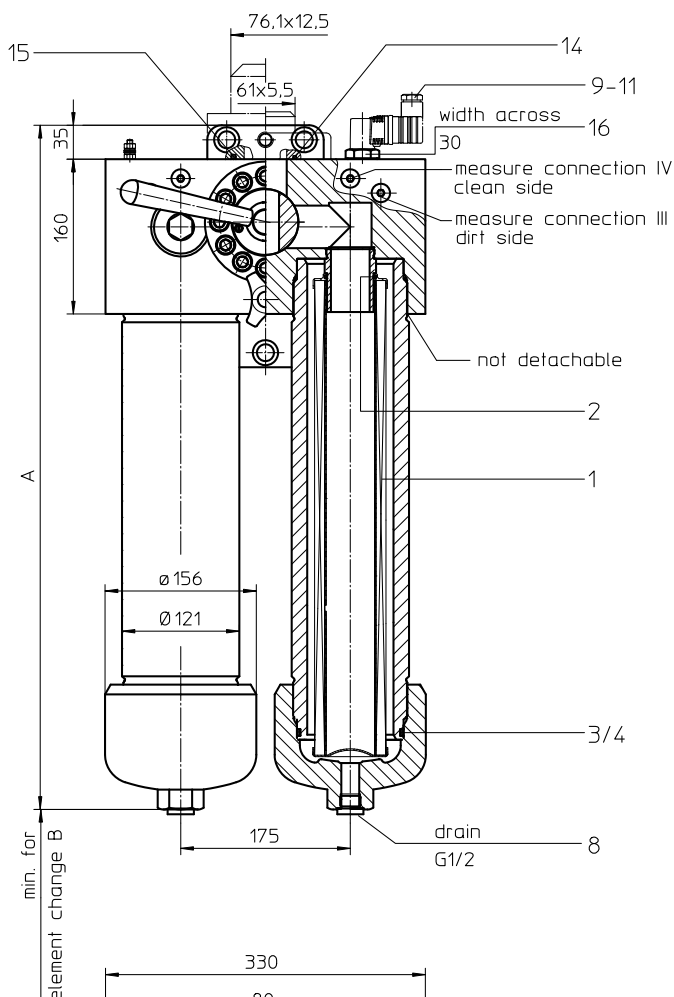
Singapore
100G Pasir Panjang Road #07-08
Singapore 118523
Tel: +65 6825-1668

Brazil
Av. Ermano Marchetti, 1435 -
Água Branca, São Paulo - SP,
05038-001, Brazil
Tel: +55 11 3616-8461

**For more information, please
email us at filtration@eaton.com
or visit www.eaton.com/filtration**

© 2019 Eaton. All rights reserved. All trademarks and registered trademarks are the property of their respective owners. All information and recommendations appearing in this brochure concerning the use of products described herein are based on tests believed to be reliable. However, it is the user's responsibility to determine the suitability for his own use of such products. Since the actual use by others is beyond our control, no guarantee, expressed or implied, is made by Eaton as to the effects of such use or the results to be obtained. Eaton assumes no liability arising out of the use by others of such products. Nor is the information herein to be construed as absolutely complete, since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

Series HDD 601-1351
DN50 PN315



Dimensions:

type	HDD 601	HDD 901	HDD 1351
connection	2"		
A	557	707	955
B	310	460	710
weight kg	145	158	182
volume tank	2x 2.1 l	2x 3.1 l	2x 4.6 l

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

Measure 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: mm

Designs and performance values are subject to change.

Pressure Filter, change over Series HDD 601-1351 DN50 PN315

Description:

Pressure filters changeover series HDD 601-1351 are suitable for operating pressure up to 315 bar. The pressure peaks are absorbed by a sufficient margin of safety.

Duplex filters can be maintained without interruption. 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 reduction of area.

The change-over can be done easily by opening of the change-over valve.

The mini-measuring connections on each filter-side allow the measuring of the pressure drop through the filter element, as well as at the pressure discharge of the tube plug during the maintenance. Filter elements are available down to a filter fineness of 4 µm(c).

For cleaning the stainless steel mesh element (see special leaflets 21070-4 and 39448-4) or changing the filter element, remove the tube plug and take out the element. The mesh elements are not guaranteed to maintain 100% performance after cleaning.

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 up to a pressure resistance of Δp 160 bar and a rupture strength of Δp 250 bar.

Eaton filter can be used for petroleum-based fluids, HW emulsions, water glycols, most synthetic fluids and lubrication fluids. Consult factory for specific fluid applications.

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.

Type index:

Complete filter: (ordering example)

HDD.	901.	10VG.	HR.	E.	P.	-	FS.	8.	-	-	AE
1	2	3	4	5	6	7	8	9	10	11	12

- 1 | **series:**
HDD = pressure filter change over
- 2 | **nominal size:** 601, 901, 1351
- 3 | **filter material:**
80G, 40G, 25G stainless steel wire mesh
25VG, 16VG, 10VG, 6VG, 3VG microglass
- 4 | **filter element collapse rating:**
30 = Δp 30 bar
HR = Δp 160 bar (rupture strength Δp 250 bar)
- 5 | **filter element design:**
E = single-end open
- 6 | **sealing material:**
P = Nitrile (NBR)
V = Viton (FPM)
- 7 | **filter element specification:**
- = standard
VA = stainless steel
- 8 | **process connection:**
FS = SAE-flange connection 6000 PSI (standard)
FV = AVIT-flange connection 320 bar (special design)
- 9 | **process connection size:**
8 = 2"
- 10 | **filter housing specification:**
- = standard
- 11 | **internal valve:**
- = without
S1 = with bypass valve Δp 3,5 bar
S2 = with bypass valve Δp 7,0 bar
R = reversing valve, Q ≤ 465,384 l/min
- 12 | **clogging indicator or clogging sensor:**
- = without
AOR = visual, see sheet-no. 1606
AOC = visual, see sheet-no. 1606
AE = visual-electric, see sheet-no. 1615
VS5 = electronic, see sheet-no. 1619

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

Filter element: (ordering example)

01E.	900.	10VG.	HR.	E.	P.	-
1	2	3	4	5	6	7

- 1 | **series:**
01E = filter element according to company standard
- 2 | **nominal size:** 600, 900, 1350
- 3 | - 7 | see type index-complete filter

Accessories:

- gauge port- and bleeder connections, see sheet-no. 1650
- SAE-counter flange, see sheet-no. 1652
- AVIT-counter flange, see sheet-no. 1654

Technical data:

operating temperature:	-10 °C to +100 °C
operating medium:	mineral oil, other media on request
max. operating pressure:	315 bar
test pressure:	450 bar
process connection:	SAE-flange 6000 PSI (standard) or AVIT-flange 320 bar (special design)
housing material:	C-steel
sealing material:	Nitrile (NBR) or Viton (FPM), other materials on request
installation position:	vertical
bleeder- and measuring connections:	G 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 Δp and the element Δp and is calculated as follows:

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

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

$$\Delta p_{\text{Element}} (\text{mbar}) = Q \left(\frac{\text{l}}{\text{min}} \right) \times \frac{\text{MSK}}{10} \left(\frac{\text{mbar}}{\text{l/min}} \right) \times v \left(\frac{\text{mm}^2}{\text{s}} \right) \times \frac{p}{0,876} \left(\frac{\text{kg}}{\text{dm}^3} \right)$$

For ease of calculation our Filter Selection tool is available online at

www.eatonpowersource.com/calculators/filtration/

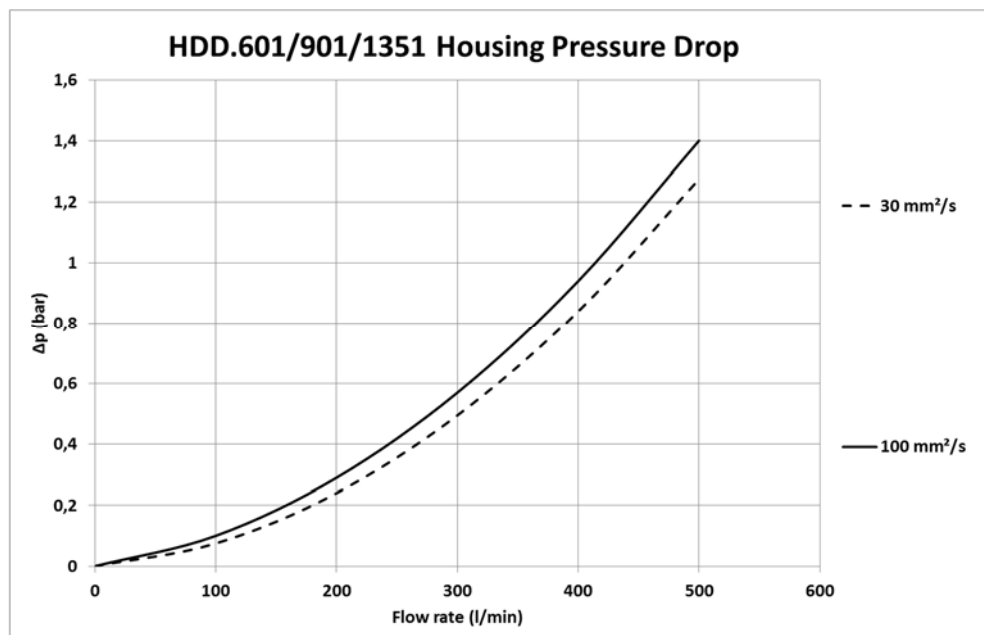
Material gradient coefficients (MSK) for filter elements

The material gradient coefficients in mbar/(l/min) apply to mineral oil (HLP) with a density of 0,876 kg/dm³ and a kinematic viscosity of 30 mm²/s (139 SUS). The pressure drop changes proportionally to the change in kinematic viscosity and density.

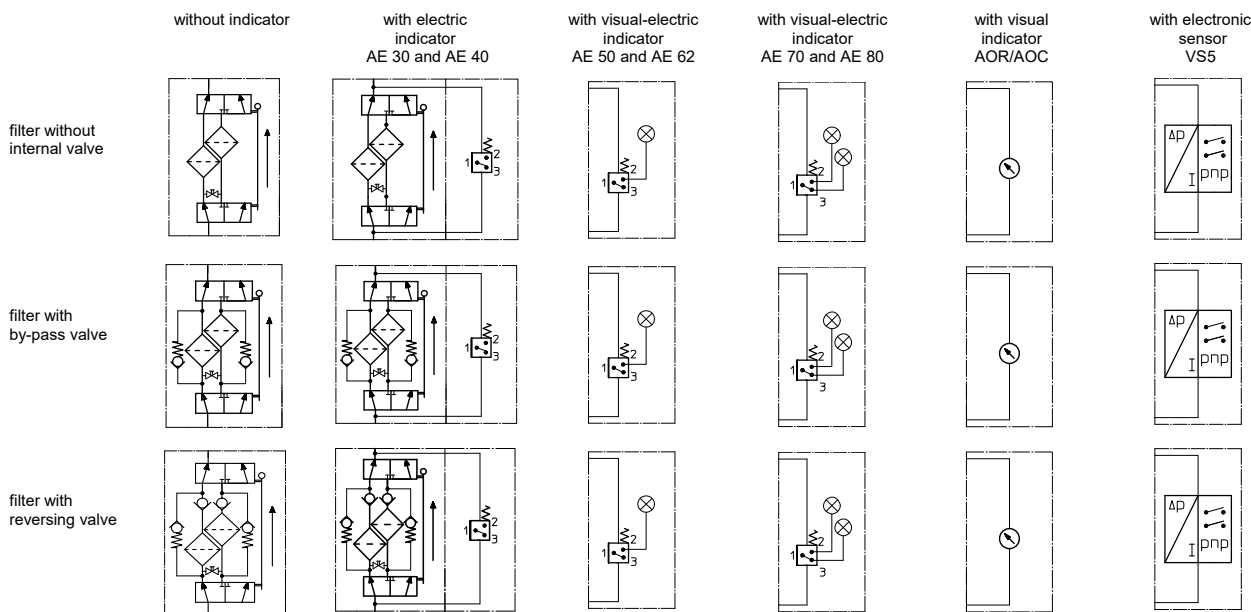
HDD	VG					G		
	3VG	6VG	10VG	16VG	25VG	25G	40G	80G
601	0,776	0,539	0,345	0,300	0,205	0,0247	0,0231	0,0158
901	0,538	0,374	0,239	0,208	0,142	0,0155	0,0144	0,0099
1351	0,336	0,233	0,149	0,130	0,089	0,0100	0,0093	0,0064

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

The pressure drop characteristics apply to mineral oil (HLP) with a density of 0,876 kg/dm³. The pressure drop changes proportionally to the density.



Symbols:



Spare parts:

item	qty.	designation	dimension			article-no.	
			HDD 601	HDD 901	HDD 1351		
1	2	filter element	01E.600...	01E.900...	01E.1350...		
2	2	O-ring		48 x 3		304357 (NBR)	304404 (FPM)
3	2	O-ring		98 x 4		301914 (NBR)	304765 (FPM)
4	2	support ring		110 x 3,5 x 2		304802	
5	2	O-ring		18 x 3		304359 (NBR)	304399 (FPM)
6	2	support ring		25 x 2,5 x 0,5		311311	
7	2	O-ring		71 x 3		306451 (NBR)	306897 (FPM)
8	2	screw plug		G 1/2		304678	
9	1	clogging indicator, visual		AOR or AOC		see sheet-no. 1606	
10	1	clogging indicator, visual-electric		AE		see sheet-no. 1615	
11	1	clogging sensor, electronic		VS5		see sheet-no. 1619	
12	4	screw plug		G 1/4		305003	
13	8	screw plug		G 1 1/2		311475	
14	1	O-ring		56,75 x 3,53		306035 (NBR)	310264 (FPM)
15	1	O-ring		61 x 5			
16	1	screw plug		20913-4		309817	
17	1	pressure balance valve		DN10		305000	

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

North America
44 Apple Street
Tinton Falls, NJ 07724
Toll Free: 800 656-3344
(North America only)
Tel: +1 732 212-4700

China
No. 3, Lane 280,
Linhong Road
Changning District, 200335
Shanghai, P.R. China
Tel: +86 21 5200-0099

Europe/Africa/Middle East
Auf der Heide 2
53947 Nettersheim, Germany
Tel: +49 2486 809-0

Friedensstraße 41
68804 Altlussheim, Germany
Tel: +49 6205 2094-0

An den Nahewiesen 24
55450 Langenlonsheim, Germany
Tel: +49 6704 204-0

Singapore
100G Pasir Panjang Road #07-08
Singapore 118523
Tel: +65 6825-1668

Brazil
Av. Ermano Marchetti, 1435 -
Água Branca, São Paulo - SP,
05038-001, Brazil
Tel: +55 11 3616-8461

**For more information, please
email us at filtration@eaton.com
or visit www.eaton.com/filtration**

© 2019 Eaton. All rights reserved. All trademarks and registered trademarks are the property of their respective owners. All information and recommendations appearing in this brochure concerning the use of products described herein are based on tests believed to be reliable. However, it is the user's responsibility to determine the suitability for his own use of such products. Since the actual use by others is beyond our control, no guarantee, expressed or implied, is made by Eaton as to the effects of such use or the results to be obtained. Eaton assumes no liability arising out of the use by others of such products. Nor is the information herein to be construed as absolutely complete, since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.